SIGMATEK

Product Catalog

V8.7

01/2024

S-DIAS Control and I/O System

S-DIAS Safety

P-DIAS I/O System (IP67)

Industrial PCs

HMIs

Motion Control System

MSR-System

Accessories

VARAN Accessories

Engineering Tool LASAL

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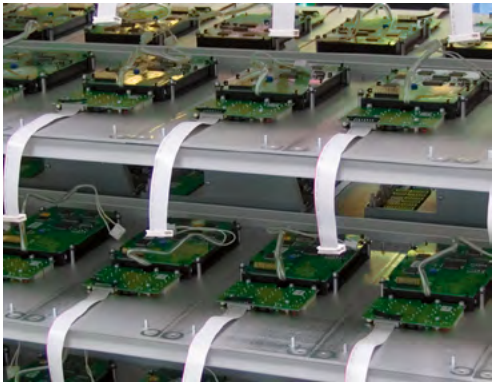



SIGMATEK

SIGMATEK

Founded in 1988, today SIGMATEK is internationally one of the leading manufacturers of complete and fully integrated automation systems. A spirit of innovation, competence and absolute customer orientation has brought us to the forefront of automation technology.

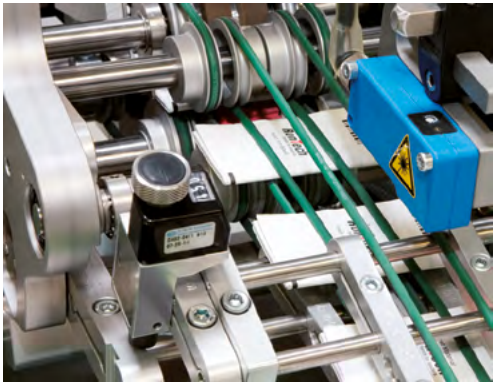
Trend-Setting Automation Solutions

Integrated automation systems increase the flexibility and productivity of your machine. Here lies SIGMATEK's core expertise. All hard and software components for our automation systems are designed and produced in the main factory in Lamprechtshausen. Thanks to their compatibility and scalability, the components can be flexibly combined; a tailor-made automation solution with long-term availability is therefore provided.


We MaxUp
your Automation

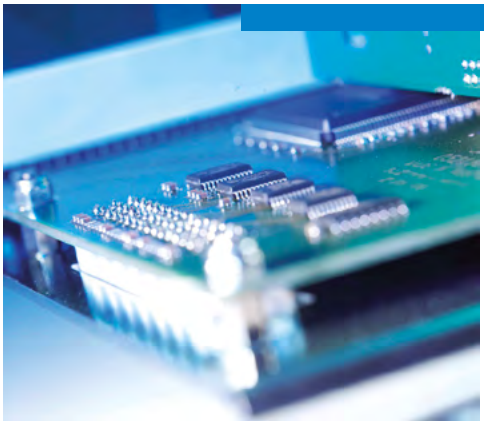
We MaxUp your Automation

... with complete automation systems, engineering know-how and industry experience. You therefore receive flexible solutions with added value.



Solution Expertise

SIGMATEK has combined expertise and a high degree of experience in the most varying application areas and industries. We understand your specific needs, have a feeling for trends and quickly convert them into serial products. Whereby, we never lose sight of the big picture. The customer therefore receives a tailor-made industry solution.

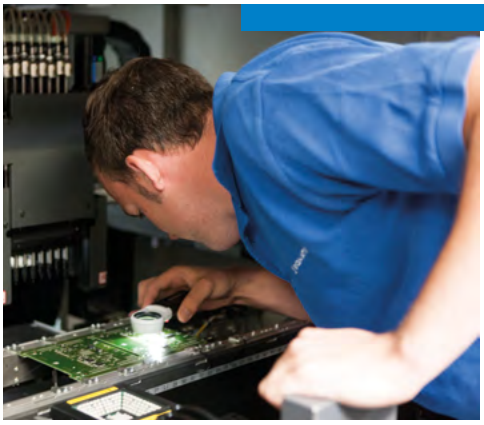


Head Start Through Innovation

Innovation is the result of our passion for the continuous improvement of products and solutions. With innovative new and improved designs, we are setting future trends. This allows us to maintain our role as a technology leader and continually build on our position in the automation industry.

Always Close to the Customer

We are experts in integrated complete solutions. This gives the customer the advantage of having just one contact partner for all their automation questions. With a complete view of the machine process, we support you over for the entire product life cycle: from finding a solution, project development through the application engineering and initial start-up to service and remote maintenance.



Uncompromising Quality

All components are produced in the main facility in Austria. Here, trend-setting technology at an economic price with high reliability and long-term availability is produced. This is an added value that our customers know to appreciate. The most modern production technologies and an ISO 9001: 2008-certified quality management system guarantee the continuous high quality of our products.

Complete Automation Systems

At SIGMATEK, hard and software come from one source. Our fully integrated system solutions are modularly constructed like a toolbox system. This modularity offers you an important competitive advantage: the most varying customer requirements can be implemented flexibly and efficiently. The compatibility and scalability of the components are just as guaranteed as the long-term availability.

PLC

The right CPU is available for any application: compact controls component series, control panels with integrated visualization or classic industrial PCs. Different processors are thereby used, from low-loss EDGE technology to Intel® Atom™. The scalability and compatibility of the user software goes without saying.

I/O

The I/O modules of the DIAS system family cover IP20 (S-DIAS) as well as IP67 (P-DIAS) requirements. For Safety applications, S-DIAS Safety modules are available. The numerous standard modules can be combined individually and therefore perfectly customized for any application.

HMI

A broad spectrum of HMI panels are available to choose from: from simple non-intelligent operating terminals to control panels with integrated CPUs. A diversity of sizes is also available: from 5.7″ to 24″.

Motion Control

At SIGMATEK, motion control is fully integrated into the control system. Motors, DIAS Drives and software interact perfectly and enable highly dynamic and exact movement sequences. The engineering is simple. Important safety functions are already integrated.

Safety

The fully integrated and TÜV-certified Safety system allows the simple implementation of Safety requirements in accordance with EN 62061/SIL3/PL e. The Safety systems can be combined with the S-DIAS series as desired. The uncomplicated installation and comfortable programming contribute to the efficiency of your machine.

Communication

Integrated, hard real-time communication is the backbone of modern communication systems. The Ethernet technology-based VARAN bus system provides a great deal of freedom for plant design through different network topologies. Data is exchanged in hard real-time with guaranteed determination at cycle times up to 100 µs and jitter under 100 ns.

Engineering

SIGMATEK automation systems are completed with the comfortable "all-in-one" engineering tool LASAL, which scores with object oriented programming and graphic representation. LASAL enables the fast and efficient realization of machine concepts: PLC programming, HMI, motion control, Safety, diagnostics and service.

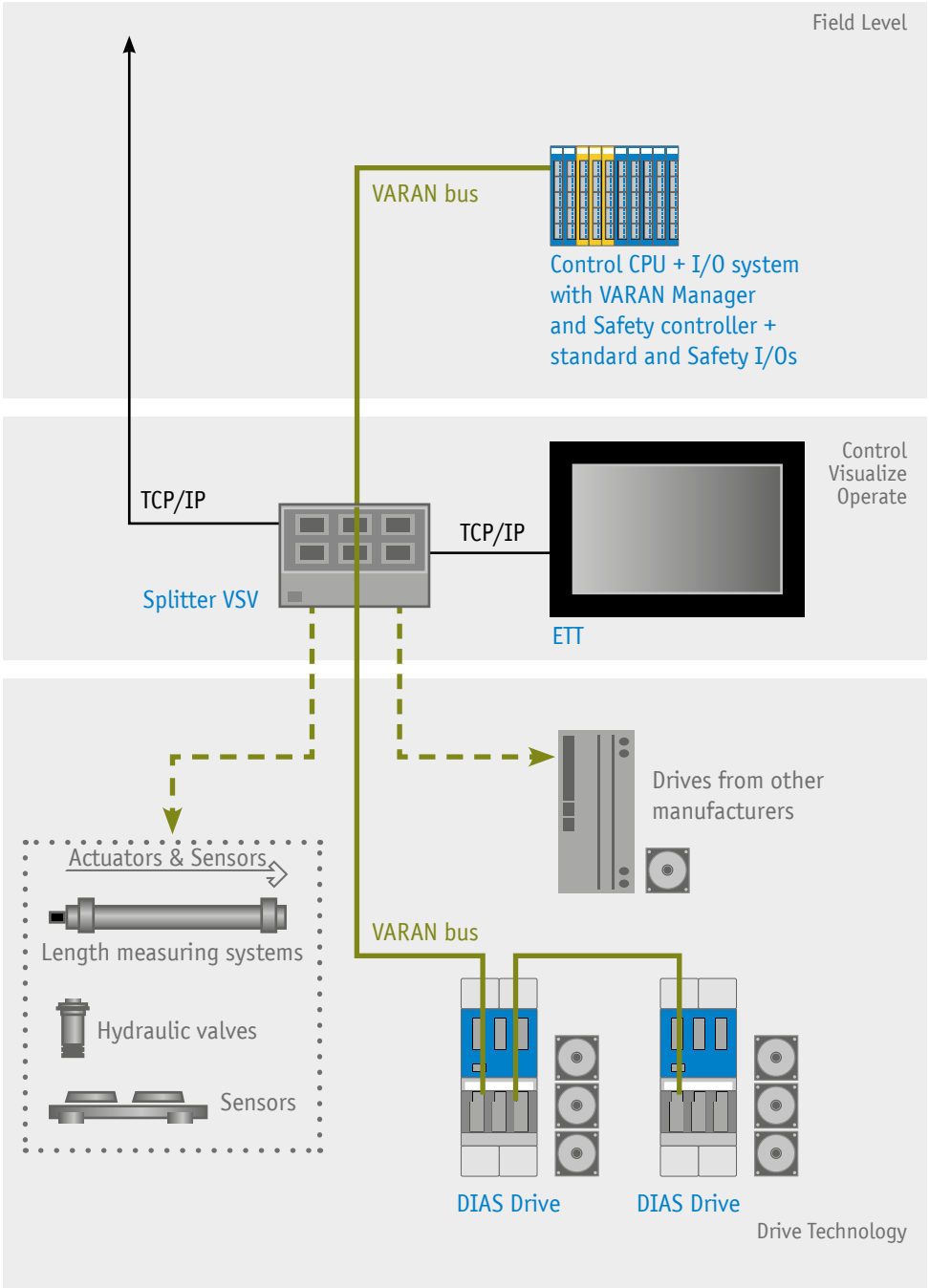

SYSTEM
HMI
10010011
PLC
MOTION
SAFETY
COMMUNICATION
LASAL
ENGINEERING
We MaxUp
your Automation

Standard Topologies

With our multiple standard components, we can customize the solution for your automation tasks to fit your individual requirements; your needs are met with the best solution at an economic price.

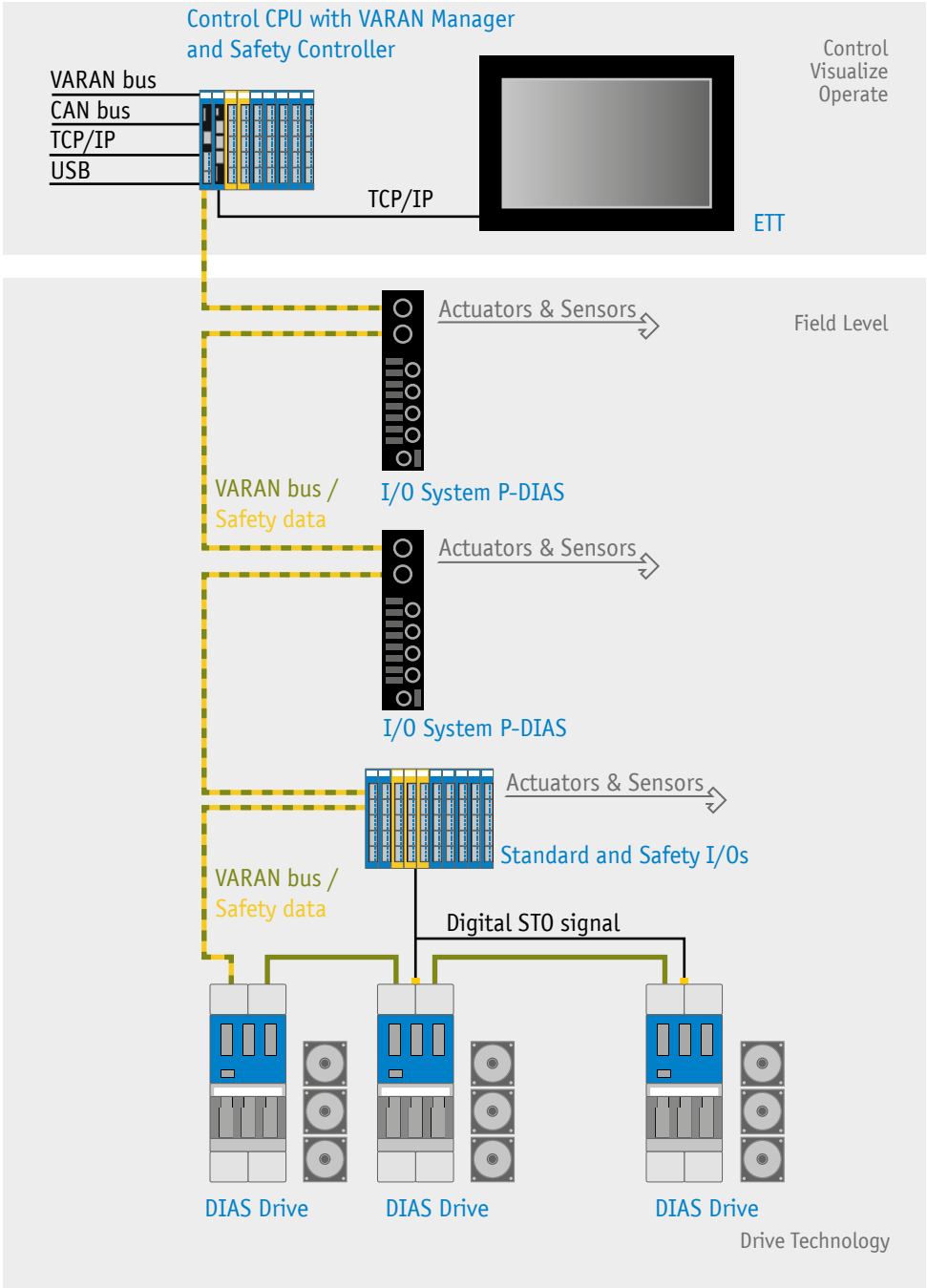
Distributed Sensors + Centralized Automation

For modular machine concepts with several function units that are similar, a central control is used to reduce costs. and all components are networked over the extremely fast, high performance real-time Ethernet bus VARAN.
With a Laptop, for example, the designer can establish an online connection over each available splitter.


Field Level
VARAN bus
Control CPU + I/O system
with VARAN Manager
and Safety controller +
standard and Safety I/Os
Control
Visualize
Operate
TCP/IP
TCP/IP
Splitter VSV
ETT
Drives from other
manufacturers
Actuators & Sensors
Length measuring systems
Hydraulic valves
Sensors
VARAN bus
DIAS Drive
DIAS Drive
Drive Technology

Control Unit with Remote Visualization

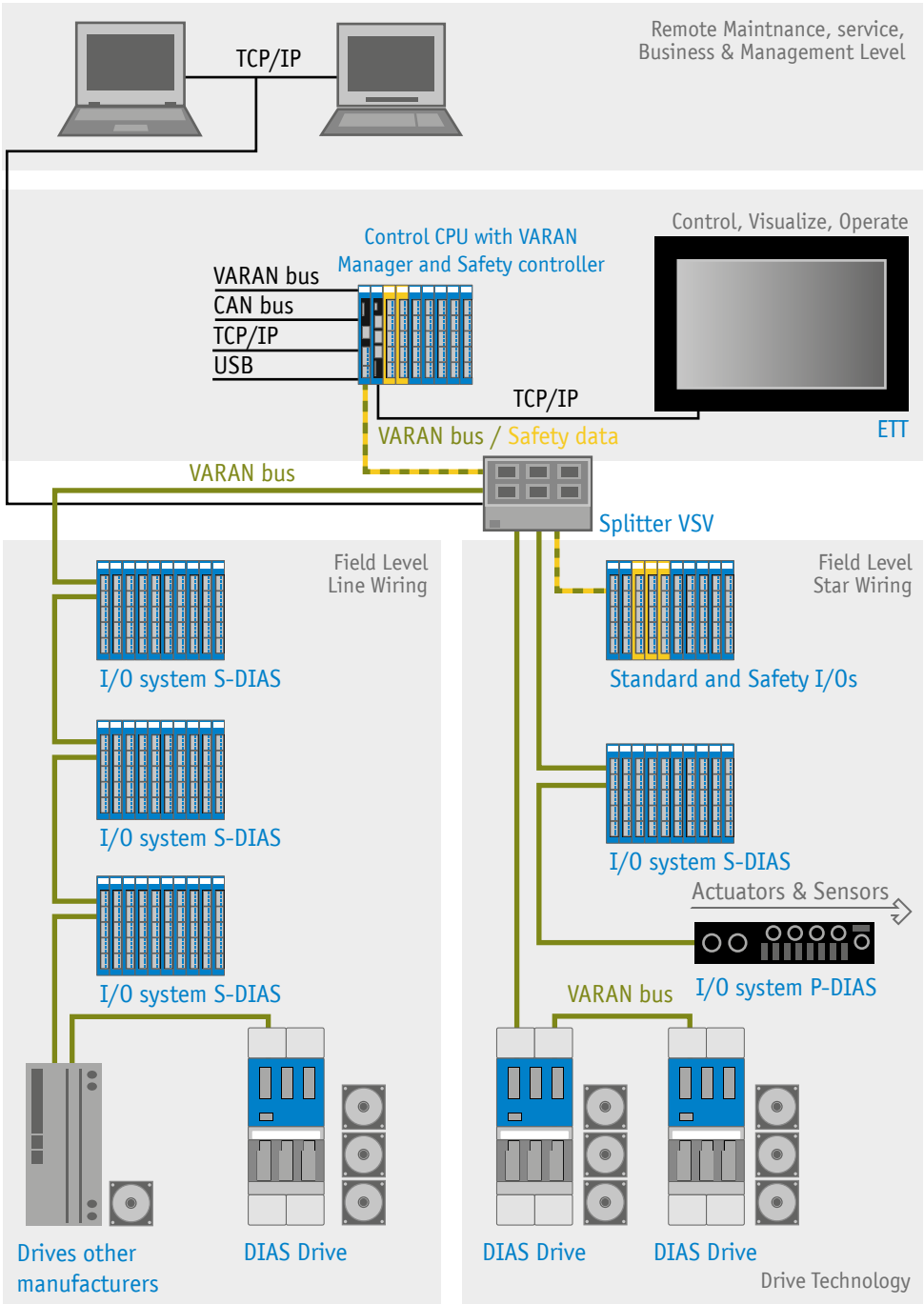
The terminal can be located up to 15 meters away from the control unit in the switching closet. The screen content, touch input and the USB are integrated into the S-DVI; the display unit itself does not have any intelligence. The various I/O components and drives are networked over the extremely fast, high performance real-time Ethernet bus VARAN.


Control CPU with VARAN Manager
and Safety Controller
Control
Visualize
Operate
VARAN bus
CAN bus
TCP/IP
USB
TCP/IP
ETT
Actuators & Sensors
Field Level
VARAN bus /
Safety data
I/O System P-DIAS
Actuators & Sensors
I/O System P-DIAS
Actuators & Sensors
Standard and Safety I/Os
VARAN bus /
Safety data
Digital STO signal
DIAS Drive
DIAS Drive
DIAS Drive
Drive Technology

Continuous Network with the Real-Time Ethernet VARAN Bus

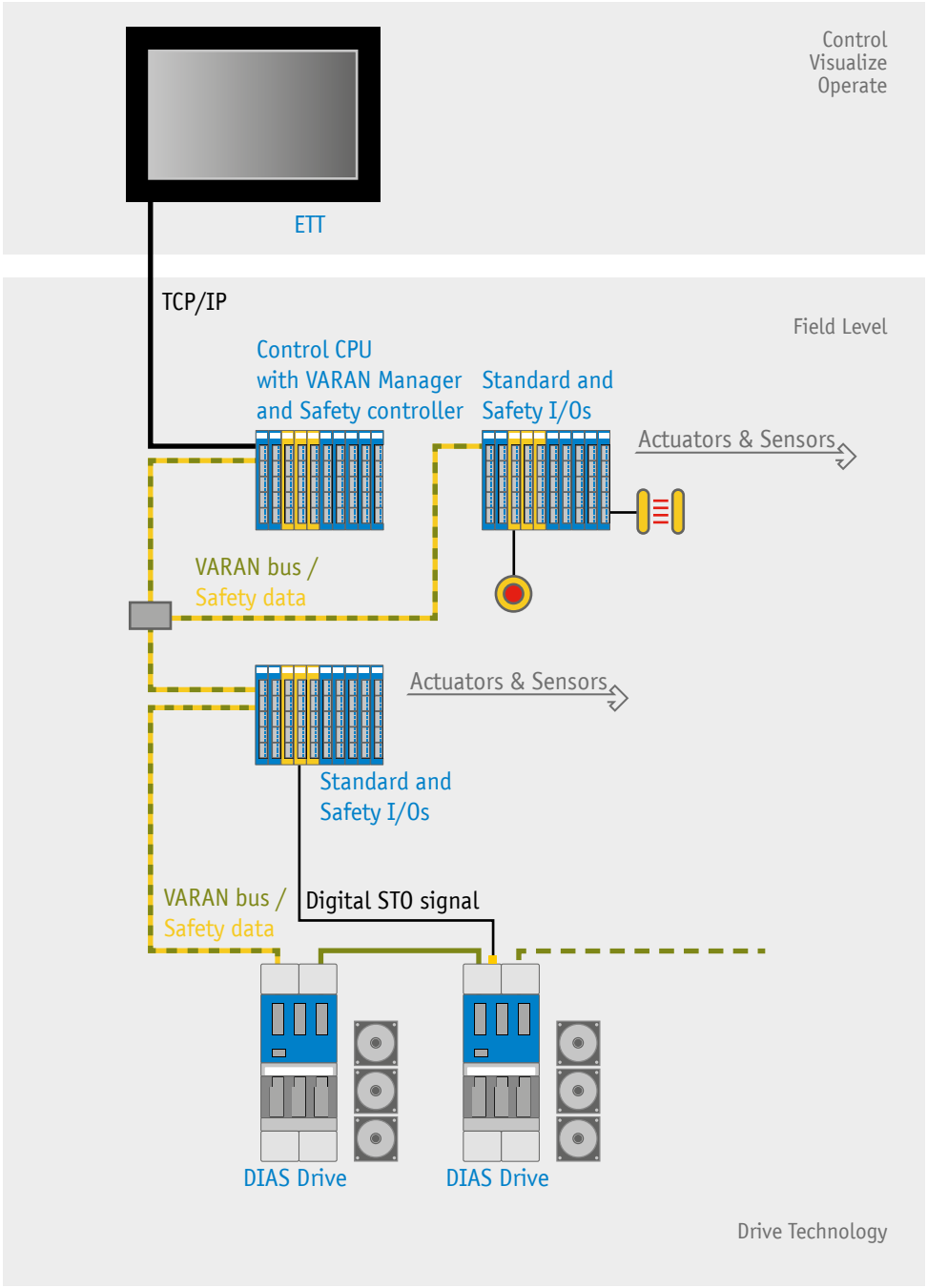
Continuous vertical communication is becoming increasingly important; connectivity from the control level to the field bus level.

The hard real-time capable VARAN bus is used to connect or network the automation components. The VMC 052 Varan Manager client makes it possible to network several autonomous VARAN systems. This client has a DPRAM over which a defined exchange of data occurs between VARAN networks in real time, ensuring highly dynamic and synchronous applications.


Remote Maintnance, service,
Business & Management Level
TCP/IP
Control CPU with VARAN
Manager and Safety controller
VARAN bus
CAN bus
TCP/IP
USB
Control, Visualize, Operate
TCP/IP
VARAN bus / Safety data
ETT
VARAN bus
Splitter VSV
Field Level
Line Wiring
I/O system S-DIAS
I/O system S-DIAS
I/O system S-DIAS
Drives other
manufacturers
DIAS Drive
Field Level
Star Wiring
Standard and Safety I/Os
I/O system S-DIAS
Actuators & Sensors
I/O system P-DIAS
VARAN bus
DIAS Drive
DIAS Drive
Drive Technology

Safety Fully Integrated into the Control System

Through a decentralized configuration and component modularity, the Safety components can be flexibly integrated into the control architecture. Safe and non-safe components can be combined as desired. The DIAS Drives already contain important safety functions such as Safe Stop 1 (SS1) and Safe Torque Off (STO).


Control
Visualize
Operate
ETT
TCP/IP
Field Level
Control CPU
with VARAN Manager
and Safety controller
Standard and
Safety I/Os
Actuators & Sensors
VARAN bus /
Safety data
Actuators & Sensors
Standard and
Safety I/Os
VARAN bus /
Safety data
Digital STO signal
DIAS Drive
DIAS Drive
Drive Technology

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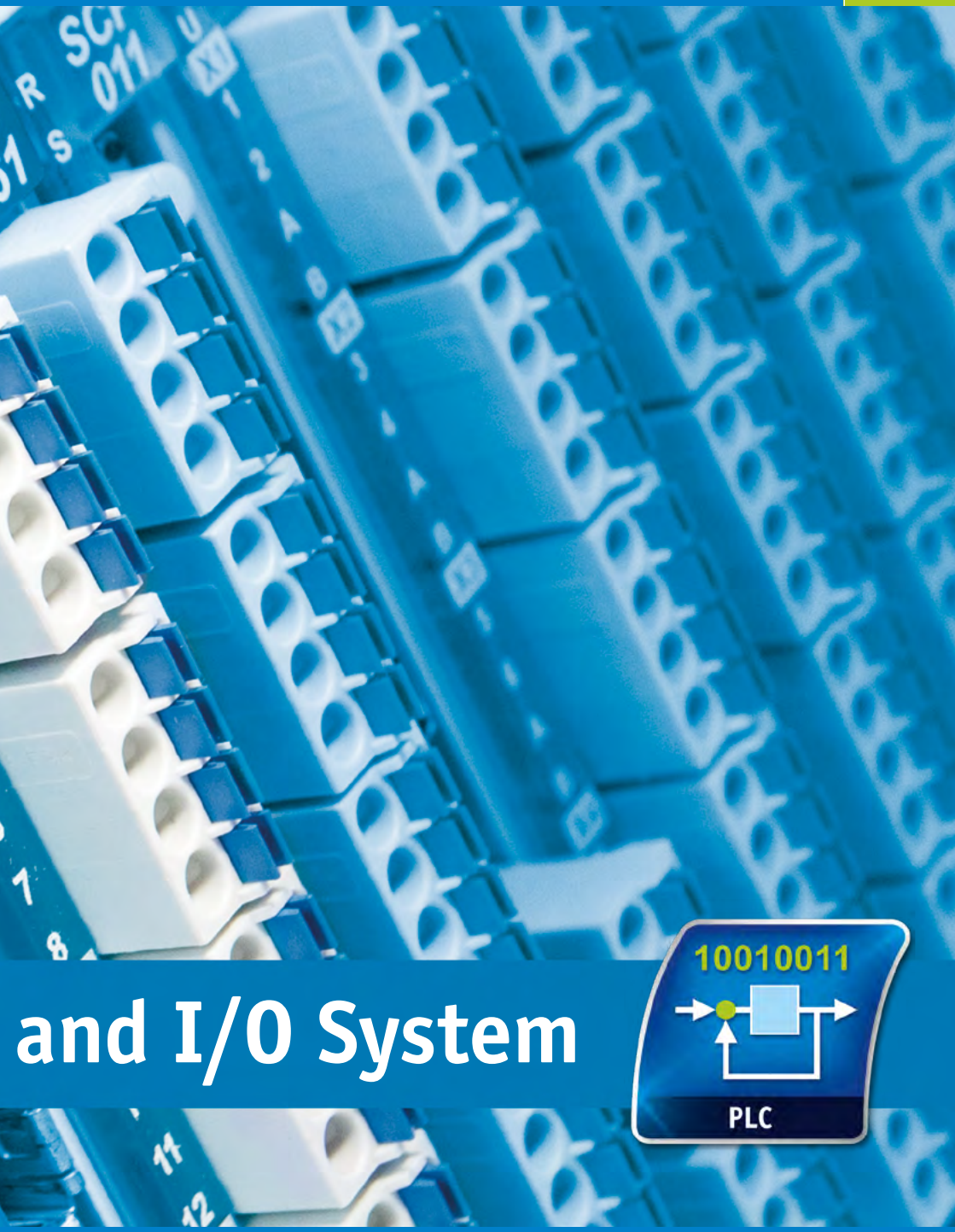
S-DIAS Control



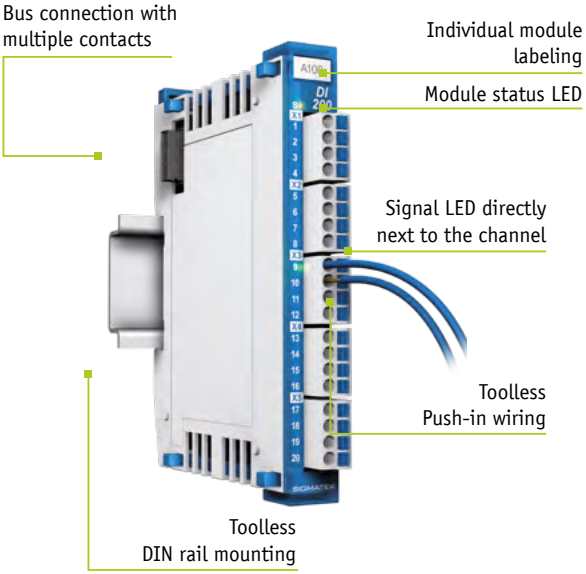
and I/O System

System S-DIAS

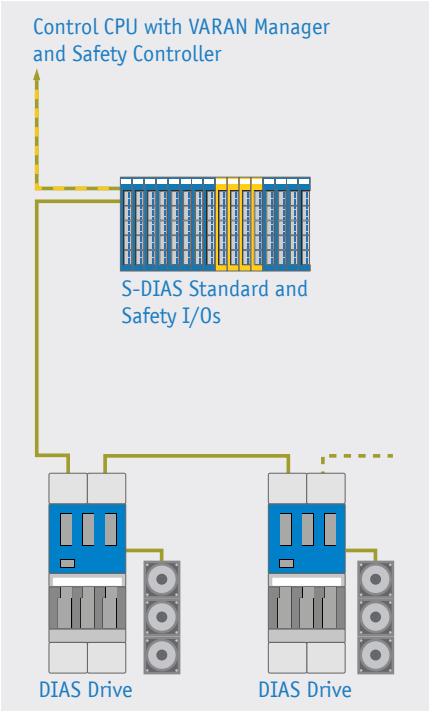
With up to 20 I/Os per module, the new, super compact I/O series has the highest package density to date - and that with dimensions of only 12.5 x 103.5 x 72 mm (W x H x D).

The modules communicate quickly (100 MBit/s) and safely over the realtime ethernet bus VARAN. The update time for 64 modules with up to 1,280 I/Os is under 60 µs.

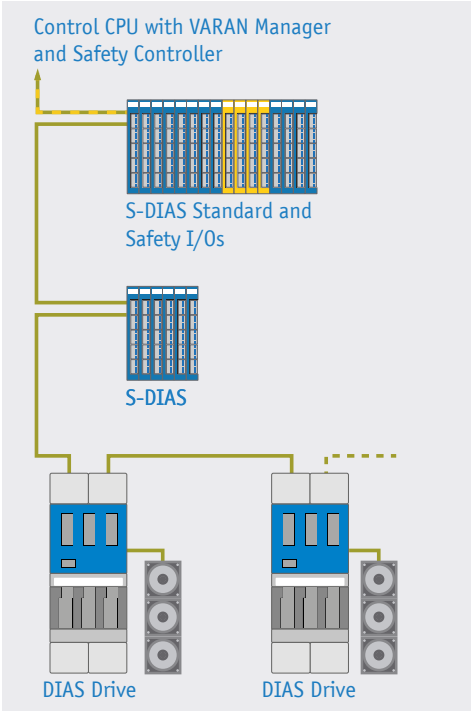
In addition to the space-saving design, special attention was given to high usability and easy handling: operational complete modules, toolless DIN rail mount, standard connectors with Push-in wiring, signal LEDs directly next to the individual channels and mechanical interlocking, which provides high reliability and vibration tolerance. This reduces the work of assembly, wiring, servicing as well as ordering and storing to a minimum. Safety is fully integrated and already TÜV certified.



Possible Configurations



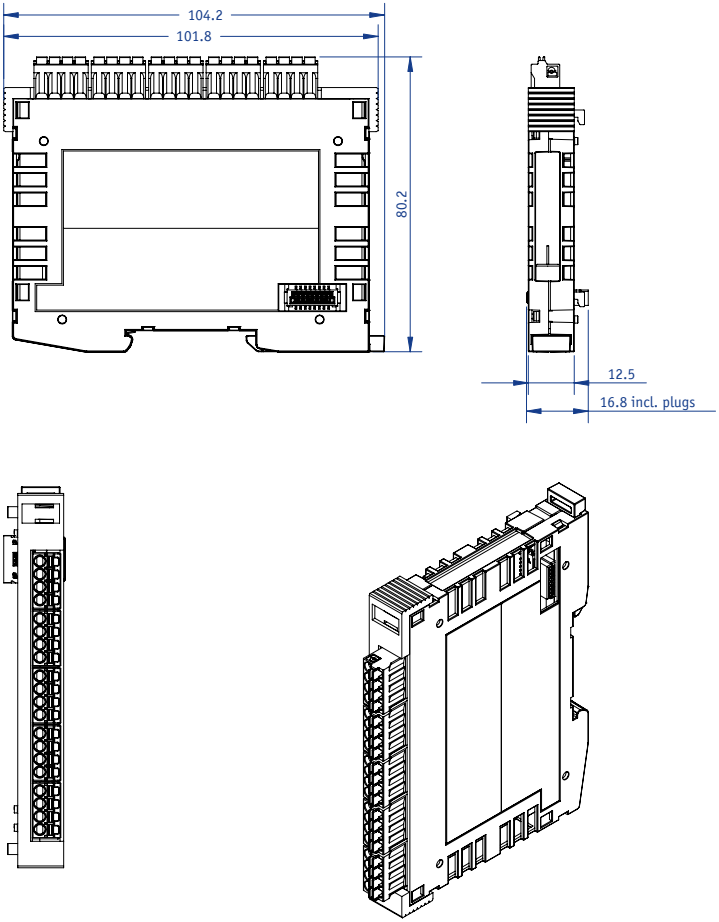
local

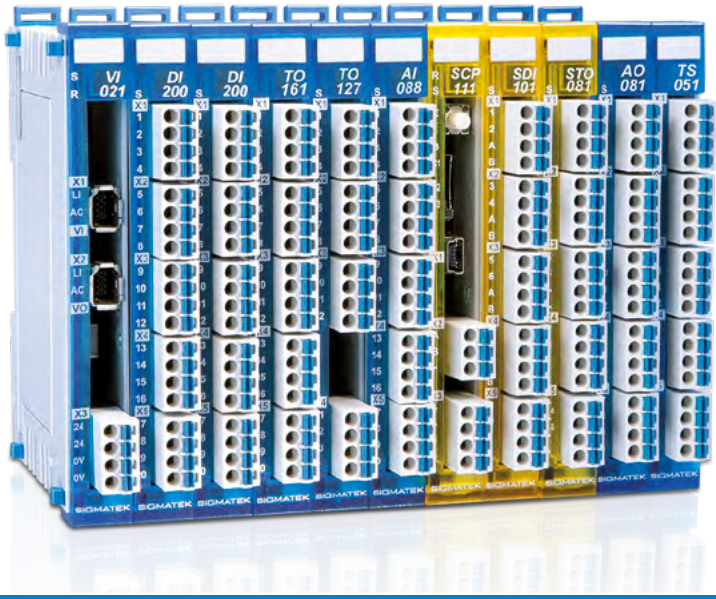


decentralized

The configuration can be local, decentralized or a combination of both. Whether the modules are mechanically placed next to one another or perform their tasks in a physically separated location does not matter.

Mechanical Dimensions




VI 021
DI 200
DI 200
TO 161
TO 127
AI 088
SCP 111
SDI 101
STO 081
AO 081
TS 051
SIGMATEK

S-DIAS Modules

CPU & Bus Coupling

Interfaces & Splitters

Digital Input
Digital Output
Digital Mix
Digital Analog Mix

Analog Input
Analog Output
Analog Mix

Counters & Position Recording

Measurement Technology

Motion

Special Functions

S-DIAS CPU Module
CP 101

with 1 Ethernet
1 USB Device
1 CAN

The S-DIAS CP 101 CPU module is a high-performance processor unit for the S-DIAS I/O modules. With the Ethernet and CAN bus interfaces, the module can be used for various applications. A zero-voltage protected RAM area is available, which is implemented by copying a data block from the DDR RAM to the NAND Flash.

The voltage supply is already available in the module. With this variant, a maximum of 12 I/O modules can be powered. S-DIAS has no intelligent master (manager).

Performance Data

Processor	EDGE2 Technology
Addressable I/O/P modules	CAN participants: > 100 S-DIAS bus: 64 (of which a maximum of 12 modules can be powered)
Internal I/O	no
Internal cache	512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	256-Mbyte
Internal remnant data memory	2-kbytes (one Flash block)
Internal storage device	NAND Flash 256-Mbyte
Interfaces	1x Ethernet 1x CAN 1x USB device 1.1 1x S-DIAS (without manager)
Data buffer	yes
Status display	no
Status LEDs	yes
Real-time clock	no

Electrical Requirements

Module Supply (Input)			
	Supply voltage	+18-30 V DC, typically +24 V DC UL: Class 2 or LVLC	
	Current consumption of voltage supply (+24 V)	typically 80 mA	maximum 850 mA
S-DIAS Bus Supply (Output)			
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	maximum 0.6 A	
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V supply)	maximum 0.6 A	

Article Number and Miscellaneous

	Article number	20-004-101
	Operating system	Salamander
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS CPU-Module
CP 102

with 1 Ethernet
1 USB-OTG (On-the-Go)
1 CAN

The CPU in slice format with USB OTG is the right choice for slim automation systems. Individual I/O modules can be accessed within 1.12 µs.

A zero-voltage protected RAM area is available, which is implemented by copying a data block from the DDR RAM to the NAND Flash.

The voltage supply is already available in the module and with this variant, a maximum of 12 I/O modules can be powered. S-DIAS has no intelligent master (manager).

Performance Data

Processor	EDGE2 Technology
Addressable I/O/P modules	CAN participants: > 100 S-DIAS bus: 64 (of which a maximum of 12 modules can be powered)
Internal I/O	no
Internal cache	512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	256-Mbyte
Internal remnant data memory	2-kbyte (one Flash block)
Internal storage device	NAND Flash 256-Mbyte
Interfaces	1x Ethernet 1x CAN 1x USB-OTG (Host/Device) (for service purposes only) 1x S-DIAS (without manager)
Data buffer	yes
Status display	no
Status LEDs	yes
Real-time clock	no

Electrical Requirements

Module Supply (Input)			
	Supply voltage	+18-30 V DC, typically +24 V DC UL: Class 2 or LVLC	
	Current consumption of voltage supply (+24 V)	typically 100 mA	maximum 1 A
S-DIAS Bus Supply (Output)			
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	maximum 0.6 A	
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V supply)	maximum 0.6 A	
	USB Host (OTG) (can only be used with a USB stick for service purposes)	+5 V DC maximum 200 mA (current limited)	

Article Number and Miscellaneous

	Article number	20-004-102
	Operating system	Salamander
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5 Hz – 8.4 Hz 1 g from 8.4 Hz – 150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS CPU Module
CP 111

with 2 VARAN Out
1 Ethernet
1 USB Device
1 microSD

The S-DIAS CP 111 CPU module is a high-performance processor unit for the S-DIAS I/O modules. Through various interfaces, such as Ethernet, 2x VARAN, CAN bus, USB and an exchangeable microSD card, this module can be used for a variety of applications. Additionally, a RealTimeClock and zero voltage proof RAM space with buffer battery are provided. To operate the CPU, a voltage supply module is required that also has the USB host and CAN interface.

Performance Data

Processor	EDGE2 Technology
Addressable I/O/P modules	VARAN bus: 65,280 CAN participants: > 100 S-DIAS bus: 64
Internal I/O	no
Internal cache	512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	256-Mbyte
Internal remnantdata memory	256-kbyte SRAM (battery buffered)
Internal storage device	1-Gbyte microSD card
Interfaces	1x Ethernet 2x VARAN Out (Manager) (maximum cable length: 100 m) 1x CAN (via PS 101) 1x USB host 2.0 (high speed 480 Mbit/s) (via PS 101) 1x USB device 1.1 1x S-DIAS (with manager)
Status display	no
Status LEDs	yes
Real-time clock	yes (battery buffered)

Electrical Requirements

	Supply voltage	+5 V from PS 101	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on S-DIAS bus (+5 V power supply)	typically 400 mA	maximum 450 mA

Electrical Requirements

Module Supply (Input)			
	Supply voltage	+5 V from PS 101	
S-DIAS Bus Supply (Output)			
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 400 mA	maximum 450 mA

Article Number and Miscellaneous

	Article number	20-004-111
	Article number power supply module	20-003-101
	Operating system	Salamander
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Project backup	internally on the microSD card
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS CPU Module
CP 111-2

with 1 Ethernet
2 VARAN Out
1 CAN
1 USB Device
1 USB Host
1 microSD

The S-DIAS CP 111-2 CPU module is a high-performance processor unit for the S-DIAS I/O modules. Through the various interfaces, such as Ethernet, 2x VARAN, CAN bus, USB and an exchangeable microSD card, this module can be used for a variety of applications. Additionally, a RealTimeClock and zero voltage proof RAM space with buffer battery are provided.
The CPU and I/O modules are supplied by the integrated voltage supply module.

Performance Data

Processor	EDGE2-Technology
Processor cores	1
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 256-kbyte L2 Cache
Addressable I/O/P modules	VARAN bus: 65,280 CAN participants: > 100 S-DIAS bus: 64
Internal I/O	no
Internal program and data memory (DDR3 RAM)	256-Mbyte
Internal remnantdata memory	256-kbyte SRAM (battery buffered)
Internal storage device	4 GB microSD card (3D-TLC pSLC technology)
Interfaces	1x Ethernet 2x VARAN Out (Manager) (maximum cable length: 100 m) 1x CAN 1x USB host 2.0 (high speed 480 Mbit/s) 1x USB-OTG (Host/Device), Type Mini B 1x S-DIAS (with manager)
Status display	no

	Status LEDs	yes
	Real-time clock	yes (battery buffered)
	Cooling	passive (fanless)

Electrical Requirements

Module Supply (Input)		
	Supply voltage	+18-30 V DC, typically +24 V DC UL: Class 2 or LVLC
	Current consumption of +24 V supply voltage	maximum 2.75 A
S-DIAS Bus Supply (Output)		
	Voltage supply from S-DIAS bus	+5 V
	Current consumption on the S-DIAS bus (+5 V supply)	maximum 1.6 A
	Voltage supply from S-DIAS bus	+24 V
	Current consumption on the S-DIAS bus (+24 V supply)	maximum 1.6 A

Article Number and Miscellaneous

	Article number	20-004-111-2
	Operating system	Salamander
	Dimensions	25 x 104 x 80 mm (W x H x D)
	Project backup	internally on the microSD card
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS CPU Module
CP 112

with 2 Ethernet
1 VARAN Out
1 USB Device
1 microSD

The S-DIAS CP 112 CPU module is a high-performance processor unit for the S-DIAS I/O modules. Through various interfaces, such as 2x Ethernet, VARAN, CAN bus, USB and an exchangeable microSD card, this module can be used for a variety of applications. Additionally, a RealTimeClock and zero voltage proof RAM space with buffer battery are provided. To operate the CPU, a voltage supply module is required that also has the USB host and CAN interface.

Performance Data

Processor	EDGE2 Technology
Addressable I/O/P modules	VARAN bus: 65,280 CAN participants: > 100 S-DIAS bus: 64
Internal I/O	no
Internal cache	512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	256-Mbyte
Internal remnantdata memory	256-kbyte SRAM (battery buffered)
Internal storage device	1-Gbyte microSD card
Interfaces	2x Ethernet 1x VARAN Out (Manager) (maximum cable length: 100 m) 1x CAN (via PS 101) 1x USB host 2.0 (high speed 480 Mbit/s) (via PS 101) 1x USB device 1.1 1x S-DIAS (with manager)
Status display	no
Status LEDs	yes
Real-time clock	yes (battery buffered)

Electrical Requirements

Module Supply (Input)			
	Supply voltage	+5 V from PS 101	
S-DIAS Bus Supply (Output)			
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 400 mA	maximum 450 mA

Article Number and Miscellaneous

Article number	20-004-112
Article number power supply module	20-003-101
Operating system	Salamander
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Project backup	internally on the microSD card
Standard	UL 508 (E247993)
Approvals	UL, cUL, CE, UKCA

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +55 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS CPU Module
CP 112-2

with 2 Ethernet
- 1 VARAN Out
- 1 CAN
- 1 USB Device
- 1 USB Host
- 1 microSD

The S-DIAS CP 112-2 CPU module is a high-performance processor unit for the S-DIAS I/O modules. Through the various interfaces, such as 2x Ethernet, VARAN, CAN bus, USB and an exchangeable microSD card, this module can be used for a variety of applications. Additionally, a RealTimeClock and zero voltage proof RAM space with buffer battery are provided.
The CPU and I/O modules are supplied by the integrated voltage supply module.

Performance Data

Processor	EDGE2-Technology
Processor cores	1
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 256-kbyte L2 Cache
Addressable I/O/P modules	VARAN bus: 65,280 CAN participants: > 100 S-DIAS bus: 64
Internal I/O	no
Internal program and data memory (DDR3 RAM)	256-Mbyte
Internal remnantdata memory	256-kbyte SRAM (battery buffered)
Internal storage device	4 GB microSD card (3D-TLC pSLC technology)
Interfaces	2x Ethernet 1x VARAN Out (Manager) (maximum cable length: 100 m) 1x CAN 1x USB host 2.0 (high speed 480 Mbit/s) 1x USB-OTG (Host/Device), Type Mini B 1x S-DIAS (with manager)
Status display	no

	Status LEDs	yes
	Real-time clock	yes (battery buffered)
	Cooling	passive (fanless)

Electrical Requirements

Module Supply (Input)		
	Supply voltage	+18-30 V DC, typically +24 V DC UL: Class 2 or LVLC
	Current consumption of +24 V supply voltage	maximum 2.75 A
S-DIAS Bus Supply (Output)		
	Voltage supply from S-DIAS bus	+5 V
	Current consumption on the S-DIAS bus (+5 V supply)	maximum 1.6 A
	Voltage supply from S-DIAS bus	+24 V
	Current consumption on the S-DIAS bus (+24 V supply)	maximum 1.6 A

Article Number and Miscellaneous

	Article number	20-004-112-2
	Operating system	Salamander
	Dimensions	25 x 104 x 80 mm (W x H x D)
	Project backup	internally on the microSD card
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS CPU Module
CP 311

with 1 Ethernet
- 2 VARAN Out
- 1 CAN
- 1 USB Device, 1 USB Host
- 1 microSD

The S-DIAS CP 311 CPU module is a high-performance processor unit for the S-DIAS I/O modules. Through the various interfaces, such as Ethernet, 2x VARAN, CAN bus, USB and an exchangeable microSD card, this module can be used for a variety of applications. Additionally, a RealTimeClock and zero voltage proof RAM space with buffer battery are provided.

The CPU and I/O modules are supplied by the integrated voltage supply module.

Performance Data

Processor	EDGE2-Technology Dual Core
Processor cores	2
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 256-kbyte L2 Cache
Addressable I/O/P modules	VARAN bus: 65,280 CAN participants: > 100 S-DIAS bus: 64
Internal I/O	no
Internal program and data memory (DDR3 RAM)	256-Mbyte
Internal remnantdata memory	256-kbyte SRAM (battery buffered)
Internal storage device	1-Gbyte microSD card
Interfaces	1x Ethernet 2x VARAN Out (Manager) (maximum cable length: 100 m) 1x CAN 1x USB host 2.0 (high speed 480 Mbit/s) 1x USB-OTG (Host/Device), Type Mini B 1x S-DIAS (with manager)
Status display	no

	Status LEDs	yes
	Real-time clock	yes (battery buffered)
	Cooling	passive (fanless)

Electrical Requirements

Module Supply (Input)		
	Supply voltage	+18-27 V DC, typically +24 V DC UL: Class 2 or LVLC
	Current consumption of +24 V supply voltage	maximum 2.75 A
S-DIAS Bus Supply (Output)		
	Voltage supply from S-DIAS bus	+5 V
	Current consumption on the S-DIAS bus (+5 V supply)	maximum 1.1 A
	Voltage supply from S-DIAS bus	+24 V
	Current consumption on the S-DIAS bus (+24 V supply)	maximum 1.6 A

Article Number and Miscellaneous

	Article number	20-004-311
	Operating system	Salamander
	Dimensions	37.5 x 104.2 x 72 mm (W x H x D)
	Project backup	internally on the microSD card
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS CPU Module
CP 312

with 2 Ethernet
- 1 VARAN Out
- 1 CAN
- 1 USB Device, 1 USB Host
- 1 microSD

The S-DIAS CP 312 CPU module is a high-performance processor unit for the S-DIAS I/O modules. Through the various interfaces, such as Ethernet, 2x VARAN, CAN bus, USB and an exchangeable microSD card, this module can be used for a variety of applications. Additionally, a RealTimeClock and zero voltage proof RAM space with buffer battery are provided.

The CPU and I/O modules are supplied by the integrated voltage supply module.

Performance Data

Processor	EDGE2-Technology Dual Core
Processor cores	2
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 256-kbyte L2 Cache
Addressable I/O/P modules	VARAN bus: 65,280 CAN participants: > 100 S-DIAS bus: 64
Internal I/O	no
Internal program and data memory (DDR3 RAM)	256-Mbyte
Internal remnantdata memory	256-kbyte SRAM (battery buffered)
Internal storage device	1-Gbyte microSD card
Interfaces	2x Ethernet 1x VARAN Out (Manager) (maximum cable length: 100 m) 1x CAN 1x USB host 2.0 (high speed 480 Mbit/s) 1x USB-OTG (Host/Device), Type Mini B 1x S-DIAS (with manager)
Status display	no

	Status LEDs	yes
	Real-time clock	yes (battery buffered)
	Cooling	passive (fanless)

Electrical Requirements

Module Supply (Input)		
	Supply voltage	+18-27 V DC, typically +24 V DC UL: Class 2 or LVLC
	Current consumption of +24 V supply voltage	maximum 2.75 A
S-DIAS Bus Supply (Output)		
	Voltage supply from S-DIAS bus	+5 V
	Current consumption on the S-DIAS bus (+5 V supply)	maximum 1.1 A
	Voltage supply from S-DIAS bus	+24 V
	Current consumption on the S-DIAS bus (+24 V supply)	maximum 1.6 A

Article Number and Miscellaneous

	Article number	20-004-312
	Operating system	Salamander
	Dimensions	37.5 x 104.2 x 72 mm (W x H x D)
	Project backup	internally on the microSD card
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS CPU Module
CP 313

with 1 Ethernet
- 1 EtherCAT Drive Controller
- 1 VARAN Out
- 1 CAN
- 1 USB Device, 1 USB Host
- 1 microSD

The S-DIAS CP 313 CPU module is a high-performance processor unit for the S-DIAS I/O modules. Through the various interfaces, such as Ethernet, EtherCAT, VARAN, CAN bus, USB and an exchangeable microSD card, this module can be used for a variety of applications. Additionally, a RealTimeClock and zero voltage proof RAM space with buffer battery are provided. The CPU and I/O modules are supplied by the integrated voltage supply module.

Performance Data

Processor	EDGE2-Technology Dual Core
Processor cores	2
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 256-kbyte L2 Cache
Addressable I/O/P modules	VARAN bus: 65,280 CAN participants: > 100 S-DIAS bus: 64
Internal I/O	no
Internal program and data memory (DDR3 RAM)	256-Mbyte
Internal remnantdata memory	256-kbyte SRAM (battery buffered)
Internal storage device	1-Gbyte microSD card
Interfaces	1x Ethernet 1x EtherCAT Drive Controller 1x VARAN Out (Manager) (maximum cable length: 100 m) 1x CAN 1x USB host 2.0 (high speed 480 Mbit/s) 1x USB-OTG (Host/Device), Type Mini B 1x S-DIAS (with manager)
Status display	no

	Status LEDs	yes
	Real-time clock	yes (battery buffered)
	Cooling	passive (fanless)

Electrical Requirements

Module Supply (Input)		
	Supply voltage	+18-27 V DC, typically +24 V DC UL: Class 2 or LVLC
	Current consumption of +24 V supply voltage	maximum 2.75 A
S-DIAS Bus Supply (Output)		
	Voltage supply from S-DIAS bus	+5 V
	Current consumption on the S-DIAS bus (+5 V supply)	maximum 1.1 A
	Voltage supply from S-DIAS bus	+24 V
	Current consumption on the S-DIAS bus (+24 V supply)	maximum 1.6 A

Article Number and Miscellaneous

	Article number	20-004-313
	Operating system	Salamander
	Dimensions	37.5 x 104.2 x 72 mm (W x H x D)
	Project backup	internally on the microSD card
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS CPU Unit
CP 731

with 2 Ethernet
- 2 VARAN
- 1 CAN
- 1 USB Device, 1 USB 3.0
- 1 microSD

The CP 731 is an industrial PC with an Intel Atom E3827 processor. The CPU unit is used to control S-DIAS modules and has various interface connections such as: CAN, Gigabit Ethernet and two VARAN Out interfaces. 14 status LEDs provide information CPU status directly on the CPU unit. A microSD card can be used to store program memory.
The CP 731 can be operated with 2 independent VARAN Managers.

Performance Data

Processor	Intel Atom E3827 DualCore
Processor cores	2
Addressable I/O/P modules	VARAN bus: 65.280 CAN participants: > 100 S-DIAS bus: 64
Internal program memory (microSD)	1 Gbyte (12-630-105, included with delivery)
Internal data memory (SRAM)	512-kbyte (battery buffered)
Internal memory (DDR3 RAM)	2-GByte DDR3L 1333 MHz
Internal I/O	no
Internal cache	1-Mbyte L2 Cache
Interfaces	1x Ethernet1 10/100/1000 1x Ethernet2 10/100 2x VARAN Out (manager) 1x CAN 1x USB 3.0 1x USB Device 2.0 (Micro USB Type B) 1x S-DIAS
Status display	no

Status LEDs	yes	
Real-time clock	yes	
Input voltage measurement	yes	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC (SELV/PELV)	
	minimum +18 V DC	maximum +30 V DC
Supply voltage (UL)	+18-30 V DC (NEC Class 2 or LVLC)	
Supply voltage current consumption (maximum total current)	maximum 3.0 A at +24 V	
Current consumption without external devices	0.5 A at +24 V	
Inrush current with 24 V/10 A fixed voltage supply	maximum 1.2 A (for 25 ms, load-dependent)	
Inrush current without current-limiting supply	maximum 30 A (for 22.5 µs, load-dependent)	
Available current for S-DIAS (+5 V)	maximum 1.6 A	
Available current for S-DIAS (+24 V)	maximum 1.6 A	
Available current for USB 3.0 (+5 V)	maximum 0.9 A	

Article Number and Miscellaneous

Article number	20-004-731
Operating system	Salamander
Dimensions	40.2 x 147.7 x 193.6 mm (W x H x D)
Project backup	internally on the microSD card
Approvals	CE, UKCA

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Ambient temperature	0 ... +55 °C	
Maximum processor temperature	+110 °C (automatic cut-off)	
Humidity	10-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 2-9 Hz 1 g (10 m/s2) from 9-200 Hz
Shock resistance	EN 60068-2-27	15 g (150 m/s2) duration 11 ms, 18 shocks
Protection type	EN 60529	IP20

S-DIAS CPU Unit
CP 733

with 1 Ethernet
- 1 EtherCAT Master
- 2 VARAN
- 1 CAN
- 1 USB Device, 1 USB 3.0
- 1 microSD

The CP 733 is an industrial PC with an Intel Atom E3827 processor. The CPU unit is used to control S-DIAS modules and has various interface connections such as: CAN, Gigabit Ethernet, EtherCAT and two VARAN Out interfaces. 14 status LEDs provide information CPU status directly on the CPU unit. A microSD card can be used to store program memory. The CP 733 can be operated with 2 independent VARAN Managers.

Performance Data

Processor	Intel Atom E3827 DualCore
Processor cores	2
Addressable I/O/P modules	VARAN bus: 65.280 CAN participants: > 100 S-DIAS bus: 64
Internal program memory (microSD)	1 Gbyte (12-630-105, included with delivery)
Internal data memory (SRAM)	512-kbyte (battery buffered)
Internal memory (DDR3 RAM)	2-GByte DDR3L 1333 MHz
Internal I/O	no
Internal cache	1-Mbyte L2 Cache
Interfaces	1x Ethernet1 10/100/1000 1x Ethernet2 10/100 2x VARAN Out (manager) 1x CAN 1x USB 3.0 1x USB Device 2.0 (Micro USB Type B) 1x S-DIAS
EtherCAT Master	Class A EtherCAT Master mit Distributed Clock
Status display	no
Status LEDs	yes

Real-time clock	yes	
Temperature sensor	yes	
Input voltage measurement	yes	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC (SELV/PELV)	
	minimum +18 V DC	maximum +30 V DC
Supply voltage (UL)	+18-30 V DC (NEC Class 2 or LVLC)	
Supply voltage current consumption (maximum total current)	maximum 3.0 A at +24 V	
Current consumption without external devices	0.5 A at +24 V	
Inrush current with 24 V/10 A fixed voltage supply	maximum 1.2 A (for 25 ms, load-dependent)	
Inrush current without current-limiting supply	maximum 30 A (for 22.5 µs, load-dependent)	
Available current for S-DIAS (+5 V)	maximum 1.6 A	
Available current for S-DIAS (+24 V)	maximum 1.6 A	
Available current for USB 3.0 (+5 V)	maximum 0.9 A	

Article Number and Miscellaneous

Article number	20-004-733
Operating system	Salamander
Dimensions	40.2 x 147.7 x 193.6 mm (W x H x D)
Approvals	CE

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Ambient temperature	0 ... +55 °C	
Maximum processor temperature	+110 °C (automatic cut-off)	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 2-9 Hz 1 g (10 m/s2) from 9-200 Hz
Shock resistance	EN 60068-2-27	15 g (150 m/s2) duration 11 ms, 18 shocks
Protection type	EN 60529	IP20

S-DIAS CPU Unit
CP 841

with 2 Ethernet
2 VARAN, 1 CAN
2 USB 2.0 (Type A), 1 USB 3.2 (Type C)
1 DisplayPort, 1 S-DVI

The S-DIAS CPU unit CP 841 is equipped with an Intel® Atom x6413E. The CPU unit is used to control S-DIAS modules and has various interface connections. Status LEDs directly on the CPU unit provide current CPU status information. The CPU unit is mounted directly on the DIN rail with the S-DIAS modules.

Performance Data

Processor	Intel® Atom x6413E
Processor cores	4
Processor clock	1.5 GHz
Internal program and data memory (RAM)	4-Gbyte DDR4, 3200 MHz
Internal remnant data memory	1-Mbyte MRAM
Internal storage device	128-Gbyte M.2 SATA SSD
Graphic	Intel® UHD Graphics
Addressable I/O/P modules	VARAN Bus: 65,280 CAN Bus: > 100 S-DIAS Bus: 64
Interfaces	2x Ethernet (10/100/1000) 2x VARAN Out Manager 1x CAN 2x USB 2.0 Type A 1x USB 3.2 Gen 1 Type C (only host) 1x DisplayPort 1.4a 1x S-DVI 1x S-DIAS
Internal interfaces and devices	M.2 Slot 2280 Key M (SATA 3 / PCIe 3.0 x1, occupied by main memory) Expansion module slot (occupied by S-DVI expansion)

Controls	2x button (SET/RESET)	
Status LEDs	14x Status LEDs 2x 7-Segment Displays	
Real-time clock	yes (battery buffered)	
Temperature sensors	7 (2x ambient, 5x core temperature sensors)	
Input voltage measurement	yes	
Cooling	passive	

Electrical Requirements

Supply voltage	+24 V DC ±20 % (SELV/PELV) UL: NEC Class 2	
Protection class	III	
Current consumption of (+24 V) power supply	typically 0.7 A (with no external devices connected)	maximum 4 A (with external devices connected)
Inrush current without currentlimiting supply	maximum 45 A (for 153 µs, load-dependent)	
Inrush current with 24 V/10 A fixed voltage supply	maximum 1.5 A (for 6 ms, load-dependent)	
USB host current load (Type A & Type C)	maximum 0.9 A per USB	
Available current for S-DIAS (+5 V)	maximum 1.6 A	
Available current for S-DIAS (+24 V)	maximum 1.6 A	
Available current for S-DVI	maximum 2 A	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Ambient temperature	0 ... +50 °C (65 °C with opt. fan module)	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
Noise emissions	≤ 70 dB	
EMC resistance	according to EN 61000-6-2 (industrial area)	
EMC noise generation	according to EN 61000-6-4 (industrial area with S-DVI) according to EN 61000-6-3 (residential area without S-DVI)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²)
Protection type	EN 60529 protection through housing	IP20

Article Number and Miscellaneous

Article number	20-004-841
Operating system	Salamander
Dimensions	60 x 110 x 193.5 mm (W x H x D)
Standard	designed according to UL
Approvals	CE

Notes

S-DIAS CPU Unit
CP 931

with 2 Ethernet
2 VARAN, 1 CAN
2 USB 3.2 (Type A), 1 USB 3.2 (Type C)
1 DisplayPort

The S-DIAS CPU unit CP 931 is equipped with an Intel® Core i3 1115G4E. The CPU unit is used to control S-DIAS modules and has various interface connections. Status LEDs directly on the CPU unit provide current CPU status information. The CPU unit is mounted directly on the DIN rail with the S-DIAS modules.

Performance Data

Processor	Intel® Core i3 1115G4E
Processor cores	2
Processor clock	3.0 GHz
Internal program and data memory (RAM)	4-Gbyte DDR4, 3200 MHz
Internal remnant data memory	1-Mbyte MRAM
Internal storage device	128-Gbyte M.2 SATA SSD
Graphic	Intel® UHD Graphics
Addressable I/O/P modules	VARAN Bus: 65,280 CAN Bus: > 100 S-DIAS Bus: 64
Interfaces	2x Ethernet (10/100/1000) 2x VARAN Out Manager 1x CAN 2x USB 3.2 Gen 1 Type A 1x USB 3.2 Gen 1 Type C (only host) 1x DisplayPort 1.4a 1x S-DIAS
Internal interfaces and devices	M.2 Slot 2280 Key M (SATA 3 / PCIe 3.0 x1, occupied by main memory) Expansion module slot

Controls	2x button (SET/RESET)	
Status LEDs	14x Status LEDs 2x 7-Segment Displays	
Real-time clock	yes (battery buffered)	
Temperature sensors	7 (2x ambient, 5x core temperature sensors)	
Input voltage measurement	yes	
Cooling	passive	

Electrical Requirements

Supply voltage	+24 V DC ±20 % (SELV/PELV) UL: NEC Class 2	
Protection class	III	
Current consumption of (+24 V) power supply	typically 1 A (with no external devices connected)	maximum 4.2 A (with external devices connected)
Inrush current without currentlimiting supply	maximum 45 A (for 153 µs, load-dependent)	
Inrush current with 24 V/10 A fixed voltage supply	maximum 1.5 A (for 6 ms, load-dependent)	
USB host current load (Type A & Type C)	maximum 0.9 A per USB	
Available current for S-DIAS (+5 V)	maximum 1.6 A	
Available current for S-DIAS (+24 V)	maximum 1.6 A	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Ambient temperature	0 ... +45 °C (60 °C with opt. fan module)	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
Noise emissions	≤ 70 dB	
EMC resistance	according to EN 61000-6-2 (industrial area)	
EMC noise generation	according to EN 61000-6-4 according to EN 61000-6-3	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²)
Protection type	EN 60529 protection through housing	IP20

Article Number and Miscellaneous

Article number	20-004-931
Operating system	Salamander
Dimensions	60 x 110 x 193.5 mm (W x H x D)
Standard	designed according to UL
Approvals	CE

Notes

S-DIAS CPU Unit
CP 831

with 2 Ethernet
2 VARAN, 1 CAN
2 USB 2.0 (Type A), 1 USB 3.2 (Type C)
1 DisplayPort

The S-DIAS CPU unit CP 831 is equipped with an Intel® Atom x6413E. The CPU unit is used to control S-DIAS modules and has various interface connections. Status LEDs directly on the CPU unit provide current CPU status information. The CPU unit is mounted directly on the DIN rail with the S-DIAS modules.

Performance Data

Processor	Intel® Atom x6413E
Processor cores	4
Processor clock	1.5 GHz
Internal program and data memory (RAM)	4-Gbyte DDR4, 3200 MHz
Internal remnant data memory	1-Mbyte MRAM
Internal storage device	128-Gbyte M.2 SATA SSD
Graphic	Intel® UHD Graphics
Addressable I/O/P modules	VARAN Bus: 65,280 CAN Bus: > 100 S-DIAS Bus: 64
Interfaces	2x Ethernet (10/100/1000) 2x VARAN Out Manager 1x CAN 2x USB 2.0 Type A 1x USB 3.2 Gen 1 Type C (only host) 1x DisplayPort 1.4a 1x S-DIAS
Internal interfaces and devices	M.2 Slot 2280 Key M (SATA 3 / PCIe 3.0 x1, occupied by main memory) Expansion module slot

Controls	2x button (SET/RESET)	
Status LEDs	14x Status LEDs 2x 7-Segment Displays	
Real-time clock	yes (battery buffered)	
Temperature sensors	7 (2x ambient, 5x core temperature sensors)	
Input voltage measurement	yes	
Cooling	passive	

Electrical Requirements

Supply voltage	+24 V DC ±20 % (SELV/PELV) UL: NEC Class 2	
Protection class	III	
Current consumption of (+24 V) power supply	typically 0.7 A (with no external devices connected)	maximum 3.5 A (with external devices connected)
Inrush current without currentlimiting supply	maximum 45 A (for 153 µs, load-dependent)	
Inrush current with 24 V/10 A fixed voltage supply	maximum 1.5 A (for 6 ms, load-dependent)	
USB host current load (Type A & Type C)	maximum 0.9 A per USB	
Available current for S-DIAS (+5 V)	maximum 1.6 A	
Available current for S-DIAS (+24 V)	maximum 1.6 A	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Ambient temperature	0 ... +50 °C (65 °C with opt. fan module)	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
Noise emissions	≤ 70 dB	
EMC resistance	according to EN 61000-6-2 (industrial area)	
EMC noise generation	according to EN 61000-6-4 according to EN 61000-6-3	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²)
Protection type	EN 60529 protection through housing	IP20

Article Number and Miscellaneous

Article number	20-004-831
Operating system	Salamander
Dimensions	60 x 110 x 193.5 mm (W x H x D)
Standard	designed according to UL
Approvals	CE

Notes

S-DIAS Control Module EtherCAT
EC 121

with 1 EtherCAT IN
1 EtherCAT OUT
1 S-DIAS Bus OUT

The S-DIAS EtherCAT control module EC 121 is an interface module between an S-DIAS control system and EtherCAT bus. The module provides the voltage supply for up to 32 S-DIAS modules. With an additional power boost module (PSB 001), up to 64 modules can be connected via the EtherCAT control module.
The EC 121 detects the connected S-DIAS modules automatically. It provides the EtherCAT slave configuration for the EtherCAT master and exchanges data between the EtherCAT and S-DIAS bus during operation.

Performance Data

Interfaces	1x EtherCAT In (RJ45) 1x EtherCAT Out (RJ45) 1x S-DIAS bus

Spezifikation EtherCAT

Configuration	2x shielded RJ45 port
Cable length	maximum 100 m between stations
Propagation delay	approximately 1 µs
Potential separation	500 V (EtherCAT - S-DIAS bus)
FMMU	3
Sync Manager	4
Process data RAM	8-kbyte
Synchronization	64-bit distributed clock
Process image	modular device profile

	Asynchronous data exchange	Protocol	Supported functions	Description
		CoE	Complete Access Support SDO-Info Support PDO Assign	CANopen over EtherCAT is required for transmitting parameters
		FoE	X	File over EtherCAT for transferring files (only in BOOTSTRAP mode)
		FSoE	X	designed according to UL
	Max. number of S-DIAS modules		up to 32 (64 with PSB 001) S-DIAS modules	

Electrical Requirements

	Power supply +24 V	+18-30 V DC UL: Class 2 or LVLC	
	Current consumption of +24 V power supply	the current consumption depends on the connected loads (max. 2.75 A)	
	Power supply on the S-DIAS bus	via the EC 121	
	Current capacity on the S-DIAS bus (power supply for the modules).	+5 V	+24 V
		maximum 1.6 A	maximum 1.6 A

Article Number and Miscellaneous

	Article number	20-003-121
	Dimensions	25 x 104.2 x 72 mm (W x H x D)
	Approvals	CE, UL 508 (E247993)

Environmental Conditions

	Storage temperature	-40 ... +85 °C	
	Environmental temperature	-25 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	5-150 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
	Shock resistance	EN 60068-2-27	15 g (147,15 m/s²)
	Protection type	EN 60529	IP20

S-DIAS Control Module VARAN
VI 021

with 1 VARAN In
1 VARAN Out (optional Ethernet (VtE))

The S-DIAS VI 021 module serves as the power supply and connection for decentralized S-DIAS module groups with a CPU over the VARAN bus.

A module group consists of a control module and up to 32 connected S-DIAS modules.

The VARAN Out port allows the construction of the VARAN bus in a line structure.

Performance Data

	Interfaces	1x VARAN In (Industrial Mini I/O) 1x VARAN Out (optional Ethernet (VtE)) (Industrial Mini I/O)

Electrical Requirements

	Supply voltage	18-27 V DC	
	Supply voltage (UL)	18-27 V DC (Class 2)	
	Current consumption of voltage supply	the current consumption is dependent on the connected loads (max. 2.75 A)	
	Power supply on the S-DIAS bus	via the VI 021	
	Current capacity on S-DIAS bus (power supply for I/O/P modules)	+5 V	+24 V
		maximum 1.6 A	maximum 1.6 A

Article Number and Miscellaneous

	Article number	20-003-021
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +50 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Interface Module
ICA 011

with 1 CAN bus
1 termination circuit switchable

The S-DIAS ICA 011 interface module has a CAN interface.

The internal CAN termination resistor can be deactivated at the connector via software or wire jumper.

Performance Data

Interfaces	1x CAN 1x Termination connection		
Adjustable data transfer rates	CAN	20,000 Baud, 50,000 Baud, 100,000 Baud, 125,000 Baud, 250,000 Baud, 500,000 Baud, 615,000 Baud, 1,000.000 Baud	
Over voltage protection	CAN	Pin CAN H	±30 V
		Pin CAN L	±30 V
	Termination	Pin TERM+	+30 V -0 V
		Pin TERM-	0
Maximum connectible CAN participants	100		
Short-circuit proof	yes		
Status LEDs	yes		

Electrical Requirements

	Power supply +24 V	18-30 V DC	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 60 mA	maximum 70 mA
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V supply)	typically 20 mA	maximum 40 mA

Article Number and Miscellaneous

	Article number	20-102-011
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Interface Module
ICA 012

with 1 CAN bus galvanically separated
1 termination circuit switchable

The S-DIAS ICA 012 interface module has a galvani cally separated CAN interface.

The internal CAN termination resistor can be deacti-vated at the connector via software or wire jumper.

Performance Data

	Interfaces	1x CAN 1x Termination connection		
	Adjustable data transfer rates	CAN	20,000 Baud, 50,000 Baud, 100,000 Baud, 125,000 Baud, 250,000 Baud, 500,000 Baud, 615,000 Baud, 1,000.000 Baud	
	Over voltage protection	CAN	Pin CAN H	±30 V
			Pin CAN L	±30 V
		Termination	Pin TERM+	+30 V -0 V
			Pin TERM-	0
	Maximum connectible CAN participants	100		
	Short-circuit proof	yes		
	Galvanic isolation	yes (isolation voltage 500 V)		
	Status LEDs	yes		

Electrical Requirements

Power supply +24 V	18-30 V DC	
Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V supply)	typically 60 mA	maximum 70 mA
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V supply)	typically 25 mA	maximum 40 mA

Article Number and Miscellaneous

Article number	20-102-012
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Standard	designed according to UL
Approvals	UL, cUL, CE

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +55 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Interface SDCI Master Module
IIO 041

with 4 SDCI ports
4 digital inputs

The S-DIAS Single-Drop Digital Communication Interface (SDCI) master module enables the connection of up to 4 intelligent SDCI sensors or SDCI actuators in compliance with the SDCI specification V1.1 according to IEC61131-9. All SDCI ports can also be configured as +24 V digital inputs or +24 V digital outputs. The module has a 24 V supply connection for powering the SDCI ports and connected SDCI devices. Additionally, the module has 4 standard +24 V/3.7 mA/0.5 ms digital inputs.

SDCI Interface Specifications

Number of interfaces	4
Specification version	SDCI V1.1
Data transfer rate	4.8 kbit/s, 38.4 kbit/s, 230.4 kbit/s
SDCI supply	24 V (via power switch, short-circuit proof)
SDCI supply current	maximum 500 mA per connection
SDCI switching signal	+24 V and GND switching
SDCI switching current	maximum 500 mA
Connection technology	3-wire (unshielded)
Cable length	maximum 20 m
wire resistance	maximum 6 Ω
wire capacity	maximum 3 nF
Status LEDs	yes

SDCI Interface as a Digital Output

Output signal	+24 V-switching	
Short-circuit proof	yes	
Maximum continuous current load/ channel allowed	0.25 A	
Maximum total current (all channels)	1 A (100 % of on-time)	
Maximum braking energy of outputs (inductive load)	1 Joule/channel	
Residual current output (off)	≤ 10 µA	
Turn-on delay	< 10 µs	
Turn-off delay	< 10 µs	

SDCI Interface as a Digital Input

Input voltage	typically +24 V	maximum +30 V
Signal level	low: < +8 V	high: > +14 V
Switching threshold	typically +11 V	
Input current	6.8 mA at +24 V	
Input delay	typically 0.5 µs	

Digital Input Specifications

Number	4	
Input voltage	typically +24 V	maximum +30 V
Signal level	low: < +8 V	high: > +14 V
Switching threshold	typically +11 V	
Input current	3.7 mA at +24 V	
Input delay	typically 0.5 ms	

Electrical Requirements

External +24 V supply	+18-30 V DC	
Current consumption external +24 V supply without actuators or sensors	typically 20 mA at +18 V typically 23 mA at +24 V typically 26 mA at +30 V	maximum 25 mA (at +18 V) maximum 29 mA (at +24 V) maximum 33 mA (at +30 V)
Current consumption external +24 V supply with actuators or sensors	Intrinsic current consumption of the external +24 V supply + current consumption of the connected SDCI actuators or sensors + switching current of the SDCI actuators or sensors (max. 3.0 A)	
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V power supply)	typically 33 mA at +18 V typically 27 mA at +24 V typically 23 mA at +30 V	maximum 41 mA at +18 V maximum 34 mA at +24 V maximum 29 mA at +30 V

Voltage Monitor

	Supply voltage +24 V SDCI	supply voltage > 18 V (corresponding DC OK-LED lights green)

Article Number and Miscellaneous

	Article number	20-104-041
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	designed according to UL
	Approvals	UL, cUL, CE in preparation

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS PROFINET I/O Slave
IPN 021

with 1 Profinet I/O IN
1 Profinet I/O OUT

The S-DIAS Profinet I/O slave module IPN 021 slave module is an interface module between the S-DIAS control system and PROFINET bus.

Performance Data

Bus Controller	Profinet I/O (lt. Profinet I/O Specification V2.3)	
Configuration	2x shielded Tyco Mini I/O port	
Cable length	maximum of 100 m between two stations (segment length)	
Minimum cyclic time	1 ms	
Maximum input data per cycle	1440	
Maximum output data per cycle	1440	
Data transfer rate	100 Mbits/s Full duplex auto negotiation auto crossover	
Diagnosis	module status	per status LED and SW status
	bus function	per status LED and SW status
Supported conformity classes	Class A Class B	
Media redundancy support	yes, the module can be used as a client in a Profinet MRP ring, but there must be at least one other client with redundancy manager (RM, MRM) functionality in the ring	
Status LEDs	yes	

Electrical Requirements

	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V power supply)	typically 125 mA at +18 V 95 mA at +24 V 75 mA at +30 V	maximum 140 mA at +18 V 110 mA at +24 V 95 mA at +30 V

Article Number and Miscellaneous

	Article number	20-103-021
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Interface Module
ISE 021

with 1 RS232 interface with handshake lines
or 2 RS232 interfaces without handshake lines
1 RS485 interface with switchable termination
and spread resistors

The S-DIAS ISE 021 interface module has an RS232 interface with the handshake signals RTS and CTS. Alternatively to the handshake signals, these signals can be configured as a second RS232 interface. The ISE 021 also has an RS485 interface with switchable 120 Ω termination and spread resistors (switchable via software).

The module requires no external +24 V supply.

Performance Data

Interfaces	1x RS232 (2x RS232, switchable via software) 1x RS485			
Adjustable data transfer rates	RS232	2400 Baud, 4800 Baud, 9600 Baud, 19200 Baud, 38400 Baud, 57600 Baud, 62500 Baud, 115200 Baud		
	RS485	2400 Baud, 4800 Baud, 9600 Baud, 19200 Baud, 38400 Baud, 57600 Baud, 62500 Baud, 115200 Baud, 230400 Baud, 460800 Baud, 921600 Baud		
Over voltage protection	RS232	pin RxD	±30 V	
		pin TxD	±15 V	
	RS485	pin A/B	-9 V ... +14 V	
Spread resistor	RS485	1 kΩ => 5 V 1 kΩ => GND internally settable		
Terminating resistor		120 Ω internally settable		
Short-circuit proof	yes			
Status LEDs	yes			
Send buffer	240 Byte			
Receive buffer	784 Byte			

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 60 mA	maximum 70 mA
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V supply)	typically 8 mA	maximum 15 mA

Article Number and Miscellaneous

	Article number	20-101-021
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Interface Module
ISE 031

with 1 RS232 interface with handshake lines
or 2 RS232 interfaces without handshake lines
1 RS485 interface with switchable termination and spread resistors
1 TTY

The S-DIAS ISE 031 interface module has an RS232 interface with the handshake signals RTS and CTS, an RS485 and active TTY interface. Alternatively to the handshake signals, these signals can be configured as a second RS232 interface. The ISE 031 also has an RS485 interface with switchable 120 Ω termination and spread resistors (switchable via software).

Performance Data

Interfaces	1x RS232 (2x RS232, switchable via software) 1x RS485 1x TTY (20 mA)		
Adjustable data transfer rates	RS232/RS485	2400 Baud, 4800 Baud, 9600 Baud, 19200 Baud, 38400 Baud, 57600 Baud, 62500 Baud, 115200 Baud	
	RS485	2400 Baud, 4800 Baud, 9600 Baud, 19200 Baud, 38400 Baud, 57600 Baud, 62500 Baud, 115200 Baud, 230400 Baud, 460800 Baud, 921600 Baud	
	TTY	2400 Baud, 4800 Baud, 9600 Baud	
Over voltage protection	RS232	pin RxD	±30 V
		pin TxD	±15 V
	RS485	pin A/B	-9 V ... +14 V
	TTY	pin 20 mA	70 V
Spread resistor	RS485		1 kΩ => 5 V 1 kΩ => GND internally settable
Terminating resistor			120 Ω internally settable
Maximum connectable TTY participants	depends on the voltage drop on the participants, cables and connectors (up to a maximum of 6)		

Short-circuit proof	yes	
Status LEDs	yes	
Send buffer	240 Byte	
Receive buffer	784 Byte	

Electrical Requirements

Power supply +24 V	18-30 V DC	
Current consumption of the +24 V supply	maximum 100 mA	
Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V supply)	typically 60 mA	maximum 76 mA

Article Number and Miscellaneous

Article number	20-101-031
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Standard	UL 508 (E247993)
Approvals	UL, cUL, CE

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +55 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Splitter Ethernet
SE 051

with 5 ethernet interfaces (RJ45)

The S-DIAS SE 051 Ethernet splitter connects several network segments via 5 ports. In-coming data packets at one Ethernet port are distributed over the other ports. The splitter module is located in a double-wide S-DIAS housing. Power is applied from above through a 4-pin Phoenix plug.

Performance Data

Interfaces	5x Ethernet 10/100 Mbits (RJ45)
Network coupling type	Layer 2 Switch
Supported functionalities	Auto MDI/MDIX, Autonegotiation with 100Base-TX, full-duplex, 100Base-TX, half-duplex, 10Base-T, full-duplex, 10Base-T, half-duplex
Switch architecture	Store and Forward
MAC addresses	1000
Frame buffer size	64-kByte
Flow control	yes
Quality of service	yes

Standard Configuration

Ethernet 1	X1	
Ethernet 2	X2	
Ethernet 3	X3	
Ethernet 4	X4	
Ethernet 5	X5	

Electrical Requirements

Supply voltage	18-30 V DC UL: Class 2 or LVLC	
Supply voltage via X6	typically 45 mA at 18 V typically 35 mA at 24 V typically 30 mA at 30 V	maximum 50 mA at 18 V maximum 40 mA at 24 V maximum 35 mA at 30 V

Article Number and Miscellaneous

Article number	20-023-051	
Dimensions	25 x 104.2 x 72 mm (W x H x D)	
Standard	UL 508 (E247993)	
Approvals	UL, cUL, CE, UKCA	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +55 °C	
Humidity	0-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Splitter Ethernet
SE 052

with 5 ethernet interfaces (Tyco Mini I/O)

The S-DIAS SE 052 Ethernet splitter connects several network segments via 5 ports. In-coming data packets at one Ethernet port are distributed over the other ports. The splitter module is located in a double-wide S-DIAS housing. Power is applied from above through a 4-pin Phoenix plug.

Performance Data

Interfaces	5x Ethernet 10/100 Mbits (Tyco Mini I/O)
Network coupling type	Layer 2 Switch
Supported functionalities	Auto MDI/MDIX, Autonegotiation with 100Base-TX, full-duplex, 100Base-TX, half-duplex, 10Base-T, full-duplex, 10Base-T, half-duplex

Standard Configuration

Ethernet 1	X1
Ethernet 2	X2
Ethernet 3	X3
Ethernet 4	X4
Ethernet 5	X5

Electrical Requirements

	Supply voltage	18-30 V DC UL: Class 2 or LVLC	
	Supply voltage via X6	typically 45 mA at 18 V typically 35 mA at 24 V typically 30 mA at 30 V	maximum 50 mA at 18 V maximum 40 mA at 24 V maximum 35 mA at 30 V

Article Number and Miscellaneous

	Article number	20-023-052
	Dimensions	25 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Splitter VARAN
SV 141

with 1 VARAN In (RJ45)
4 VARAN Out (RJ45)

With its four VARAN Out ports, the VARAN SV 141 S-DIAS splitter module allows a VARAN bus system to be configured in a tree structure.

The VARAN Out ports have a +24 V supply for the VARAN bus, which can be switched via the software. With this supply, special VARAN peripheral devices can be connected to the SV 141 and supplied with +24 V without an additional power cable.

Performance Data

Interfaces	1x VARAN In (RJ45) 4x VARAN Out (RJ45), +24 V switchable over VARAN, 500 mA per port (of which 1x Ethernet (Vte) or real-time Ethernet optional)

Electrical Requirements

Supply voltage	18-30 V DC
Current consumption of +24 V power supply	typically 0.25 A internal electronics supply VARAN Out port load (maximum 2 A)

Article Number and Miscellaneous

Article number	20-023-141
Dimensions	25 x 104.2 x 72 mm (W x H x D)
Standard	UL 508 (E247993)
Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +50 °C	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Splitter VARAN
SV 142

with 1 VARAN In (Tyco Mini I/O)
4 VARAN Out (Tyco Mini I/O)

With its four VARAN Out ports, the VARAN SV 142 S-DIAS splitter module allows a VARAN bus system to be configured in a tree structure.

The VARAN Out ports have a +24 V supply for the VARAN bus, which can be switched via the software. With this supply, special VARAN peripheral devices can be connected to the SV 142 and supplied with +24 V without an additional power cable.

Performance Data

Interfaces	1x VARAN In (Tyco Mini I/O) 4x VARAN Out (Tyco Mini I/O), +24 V switchable over VARAN, 500 mA per port (of which 1x Ethernet (Vte) or real-time Ethernet optional)

Electrical Requirements

Supply voltage	18-30 V DC
Current consumption of +24 V power supply	typically 0.25 A internal electronics supply VARAN Out port load (maximum 2 A)

Article Number and Miscellaneous

Article number	20-023-142
Dimensions	25 x 104.2 x 72 mm (W x H x D)
Standard	UL 508 (E247993)
Approvals	CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +50 °C	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Digital Input Module
DI 080

with 8 inputs, input delay 5 ms

The S-DIAS DI 080 digital input module is equipped with eight inputs and a +24 V signal for reading the signal states “0” and “1”. Input filters are available to suppress noise signals occurring in the signal lines.

Digital Input Specifications

	Number	8	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +5 V	high: > +15 V
	Input current	3.7 mA at +24 V	
	Input delay	typically 5 ms	

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 35 mA	maximum 40 mA

Article Number and Miscellaneous

	Article number	20-006-080
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Digital Input Module
DI 160

with 16 digital inputs, input delay 5 ms

The S-DIAS DI 160 digital input module is equipped with 16 inputs and a +24 V signal for reading the signal states “0“ and “1“. Input filters are available to suppress noise signals occurring in the signal lines.

Digital Input Specifications

	Number	16	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +5 V	high: > +15 V
	Input current	3.7 mA at +24 V	
	Input delay	typically 5 ms	

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 51 mA	maximum 56 mA

Article Number and Miscellaneous

	Article number	20-006-160
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Digital Input Module
DI 169

with 16 digital inputs

The S-DIAS digital input module DI 169 is equipped with 16 counter inputs for Open-Collector outputs. The actual input signal can be read (use as digital input - earthing switching).

To suppress noise in the signal lines, input filters are provided.

Digital Input Specifications

	Number	16	
	Input signal	GND switching	
	Pull-up voltage	typically +24 V	maximum +30 V
	Collector current	typically 2.5 mA	maximum 3.5 mA
	Saturation voltage	maximum 1 V at 3 mA	
	Residual current	maximum 200 µA	
	Input delay	50 µs low pass 1. order	
	Input frequency	maximum 1 kHz	
	Counter frequency	1 kHz in normal counter mode resp. 4 kHz in incremental counter mode with 4-edge analysis	
	Status display	LED (green) lights when the input signal < 1 V	

Counter Functionality

	Channel	16	8
	Operating modes	counter mode	1-/4-edge analysis
	Resolution	8-bit	

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V		+24 V	
	Current consumption on the S-DIAS bus	typically 38 mA	maximum 43 mA	typically 40 mA (at +24 V)	maximum 56 mA (at +30 V)

Article Number and Miscellaneous

	Article number	20-006-169
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Digital Input Module
DI 200

with 20 digital inputs, input delay 5 ms

The S-DIAS DI 200 digital input module has 20 inputs with a +24 V signal for reading the signal statuses „0" and „1". To suppress noise in the signal lines, input filters are provided.

Digital Input Specifications

	Number	20	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +5 V	high: > +15 V
	Input current	3.7 mA at +24 V	
	Input delay	typically 5 ms	

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 51 mA	maximum 56 mA

Article Number and Miscellaneous

	Artikel number	20-006-200
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Digital Input Module
DI 202

with 16 digital inputs
4 digital inputs with counter function

The S-DIAS DI 202 digital input module is equipped with 20 inputs and a +24 V signal for reading the signal states “0” and “1”. To suppress noise in the signal lines, input filters are provided. In addition, digital inputs 1-4 have a counter function.

Digital Input Specifications

	Number	20	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +5 V	high: > +15 V
	Input current	3.7 mA at +24 V	
	Input delay	input 1-4: 10 µs input 5-20: 0.5 ms	
	Input frequency, inputs 1-4	25 kHz in normal counter mode or in incremental counter mode with 4-edge analysis	
	Counter frequency input 1-4	25 kHz in normal counter mode 100 kHz in incremental counter mode with 4-edge analysis	

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 40 mA	maximum 45 mA

Article Number and Miscellaneous

Artikel number	20-006-202	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	UL 508 (E247993)	
Approvals	UL, cUL, CE, UKCA	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +55 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Digital Input Module
DI 203

with 20 digital inputs, input delay 0.5 ms

The S-DIAS DI 203 digital input module has 20 inputs with a +24 V signal for reading the signal status „0" and „1". To suppress noise in the signal lines, input filters are provided.

Digital Input Specifications

	Number	20	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +5 V	high: > +15 V
	Input current	3.7 mA at +24 V	
	Input delay	typically 0.5 ms	

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 36 mA	maximum 50 mA

Article Number and Miscellaneous

	Artikel number	20-006-203
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Digital Input Module
DI 205

with 20 ground-switching digital inputs

The S-DIAS digital input module DI 205 is equipped with 20 ground-switching inputs with a pull-up resistor to a +24 V signal. Each input can be connected to ground with a transistor or switch. An open switch corresponds to the signal condition „0“, switches connected to ground correspond to the signal condition „1“. Input filters are available to suppress noise signals occurring in the signal lines.

Digital Input Specifications

	Number	20	
	Input signal	GND switching	
	Pull-up voltage	typically +24 V	maximum +30 V
	Collector current	typically 3 mA	maximum 4 mA
	Saturation voltage	maximum 1 V at 3 mA	
	Residual current	maximum 200 µA	
	Input delay	typically 5 ms	
	Status display	LED (green) lights when the input signal < 1 V	

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V		+24 V	
	Current consumption on the S-DIAS bus	typically 35 mA	maximum 50 mA	maximum 60 mA (at +24 V)	maximum 80 mA (at +30 V)

Article Number and Miscellaneous

Article number	20-006-205	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	UL 508 (E247993)	
Approvals	UL, cUL, CE	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Digital Output Module
TO 081

with 8 short-circuit proof digital outputs

The S-DIAS TO 081 digital output module has eight short-circuit protected outputs in a group (+24 V/0.5 A/short-circuit protected). The power supply for the group is monitored for under voltage.

Digital Output Specifications

Number	8	
Short-circuit proof	yes	
Maximum continuous current load allowed per channel	0.5 A	
Maximum total current (entire module)	4 A (100% of on-time)	
Maximum braking energy of outputs (inductive load)	maximum 1 Joule/channel	
Residual current (off)	≤ 10 µA	
Turn-on delay	< 200 µs	
Turn-off delay	< 200 µs	

Electrical Requirements

+24 V supply voltage	18-30 V DC	
Current consumption of voltage supply +24 V1	corresponds to the load on the digital outputs	
Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V supply)	typically 40 mA	maximum 45 mA

Voltage Monitor

	+24 V supply voltage	supply voltage > 18 V (DC OK-LED lights green)

Article Number and Miscellaneous

	Article number	20-007-081
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Digital Output Module
TO 127

with 12 short-circuit proof digital outputs

The S-DIAS TO 127 digital output module has 12 short-circuit proof digital outputs in three groups (+24 V /1.7 A). The supply voltage for each group is monitored for low voltage.

In compliance with the safety-relevant requirements of the BG Institute for Occupational Safety (BIA), the outputs on the primary (+5 V) and the secondary (+24 V) sides are isolated using optic couplers (according to application class 3, pollution degree 2). In the monitoring circuits of the voltage supply for each channel group, the primary and secondary sides are also isolated with optic couplers.

Digital Output Specifications

Number	12
Short-circuit proof	yes
Maximum continuous current load allowed per channel	1.7 A
Maximum total current (group)	5,1 A at 40 °C ambient temperature 3,4 A at 55 °C ambient temperature
Maximum total current (complete module)	15,3 A at 40 °C ambient temperature 10,2 A at 55 °C ambient temperature
Maximum braking energy of outputs (inductive load)	maximum 0.65 Joules/channel maximum 1.95 Joules/ 4 channels
Leakage current (output inactive)	≤ 12 µA
Turn-on delay	< 200 µs
Turn-off delay	< 200 µs

Electrical Requirements

	Supply voltage +24 V /1-3	18-30 V DC	
	Current consumption of voltage supply +24 V /1-3	corresponds to the load on the digital outputs	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 45 mA	maximum 50 mA

Voltage Monitor

	Supply voltage +24 V /1-3	supply voltage > 18 V (corresponding DC OK-LED lights green)

Article Number and Miscellaneous

	Article number	20-007-127
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Digital Output Module
TO 161

with 16 short-circuit proof digital outputs

The S-DIAS TO 161 digital output module has 16 short-circuit proof digital outputs in two groups (+24 V/0.5 A, short-circuit proof). The supply voltage for each group is monitored for low voltage.

Digital Output Specifications

Number	16
Short-circuit proof	yes
Maximum continuous current load allowed per channel	0.5 A
Maximum total current (per 8-channel group)	4 A (100 % of on-time)
Maximum total current (entire module)	8 A (100 % of on time)
Maximum braking energy of outputs (inductive load)	maximum 1 Joule/channel
Residual current (off)	≤ 10 µA
Turn-on delay	< 200 µs
Turn-off delay	< 200 µs

Electrical Requirements

	Supply voltage +24 V /1-2	18-30 V DC	
	Current consumption of voltage supply +24 V /1-2	corresponds to the load on the digital outputs	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 45 mA	maximum 50 mA

Voltage Monitor

	Supply voltage +24 V /1-2	supply voltage > 18 V (corresponding DC OK-LED lights green)

Article Number and Miscellaneous

	Article number	20-007-161
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Pulse Width Module
PW 022

with 2 PWM outputs

The S-DIAS PW 022 pulse width module has two +24 V switching PWM outputs with an adjustable frequency for controlling inductive loads (magnetic valve, proportional valve, ...). The 2 PWM outputs are powered through a supply connection.
The supply voltage is monitored for under voltage.

PWM Output Specifications

Number	2
Configuration	+24 V-switching
Short-circuit proof	yes
Maximum output current/channel	1.5 A to 45 °C 1 A to 55 °C
PWM frequency	adjustable as period in 0.5 µs increments between 30.5 Hz and 20 kHz
PWM pulse width	adjustable via software in 0.5 µs increments

Electrical Requirements

	PWM output supply voltage	+18-30 V DC	
	Current consumption of PWM output supply	corresponds to the load on PWM outputs	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V power supply)	typically 50 mA	maximum 65 mA

Voltage Monitor

	PWM supply voltage	supply voltage > 18 V (corresponding DC OK LED lights)

Article Number and Miscellaneous

	Article number	20-030-022
	Hardware version	12,5 x 104,2 x 72 mm (B x H x T)
	Standard	UL 508 (E247993)
	Approvals	CE, $_{c}$UL$_{US}$, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating Conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Pulse Width Module
PW 161

with 16 valve outputs

The S-DIAS PW 161 pulse width module has 16 valve outputs for valves with a starting current of up to 1 A and a 0.5 A stopping current. The 16 valve outputs are divided into two supply groups of 8 outputs each. Each supply group provides a current measurement for the switch point detection of the valve.

The supply voltages are monitored for under voltage.

Valve Outputs Specifications

Number	16
Execution	GND switching
Short-circuit proof	yes
Maximum starting current/channel	1 A
Maximum stopping current/channel	0.5 A
Maximum total current/group	4 A
Brake voltage during shutdown	39 V
Maximum braking energy of outputs (inductive load)	maximum 1 Joule/for all channels maximum 0.25 Joules/channel
Turn-on delay	100 µs can be set through the software in 0-255 increments
Excitation time	100 µs can be set through the software in 0-255 increments
PWM frequency	20 kHz
Current measurement/group	0-2 A 10-bit ADC 100 µs conversion time

Derating variants	50 % starting ratio of all channels, 100 % simultaneity of all channels, 100 % of the maximum stopping current per channel. 100 % starting ratio of all channels, 50 % simultaneity of all channels, 100 % of the maximum stopping current per channel. 100 % starting ratio of all channels, 100 % simultaneity of all channels, 50 % of the maximum stopping current per channel.	

Electrical Requirements

Supply voltage of valve +UV /1-2 +UV /1-2	18-52 V DC	
Current consumption of voltage supply +UV /1-2	corresponds to the load on the valve outputs	
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V power supply)	typically 45 mA	maximum 50 mA

Voltage Monitor

Supply voltage +UV /1-2	Supply voltage > 18 V (corresponding DC OK-LED lights green)	

Article Number and Miscellaneous

Article number	20-030-161	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	UL 508 (E247993)	
Approvals	UL, cUL, CE, UKCA	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +55 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3,5 mm von 5 Hz-8,4 Hz 1 g von 8,4 Hz-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Relay Output Module
RO 041

with 4 relay outputs

The S-DIAS RO 041 relay output module has four relay outputs, each with normally open contacts for 230 V/6 A AC or 24 V/6 A DC.

Relay Outputs Specifications

	Number	4	
	Contact	normally open	
	Relay type	V23061-A1007-A302	
	Nominal voltage	24 V DC	230 V AC
	Switching voltage	maximum 30 V	maximum 250 V AC
	Maximum continuous current /channel	maximum 6 A DC	maximum 6 A AC
	Simultaneity of all outputs	100 %	
	Maximum continuous current per connector plug contact allowed	10 A DC	10 A AC
	Turn-on delay	≤ 10 ms	
	Turn-off delay	≤ 10 ms	

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 35 mA	maximum 40 mA
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V supply) (all relays active)	typically 37 mA at +18 V typically 50 mA at +24 V typically 62 mA at +30 V	maximum 44 mA at +18 V maximum 58 mA at +24 V maximum 73 mA at +30 V

Article Number and Miscellaneous

	Article number	20-064-041
	Dimensions	25 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-40 ... +85 °C	
	Environmental temperature	-25 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3,5 mm von 5 Hz-8,4 Hz 1 g von 8,4 Hz-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Relay Output Module
RO 051

with 5 relay outputs

The S-DIAS RO 051 relay output module has five relay outputs, each with change over contacts for 115 V/6 A AC or 24 V/6 A DC.

Relay Outputs Specifications

	Number	5	
	Contact	change over	
	Relay type	V23061-B1007-A301	
	Nominal voltage	24 V DC	115 V AC
	Switching voltage	maximum 30 V	maximum 125 V AC
	Maximum continuous current /channel	maximum 6 A DC	maximum 6 A AC
	Simultaneity of all outputs	100 %	
	Maximum continuous current per connector plug contact allowed	6 A DC	6 A AC
	Turn-on delay	≤ 10 ms	
	Turn-off delay	≤ 10 ms	

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 35 mA	maximum 40 mA
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V supply) (all relays active)	typically 46 mA at +18 V typically 62 mA at +24 V typically 77 mA at +30 V	maximum 54 mA at +18 V maximum 72 mA at +24 V maximum 91 mA at +30 V

Article Number and Miscellaneous

	Article number	20-064-051
	Dimensions	25 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-40 ... +85 °C	
	Environmental temperature	-25 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3,5 mm von 5 Hz-8,4 Hz 1 g von 8,4 Hz-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Digital Mixed Module
DM 046

with 4 back-readable digital outputs

The S-DIAS Digital Mixed Module DM 046 has four back-readable digital outputs (+24 V/1.7 A). These can also be used as digital inputs (24 V/3.7 mA/ 0.5 ms) The supply voltage is monitored for under voltage. The back-readable outputs are galvanically separated.

Digital Input Specifications

	Number	4	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +8 V	high: > +14 V
	Switching threshold	typically +11 V	
	Input current	3.7 mA at +24 V	
	Input delay	typically 0.5 ms	
	Galvanic isolation	yes (isolation voltage 500 V)	

Digital Output Specifications

	Number	4
	Short-circuit proof	yes
	Maximum continuous current load/channel allowed	1.7 A
	Maximum total current (entire module)	6.8 A
	Maximum braking energy of outputs (inductive load)	maximum 0.65 Joule/channel maximum 1.95 Joule/4 channels

Residual current output (off)	≤ 12 µA	
Turn-on delay	< 200 µs	
Turn-off delay	< 200 µs	
Galvanic isolation	yes (isolation voltage 500 V)	

Electrical Requirements

External power supply +24 V	18-30 V DC	
External current consumption Power supply +24 V	corresponds to the load on the digital outputs + outgoing 24 V supply maximum 6.8 A	
Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V supply)	typically 39 mA	maximum 50 mA

Voltage Monitor

Power supply +24 V	supply voltage > 18 V (DC OK-LED lights green)

Article Number and Miscellaneous

Artikel number	20-008-046
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Standard	designed according to UL
Approvals	designed according to UL

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Digital Mixed Module
DM 081

with 4 digital inputs
4 short-circuit proof digital outputs

The S-DIAS DM 081 digital mixed module has four digital inputs (+24 V/3.7 mA/5 ms) and four short-circuit proof digital outputs (+24 V/0.5 A). The supply voltage is monitored for under voltage.

Digital Input Specifications

	Number	4	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +5 V	high: > +15 V
	Input current	3.7 mA at +24 V	
	Input delay	typically 5 ms	

Digital Output Specifications

	Number	4
	Short-circuit proof	yes
	Maximum continuous current load allowed per channel	0.5 A
	Maximum total current (all 4 outputs)	2 A (100 % of on time)
	Maximum braking energy of outputs (inductive load)	maximum 1 Joule/channel
	Residual current (off)	≤ 10 µA
	Turn-on delay	< 200 µs
	Turn-off delay	< 200 µs

Electrical Requirements

	Power supply +24 V	18-30 V DC	
	Current consumption of the +24 V supply	corresponds to the load on the digital outputs	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 45 mA	maximum 50 mA

Voltage Monitor

	Power supply +24 V	supply voltage > 18 V (DC OK-LED lights green)

Article Number and Miscellaneous

	Artikel number	20-008-081
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Digital Mixed Module
DM 108

with 4 digital inputs +24 V/5 ms/3.7 mA
4 digital outputs +24 V/0.5 A
2 digital outputs +24 V/0.5 A/back-readable
4 supply connections +24 V/0.25 A

The S-DIAS DM 108 digital mixed module has four digital inputs (+24 V/3.7 mA/5 ms), four short-circuit proof digital outputs (+24 V/0.5 A) and two short-circuit proof back-readable outputs (+24 V/0.5 A). These can be used as digital inputs (+24 V/3.7 mA/0.5 ms).

Four +24 V/0.25 A supply connections for sensors or actuators. The supply voltage is monitored for under voltage.

Digital Input Specifications

	Number	4	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +5 V	high: > +15 V
	Input current	3.7 mA at +24 V	
	Input delay	typically 5 ms	

Digital Output Specifications

	Number	4
	Short-circuit proof	yes
	Maximum continuous current load allowed per channel	0.5 A
	Maximum total current (all 4 outputs)	2 A (100 % of on time)
	Maximum braking energy of outputs (inductive load)	maximum 0,1 Joule/channel
	Residual current (off)	≤ 10 µA
	Turn-on delay	< 100 µs
	Turn-off delay	< 150 µs

Digital Back-readable Output Specifications

	Number	2	
	Short-circuit proof	yes	
	Maximum continuous current load/ channel allowed	0.5 A	
	Maximum total current (all 2 outputs)	1 A (100 % of on-time)	
	Maximum braking energy of the output (inductive load)	maximum 0.1 Joule/channel	
	Residual current output (off)	≤ 10 µA	
	Turn-on delay	< 100 µs	
	Turn-off delay	< 150 µs	
	Back-reading input voltage	typically +24 V	maximum +30 V
	Back-reading signal level	low: < +8 V	high: > +14 V
	Back-reading switching threshold	typically +11 V	
	Input current	3.7 mA at +24 V	
	Back-reading input delay	typically 5 ms	

Sensor/Actuator Supply Specifications

	Sensor/actuator supply	corresponds to the +24 V supply applied at X5	
	Short-circuit proof	yes	
	Maximum permissible continuous current/supply connection	0.25 A	
	Maximum total current (all 4 outgoing supply connections)	1.0 A	

Electrical Requirements

	Power supply +24 V	18-30 V DC	
	Current consumption of the +24 V supply	corresponds to the load on the digital outputs and sensor/actuator supply (max. 4 A)	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 40 mA	maximum 50 mA

Voltage Monitor

	Power supply +24 V	supply voltage > 18 V (DC OK-LED lights green)

Article Number and Miscellaneous

	Artikel number	20-008-108
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating, > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS Digital Mixed Module
DM 161

with 8 digital inputs
8 short-circuit proof digital outputs

The S-DIAS DM 161 digital mixed module has eight digital inputs +24 V/3.7 mA/5 ms) and eight short-circuit proof digital outputs (+24 V/0.5 A). The supply voltage is monitored for under voltage.

Digital Input Specifications

	Number	8	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +5 V	high: > +15 V
	Input current	3.7 mA at +24 V	
	Input delay	typically 5 ms	

Digital Output Specifications

	Number	8
	Short-circuit proof	yes
	Maximum continuous current load allowed per channel	0.5 A
	Maximum total current (all 8 outputs)	4 A (100% of on-time)
	Maximum braking energy of outputs (inductive load)	maximum 1 Joule/channel
	Residual current (off)	≤ 10 µA
	Turn-on delay	< 200 µs
	Turn-off delay	< 200 µs

Electrical Requirements

	Power supply +24 V	18-30 V DC	
	Current consumption of the +24 V supply	corresponds to the load on the digital outputs	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 45 mA	maximum 50 mA

Voltage Monitor

	Power supply +24 V	supply voltage > 18 V (DC OK-LED lights green)

Article Number and Miscellaneous

	Artikel number	20-008-161
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Digital Mixed Module
DM 162

with 4 digital inputs
4 digital inputs with counter function and time measurement
8 short-circuit proof digital outputs

The S-DIAS DM 162 digital mixed module has four digital inputs +24 V/3.7 mA/5 ms), four digital inputs with counter function and time measurement and eight short-circuit proof digital outputs (+24 V/0.5 A). The supply voltage is monitored for under voltage.

Digital Input Specifications

	Number	8	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +5 V	high: > +15 V
	Input current	3.7 mA at +24 V	
	Input delay	Input 1-4: 1 µs (counter, time measurement) Input 5-8: 5 ms	
	Input frequency of counter input	25 kHz in normal counter mode or in incremental counter mode with 4-edge analysis	
	Counter frequency	25 kHz in normal counter mode 100 kHz in incremental counter mode with 4-edge analysis	
	Time measurement	measurement of the time between Sync and edge change in µs for input 1-4	

Digital Output Specifications

Number	8	
Short-circuit proof	yes	
Maximum continuous current load allowed per channel	0.5 A	
Maximum total current (all 8 outputs)	4 A (100% of on-time)	
Maximum braking energy of outputs (inductive load)	maximum 1 Joule/channel	
Residual current (off)	≤ 10 µA	
Turn-on delay	< 200 µs	
Turn-off delay	< 200 µs	

Electrical Requirements

Power supply +24 V	18-30 V DC	
Current consumption of the +24 V supply	corresponds to the load on the digital outputs	
Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V supply)	typically 50 mA	maximum 55 mA

Voltage Monitor

Power supply +24 V	supply voltage > 18 V (DC OK-LED lights green)

Article Number and Miscellaneous

Artikel number	20-008-162
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Standard	UL 508 (E247993)
Approvals	UL, cUL, CE, UKCA

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Digital Mixed Module
DM 167

with 8 digital inputs
8 short-circuit proof digital outputs

The S-DIAS Digital Mixed Module DM 167 has eight digital inputs (+24 V/3.7 mA/5 ms) and eight short circuit proof outputs (+24 V/1.7 A) in two groups. The power supply for each channel group is monitored for under voltage.
In compliance with the safety-relevant requirements of the BIA, the outputs on the primary (+5 V) and the secondary (+24 V) sides are isolated using optic couplers (according to application class 3, pollution degree 2). For the inputs, the primary (+24 V) and the secondary sides (+5 V) are separated using optic couplers.

Digital Input Specifications

	Number	8	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +8 V	high: > +14 V
	Switching threshold	typically +11 V	
	Input current	3.7 mA at +24 V	
	Input delay	typically 5 ms	
	Galvanic isolation	Optic coupler, GND/EXTGND not galvanically isolated	

Digital Output Specifications

	Number	8
	Short-circuit proof	yes
	Maximum continuous current load allowed per channel	1.7 A
	Maximum total current (group)	5.1 A to 50 °C ambient temperature 3.4 A to 55 °C ambient temperature
	Maximum total current (entire module)	10.2 A to 50 °C ambient temperature 6.8 A to 55 °C ambient temperature

Maximum braking energy of outputs (inductive load)	maximum 0.65 Joules/channel maximum 1.95 Joules/ 4 channels	
Residual current output (off)	≤ 12 µA	
Turn-on delay	< 200 µs	
Turn-off delay	< 200 µs	
Galvanic isolation	Optic coupler, GND/EXTGND not galvanically isolated	

Electrical Requirements

Supply voltage +24 V /1-2	18-30 V DC, typically +24 V DC	
Current consumption of voltage supply +24 V /1-2	corresponds to the load on the digital outputs	
Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V supply)	typically 45 mA	maximum 50 mA

Voltage Monitor

Supply voltage +24 V 1/2/3	Supply voltage > 18 V (corresponding DC OK-LED lights green)	
Galvanic isolation	Optic coupler, GND/EXTGND not galvanically isolated	

Article Number and Miscellaneous

Artikel number	20-008-167	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	UL 508 (E247993)	
Approvals	UL, cUL, CE	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Multi I/O Module
IO 011

with 6 digital inputs
8 short-circuit proof digital outputs
1 analog voltage input
1 analog current input

The module has 6 digital inputs (+24 V/3.5 mA/ 0.5 ms) and 8 short circuit proof digital outputs (+24 V/0.5 A), these support read-back (0.5 ms). The voltage supply for the digital outputs are monitored for under voltage.

Additionally, the module has an analog ±10 V input and an analog current input (0-20 mA or 4-20 mA). The resolution of the two analog inputs is 16 bits.

Digital Input Specifications

	Number	6	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +5 V	high: > +15 V
	Input current	3.7 mA at +24 V	
	Input delay	typically 0.5 ms	

Digital Output Specifications

	Number	8
	Short-circuit proof	yes
	Maximum permitted continuous load current / channel	0.5 A
	Maximum total current (all 8 outputs)	4 A (100 % of on-time)
	Maximum braking energy of outputs (inductive load)	maximum 1 Joule/channel

	Residual current output (off)	≤ 10 µA	
	Turn-on delay	< 100 µs	
	Turn-off delay	< 150 µs	
	Read-back signal level	low: < +8 V	high: > +14 V
	Input delay	typically 0.5 ms	
	Maximum allowed voltage on the digital output when switched off	A voltage supplied to the digital output pin from external must not exceed the voltage on the supply pin (24 V) by more than 0.7 V.	

Voltage Monitor

	Power supply +24 V	supply voltage > 18 V (DC OK-LED lights green)

Analog ±10 V Input Specifications

	Number of channels	1	
	Measurement range	-10 ... +10 V	0 ... +10 V
	Measurement value	-10,000 ... +10,000 or -30,000 ... +30,000 (at full range)	0 ... +10,000 or 0 ... +30,000 (at full range)
	Input type	difference input	
	Resolution	16-bit (ca. 0.3 mV/LSB)	
	Conversion time for all channels	depending on the selected timing Speed mode: 15.26 µs Time offset mode: corresponds to the S-DIAS cyclic time	
	Common mode range	±12 V	
	Input resistance	typically 660 kΩ	
	Cable break monitor	yes	
	Input filter hardware	typically 1 kHz, low pass 3rd order system	
	Input filter software	configurable, low pass 1st order system	
	Basic accuracy	±0.20 % of maximum measurement value	
	Total accuracy (0-60 °C)	±0.30 % of maximum measurement value	

Analog Current Input Specifications

	Number of channels	1	
	Measurement range	0-20 mA	4-20 mA
	Measurement value	0-20,000 or 0-60,000 (at Full-Range)	4,000-20,000 or 12,000-60,000 (at Full-Range)
	Input type	difference input	
	Resolution current	16-bit (ca. 0.3 µA/LSB)	
	Conversion time for all channels	depending on the selected timing Speed mode: 15.26 µs Time offset mode: corresponds to the S-DIAS cyclic time	
	Common mode range	±10 V	
	Input resistance	typically 50 Ω	
	Cable break monitor	no	yes, settable via software between 0-4 mA (default: 3 mA)
	Short-circuit monitor	no	yes, settable via software between 0-4 mA (default: 3 mA)
	Input filter hardware	typically 1 kHz, low pass 3rd order	
	Input filter software	configurable low pass 1st order system	
	Basic accuracy	±0.30 % of maximum measurement value	
	Total accuracy (0-60 °C)	±0.50 % of maximum measurement value	

Electrical Requirements

	Power supply +24 V	18-30 V DC	
	Current consumption of the +24 V supply	corresponds to the load on the digital outputs	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V power supply)	typically 60 mA	maximum 65 mA
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V power supply)	typically 20 mA	maximum 25 mA
	UL standard	for UL: must be supplied with SELV / PELV and Limited Energy	

Article Number and Miscellaneous

	Artikel number	20-013-011
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Multi I/O Module Smart
IO 011S

with 6 digital inputs
8 short-circuit proof digital outputs
1 analog voltage input
1 analog current input

The module has 6 digital inputs (+24 V/3.5 mA/ 1 µs) and 8 short circuit proof digital outputs (+24 V/0.5 A), these support read-back (150 µs). The voltage supply for the digital outputs are monitored for under voltage.

Additionally, the module has an analog ±10 V input and an analog current input (0-20 mA). The resolution of the two analog inputs is 16 bits.

Digital Input Specifications

	Number	6	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +8 V	high: > +14 V
	Switching threshold	typically +11 V	
	Input current	3.7 mA at +24 V	
	Input delay	typically 1 µs	

Digital Output Specifications

	Number	8
	Short-circuit proof	yes
	Maximum permitted continuous load current / channel	0.5 A
	Maximum total current (all 8 outputs)	4 A (100 % of on-time)
	Maximum braking energy of outputs (inductive load)	maximum 1 Joule/channel

	Residual current output (off)	≤ 10 µA	
	Turn-on delay	< 100 µs	
	Turn-off delay	< 150 µs	
	Read-back signal level	low: < +8 V	high: > +14 V
	Input delay	typically 1 µs	
	Maximum allowed voltage on the digital output when switched off	An external voltage supplied to the digital output pin must not exceed the voltage on the supply pin (24 V) by more than 0.7 V.	

Voltage Monitor

	Power supply +24 V	supply voltage > 18 V (DC OK-LED lights green)

Analog ±10 V Input Specifications

	Number of channels	1	
	Measurement range	-10 ... +10 V	0 ... +10 V
	Measurement value	-30.000 ... +30.000	0 ... +30.000
	Input type	differential input	
	Resolution	16-bit (ca. 0.3 mV/LSB)	
	Conversion time for all channels	default mode: 10 µs (current input disabled) default mode: 20 µs (current input enabled) time-trigger mode: 15 µs (current input disabled/enabled) latch mode: 10 µs (current input disabled, 1-4 latch registers enabled) latch mode: 20 µs (current input disabled, 5-8 latch registers enabled) latch mode: 20 µs (current input enabled, 1-8 latch registers enabled)	
	Common mode range	±12 V	
	Input resistance	typically 660 kΩ	
	Cable break monitor	yes	
	Input filter hardware	typically 100 kHz, low pass 3rd order system	
	Input filter software	configurable low pass 1st order system (in standard mode only)	
	Basic accuracy	±0.20 % of maximum measurement value	
	Total accuracy (0-60 °C)	±0.30 % of maximum measurement value	

Analog Current Input Specifications

	Number of channels	1	
	Measurement range	0-20 mA	4-20 mA
	Measurement value	0-60,000	12,000-60,000
	Input type	difference input	
	Resolution current	16-bit (ca. 0.3 µA/LSB)	
	Conversion time for all channels	default mode: 10 µs (voltage input disabled) default mode: 20 µs (voltage input enabled) time-trigger mode: 15 µs (voltage input disabled/enabled) latch mode: 10 µs (voltage input disabled, 1-4 latch register enabled) latch mode: 20 µs (voltage input disabled, 5-8 latch register enabled) latch mode: 20 µs (voltage input enabled, 1-8 latch register enabled)	
	Common mode range	±10 V	
	Input resistance	typically 50 Ω	
	Cable break monitor	no	yes, settable via software between 0-4 mA (default: 3 mA)
	Short-circuit monitor	no	yes, settable via software between 0-4 mA (default: 3 mA)
	Input filter hardware	typically 1 kHz, low pass 3rd order	
	Input filter software	configurable low pass 1st order system (in standard mode only)	
	Basic accuracy	±0.30 % of maximum measurement value	
	Total accuracy (0-60 °C)	±0.50 % of maximum measurement value	

Electrical Requirements

	Power supply +24 V	18-30 V DC	
	Current consumption of the +24 V supply	corresponds to the load on the digital outputs	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V power supply)	typically 70 mA	maximum 75 mA
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V power supply)	typically 20 mA	maximum 25 mA
	UL standard	for UL: must be supplied with SELV / PELV and Limited Energy	

Article Number and Miscellaneous

	Artikel number	20-013-011S
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993) in preparation
	Approvals	cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Strain Gauge Input Module
AI 022

with 2 analog inputs
measurement range ±1.875 mV until ±120 mV

The S-DIAS AI 022 strain gauge input module is used to analyze measuring bridges (i.e. DMS load cells). With a 24-bit resolution, measurement values with an accuracy of 0.035 % are provided.

Analog Channel Specifications

Number of channels	2					
Bridge supply voltage	+5 V					
Load cell rated values	0.25 mV/V	0.5 mV/V	1 mV/V	2 mV/V	16 mV/V	
Measurement range	±1.875 mV	±3.75 mV	±7.5 mV	±15 mV	±120 mV	
Measurement value	±8388608 d					
Resolution	24-bit					
Hardware filter	180 Hz, 1st order					
Filter setting, conversion time and noise-free resolution	filter word	2	5	1023		
	filter type	Sinc4	Sinc4	Sinc4		
	cutoff frequency (-3 dB)	144 Hz	57.7 Hz	0.282 Hz		
	conversion time	4 ms	9 ms	1702 ms		
	noise-free resolution	15.5 bits	16 bits	20 bits		
Sensor break detection	yes					
Load per channel	75-5000 Ω (when using one channel) 150-5000 Ω (when using both channels)					

Noise	±0.0031 % referred to the full scale value for filter Word 2	
Temperature drift	±0.001 % / °C referred to the full scale value of the measuring range	
Overall accuracy	±0.035 % referred to the full scale value of the measuring range	
Calibration data Null-voltage protected	yes	
Calibratable	no	

Electrical Requirements

Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V power supply)	typically 50 mA	maximum 55 mA
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V power supply) without load on the measuring bridge supply voltage	typically 17 mA at +18 V typically 15 mA at +24 V typically 14 mA at +30 V	maximum 20 mA at +18 V maximum 18 mA at +24 V maximum 17 mA at +30 V
Current consumption on the S-DIAS bus (+24 V power supply) with maximum load on the both measuring bridge supply voltage	typically 41 mA at +18 V typically 34 mA at +24 V typically 29 mA at +30 V	maximum 48 mA at +18 V maximum 40 mA at +24 V maximum 34 mA at +30 V

Article Number and Miscellaneous

Article number	20-009-022
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Standard	UL 508 (E247993)
Approvals	UL, cUL, CE, UKCA

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Strain Gauge Input Module
AI 022-1

with 2 analog inputs
measurement range ±1.25 mV until ±80 mV

The S-DIAS AI 022-1 strain gauge input module is used to analyze measuring bridges (i.e. DMS load cells). With a 24-bit resolution, measurement values with an accuracy of 0.035 % are provided.

Analog Channel Specifications

	Number of channels	2				
	Bridge supply voltage	+5 V				
	Load cell rated values	0.25 mV/V	0.5 mV/V	1 mV/V	2 mV/V	16 mV/V
	Measurement range	±1.25 mV	±2.5 mV	±5 mV	±10 mV	±80 mV
	Measurement value	±8388608 d				
	Resolution	24-bit				
	Hardware filter	8 Hz, 1st order				
	Filter setting, conversion time and noise-free resolution	filter word	2	5	1023	
		filter type	Sinc4	Sinc4	Sinc4	
		cutoff frequency (-3 dB)	144 Hz	57.7 Hz	0.282 Hz	
		conversion time	4 ms	9 ms	1702 ms	
		noise-free resolution	15.5 bits	16 bits	20 bits	
	Sensor break detection	yes				
	Load per channel	60-5000 Ω (when using one channel)				

Noise	±0.0031 % referred to the full scale value for filter Word 2	
Temperature drift	±0.001 % / °C referred to the full scale value of the measuring range	
Overall accuracy	±0.035 % referred to the full scale value of the measuring range	
Calibration data Null-voltage protected	yes	
Calibratable	no	

Electrical Requirements

Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V power supply)	typically 50 mA	maximum 55 mA
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V power supply) without load on the measuring bridge supply voltage	typically 17 mA at +18 V typically 15 mA at +24 V typically 14 mA at +30 V	maximum 20 mA at +18 V maximum 18 mA at +24 V maximum 17 mA at +30 V
Current consumption on the S-DIAS bus (+24 V power supply) with maximum load on the both measuring bridge supply voltage	typically 41 mA at +18 V typically 34 mA at +24 V typically 29 mA at +30 V	maximum 48 mA at +18 V maximum 40 mA at +24 V maximum 34 mA at +30 V

Article Number and Miscellaneous

Article number	20-009-022-1
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Standard	UL 508 (E247993)
Approvals	UL, cUL, CE

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Analog Input Module
AI 023

with 2 resistance or temperature inputs

The AI 023 S-DIAS analog input module has two resistance inputs with five settable measurement ranges from 0-250 Ω, 0-500 Ω, 0-1000 Ω, 0-2500 Ω and 0-5000 Ω. Sup-ported temperature sensors include PT100, PT1000, NI100, NI1000 and various KTY sensors. The module allows a connection with 2 or 4-wire measuring technology. The analog inputs are galvanically separated from the S-DIAS bus.

Analog Input Resistor/Temperature Specifications

Number of channels	2
Measurement range	see the following measurement range table.
AD converter resolution	16-bit
Typical current measurement	< 0.3 ms
Conversion time for all channels	4 ms
Input resistance	> 10 MΩ
Input filter hardware	10 kHz, low pass 2nd order system
Input filter	configurable
Measurement precision	±0.3 % of maximum measurement value
Resistor sensor connection cable	< 100 Ω
Galvanic separation of analog inputs to S-DIAS bus	yes (560 V)
Status display	green LEDs

Measurement Range of Resistor Inputs

Type	**Resistance range**	Measurement value
1	0 ... 250 Ω	0-2500
2	0 ... 500 Ω	0-5000
3	0 ... 1000 Ω	0-10000
4	0 ... 2500 Ω	0-25000
5	0 ... 5000 Ω	0-50000

Measurement Range of Temperature Inputs

Type	Temperature range	Resistance range	Measurement value
Pt100	-200 ... +150 °C	18.5 ... 157.3 Ω	-2000 ... +1500
Pt100	-200 ... +850 °C	18.5 ... 390.5 Ω	-2000 ... +8500
Pt200	-200 ... +150 °C	37.0 ... 314.6 Ω	-2000 ... +1500
Pt200	-200 ... +850 °C	37.0 ... 781.0 Ω	-2000 ... +8500
Pt500	-200 ... +150 °C	92.6 ... 786.6 Ω	-2000 ... +1500
Pt500	-200 ... +850 °C	92.6 ... 1952.4 Ω	-2000 ... +8500
Pt1000	-200 ... +150 °C	185.2 ... 1573.3 Ω	-2000 ... +1500
Pt1000	-200 ... +850 °C	185.2 ... 3904.8 Ω	-2000 ... +8500
NI100	-60 ... +150 °C	69.5 ... 198.6 Ω	-600 ... +1500
NI100	-60 ... +250 °C	69.5 ... 289.2 Ω	-600 ... +2500
NI1000	-60 ... +150 °C	695.2 ... 1986.3 Ω	-600 ... +1500
NI1000	-60 ... +250 °C	695.2 ... 2891.6 Ω	-600 ... +2500
KTY10-62 KTY11-62	-50 ... +150 °C	1035.9 ... 4575.3 Ω	-500 ... +1500
KTY81-110 KTY81-120 KTY81-150	-55 ... +150 °C	490.0 ... 2211.0 Ω	-550 ... +1500
KTY81-121	-55 ... +150 °C	485.1-2189.1 Ω	-550 ... +1500
KTY81-122	-55 ... +150 °C	494.9-2233.0 Ω	-550 ... +1500
KTY84-130 KTY84-150	-40 ... +300 °C	358.8 ... 2623.0 Ω	-400 ... +3000

Electrical Requirements

Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V power supply)	typically 46 mA at +18 V typically 37 mA at +24 V typically 32 mA at +30 V	maximum 50 mA at +18 V maximum 41 mA at +24 V maximum 36 mA at +30 V

Article Number and Miscellaneous

Article number	20-009-023	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	designed according to UL	
Approvals	CE	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without Derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	according to EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

Notes

S-DIAS Analog Input Module
AI 043

with 4 resistor or temperature inputs

The S-DIAS AI 043 analog input module has four resistor inputs with five adjustable measurement ranges from 0-250 Ω, 0-500 Ω, 0-1000 Ω, 0-2500 Ω and 0-5000 Ω. PT100, PT1000, NI100, NI1000 are used as temperature sensors and various KTY sensors are supported. The module allows the connection of the sensors using 2 or 3-wire measuring technology. The analog inputs are galvanically separated from the S-DIAS bus.

Analog Input Resistor/Temperature Specifications

Number of channels	4
Measurement range	see the following measurement range table.
AD converter resolution	16-bit
Typical current measurement	< 0.3 ms
Conversion time for all channels	4 ms
Input resistance	> 10 MΩ
Input filter hardware	10 kHz, low pass 2nd order system
Input filter	configurable
Measurement precision	±0.3 % of maximum measurement value
Resistor sensor connection cable	< 100 Ω
Galvanic separation of analog inputs to S-DIAS bus	yes (560 V)
Status display	green LEDs

Measurement Range of Resistor Inputs

Type	**Resistance range**	Measurement value
1	0 ... 250 Ω	0-2500
2	0 ... 500 Ω	0-5000
3	0 ... 1000 Ω	0-10000
4	0 ... 2500 Ω	0-25000
5	0 ... 5000 Ω	0-50000

Measurement Range of Temperature Inputs

Type	Temperature range	Resistance range	Measurement value
Pt100	-200 ... +150 °C	18.5 ... 157.3 Ω	-2000 ... +1500
Pt100	-200 ... +850 °C	18.5 ... 390.5 Ω	-2000 ... +8500
Pt200	-200 ... +150 °C	37.0 ... 314.6 Ω	-2000 ... +1500
Pt200	-200 ... +850 °C	37.0 ... 781.0 Ω	-2000 ... +8500
Pt500	-200 ... +150 °C	92.6 ... 786.6 Ω	-2000 ... +1500
Pt500	-200 ... +850 °C	92.6 ... 1952.4 Ω	-2000 ... +8500
Pt1000	-200 ... +150 °C	185.2 ... 1573.3 Ω	-2000 ... +1500
Pt1000	-200 ... +850 °C	185.2 ... 3904.8 Ω	-2000 ... +8500
NI100	-60 ... +150 °C	69.5 ... 198.6 Ω	-600 ... +1500
NI100	-60 ... +250 °C	69.5 ... 289.2 Ω	-600 ... +2500
NI1000	-60 ... +150 °C	695.2 ... 1986.3 Ω	-600 ... +1500
NI1000	-60 ... +250 °C	695.2 ... 2891.6 Ω	-600 ... +2500
KTY10-62 KTY11-62	-50 ... +150 °C	1035.9 ... 4575.3 Ω	-500 ... +1500
KTY81-110 KTY81-120 KTY81-150	-55 ... +150 °C	490.0 ... 2211.0 Ω	-550 ... +1500
KTY81-121	-55 ... +150 °C	485.1-2189.1 Ω	-550 ... +1500
KTY81-122	-55 ... +150 °C	494.9-2233.0 Ω	-550 ... +1500
KTY84-130 KTY84-150	-40 ... +300 °C	358.8 ... 2623.0 Ω	-400 ... +3000

Electrical Requirements

Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V power supply)	typically 46 mA at +18 V typically 37 mA at +24 V typically 32 mA at +30 V	maximum 50 mA at +18 V maximum 41 mA at +24 V maximum 36 mA at +30 V

Article Number and Miscellaneous

Article number	20-009-043	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	UL 508 (E247993)	
Approvals	UL, cUL, CE, UKCA	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

Notes

S-DIAS Analog Input Module
AI 046

with 4 analog inputs ±11 V or ±1.1 V

The S-DIAS analog input module AI 046 has four analog inputs with two adjustable measurement ranges with ±11 V or ±1.1 V with an 18-bit resolution. The voltage supply for the analog inputs are monitored for under voltage. The analog inputs are gal-vanically separated from the S-DIAS bus.

Analog Input Specifications

	Number of channels	4	
	Measurement range	-11 ... +11 V	-1.1 ... +1.1 V
	Amplification	1	10
	Measurement value	-110,000 ... +110,000 (Mode: 18-bit signed value range) -27,500 ... +27,500 (Mode: 16-bit signed value range)	
	Galvanic isolation	500 V (maximum isolation voltage)	
	Input type	difference input	
	A/D converter	18-bit SAR with simultaneous scanning	
	Measurement range resolution	18-bit	
		ca. 84 µV/LSB	ca. 8.4 µV/LSB
	Scan rate per channel	≥ 10 µs (minimum S-DIAS cycle time: 100 µs)	
	Data memory depth per channel	512 Dwords (32 bits) 1024 words (16 bits)	
	Calculation basis for number of values per channel (n)	n = S-DIAS cycle time / scan rate	
	Common mode range	±12 V	±6 V

	Input resistance	typically 5 MΩ	
	Cable break monitor	yes (10 MΩ between AI+ and +12 V, 10 MΩ between AI- and -12 V)	
	Input filter hardware	10 kHz, low pass 3rd order (differential mode) 100 kHz, low pass 1st order (common mode)	
	Input filter software	configurable	
	Maximum allowable input voltage	±30 V	
	Total measurement precision	±0.030 % (20-40 °C)	±0.045 % (20-40 °C)
	Measurement method: Mode 2, sampling rate 50 µs	±0.045 % (0-55 °C)	±0.060 % (0-55 °C)
	Status display	green LED	

Measuring Modes

Scan rate (µs)	Mode 1	Mode 2
	hardware frequency limit in kHz	hardware frequency limit in kHz
10	10	10
20	10	10
25	10	10
50	10	8
100	10	5
200	10	3
250	10	3
500	10	1.5
1000	10	1.5

Measurement Precision

	Measurement range	-11 ... +11 V	-1.1 ... +1.1 V
	Accuracy incl. calibration error and noise Mode 2, sampling rate 50 µs 25 °C	0.010 %	0.017 %
	Temperature drift 20-40 °C 0-55 °C	 0.006 % 0.020 %	 0.008 % 0.025 %
	Linearity	0.003 %	0.005 %
	Crosstalk	0.003 %	0.003 %
	Symmetry	0.009 %	0.010 %
	Total error 20-40 °C 0-55 °C	 ±0.030 % (±3.3 mV) ±0.045 % (±5.0 mV)	 ±0.045 % (±0.50 mV) ±0.060 %(±0.66 mV)

Electrical Requirements

	External voltage supply X5	18-30 V DC	
	Current consumption X5	maximum 650 mA (maximum 500 mA for all sensor supplies) typically 60 mA (electronics)	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	0	0
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V supply)	typically 30 mA	maximum 35 mA

Voltage Monitor External +24 V Supply

	Power supply +24 V	supply voltage > 18 V (DC OK-LED lights green)

Article Number and Miscellaneous

	Article number	20-009-046
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	designed according to UL
	Approvals	UL, cUL, CE in preparation, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS Analog Input Module
AI 047

with 4 analog inputs 0-22 mA or 4-22 mA

The S-DIAS analog input module AI 047 has four analog inputs 0-22 mA or 4-22 mA with an 18-bit resolution. The voltage supply for the analog inputs are monitored for under voltage. The analog inputs are galvanically separated from the S-DIAS bus.

Analog Input Specifications

	Number of channels	4	
	Measurement range	0-22 mA	4-22 mA
	Amplification	10	
	Measurement value	0-220,000 (Mode: 19-bit signed value range) 0-27,500 (Mode: 16-bit signed value range)	40,000-220,000 (Mode: 19-bit signed value range) 5,000-27,500 (Mode: 16-bit signed value range)
	Galvanic isolation	500 V (maximum isolation voltage)	
	Input type	difference input	
	A/D converter	18-bit SAR with simultaneous scanning	
	Measurement range resolution	17-bit ca. 0.17 µA/LSB	
	Scan rate per channel	10 µs minimum	
	Data memory depth per channel	512 Dwords (32 bits) 1024 words (16 bits)	
	Calculation basis for number of values per channel (n)	n = S-DIAS cycle time / scan rate	
	S-DIAS cyclic time	100 µs minimum	

Common mode range	±8 V	
Load	typically 45 Ω	
Cable break monitor	no	yes, can be set from 0-4 mA via software (default: 3 mA)
Input filter hardware	10 kHz, low pass 3rd order (differential mode) 100 kHz, low pass 1st order (common mode)	
Input filter software	configurable	
Maximum input current allowed	continuous 50 mA single pulse 0.12 A/1 s single pulse 0.25 A/40 ms single pulse 0.75 A/200 µs	
Total measurement precision Measurement method: Mode 2, sampling rate 50 µs	±0.060 % (20-40 °C) ±0.070 % (0-55 °C)	
Status display	green LED	

Measuring Modes

Scan rate (µs)	Mode 1	Mode 2
	hardware frequency limit in kHz	hardware frequency limit in kHz
10	10	10
20	10	10
25	10	10
50	10	8
100	10	5
200	10	3
250	10	3
500	10	1,5
1000	10	1,5

Measurement Precision

Accuracy incl. calibration error and noise Mode 2, sampling rate 50 µs 25 °C	0.028 %
Temperature drift 20-40 °C 0-55 °C	 0.007 % 0.032 %
Linearity	0.005 %
Crosstalk	0.003 %
Total error 20-40 °C 0-55 °C	 ±0.045 % (±9.9 µA) ±0.070 % (±15.4 µA)

Electrical Requirements

	External voltage supply X5	18-30 V DC	
	Current consumption X5 1)	maximum 650 mA (maximum 500 mA for all sensor supplies) typically 60 mA (electronics)	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	0	0
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V supply)	typically 30 mA	maximum 35 mA

Voltage Monitor External +24 V Supply

	Power supply +24 V	supply voltage > 18 V (DC OK-LED lights green)

Article Number and Miscellaneous

	Article number	20-009-047
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	designed according to UL
	Approvals	UL, cUL, CE in preparation

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS Analog Input Module
AI 075

with 6 analog inputs or potentiometer inputs
1 temperature input
1 reference output (10 V)

The S-DIAS AI 075 analog input module has six ±10 V analog inputs or 0-100 % potentiometer inputs with a 16-bit resolution, whereby the first input can be used as a temperature input (KTY, PT1000). For the potentiometer inputs a separate temperature input (KTY, PT1000) and a 10 V reference output, which can be loaded with a maximum of 25 mA, are available.

Periphery Controller

Periphery Controller	yes	
Functionality	The periphery controller executes the analog conversion, the standardization of the analog inputs and the software filtering of the analog inputs and provides the data on the S-DIAS bus via DPRAM with variable settings for the measuring time points.	

Analog Inputs Specifications ±10 V or Potentiometer Inputs 0-100 %

Number of channels	6	
Measurement range	-10 ... +10 V	0-100 %
Measurement value	-10.000 ... 10.000	0 ... 10.000
Inputs	differential input	potential input
Resolution	16-bit (ca. 0.3 mV/LSB)	
Conversion time per channel	standard mode: 250 µs variable sample points: S-DIAS cycle time (min. 250 µs)	
Common mode range	±12 V	
Input resistance	> 10 MΩ	

	Cable break monitor	yes	
	Hardware input filter	typically 1 kHz, low pass 3rd order	
	Input filter software	configurable resp. to deactivate	
	Measurement precision	±0.3 % of maximum measurement value	±0.35 % of maximum measurement value

Reference Output Specifications

	Number of channels	1
	Reference voltage	+10 V
	Allowed output current	maximum 15 mA (< HW-Version 1.5, Ta_{MAX} = 60 °C) maximum 25 mA (≥ HW-Version 1.5, Ta_{MAX} = 55 °C)
	Allowable load per potentiometer input	≤ 2.50 mA (< HW-Version 1.5, Ta_{MAX} = 60 °C) ≤ 4.17 mA (≥ HW-Version 1.5, Ta_{MAX} = 55 °C) ≥ 4.0 kΩ (< HW-Version 1.5, Ta_{MAX} = 60 °C) ≥ 2.4 kΩ (≥ HW-Version 1.5, Ta_{MAX} = 55 °C)
	Allowed capacitive load	maximum 100 nF
	Short-circuit protection	yes
	Precision	±0.5 %

Temperature Input Specification

	Number of channels	1	
	Measurement range	500.6 ... 3904.8 Ω	1035.9 ... 4575.3 Ω
		PT1000	KTY10
		-125 ... +850 °C	-50 ... +150 °C
	Resolution	0,1 °C	
	Conversion time per channel	standard mode: 250 µs variable sample points: S-DIAS cycle time (min. 250 µs)	
	Input resistance	33 kΩ	
	Short circuit monitor	yes	
	Cable break monitor	yes	
	Hardware input filter	typically 1 kHz	low pass 3rd order
	Input filter software	10 Hz	
	Measurement precision	±0.5 % of maximum measurement value	

Electrical Requirements

	Power supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V power supply)	typically 50 mA	maximum 55 mA
	Power supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V power supply)	typically 40 mA (without load on reference output) typically 68 mA (reference output loaded with 6x 4 kΩ) typically 85 mA (reference output loaded with 6x 2k4 kΩ)	typically 50 mA (without load on reference output) maximum 80 mA (reference output loaded with 6x 4 kΩ) maximum 100 mA (reference output loaded with 6x 2k4 kΩ)

Article Number and Miscellaneous

	Article number	20-009-075
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS Analog Input Module
AI 084

with 8 current inputs

The S-DIAS AI 084 analog input module has eight current inputs with a 16-bit resolution.

The module supports the measurement ranges 0-20 mA and 4-20 mA.

Analog Current Input Specifications

	Number of channels	8	
	Measurement range	0-20 mA	4-20 mA
	Measurement value	0-20000	4000-20000
	Input type	differential input	
	Current resolution	16-bit (circa 0.3 µA/LSB)	
	Conversion time for all channels	1 ms	
	Common mode range	±10 V	
	Input resistance	typically 50 Ω	
	Hardware input filter	typically 1 kHz low pass 3rd order system	
	Input filter	configurable	
	Cable break monitor	no	yes, adjustable via software between 0-4 mA (Default: 3 mA)
	Short circuit monitor	20.25 mA	20.25 mA
	Basic precision incl. calibration error, linearity and noise at 25 °C	±0.30 % of maximum measurement value	
	Temperature drift 0-60 °C	±0.20 % of maximum measurement value	
	Total measurement precision (0-60 °C)	±0,50 % of maximum measurement value	

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V power supply)	typically 50 mA	maximum 55 mA
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V power supply)	typically 32 mA	maximum 37 mA

Article Number and Miscellaneous

	Article number	20-009-084
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Normung	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Analog Input Module
AI 0812

with 8 analog inputs

The S-DIAS analog input module AI 0812 has eight PT1000/KTY inputs with 16-bit resolution.

As temperature sensors PT1000, KTY10-62, KTY11-62, KTY81-110, KTY81-120, KTY81-150, KTY81-121, and KTY81-122 are supported.

Analog Input Specifications Resistance/Temperature

	Number of inputs	8	
	Measurement range	see the following measurement range table	
	Resolution	0.1°C or 0.1 Ω	
	Conversion time for all channels	1 ms	
	Input resistance	> 30 KΩ	
	Typical input current	< 0.33 ms	
	Input filter hardware	typically 1 kHz	Low pass 3rd order
	Input filter software	configurable (10, 25, 50, 100 Hz, or switched off)	
	Measurement precision	0.75 % of maximum measurement value	
	Potential isolation S-DIAS bus to inputs	no	

Measurement Range of Temperature Inputs

Type	Temperature range	Resistance range	Measurement value
Pt1000	-150 ... +850 °C	397.2-3904.8 Ω	-1500 ... +8500
KTY10-62 KTY11-62	-50 ... +150 °C	1035.9-4575.3 Ω	-500 ... +1500
KTY81-110 KTY81-120 KTY81-150	-55 ... +150 °C	490.0-2211.0 Ω	-550 ... +1500
KTY81-121	-55 ... +150 °C	485.1-2189.1 Ω	-550 ... +1500
KTY81-122	-55 ... +150 °C	494.9-2233.0 Ω	-550 ... +1500

Electrical Requirements

Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V power supply)	typically 24 mA at +18 V typically 22 mA at +24 V typically 20 mA at +30 V	maximum 27 mA at +18 V maximum 24 mA at +24 V maximum 23 mA at +30 V

Article Number and Miscellaneous

Article number	20-009-0812
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Normung	designed according to UL
Approvals	UKCA

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Analog Input Module
AI 088

with 8 thermal element inputs
2 KTY temperature sensors

The S-DIAS AI 088 analog input module has eight thermal element inputs for all conventional thermal element types. Two inputs for KTY temperature sensors for coupling compensation are also provided and additional temperature sensor for thermocouple compensation are integrated into the module.

Thermal Element Input Specifications

	Number of channels	8	
	Measurement range	see the following table, Measurement Ranges Thermo Elements	
	Converter resolution	16-bit	
	Conversion time per channel	1 ms	
	Common mode range	±10 V	
	Input resistance	2 MΩ	
	Cable break monitor	yes	
	Measurement current for cable brake monitor	typically 3 µA	
	Over voltage protection	265 V AC	
	Input filter Hardware	typically 2 Hz	low pass 3rd order
	Input filter Software	50 Hz/60 Hz	
	Measurement precision	±0.7 % of maximum measurement value	

Measurement Ranges Thermo Elements

Type	Thermocouple	Measurement range	Measurement value	Measurement error
J	Fe-CuNi	-10 ... +690 °C (-0.501-38.512 mV)	-100-6900	0.0078 %/Ω
K	NiCr-Ni	-40 ... +940 °C (-1.527-38.918 mV)	-400-9400	0.0077 %/Ω
T	Cu-CuNi	-40 ... +400 °C (-1.475-20.872 mV)	-400-4000	0.0144 %/Ω
E	NiCr-CuNi	0 ... +520 °C (0-38.624 mV)	0-5200	0.0078 %/Ω
N	NiCrSi-NiSi	-80 ... 1080 °C (-1.972-39.326 mV)	-800-10800	0.0076 %/Ω
S	Pt10Rh-Pt	-50 ... 1760 °C (-0.236-18.609 mV)	-500-17600	0.0161 %/Ω
R	Pt13Rh-Pt	-50 ... 1760 °C (-0.226-21.003 mV)	-500-17600	0.0142 %/Ω
B	Pt30Rh-Pt6Rh	0 ... +1820 °C (0-13.820 mV)	0-18200	0.0217 %/Ω
L	Fe-CuNi	0 ... +680 °C (0-38.487 mV)	0-6800	0.0078 %/Ω
U	Cu-CuNi	0 ... +590 °C (0-33.606 mV)	0-5900	0.0089 %/Ω

Voltage Measurement Range

Type	Voltage range	Measurement value
1	0-40 mV	0-40000

Temperature Sensor Input Spec. for Thermo Coupling Compensation

Number of channels	2	
Sensor type	KTY 10-62 or KTY 11-62	
Measurement range	-20 ... +80 °C	
Measurement value	-200 ... 800	
Converter resolution	16-bit	
Conversion time per channel	1 ms	
Sensor current	typically 0.3 mA at 25 °C	
Cable break monitor	yes	
Short circuit monitor	yes	
Input filter	typically 2 Hz	low pass 3rd order
Measurement precision	±0,7 % of maximum measurement value	

Electrical Requirements

Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V power supply)	typically 62 mA	maximum 68 mA
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V power supply)	typically 80 mA	maximum 102 mA

Article Number and Miscellaneous

Article number	20-009-088	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	UL 508 (E247993)	
Approvals	UKCA	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

Notes

S-DIAS Analog Input Module
AI 088-1

with 8 thermal element inputs
2 KTY temperature sensors

The S-DIAS AI 088-1 analog input module has eight thermal element inputs for all conventional thermal element types. Two inputs for KTY temperature sensors for coupling compensation are also provided and additional temperature sensor for thermocouple compensation are integrated into the module.

Extended measurement range compared to AI 088.

Thermal Element Input Specifications

	Number of channels	8	
	Measurement range	see the following table, Measurement Ranges Thermo Elements	
	Converter resolution	16-bit	
	Conversion time per channel	1 ms	
	Common mode range	±10 V	
	Input resistance	2 MΩ	
	Cable break monitor	yes	
	Measurement current for cable brake monitor	typically 3 µA	
	Over voltage protection	265 V AC	
	Input filter Hardware	typically 2 Hz	low pass 3rd order
	Input filter Software	50 Hz/60 Hz	
	Measurement precision	±0.7 % of maximum measurement value	

Measurement Ranges Thermo Elements

Type	Thermocouple	Measurement range	Measurement value	Measurement error
J	Fe-CuNi	-10 ...+850 °C (-0.501-48.715 mV)	-100-8500	0.0062 %/Ω
K	NiCr-Ni	-40 ... +1200 °C (-1.527-48.838 mV)	-400-12000	0.0061 %/Ω
T	Cu-CuNi	-40 ... +400 °C (-1.475-20.872 mV)	-400-4000	0.0144 %/Ω
E	NiCr-CuNi	0 ... +640 °C (0-48.313 mV)	0-6400	0.0062 %/Ω
N	NiCrSi-NiSi	-80 ... +1300 °C (-1.972-47.513 mV)	-800-13000	0.0063 %/Ω
S	Pt10Rh-Pt	-50 ... +1768 °C (-0.236-18.693 mV)	-500-17680	0.0160 %/Ω
R	Pt13Rh-Pt	-50 ... +1768 °C (-0.226-21.101 mV)	-500-17680	0.0142 %/Ω
B	Pt30Rh-Pt6Rh	0 ... +1820 °C (0-13.820 mV)	0-18200	0.0217 %/Ω
L	Fe-CuNi	0 ... +-840 °C (0-48.943 mV)	0-8400	0.0061 %/Ω
U	Cu-CuNi	0 ... +-600 °C (0-34.309 mV)	0-6000	0.0087 %/Ω

Voltage Measurement Range

Type	Voltage range	Measurement value
1	0-50 mV	0-50000

Temperature Sensor Input Spec. for Thermo Coupling Compensation

Number of channels	2	
Sensor type	KTY 10-62 or KTY 11-62	
Measurement range	-20 ... +80 °C	
Measurement value	-200 ... 800	
Converter resolution	16-bit	
Conversion time per channel	1 ms	
Sensor current	typically 0.3 mA at 25 °C	
Cable break monitor	yes	
Short circuit monitor	yes	
Input filter	typically 2 Hz	low pass 3rd order
Measurement precision	±0,7 % of maximum measurement value	

Electrical Requirements

Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V power supply)	typically 62 mA	maximum 68 mA
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V power supply)	typically 75 mA	maximum 90 mA

Article Number and Miscellaneous

Article number	20-009-088-1	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	UL 508 (E247993)	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

Notes

S-DIAS Analog Output Module
AO 026

with 2 outputs (voltage/current switchable)

The S-DIAS AO 026 analog output module has two galvanically isolated outputs with a resolution of 16 bits, which can be switched between voltage and current outputs. The supply of the analog outputs is realized with an external +24 V supply.

Analog Output Voltage Specifications

	Number of channels	2	
	Output range	-10 ... +10 V	0 ... +10 V
	Output value	-30,000 ... +30,000	0 ... +60,000
	Output range over range	-10.8 ... +10.8 V	0 ... +10.8 V
	Output value over range	-32,400 ... +32,400	0 ... +64,800
	Resolution	16-bit (ca. 0.3 mV/LSB)	16-bit (ca. 0.15 mV/LSB)
	Refresh time of all channels	≥ 250 µs (depending on the cyclic time)	
	Output voltage capacity	maximum 2 mA	
	Allowable capacitive load	maximum 100 nF	
	Short circuit protection	yes	
	Settling time	200 µs typical for C < 100 nF (99.9 % of the end value)	
	Galvanic isolation	yes (500 V)	
	Output precision	±0.04 % of maximum output value	

Analog Output Current Specifications

	Number of channels	2	
	Output range	0-20 mA	4-20 mA
	Output value	0-60,000	12,000-60,000
	Output range over range	0-20.2 mA	3.8-20.2 mA
	Output value over range	0-60,600	11,400-60,600
	Resolution current	16-bit (ca. 0.3 µA/LSB)	
	Refresh time of all channels	≥ 250 µs (depending on the cyclic time)	
	Settling time	200 µs typical for L < 0.5 mH at 50 Ω 200 µs typical for L < 5 mH at 500 Ω	
	Load	maximum 500 Ω	
	Allowed output inductivity	maximum 0.5 mH at 50 Ω maximum 5 mH at 500 Ω	
	Cable break monitor	yes	
	Galvanic isolation	yes (500 V)	
	Output precision	±0.17 % of maximum output value	

Electrical Requirements

	External +24 V supply	+18-30 V DC	
	Current consumption external (+24 V supply) without load of the analog outputs	typically 45 mA	maximum 55 mA
	Current consumption external (+24 V supply) with load of the analog outputs	typically 82 mA	maximum 95 mA
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 60 mA	maximum 65 mA
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V supply)	-	-

Article Number and Miscellaneous

	Article number	20-010-026
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL (in preparation)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS Analog Output Module
AO 046

with 4 outputs (voltage/current switchable)

The S-DIAS AO 046 analog output module has four ±10.8 V or 0-21.6 mA analog outputs with a resolution of 16 bits. The analog outputs are powered by an external +24 V supply. The analog output system is galvanically separated from the potential of the S-DIAS bus.

Analog Output Voltage Specifications

	Number of channels	4	
	Output range	-10 ... +10 V	0 ... +10 V
	Output value	-30,000 ... +30,000	0 ... +60,000
	Output range over range	-10.8 ... +10.8 V	0 ... +10.8 V
	Output value over range	-32,400 ... +32,400	0 ... +64,800
	Resolution	16-bit (ca. 0.3 mV/LSB)	16-bit (ca. 0.15 mV/LSB)
	Refresh time of all channels	minimum 100 µs (corresponds to the S-DIAS cycle time)	
	Output voltage capacity	maximum 2 mA	
	Allowable capacitive load	maximum 100 nF	
	Short circuit protection	yes	
	Settling time	200 µs typical for C < 100 nF (99.9 % of the end value)	
	Galvanic isolation	yes (500 V)	
	Output precision	±0.04 % of maximum output value	

Output Accuracy Analog Outputs Voltage

Basic accuracy incl. calibration error and noise 25 °C	0.015 %
Temperature drift 20-40 °C 0-55 °C	 0.008 % 0.015 %
Linearity	0.010 %
Crosstalk	< 0.001 %
Total error 20-40 °C 0-55 °C	 ±0.035 % (±3.5 mV) ±0.045 % (±4.5 mV)

Analog Output Current Specifications

Number of channels	4	
Output range	0-20 mA	4-20 mA
Output value	0-60,000	12,000-60,000
Output range over range	0-21.6 mA	3.8-21.6 mA
Output value over range	0-64,800	11,400-64,800
Resolution current	16-bit (ca. 0.3 µA/LSB)	
Refresh time of all channels	minimum 100 µs (corresponds to the S-DIAS cycle time)	
Settling time	200 µs typical for L < 0.5 mH at 50 Ω 200 µs typical for L < 5 mH at 500 Ω	
Load	maximum 500 Ω	
Allowed output inductivity	maximum 0.5 mH at 50 Ω maximum 5 mH at 500 Ω	
Cable break monitor	yes	
Galvanic isolation	yes (500 V)	
Output precision	±0.17 % of maximum output value	

Output Accuracy Analog Outputs Current

Basic accuracy incl. calibration error and noise 25 °C	0.045 %
Temperature drift 20-40 °C 0-55 °C	 0.028 % 0.055 %
Linearity	0.035 %
Crosstalk	< 0.001 %
Total error 20-40 °C 0-55 °C	 ±0.140 % (±28 µA) ±0.170 % (±34 µA)

Electrical Requirements

	External +24 V supply	+18-30 V DC	
	Current consumption of the +24 V supply without load on the analog outputs	typically 34 mA	maximum 44 mA
	Current consumption of the +24 V supply with a load on the analog outputs per 20 mA	typically 92 mA	maximum 122 mA
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	0	0
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V supply)	typically 22 mA	maximum 26 mA

Voltage Monitoring External +24 V Supply

	Supply voltage +24 V	query of the supply voltage with hysteresis: voltage > 18,0 V => LED on, ExternVoltageOk=1 voltage < 16,0 V => LED off, ExternVoltageOk=0 (DC OK-LED shines green)

Article Number and Miscellaneous

	Article number	20-010-046
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL (in preparation)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS Analog Output Module
AO 081

with 8 analog outputs

The S-DIAS AO 081 analog output module has eight ±10 V analog outputs with a resolution of 12 bits.

Analog Outputs Specification

Number of channels	8
Output range	-10 ... +10 V
Output value	-10.000 ... +10.000
Resolution	12-bit (ca. 5 mV/LSB)
Refresh time for all channels	1 ms
Output voltage capacity	> 5 kOhm
Allowable capacitive load	maximum 100 nF
Short-circuit protection	yes (1 min.)
Settling time	50 µs (63 % of the end value) 100 µs (86 % of the end value) 250 µs (99 % the end value)
Analog precision	±0,5 % of maximum output value

Electrical Requirements

	External +24 V supply	+18-30 V DC	
	Current consumption of the +24 V supply without load on the analog outputs	typically 36 mA at +18 V typically 31 mA at +24 V typically 28 mA at +30 V	maximum 40 mA at +18 V maximum 35 mA at +24 V maximum 32 mA at +30 V
	Current consumption of the +24 V supply with maximum load on the analog outputs	typically 54 mA at +18 V typically 44 mA at +24 V typically 39 mA at +30 V	maximum 60 mA at +18 V maximum 49 mA at +24 V maximum 44 mA at +30 V
	Current consumption of +24 V during short-circuit	typically an additional 25 mA per analog output	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 55 mA	maximum 60 mA

Voltage Monitor External +24 V Supply

	+24 V supply voltage	Supply voltage > 18 V (DC OK-LED lights green)

Article Number and Miscellaneous

	Article number	20-010-081
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Analog Mixed Module
AM 221

with 2 analog outputs
2 analog inputs/potentiometer inputs
1 reference output

The S-DIAS AM 221 analog mixed module has two ±10 V analog outputs with a resolution of 12 bits and four ±10 V analog inputs or 0-100 % potentiometer inputs with a 16-bit resolution. For the potentiometer inputs a 10 V reference is provided that can be loaded with a maximum of 8.3 mA.

Analog Input Specifications ±10 V or Potentiometer Inputs 0-100 %

	Number of channels	2	
	Measurement range	-10 ... +10 V	0-100 %
	Measurement value	-10.000 ... +10.000 or -30,000 ... +30,000 (at full range)	0 ... 10,000 or 0 ... 30,000 (at full range)
	Input type	differential input	potential input
	Resolution	16-bit (ca. 0.3 mV/LSB)	
	Conversion time for all channels	depending on the selected timing Speed mode: 200 µs Time offset mode: corresponds to the S-DIAS cyclic time	
	Common mode range	±12 V	
	Input resistance	> 10 MΩ	
	Cable break monitor	yes	
	Input filter hardware	typically 1 kHz, low pass 3rd order system	
	Input filter software	configurable, low pass 1st order system	
	Analog measurement precision	±0.3 % of maximum measurement value	±0.35 % of maximum measurement value

Reference Output Specifications

Number of channels	1
Reference voltage	+10 V
Allowable output current	maximum 5 mA (< HW-Version 2.5) maximum 8.3 mA (≥ HW-Version 2.5)
Allowable load per potentiometer input	≤ 2.50 mA (< HW-Version 2.5) ≤ 4.17 mA (≥ HW-Version 2.5) ≥ 4.0 kΩ (< HW-Version 2.5) ≥ 2.4 kΩ (≥ HW-Version 2.5)
Short-circuit protection	yes (1 min.)
Accuracy	±0.5 %

Analog Output Specifications ±10 V

Number of channels	2
Output range	-10 ... +10 V
Output value	-10,000 ... +10,000
Resolution	12-bit (ca. 5 mV/LSB)
Refresh time for all channels	≥ 500 µs (corresponds to the S-DIAS cyclic time)
Output voltage capacity	> 5 kOhm
Allowable capacitive load	maximum 100 nF
Short-circuit protection	yes
Settling time	50 µs (63 % of the end value) 100 µs (86 % of the end value) 250 µs (99 % of the end value)
Output precision	±0.5 % of maximum output value

Electrical Requirements

Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V supply)	typically 50 mA	maximum 55 mA
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V power supply)	typically 32 mA (without load on reference output and analog outputs) typically 40 mA (reference output loaded with 4x 4 kΩ and maximum load on the analog outputs) typically 45 mA (reference output loaded with 4x 2k4 kΩ and maximum load on the analog outputs)	typically 40 mA (without load on reference output and analog outputs) maximum 55 mA (reference output loaded with 4x 4 kΩ and maximum load on the analog outputs) maximum 60 mA (reference output loaded with 4x 2k4 kΩ and maximum load on the analog outputs)
Short-circuit condition	typically an additional 30 mA per channel on a +24 V supply	

Article Number and Miscellaneous

Article number	20-017-221	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	UL 508 (E247993)	
Approvals	UL, cUL, CE, UKCA	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

Notes

S-DIAS Analog Mixed Module
AM 222

with 2 current inputs
2 current outputs

The S-DIAS AM 222 analog mixed module has two current inputs, 0-20 mA and 4-20 mA respectively, each with a 16-bit resolution as well as two current outputs, 0-20 mA and 4-20 mA respectively, with a 12-bit resolution. The voltage supply for the current inputs and outputs are monitored for under voltage.

Analog Input Specifications

Number of channels	2	
Measurement range	0-20 mA	4-20 mA
Measurement value	0-20,000	4,000-20,000
Input type	differential input	
Current resolution	16-bit (ca. 0.3 µA/LSB)	
Conversion time for all channels	1 ms	
Common mode range	±10 V	
Load	typically 50 Ω	
Input filter hardware	typically 1 kHz, low pass 3rd order system	
Input filter	configurable	
Cable break monitor	no	yes
Short circuit monitor	no	yes
Basic precision incl. calibration error, linearity and noise at 25 °C	±0.30 % of maximum measurement value	
Temperature drift 0-60 °C	±0.20 % of maximum measurement value	
Total measurement precision (0-60 °C)	±0,50 % of maximum measurement value	

Analog Output Specifications

Number of channels	2	
Output range	0-20 mA	4-20 mA
Output value	0-20,000	4,000-20,000
Current resolution	12-bit (ca. 5 µA/LSB)	
Refresh time for all channels	1 ms	
Settling time	50 µs + load * capacitive load (63 % of the end value) 100 µs + 2*load * capacitive load (86 % of the end value) 250 µs + 5*load * capacitive load (99 % of the end value)	
Load	maximum 500 Ω	
Allowable output capacity	1 µF at 50 Ω load	
Cable break monitor	no	
Basic precision incl. calibration error, linearity and noise at 25 °C	±0.30 % of maximum output value	
Temperature drift 0-60 °C	±0.20 % of maximum output value	
Total output precision (0-60 °C)	±0,50 % of maximum output value	

Analog In and Output Voltage Supply Specifications

External supply	+18-30 V
Current consumption	maximum 70 mA

Voltage Monitor External +24 V Supply

+24 V supply voltage	Supply voltage > 18 V (DC OK-LED lights green)

Electrical Requirements

External +24 V supply	+18-30 V DC	
Current consumption of the +24 V supply without load on the analog outputs	typically 27 mA at +18 V typically 24 mA at +24 V typically 23 mA at +30 V	maximum 31 mA at +18 V maximum 28 mA at +24 V maximum 27 mA at +30 V
Current consumption of the +24 V supply with maximum load on the analog outputs	typically 63 mA at +18 V typically 51 mA at +24 V typically 45 mA at +30 V	maximum 70 mA at +18 V maximum 57 mA at +24 V maximum 50 mA at +30 V
Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V supply)	typically 55 mA	maximum 62 mA

Article Number and Miscellaneous

Article number	20-017-222
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Standard	UL 508 (E247993)
Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS Analog Mixed Module
AM 441

with 4 analog outputs
4 analog inputs or potentiometer inputs
1 reference output

The S-DIAS AM 441 analog mixed module has four ±10 V analog outputs with a resolution of 12 bits and four ±10 V analog inputs or 0-100 % potentiometer inputs with a 16-bit resolution. For the potentiometer inputs a 10 V reference is provided that can be loaded with a maximum of 16.7 mA.

Analog Input Specifications ±10 V or Potentiometer Inputs 0-100 %

	Number of channels	4	
	Measurement range	-10 ... +10 V	0-100 %
	Measurement value	-10.000 ... +10.000 or -30,000 ... +30,000 (at full range)	0 ... 10,000 or 0 ... 30,000 (at full range)
	Input type	differential input	potential input
	Resolution	16-bit (ca. 0.3 mV/LSB)	
	Conversion time for all channels	depending on the selected timing Speed mode: 200 µs Time offset mode: corresponds to the S-DIAS cyclic time	
	Common mode range	±12 V	
	Input resistance	> 10 MΩ	
	Cable break monitor	yes	
	Input filter hardware	typically 1 kHz, low pass 3rd order system	
	Input filter software	configurable, low pass 1st order system	
	Measurement precision	±0.3 % of maximum measurement value	±0.35 % of maximum measurement value

Reference Output Specifications

Number of channels	1
Reference voltage	+10 V
Allowable output current	maximum 10.0 mA (< HW-Version 3.5) maximum 16.7 mA (≥ HW-Version 3.5)
Allowable load per potentiometer input	≤ 2.50 mA (< HW-Version 3.5) ≤ 4.17 mA (≥ HW-Version 3.5) ≥ 4.0 kΩ (< HW-Version 3.5) ≥ 2.4 kΩ (≥ HW-Version 3.5)
Allowable capacitive load	maximum 100 nF
Short-circuit protection	yes
Accuracy	±0.5 %

Analog Output Specifications

Number of channels	4
Output range	-10 V ... +10 V
Output value	-10,000 ... +10,000
Resolution	12-bit (ca. 5 mV/LSB)
Refresh time for all channels	≥ 500 µs (corresponds to the S-DIAS cyclic time)
Output voltage capacity	> 5 kOhm
Allowable capacitive load	maximum 100 nF
Short-circuit protection	yes
Settling time	50 µs (63 % of the end value) 100 µs (86 % of the end value) 250 µs (99 % of the end value)
Output precision	0.5 % of maximum output value

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 50 mA	maximum 55 mA
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V power supply)	typically 40 mA (without load on reference output and analog outputs) typically 60 mA (reference output loaded with 4x 4 kΩ and maximum load on the analog outputs) typically 70 mA (reference output loaded with 4x 2k4 kΩ and maximum load on the analog outputs)	typically 50 mA (without load on reference output and analog outputs) maximum 80 mA (reference output loaded with 4x 4 kΩ and maximum load on the analog outputs) maximum 95 mA (reference output loaded with 4x 2k4 kΩ and maximum load on the analog outputs)
	Short-circuit condition	typically an additional 30 mA per channel on a +24 V supply	

Article Number and Miscellaneous

	Article number	20-017-441
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS Analog Mixed Module
AM 442

with 4 current inputs
4 current outputs

The S-DIAS AM 442 analog mixed module has four current inputs, 0-20 mA and 4-20 mA respectively, each with a 16-bit resolution as well as two current outputs, 0-20 mA and 4-20 mA respectively, with a 12-bit resolution. The voltage supply for the current inputs and outputs are monitored for under voltage.

Analog Input Specifications

	Number of channels	4	
	Measurement range	0-20 mA	4-20 mA
	Measurement value	0-20,000	4,000-20,000
	Input type	differential input	
	Current resolution	16-bit (ca. 0.3 µA/LSB)	
	Conversion time for all channels	1 ms	
	Common mode range	±10 V	
	Load	typically 50 Ω	
	Input filter hardware	typically 1 kHz, low pass 3rd order system	
	Input filter	configurable	
	Cable break monitor	no	yes
	Short circuit monitor	no	yes
	Basic precision incl. calibration error, linearity and noise at 25 °C	±0.30 % of maximum measurement value	
	Temperature drift 0-60 °C	±0.20 % of maximum measurement value	
	Total measurement precision (0-60 °C)	±0,50 % of maximum measurement value	

Analog Output Specifications

	Number of channels	4	
	Output range	0-20 mA	4-20 mA
	Output value	0-20,000	4,000-20,000
	Current resolution	12-bit (ca. 5 µA/LSB)	
	Refresh time for all channels	1 ms	
	Settling time	50 µs + load * capacitive load (63 % of the end value) 100 µs + 2*load * capacitive load (86 % of the end value) 250 µs + 5*load * capacitive load (99 % of the end value)	
	Load	maximum 500 Ω	
	Allowable output capacity	1 µF at 50 Ω load	
	Cable break monitor	no	
	Basic precision incl. calibration error, linearity and noise at 25 °C	±0.30 % of maximum output value	
	Temperature drift 0-60 °C	±0.20 % of maximum output value	
	Total output precision (0-60 °C)	±0,50 % of maximum output value	

Analog In and Output Voltage Supply Specifications

	External supply	+18-30 V
	Current consumption	maximum 70 mA

Voltage Monitor External +24 V Supply

	+24 V supply voltage	supply voltage > 18 V (DC OK-LED lights green)

Electrical Requirements

	External +24 V supply	+18-30 V DC	
	Current consumption of the +24 V supply without load on the analog outputs	typically 27 mA at +18 V typically 24 mA at +24 V typically 23 mA at +30 V	maximum 31 mA at +18 V maximum 28 mA at +24 V maximum 27 mA at +30 V
	Current consumption of the +24 V supply with maximum load on the analog outputs	typically 99 mA at +18 V typically 78 mA at +24 V typically 66 mA at +30 V	maximum 110 mA at +18 V maximum 87 mA at +24 V maximum 73 mA at +30 V
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 55 mA	maximum 62 mA

Article Number and Miscellaneous

	Article number	20-017-442
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS Digital Input Module with 2 Incremental Encoder Inputs

DI 204

with 2 incremental encoder inputs
14 digital inputs

The S-DIAS digital input module DI 204 is equipped with two incremental inputs with a TTL signal and 14 inputs with a +24 V signal for reading the signal states “0“ and “1“. To suppress noise in the signal lines, input filters are provided. The incremental encoder values can be latched.

Incremental Encoder Input Specifications

Number	2	
Input voltage	typically 0.5 V	maximum 5.5 V
Signal level	low 0.8 V	high 2.0 V
Switching threshold	typically 1.4 V	
Input current	1.5 mA at +5 V	
Input delay	typically 10 µs	
Input frequency	maximum 25 kHz	
Counter frequency	maximum 100 kHz in incremental counter mode with 4-edge analysis	

Digital Input Specifications

Number	14	
Input voltage	typically +24 V	maximum +30 V
Signal level	low: < +8 V	high: > +14 V
Switching threshold	typically +11 V	
Input current	3.7 mA at +24 V	
Input delay	typically 0.5 ms	

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 38 mA	maximum 43 mA

Article Number and Miscellaneous

	Artikel number	20-006-204
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Counter Input Module
FC 021

with 2 digital RS422 inputs with counter function
2 digital TTL inputs with counter function
2 digital HTL inputs with counter function

The S-DIAS counter input module FC 021 provides the option to configure 2 counter inputs or one incremental encoder input. Thereby, the RS422, TTL or HTL inputs can be optionally used for the counter function. Parallel to the inputs, the module also provides the actual status of all digital inputs. The TTL and HTL inputs are galvanically separared on the S-DIAS bus. The sensor supply connected to X3 is also galvainically separated on the S-DIAS bus.

RS422 Digital Input Specifications

Number of channels	2
Input signals	RS422 signal (inputs: 330 Ω bus termination, 1.2 kΩ spread each against 5 volts and ground)
Input delay	0.025 µs
Input frequency	maximum of 5 MHz in normal counter mode or in incremental counter mode with 4-edge analysis
Counter frequency	5 MHz in normal counter mode 20 MHz in incremental counter mode with 4-edge analysis
Galvanic Isolation	no
Common mode range	-5 V ... +10 V
Status LEDs	yes

HTL Digital Input Specifications

	Number	2	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +8 V	high: > +14 V
	Switching threshold	typically +11 V	
	Input current	3.7 mA at +24 V	
	Input delay	10 µs	
	Input frequency	maximum of 25 kHz in normal counter mode or in incremental counter mode with 4-edge analysis	
	Counter frequency	25 kHz in normal counter mode 100 kHz in incremental counter mode with 4-edge analysis	
	Galvanic isolation	yes (isolation voltage 125 V)	

TTL Digital Input Specifications

	Number	2	
	Input voltage	typically 5.0 V	maximum 5.5 V
	Signal level	low: 0.8 V	high: 2.0 V
	Switching threshold	typically 1.4 V	
	Input current	1.5 mA at +5 V	
	Input delay	typically 1 µs	
	Input frequency	maximum of 125 kHz in normal counter mode or in incremental counter mode with 4-edge analysis	
	Counter frequency	125 kHz in normal counter mode 500 kHz in incremental counter mode with 4-edge analysis	
	Galvanic isolation	yes (isolation voltage 125 V)	
	Status LEDs	yes	

Counter Mode Specifications

Signal analysis	1-/2x edge analysis for counter input 1-/2-/4x edge analysis for incremental encoder input Period measurement falling/falling edges, Period measurement rising/rising edges, Time measurement falling -> rising edge Time measurement rising -> falling edge	
Counter resolution	32-bit	
Internal counter frequency	100 MHz	
Frequency precision	Frequency stability ±25 ppm, aging: ±3 ppm p.a.	
Prescaler	Configurable via software, 16-bit	
Input filter	Can be configured or deactivated via software, 12-bit (0-32.76 ms in 8-µs stages)	
Configuration	Up/Down Enable Load Edge Counter source	via software via software via software via software via software
Reference counter	Internal counter with programmable prescaler. If the counter of the respective channel is raised, the reference counter is saved.	

Electrical Requirements

External supply voltage	4.75-30 V DC	
External current consumption supply voltage	corresponds to the load on the digital output + outgoing 24 V supply Maximum: 6 A	
Galvanic separation of external supply voltage	yes (isolation voltage 125 V)	
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V supply)	typically 15 mA	maximum 20 mA
Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V supply)	typically 55 mA	maximum 65 mA
Current consumption of sensor supply	dependent on connected loads however, maximum is 6 A	

Voltage Monitor

Power supply +24 V	Supply voltage > 18 V (+24 V DC OK-LED lights green)
Power supply	Supply voltage > 4.75 V (+5 V DC OK-LED lights green)

Article Number and Miscellaneous

Article number	20-016-021
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Standard	in preparation
Approvals	in preparation

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm von 5-8.4 Hz 1 g von 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Positioning Module
NC 100

with 4 digital inputs
4 digital outputs
1 Incremental encoder input

The S-DIAS NC 100 positioning module has four digital outputs, four digital inputs, as well as an incremental encoder (optional TTL or RS422 signal).

With the digital inputs, the signal statuses („0" and „1") can be read with a +24 V reference. The incremental encoder value can be latched.

Digital Input Specifications

	Number	4	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +5 V	high: > +15 V
	Input current	3.7 mA at +24 V	
	Input delay	typically 10 µs	

Digital Output Specifications

	Number	4
	Short-circuit proof	yes
	Output voltage	typically +24 V
	Maximum continuous current load allowed per channel	2 A
	Max. total current (complete module)	6 A
	Maximum braking energy of outputs (inductive load)	maximum 0.65 Joules/channel maximum 1.95 Joules/ 4 channels
	Residual current (off)	≤ 12 µA
	Turn-on delay	< 200 µs
	Turn-off delay	< 200 µs

Incremental Encoder Input Specification

Number of channels	1	
Input signals	Incremental encoder signals RS422 (A, /A, B, /B, R, /R) RS422 signal (120 Ω termination, integrated in the module)	
	Incremental encoder signal TTL (A, B, R) TTL level (1200 Ω Pull-Up, integrated in the module)	
Input frequency	maximum 125 kHz	
Counter frequency	maximum 500 kHz	
Signal evaluation	4X	
Counter resolution	16-bit	
Power supply	+5 V/0.2 A short-circuit protected	

Electrical Requirements

Power supply +24 V	18-30 V	
Current consumption of +24 V power supply	maximum 250 mA/24 V	
Supply voltage digital outputs	18-30 V	
Current consumption of digital output supply	load-dependent	
Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V supply)	typically 40 mA	maximum 50 mA

Article Number and Miscellaneous

Article number	20-011-100
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Standard	UL 508 (E247993)
Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS SSI Interface Module
SI 021

with 2 SSI absolute value encoders

The S-DIAS SI 021 SSI interface module can evaluate two absolute value encoders via the S-DIAS interface.

The SSI interface is designed for SSI encoders (e.g. absolute angle encoded length measurement rods...). Non-coded and Gray coded (Gray code is internally converted to binary) sensors are supported.

SSI Absolute Value Encoder Specifications

Number	2	
Encoder	Absolute value encoder with RS422 interface	
SSI signal level	RS422 Inputs: 330 Ω bus termination, per 1.2 kΩ resistor spread against to 5 volts and mass Outputs: 330 Ω bus termination, without spread	
Data transfer speed	125 kHz, 250 kHz, 500 kHz, 1 MHz (configurable)	
Encoder resolution	maximum 32 bits	
Coding	binary/gray	
Status LED	yes	

Electrical Requirements

Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V power supply) without SSI encoders	typically 28 mA at +18 V typically 24 mA at +24 V typically 21 mA at +30 V	maximum 33 mA at +18 V maximum 28 mA at +24 V maximum 25 mA at +30 V
Current consumption on the S-DIAS bus (+24 V power supply) with two SSI encoders	typically 33 mA at +18 V typically 27 mA at +24 V typically 23 mA at +30 V	maximum 39 mA at +18 V maximum 32 mA at +24 V maximum 27 mA at +30 V

Article Number and Miscellaneous

Article number	20-022-021	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	UL 508 (E247993)	
Approvals	UL, cUL, CE, UKCA	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Transsonar Module
TS 041/TS 051

with 4 (TS 041) or 5 (TS 051) Transsonar encoders

The S-DIAS TS 041 or TS 051 transsonar module can be used to analyze ultrasound distance recordings. The advantage lies in the contact and wear-free collection of measurement values with ultrasound.

Transsonar Specifications

	Number of channels	5 (TS 051) 4 (TS 041)	
	Number of position encoders/channel	maximum 4	
	Transonic encoder	ultrasonic encoder with start/stop function and RS422 interface (MTS EPS, Balluff BTL5, Balluff BTL6, Balluff BTL7)	
	Position encoder speed	manufacturer-dependent (vus*: ca. 2845 m/s for Balluff encoder). This value must be set for each position encoder!!	
	Automatic sensor parameter recognition	for sensors with integrated protocols (= "expanded P-interface" with Balluff BTL 6 AT types with DPI/IP (BTL6-P111-.....) MTS EP start/stop sensor EPSxxxMDxxxR3)	
	Measurement value (corresponds to the runtime)	0-1048575 (0-3.50 ms)	
	Resolution	20 bits (corresponds to 9.48 µm at vus* = 2845 m/s)	
	Gate time	3.33 ns	
	Counter frequency	500 MHz	
	Distance measuring (Example)	minimum: depends on the type of position sensor	maximum: runtime x vus (3.50 ms x 2845 m/s = 9.96 m)
	Status LEDs	5	

Electrical Requirements

		TS 041	
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V power supply)	typically 85 mA at 18 V 65 mA at 24 V 55 mA at 30 V	maximum 90 mA at 18 V 70 mA at 24 V 60 mA at 30 V
		TS 051	
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V power supply)	typically 90 mA at 18 V 70 mA at 24 V 60 mA at 30 V	maximum 95 mA at 18 V 75 mA at 24 V 65 mA at 30 V

Article Number and Miscellaneous

	Article number	20-053-041 20-053-051
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

S-DIAS AC Current Measuring Module
AI 031

with 3 analog current inputs 0-5 A AC

The S-DIAS AI 031 AC current measuring module is used to measure current in low voltage networks. To decouple from the supply, an external transformer must be used, which converts the measured current to a maximum of 5 A AC.

Analog Current Input Specifications

	Number of channels	3	
	Measurement range	0-5 A AC	
	Measurement value	0-5000 digits	
	Measuring process	average value	
	Signal form	sine	
	Frequency	47-63 Hz	
	Resolution	12-bit (ca. 1.53 mA AC/digit)	
	Conversion time per channel	1 ms	
	Common mode range	±10 V	
	Input filter hardware	typically 2 Hz	low pass 3rd order system
	Resistive sensor	12 mΩ	
	Measurement precision	±1 % of maximum measurement value	

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V power supply)	typically 50 mA	maximum 55 mA
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V power supply)	typically 40 mA	maximum 50 mA

Article Number and Miscellaneous

	Article number	20-009-031
	Hardware version	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	CE, $_{c}$UL$_{us}$

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Analog Input Module
AI 040

with 4 inputs for vibration sensors with IEPE interface

The S-DIAS AI 040 analog input module has four constant current sources, which can be set independently of one another. The sensor signals converted to a broad frequency range with a 16-bit resolution.

IEPE Interface Specifications

	Number of channels	4					
	Measurement range	±5,500 V AC	±2,750 V AC	±1,375 V AC	±0,688 V AC	±0,344 V AC	±0,172 V AC
	Adjustable amplification	1	2	4	8	16	32
	Measurement value	±30000					
	AD converter resolution	16-bit					
	Conversion rate per channel	≥ 5 µs (adjustable, default setting 5 µs)					
	Data recording per channel	maximum 64 Word					
	Short circuit monitoring	yes					
	Cable break monitor	yes					
	Hardware input filter	typically 31 mHz			high pass 1st order system		
		typically 20 kHz			low pass 3rd order system		
	Measurement precision (amplification 1 to 8)	±0,5 %					
	Measurement precision (amplification 16 to 32)	±2 %					

Software Band Pass Filter Specifications

Lower frequency limit	adjustable (min 0.1 Hz)	
Upper frequency limit	adjustable (max. 10 kHz)	
Measurement values processed per cycle	configurable	
Output parameters	average value minimum value maximum value time stamp minimum value time stamp maximal value	

Supply Voltage Specifications

Adjustable current	0, 4, 8, 12 mA separately adjustable for each channel	
Setting tolerance	maximum ±5 %	
Supply voltage	+18-30 V DC	
Current consumption	typically 20 mA plus constant current setting	
Sensor voltage at 12 mA supply current	minimal 18.5 V	typically 19.1 V

Electrical Requirements

Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V power supply)	typically 30 mA	maximum 40 mA

Article Number and Miscellaneous

Article number	20-009-040
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Standard	UL 508 (E247993)
Approvals	UL, cUL, CE, UKCA

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Absolute Pressure Input Module
DM 811

with 1 absolute pressure inputs
1 PT100 temperature input
8 digital inputs

The S-DIAS DM 811 absolute pressure input module has one absolute pressure input with a measurement range of 0-1600 mbar, one PT100 temperature input 0-300 °C and eight digital inputs (+24 V/3.7 mA/0.5 ms).

Absolute Pressure Input Specifications

Number	1
Pressure sensor type	absolute pressure sensor
Measurement range	0-1600 mbar
Measurement value	0-1600
Resolution	12-bit (ca. 0.4 mbar/LSB)
Conversion time for all channels	1 ms
Input filter hardware	typically 1 kHz, low pass 3rd order system
Input filter software	configurable
Measurement precision	±0.25 % of scale end value, i.e. ±4.0 mbar for 25 °C ambient temperature with offset and gain comparison ±1.00 % of scale end value, i.e. ±16.0 mbar for 0-50 °C ambient temperature without offset and gain comparison
Calibratable	yes (2-point comparison)
Maximum overpressure	4 bar

Temperature Input Specifications PT100

	Number	1	
	Measurement range	100.0-212.1 Ω	
		PT100	
		0-300 °C	
	Resolution	0.1 °C	
	Conversion time per channel	1 ms	
	Cable break monitor	yes	
	Input filter hardware	typically 1 kHz	low pass 3rd order system
	Input filter software	configurable	
	Precision of analog channel measurement	±0.5 % of maximum measurement value	

Digital Input Specifications

	Number	8	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +5 V	high: > +15 V
	Input current	3.7 mA at +24 V	
	Input delay	typically 0.5 ms	

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V power supply)	typically 60 mA	maximum 65 mA
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V power supply)	typically 20 mA	maximum 25 mA

Article Number and Miscellaneous

	Article number	20-008-811
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS Differential Pressure Input Module
DM 822

with 2 differential pressure inputs
8 digital inputs

The S-DIAS DM 822 differential pressure input module has two differential pressure inputs with a measurement range of -2068 mbar to +2068 mbar and eight digital inputs (+24 V/3.7 mA/0.5 ms).

Differential Pressure Inputs Specifications

Number	2
Pressure sensor type	difference pressure sensor
Measurement range	-2068 ... +2068 mbar
Measurement value	-2068 ... +2068
Resolution	12-bit (ca. 1.0 mbar/LSB)
Conversion time for all channels	1 ms
Input filter hardware	typically 1 kHz, low pass 3rd order system
Input filter software	configurable
Measurement precision	Based on the entire measurement range: ±2 % (at +10 ... +50 °C ambient temperature) Based on the entire measurement range: ±3 % (at 0 ... +60 °C ambient temperature)
Maximum differential pressure	8 bar
Maximum ambient pressure	10 bar

Applicable tube types	Manufacturer	Article number	Inner tube diameter	Shore hardness	Max. pressure at 25 °C
	Frelin-Wade	95a-157	1.68 mm	95	6.89 bar
	NewAge Industries	2110535	1.68 mm	85	9.31 bar
	SMC	TU0212BU-20	1.2 mm	-	7.50 bar

Digital Input Specifications

Number	8	
Input voltage	typically +24 V	maximum +30 V
Signal level	low: < +5 V	high: > +15 V
Input current	3.7 mA at +24 V	
Input delay	typically 0.5 ms	

Electrical Requirements

Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V power supply)	typically 55 mA	maximum 60 mA
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V power supply)	typically 10 mA	maximum 15 mA

Article Number and Miscellaneous

Article number	20-008-822
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Standard	UL 508 (E247993)
Approvals	UL, cUL, CE, UKCA

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Energy Measuring Module
EE 121-1

with 3 voltage inputs (0-520 V)
12 current inputs (0-2 A AC)

The S-DIAS energy measuring module is used to record power and energy, as well as mains synchronization. The voltages from the three input phases (L1, L2 and L3) are measured, as well as the mains frequency and timestamp of the zero-voltage crossings. Additionally, up to 12 currents are also recorded. The currents can be arbitrarily assigned to the phases. The voltages are connected directly, the currents however, must be connected through the output of a current transformer with 1 A rms output.

Voltage Input Specifications

Number of channels	3
Supported nominal system voltage	0-480 V AC (phase conductor voltage Lx - Ly) 0-277 V AC (star voltage Lx - N / Lx - PE)
Measurement range	0-520 V AC (phase conductor voltage Lx - Ly) 0-300 V AC (star voltage Lx - N / Lx - PE)
Measurement value	0-52.000 (10 mV/d) 0-30.000 (10 mV/d)
Frequency range	15-120 Hz
ADC resolution	16-bit (ca. 25 mV/LSB)
Scan rate	15 µs
Voltage inputs frequency measurement range	15-120 Hz with a 0.01 Hz resolution
Frequency measurement accuracy	typically 10 MHz at 400 V AC/50 Hz and sine-formed mains voltage
Zero-voltage crossing timestamp	0 to (32767 - bus cycle time) in 1 µs increments
Input filter hardware	1.5 kHz

	Galvanic separation (voltage inputs to S-DIAS bus)	4000 V AC (1 min)
	Base accuracy incl. calibration errors, linearity and noise at 25 °C	±0.25 % based on the nominal system voltage of 480 V AC (Lx - Ly)/277 V AC (Lx - N / Lx - PE) within the nominal system voltage range at a mains frequency of 45 to 65 Hz
	Temperature drift 0-60 °C	±0.35 % based on the nominal system voltage of 480 V AC (Lx - Ly)/277 V AC (Lx - N / Lx - PE) within the nominal system voltage range at a mains frequency of 45 to 65 Hz
	Total accuracy 0-60 °C	±0.60 % based on the nominal system voltage of 480 V AC (Lx - Ly)/277 V AC (Lx - N / Lx-PE) within the nominal system voltage range at a mains frequency of 45 to 65 Hz

Current Input Specifications

	Number of channels	12
	Supported current converters, secondary nominal current	1 A AC
	Measurement range	0-2 A AC
	Measurement value	0-20.000 x $I_{PRIMARY}/I_{SECONDARY}$ (0.1 mA/d)
	Permissible overcurrent	2 A continuous 5 A for 20 s 10 A for 1 s
	Frequency range	15-120 Hz
	ADC resolution	16-bit (ca. 50 µA/LSB)
	Scan rate	30 µs
	Current shunt	60 mΩ
	Input filter hardware	1.5 kHz
	Galvanic separation (current inputs to S-DIAS bus)	none
	Base accuracy incl. calibration errors, linearity and noise at 25 °C	±0.25 % based on the nominal current of 1 A within the nominal current range of 1 A AC at a mains frequency of 45 to 65 Hz
	Temperature drift 0-60 °C	±0.40 % based on the nominal current of 1 A within the nominal current range of 1 A AC at a mains frequency of 45 to 65 Hz
	Total accuracy 0-60 °C	±0.65 % based on the nominal current of 1 A within the nominal current range of 1 A AC at a mains frequency of 45 to 65 Hz

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	0	
	Power supply on the S-Dias bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V supply)	typically 45 mA	maximum 60 mA

Article Number and Miscellaneous

Article number	20-068-121-1	
Mechanical	25 x 104.2 x 98.3 mm (W x H x D)	
Standard	UL 61010-1, CAN/CSA-C22.2	
Approvals	CE, UL	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
Operating conditions	over voltage category II, up to 5000 m over voltage category III, up to 2000 m pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

Notes

S-DIAS Axis Module
DC 061-1

with 1 motor output stage 6 A
1 resolver input
1 holding brake
2-channel enable input for STO
(Safe Torque Off)

The S-DIAS DC 061-1 axis module is used to control a synchronous servo motor with a 48-Volt supply voltage and phase current of up to 6 A. A Resolver input is available for position feedback. A 24 V output for connecting a holding brake is provided. External Regen brake can also be connected.

Motor Driver Specifications

Type	brushless DC
Operating voltage	+18-55 V
Maximum continuous current	6 A
Maximum peak current (10 sec)	15 A
Controller frequency	16 kHz
PWM frequency	16 kHz
Overload protection	Short circuit cutoff Temperature monitor I^2T monitor Over and under voltage monitor

Resolver Specifications

Type	Resolver
Resolution	12-bit
Output voltage (EXC)	typically 7 Vrms
Maximum output current (EXC)	200 mA
Output frequency	8 kHz
Input voltage	typically 3.5 Vrms
Resolver transfer ratio	0.5

Enable Inputs Specifications

	Number	2	
	Input voltage	+24 V	
	Input voltage range	+18-24 V	
	Signal level	low: < 5 V	high: > 15 V
	Switching threshold	typically 11 V	
	Input current	3 mA at 24 V	
	Input delay	typically 0.5 ms	

Holding Brake Specifications

	Output voltage	24 V
	Maximum continuous current	500 mA
	Short-circuit protection	yes
	Maximum switch-off energy (inductive load)	50 mJ

Regen Brake Specifications

	Type	external power resistor
	Output	GND switching
	Maximum current	10 A
	Lowest possible resistance	6 Ω
	Short-circuit protection	yes
	Threshold regen braking on/off	60 V/55 V

Electrical Requirements

	Power supply +24 V	+18-30 V, Class 2	
	Current consumption of the +24 V supply	load-dependent (holding brake)	
	Supply voltage motor	+18-55 V	
	Switching threshold for motor voltage monitor	minimum 18 V	maximum 65 V
	Current consumption of motor supply	load-dependent (motor)	
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V supply)	typically 70 mA	maximum 80 mA

Article Number and Miscellaneous

Article number	20-014-061-1	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	UL 508C (E336350)	
Approvals	UL, cUL, CE	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +50 °C	
Humidity	0-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with 61000-6-7 (Generic standards - Immunity re-quirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2 (industrial area) (increased requirements in accordance with IEC 62061) Additionally tested according to EN 61800-5-2:2017 (Generic Standards for Electrical Power Drive Systems with Adjustable Speed Part 5-2: Safety Requirements – Functional Safety)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

Notes

S-DIAS Axis Module
DC 062(-X)

with 1 motor output stage 6 A
1 incremental encoder input
1 holding brake

The S-DIAS DC 062(-X) axis module is used to control a synchronous servo motor with a 48-Volt supply voltage and phase current of up to 6 A. An incremental encoder input is available for position feedback. A 24 V output for connecting a holding brake is provided. External Regen brake can also be connected.

Motor Driver Specifications

Type	brushless, 4-quadrant regulator with position setting
Operating voltage	+24-55 V
Maximum continuous current	6 A
Maximum peak current (10 sec)	15 A
Controller frequency	16 kHz
PWM frequency	16 kHz
Overload protection	Short circuit cutoff Temperature monitor I^2T monitor Over and under voltage monitor

Incremental Encoder Specifications

Number of channels	1
Input signals	Incremental encoder signals RS422 (A, /A, B, /B, R, /R) RS422 signal (120 Ω termination, integrated in the module)
	Incremental encoder signals TTL (A, B, R) TTL-level (1200 Ω Pull-Up, integrated in the module)
Input frequency	maximum 125 kHz
Counter frequency	maximum 500 kHz
Signal evaluation	4x
Counter resolution	32 bits
Encoder power supply	+5 V/0.2 A short circuit protected

Enable Inputs Specifications

Number	2	
Input voltage	+24 V DC	
Input voltage range	+18-30 V DC	
Signal level	low: < 5 V	high: > 15 V
Switching threshold	typically +11 V	
Input current	3 mA at +24 V DC	
Input delay	typically 0.5 ms	

Holding Brake Specifications

Output voltage	+24 V DC
Maximum continuous current	500 mA
Short-circuit protection	yes
Maximum switch-off energy (inductive load)	50 mJ

Regen Brake Specifications

Type	external power resistor
Output	GND switching
Maximum current	10 A
Lowest possible resistance	6 Ω
Short-circuit protection	yes
Threshold regen braking on/off	60 V/55 V

Electrical Requirements

	Power supply +24V	+18-30 V DC (Class 2)	
	Current consumption of the +24 V supply	load-dependent (holding brake)	
	Supply voltage motor	+18-55 V DC	
	Switching threshold for motor voltage monitor	minimum 18 V	maximum 65 V
	Current consumption of motor supply	load-dependent (motor)	
	Voltage supply from S-DIAS bus	+24 V DC	
	Current consumption on the S-DIAS bus (+24 V supply)	typically 70 mA	maximum 80 mA

Article Number and Miscellaneous

	Article number	20-014-062 20-014-062-X (printed circuit board with protective lacquer)
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508C (E336350)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +50 °C	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with 61000-6-7 (Generic standards - Immunity re-quirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2 (industrial area) (increased requirements in accordance with IEC 62061) Additionally tested according to EN 61800-5-2:2017 (Generic Standards for Electrical Power Drive Systems with Adjustable Speed Part 5-2: Safety Requirements – Functional Safety)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS Drive Module
DC 101

with 1 motor output stage 10 A
1 resolver input
1 holding brake
2-channel enable input for STO
(Safe Torque Off)

The S-DIAS DC 101 drive module is used to control a synchronous servo motor with a 48-Volt supply voltage and phase current of up to 10 A. A resolver input is available for position feedback. A 24 V output for connecting a holding brake is provided. External Regen brake can also be connected.

Motor Driver Specifications

Type	Synchronous servo motor
Operating voltage	+18-55 V
Maximum continuous current	10 A
Maximum peak current (10 s)	20 A
Output current over the environmental temperature	maximum 10 A continuous current at 45 °C maximum 7.5 A continuous current at 50 °C maximum 5 A continuous current at 55 °C
Controller frequency	16 kHz
PWM frequency	16 kHz
Overload protection	Short circuit cutoff Temperature monitor I^2T monitor Over and under voltage monitor

Resolver Specifications

Type	Resolver
Resolution	12-bit
Output voltage (EXC)	typically 7 Vrms
Maximum output current (EXC)	200 mA
Output frequency	8 kHz
Input voltage	typically 3.5 Vrms
Resolver transfer ratio	0.5

Enable Inputs Specifications

Number	2	
Input voltage	+24 V	
Input voltage range	+18-30 V	
Signal level	low: < 5 V	high: > 15 V
Switching threshold	typically 11 V	
Input current	3 mA at 24 V	
Input delay	typically 0.5 ms	

Holding Brake Specifications

Output voltage	24 V
Maximum continuous current	500 mA
Short-circuit protection	yes
Maximum switch-off energy (inductive load)	50 mJ

Regen Brake Specifications

Type	external power resistor
Output	GND switching
Maximum current	10 A
Lowest possible resistance	6 Ω
Short-circuit protection	yes
Threshold regen braking on/off	60 V/55 V

Electrical Requirements

	Power supply +24 V	+18-30 V, Class 2	
	Current consumption of the +24 V supply	load-dependent (holding brake)	
	Supply voltage motor	+18-55 V	
	Switching threshold for motor voltage monitor	minimum 18 V	maximum 65 V
	Current consumption of motor supply	load-dependent (motor)	
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V supply)	typically 95 mA	maximum 110 mA

Article Number and Miscellaneous

	Article number	20-014-101
	Dimensions	25 x 104.2 x 72 mm (W x H x D)
	Standard	CE, TÜV EG type testing

Environmental Conditions

	Storage temperature	-20 ... +85 °C
	Environmental temperature	0 ... +55 °C
	Humidity	0-95 %, non-condensing
	Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m
	Operating conditions	pollution degree 2
	EMC resistance	in accordance with EN 61000-6-7 (Generic standards – immunity requirements for equipment designed to perform functions in safety-based systems (functional safety) at industrial facilities) according to EN 61000-6-2:2005/AC:2005 (industrial area) (increased requirements in accordance with IEC 62061) additionally tested according to EN 61800-5-2:2017 (Generic Standard – Electrical Power Drive Systems with Adjustable Speed Section 5-2: Safety Requirements – Functional Safety)
	EMC noise generation	according to EN 61000-6-4/A1:2011 (industrial area)
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS Drive Module
DC 102

with 1 motor output stage 10 A
1 incremental encoder input
1 holding brake
2-channel enable input for STO
(Safe Torque Off)

The S-DIAS DC 102 drive module is used to control a synchronous servo motor with a 48-Volt supply voltage and phase current of up to 10 A. An incremental encoder is available for position feedback. A 24 V output for connecting a holding brake is provided. External Regen brake can also be connected.

Motor Driver Specifications

Type	Synchronous servo motor
Operating voltage	+18-55 V
Maximum continuous current	10 A
Maximum peak current (10 s)	20 A
Output current over the environmental temperature	maximum 10 A continuous current at 45 °C maximum 7.5 A continuous current at 50 °C maximum 5 A continuous current at 55 °C
Controller frequency	16 kHz
PWM frequency	16 kHz
Overload protection	Short circuit cutoff Temperature monitor I^2T monitor Over and under voltage monitor

Incremental Encoder Specifications

Number of channels	1
Input signals	Incremental encoder signals RS422 (A, /A, B, /B, R, /R) RS422 signal (120 Ω termination, integrated in the module)
Input frequency	maximum 125 kHz
Counter frequency	maximum 500 kHz
Signal evaluation	4x
Counter resolution	32 bits
Encoder power supply	+5 V/0.2 A short circuit protected

Enable Inputs Specifications

Number	2	
Input voltage	+24 V	
Input voltage range	+18-30 V	
Signal level	low: < 5 V	high: > 15 V
Switching threshold	typically 11 V	
Input current	3 mA at 24 V	
Input delay	typically 0.5 ms	

Holding Brake Specifications

Output voltage	24 V
Maximum continuous current	500 mA
Short-circuit protection	yes
Maximum switch-off energy (inductive load)	50 mJ

Regen Brake Specifications

Type	external power resistor
Output	GND switching
Maximum current	10 A
Lowest possible resistance	6 Ω
Short-circuit protection	yes
Threshold regen braking on/off	60 V/55 V

Electrical Requirements

	Power supply +24 V	+18-30 V, Class 2	
	Current consumption of the +24 V supply	load-dependent (holding brake)	
	Supply voltage motor	+18-55 V	
	Switching threshold for motor voltage monitor	minimum 18 V	maximum 65 V
	Current consumption of motor supply	load-dependent (motor)	
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V supply)	typically 95 mA	maximum 110 mA

Article Number and Miscellaneous

	Article number	20-014-102 20-014-102-X (Printed circuit board with protective lacquer)
	Dimensions	25 x 104.2 x 72 mm (W x H x D)
	Standard	CE, TÜV EG type testing

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with EN 61000-6-7 (Generic standards – immunity requirements for equipment designed to perform functions in safety-based systems (functional safety) at industrial facilities) according to EN 61000-6-2:2005/AC:2005 (industrial area) (increased requirements in accordance with IEC 62061) additionally tested according to EN 61800-5-2:2017 (Generic Standard – Electrical Power Drive Systems with Adjustable Speed Section 5-2: Safety Requirements – Functional Safety)	
	EMC noise generation	according to EN 61000-6-4/A1:2011 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS DC Motor Output Stage
SR 011

with 1 DC motor output stage +50 V/5 A
1 brake chopper
1 incremental encoder input RS422/TTL
2 enable inputs +24 V/3 mA/0.5 ms
with STO function (not EG type tested)
1 digital output +24 V/0.5 A/short-circuit prot.

The S-DIAS motor output stage module SR 011 allows the connection of DC brush motors with a phase current up to 5 A. The operating modes PWM control, current and speed regula-tion via IxR compensation, as well as speed and position regulation via incremental encoder are supported.

DC Motor Output Specifications

Number	1
Supported motor type	DC brush motor
Operating modes	PWM control Current regulation Speed regulation via IxR compensation Speed regulation via incremental encoder Position regulation via incremental encoder
Supply voltage	+18-55 V
PWM frequency	32 kHz
Current controller frequency	16 kHz
Maximum PWM switching ratio	95 % (limited by hardware)
Maximum continuous current	5 A
Output current over the environmental temperature	maximum 5 A continuous current at 45 °C maximum 3.5 A continuous current at 50 °C maximum 2 A continuous current at 55 °C
Maximum peak current (1 s)	15 A
DC-link capacitance	2,8 µF
Motor current measurement	0-15 A

	Voltage measurement	0-65 V
	Temperature measurement	0-125 °C with temperature warning at 103 °C with temperature warning at 108 °C
	Safety functions	Short circuit cutoff Temperature cut-off I^2t monitor Over and under voltage monitor

Brake Chopper Specifications

	Number	1
	Output	GND switching
	Maximum current	6 A
	Short-circuit protection	yes
	Regen resistor	External power resistor
	Article number	20-014-061-Z1
	Regen resistor switching threshold on/off	60 V/55 V

Incremental Encoder Input Specifications

	Number	1
	Input signals	Incremental encoder signals RS422 (A, /A, B, /B, R, /R) RS422 signal (120 Ω termination, integrated in the module)
		Incremental encoder signal TTL (A, B, R) TTL level (1200 Ω Pull-Up, integrated in the module)
	Input frequency	maximum 125 kHz
	Counter frequency	maximum 500 kHz
	Signal analysis	4x
	Counter resolution	16 bits
	Encoder power supply	+5 V/0.2 A short-circuit proof

STO Enable Input Specifications

	Number	2	
	Input voltage	+24 V DC	
	Input voltage range	minimum +18 V	maximum +30 V
	Signal level	low: ≤ +5 V	high: ≥ +15 V
	Switch hysteresis	typically +11 V	
	Input current	3 mA at +24 V	
	Input delay	typically 0.5 ms	
	Safety Level	Complies with the requirements of Category 4, Performance Level „e“ according to EN ISO 13849-1 and SIL CL 3 according to 62061 Not EG type tested!	
	Safety function	STO according to EN 61800-5-2, section 4.2.2.2 The motor is not supplied with energy, which can cause a turn. The DC motor output stage does not supply energy to the motor, which can generate torque. Not EG type tested!	

Digital Output Specifications

	Number	1
	Short-circuit proof	yes
	Maximum continuous current load allowed	0.5 A
	Maximum braking energy of the output (inductive load)	maximum 0.5 Joules
	Residual current output (off)	≤ 10 µA
	Turn-on delay	< 200 µs
	Turn-off delay	< 200 µs

Electrical Requirements

	Supply voltage +24 V	18-30 V	
	Current consumption of the +24 V supply	load-dependent (digital output + digital output supply) maximum 0.6 A	
	Motor supply voltage	+18-55 V	
	Current consumption of motor supply	maximum 5 A (load-dependent)	
	Voltage supply from S-DIAS bus	+24 V	
	Current consumption on the S-DIAS bus (+24 V supply)	typically 60 mA	maximum 85 mA
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	-	-

Article Number and Miscellaneous

Article number	20-029-011	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	CE	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +55 °C	
Humidity	0-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating, > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with 61000-6-7 (Generic standards – immunity require-ments for equipment designed to perform functions in safety-based systems (functional safety) at industrial facilities) according to EN 61000-6-2 (industrial area) (increased requirements in accordance with IEC 62061)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Current Controller Module
SR 020

with 1 DC motor output stage 3,5 A
1 Power LED driver 350 mA
1 LED driver 20 mA

The S-DIAS SR 020 current controller module is used to operate a DC motor with a 12-30 V supply voltage and a maximum motor current of 3.5 A. Higher starting currents are possible for a short period.

The module also contains a current-controlled LED driver with a maximum current of 20 mA, as well as a current-controlled power LED with a maximum of 350 mA.

Motor Output Specifications

Number	1
Supply voltage	12-30 V DC
Controller frequency	30 kHz
Current	0-3.5 A
Motor peak start current	maximum I^2t-value = 16 A^2s
Operation mode	S3/50 % duty cycle with a maximum on-time of 1.5 min
Intermediate circuit capacity	140 µF
Voltage monitoring	Overvoltage and under voltage monitoring
Motor current measurement	0-3.5 A
Protective function	Short circuit switch-off I^2t switch-off Over temperature switch-off

Current Output Specifications

Number	2	
LED 1	0-20 mA at max. 10 V LED forward voltage	
Resolution	8-bit	
LED 2 (power LED)	0-350 mA at max. 10 V LED forward voltage	
Resolution	8-bit	

Electrical Requirements

Power supply +24 V	18-30 V	
Current consumption of +24 V power supply	maximum 210 mA/24 V	
Motor supply	12-30 V	
Current consumption of motor supply	depends on the motor	
Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V supply)	typically 68 mA	maximum 80 mA
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V supply)	typically 15 mA	maximum 20 mA

Article Number and Miscellaneous

Article number	20-029-020 20-029-020-X (polymer coated printed circuit board)	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	UL 61800-5-1 (E247993)	
Approvals	UL, cUL, CE, UKCA	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +55 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Current Controller Module
SR 022

with 1 DC motor output stage
1 incremental encoder input
1 digital input +5 V
2 digital inputs +24 V

The S-DIAS SR 022 current controller module is used to operate a DC motor with a 12-30 V supply voltage and a maximum motor current of 3.5 A. Higher starting currents are possible for a short period.

Additionally, the motor contains an incremental encoder input (optional TTL or RS422 signal), as well as three digital inputs (1x +5 V, 2x +24 V).

Motor Output Specifications

Number	1
Supply voltage	12-30 V DC
Controller frequency	30 kHz
Current	0-2.0 A in S1 mode 0-3.5 A in S3 mode
Output current over the environmental temperature	2.0 A (S1)/3.5 A (S3) up to 45 °C 1.0 A (S1)/1.4 A (S3) up to 55 °C
Operating modes	S1/100 % duty cycle S3/50 % duty cycle with a maximum on-time of 1.5 min
Intermediate circuit capacity	140 µF
Voltage monitoring	Overvoltage and under voltage monitoring
Motor current measurement	0-3.5 A
Protective function	Short circuit switch-off I^2t switch-off Over temperature switch-off

Incremental Encoder Input Specifications

Number	1	
Input signals	Incremental encoder signals RS422 (A, /A, B, /B, R, /R) RS422 signal (120 Ω termination, integrated in the module)	
	Incremental encoder signals TTL (A, B, R) TTL level (1200 Ω Pull-Up, integrated in the module)	
Input frequency	maximum 125 kHz	
Counter frequency	maximum 500 kHz	
Signal analysis	4x	
Counter resolution	16-bit	
Encoder power supply	+5 V/0.2 A short-circuit proof	

+5 V Digital Input Specifications

Number	1	
Input voltage	typically +5 V	maximum +5.5 V
Signal level	low: < +0.8 V	high: > +2.0 V
Switching threshold	typically +1.4 V	
Input current	1.5 mA at +5 V	
Input delay	typically 5 ms	

+24 V Digital Input Specifications

Number	2	
Input voltage	typically +24 V	maximum +30 V
Signal level	low: < +8 V	high: > +14 V
Switching threshold	typically +11 V	
Input current	3.7 mA at +24 V	
Input delay	typically 5 ms	

Electrical Requirements

Power supply +24 V	18-30 V	
Current consumption of the +24 V external supply	maximum 70 mA (at +24 V)	
Motor supply	12-30 V	
Current consumption of motor supply	depends on the motor	
Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V supply)	typically 85 mA	maximum 95 mA
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V supply)	typically 20 mA	maximum 25 mA

Article Number and Miscellaneous

Article number	20-029-022	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	designed according to UL	
Approvals	UL, cUL, CE in preparation, UKCA	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +55 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

Notes

S-DIAS Stepper Module
ST 011

with 1 incremental encoder input
1 output channel for the motor control
2 digital optic coupler outputs
2 digital inputs

The S-DIAS ST 011 stepper module can be used to control stepper motors and servo motor power components. The digital inputs are provided for the reference motion and monitoring the end positions. The ST 011 also has two digital optic coupler outputs. An incremental encoder connection with A/B/R analysis is available as well as the corresponding +5 V incremental encoder supply.

Incremental Encoder Specifications

Number	1
Input signals	Incremental encoder signals RS422 (A, /A, B, /B, R, /R) RS422 signal (150 Ω connection, 330 Ω spread, integrated in the module)
Input frequency	maximum 125 kHz
Counter frequency	maximum 500 kHz
Signal analysis	4X
Counter resolution	32-bit
Encoder power supply	+5 V/0.2 A short circuit protected

Power Component Control Output Specifications

Number	1
Output signals	Activation signals RS422 (C, /C, D, /D, E, /E) RS422 signal
Output frequency	maximum 500 kHz
Maximum continuous current allowed	40 mA

Digital Input Specifications

	Number	2	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +5 V	high: > +15 V
	Input current	3 mA at +24 V	
	Input delay	typically 0.1 ms	

Digital Optic Coupler Specifications

	Number	2
	Configuration	potential-free (output 1 is either back readable or can be used as an input)
	Switching voltage	maximum +30 V DC
	Current load	maximum 100 mA
	Residual voltage	< 2 V at 100 mA

Electrical Requirements

	Power supply +24 V from S-DIAS bus	+18-30 V DC	
	Current consumption of the +24 V supply on the S-DIAS bus	typically 80 mA (incl. incremental encoder supply)	maximum 90 mA (incl. incremental encoder supply)
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 180 mA	maximum 200 mA

Article Number and Miscellaneous

	Article number	20-014-011 20-014-011-X (Printed circuit board with protective lacquer)
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Shock resistance	EN 60068-2-27	150 m/s²
	Protection type	EN 60529	IP20

Notes

S-DIAS Stepper Motor Output Stage
ST 151

with 1 stepper motor output stage 50 V/5 A
- 1 brake chopper
- 1 incremental encoder input RS485/TTL
- 2 enable inputs with STO function
- 2 latch/digital inputs

The S-DIAS stepper motor output stage allows the connection of 2-phase stepper motors with a phase current up to 5 A. The incremental encoder input, which supports RS422 as well as TTL encoders, is pro-vided for position feedback. With both enable inputs, the safety function STO is implemented. The 2 latch/digital inputs are provided for the reference motion and monitoring the end positions.

Stepper Motor Output Specifications

Number of phases	2
Output voltage	dependent on the supply (18-55 V)
Current controller frequency	maximum 32 kHz
Output current	maximum 5 A RMS
Output current over the environmental temperature	maximum 5 A continuous current at 45 °C maximum 3 A continuous current at 55 °C
DC-link capacitance	10 µF
Operating modes	step frequency mode
Step resolution	full step, half step 4-/8-/16-/32-/64x micro step
Voltage measurement	15-70 V with an under voltage < 15 V or over voltage > 70 V, the motor output is shut down through the hardware.
Temperature measurement	0-125 °C with temperature warning at 103 °C with temperature warning at 108 °C

Brake Chopper Specifications

Number	1
Output	GND switching
Maximum current	6 A
Short-circuit protection	yes
Regen resistor	External power resistor
Regen resistor switching threshold on/off	60 V/55 V

Incremental Encoder Input Specifications

Number	1
Input signals	Incremental encoder signals RS422 (A, /A, B, /B, R, /R) RS422 signal (150 Ω termination, integrated in the module)
	Incremental encoder signal TTL (A, B, R) TTL level (1200 Ω Pull-Up, integrated in the module)
Input frequency	maximum 125 kHz
Counter frequency	maximum 500 kHz
Signal analysis	4x
Counter resolution	16-bit
Encoder power supply	+5 V/0.2 A short-circuit proof

STO Enable Input Specifications

Number	2	
Input voltage	+24 V DC	
Input voltage range	minimum +18 V	maximum +30 V
Signal level	low: ≤ +5 V	high: ≥ +15 V
Switch hysteresis	typically +11 V	
Input current	3 mA at +24 V	
Input delay	typically 0.5 ms	
Safety Level	complies with the requirements of Category 4, Performance Level "e" according to EN ISO 13849-1 and SIL3 according to 62061	
Safety function	STO according to EN61800-5-2, section 4.2.2.2 The motor is not supplied with energy, which can cause a turn. The stepper motor output stage does not supply energy to the motor, which can generate torque.	

Latch/Digital Input Specifications

	Number	2	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +8 V	high: > +14 V
	Switch hysteresis	typically +11 V	
	Input current	3.7 mA at +24 V	
	Input delay	typically 10 µs	

Electrical Requirements

	Motor supply	+18-55 V DC	
	Current consumption of the motor supply	maximum 6 A (load-dependent)	
	Current consumption of the +24 V supply on the S-DIAS bus	typically 80 mA (incl. +5 V supply of the incremental encoder)	maximum 120 mA (incl. +5 V supply of the incremental encoder)
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus	-	-

Article Number and Miscellaneous

	Article number	20-014-151
	Standard	designed according to UL
	Approvals	CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with 61000-6-7 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2 (industrial area) (increased requirements in accordance with IEC 62061)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS Current Output Module
CO 041

with 4 current controlled/pulse signal outputs
4 digital inputs +5 V

The S-DIAS CO 041 current output module is used for the simultaneous operation of four valves on supply voltages from 18-55 volts, a maximum holding current of 1 A and maximum output current of 3.5 A. To ensure the good, dynamic performance of the valve, the inrush current and secondary current (continuous) can be set. The four output stages are short-circuit protected. The module can also operate without a CPU (stand-alone). The module provides the option to reconfigure the current-controlled outputs as pulse signal outputs for operating micro-dosing valve control devices.

Current Controlled PWM Output Specifications

Number	4
Configuration	plus-switching (current controlled)
Short-circuit proof	yes
Maximum inrush current/channel	3.5 A (corresponds to reset inrush current 100 %)
Maximum inrush current/channel	0.30 A (corresponds to reset inrush current 8.5 %)
Maximum holding current/channel (peak value)	1.35 A (corresponds to reset inrush current 100 %)
Minimum holding current/channel (peak value)	0.115 A (corresponds to reset inrush current 8.5 %)
Maximum holding current/channel (average value)	1.0 A
Maximum total current per supply group (+UV1/+UV2)	7.0 A peak current (peak value) 2.0 A holding current (average value)
Default resolution value inrush current	8 Bit (0-255, 255 corresponds to 100 %)
Max. inrush current duration	100 ms
Holding current preset resolution value	8 Bit (0-255, 255 corresponds to 100 %)
Min. period in holding current phase	50 µs (corresponds to a maximum PWM frequency of 20.0 kHz)

Max. period in holding current phase	32.77 ms (corresponds to a minimum PWM frequency of 30.5 Hz)	
Turn-on delay	adjustable via software in 1 µs increments from 0-32767	
Turn-off delay	adjustable via software in 1 µs increments from 0-32767	
Status display	4x LED (yellow)	
Safety functions	short-circuit/over temperature cut-off	

Digital Input Specifications

Number	4	
Input voltage	typically +5 V	maximum +7 V
Signal level	low: < +0.8 V	high: > +2.0 V
Switching threshold	typically +1.4 V	
Input current	1.5 mA at +5 V	
Input delay	typically 100 µs	
Status display	4x LED (green)	

Electrical Requirements

Valve supply voltages +UV/1-2	18-55 V	
Current consumption of the valve supply +UV/1-2	corresponds to the load on valve outputs	
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V supply) operating all valves	typically 35 mA	maximum 50 mA

Article Number and Miscellaneous

Article number	20-018-221
Dimensions	217.4 x 187.7 x 72 mm (W x H x D)
Standard	UL 508 (E247993)
Approvals	CE

Environmental Conditions

Storage temperature	-20 ... +85 °C	
ambient temperature	0 ... +55 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Differential Pressure Input Module
DM 821

with 2 differential pressure inputs
8 digital inputs

The S-DIAS DM 821 differential pressure input module has two differential pressure inputs with a measurement range from -1034 mbar to +1034 mbar and eight digital inputs (+24 V/3.7 mA/0.5 ms).

Differential Pressure Inputs Specifications

Number	2
Pressure sensor type	difference pressure sensor
Measurement range	-1034 ... +1034 mbar
Measurement value	-1034 ... +1034
Resolution	12-bit (ca. 0.5 mbar/LSB)
Conversion time for all channels	1 ms
Input filter hardware	typically 1 kHz, low pass 3rd order system
Input filter software	configurable
Measurement precision	Based on the entire measurement range: ±2 % (at +10 ... +50 °C ambient temperature) Based on the entire measurement range: ±3 % (at 0 ... +60 °C ambient temperature)
Maximum differential pressure	4 bar
Maximum ambient pressure	10 bar

Applicable tube types	Manufac-turer	Article number	Inner tube diameter	Shore hardness	Max. pressu-re at 25 °C
	Frelin-Wade	95a-157	1.68 mm	95	6.89 bar
	NewAge Industries	2110535	1.68 mm	85	9.31 bar
	SMC	TU0212BU-20	1.2 mm	-	7.50 bar

Digital Input Specifications

Number	8	
Input voltage	typically +24 V	maximum +30 V
Signal level	low: < +5 V	high: > +15 V
Input current	3.7 mA at +24 V	
Input delay	typically 0.5 ms	

Electrical Requirements

Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V power supply)	typically 55 mA	maximum 60 mA
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V power supply)	typically 10 mA	maximum 15 mA

Article Number and Miscellaneous

Article number	20-008-821
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Standard	UL 508 (E247993)
Approvals	UL, cUL, CE

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Digital Input Module
EZ 101

with 10 digital inputs

The S-DIAS EZ 101 digital input module is equipped with 10 inputs and a +24 V signal for reading the signal states “0” and “1“. To suppress noise in the signal lines, according input filters are provided.

The EZ 101 is used for the implementation of the Euromap interface.

The fed in supply voltage is protected with a self-resettable PTC-fuse (200 mA at 23 °C) available again at the power plug.

Digital Input Specifications

	Number	10	
	Input voltage	typically +24 V	maximum +36 V
	Signal level	low: < +5 V	high: > +15 V
	Input current	6.9 mA at +24 V	
	Input delay	typically 5 ms	

Electrical Requirements

	Supply voltage +24 V IN	+18-36 V DC	
	+24 V IN current consumption	according to the current consumption of the external circuit of the +24 V output (maximum 200 mA with 23 °C)	
	Supply voltage +24 V OUT	+18-36 V DC	
	Current drain at +24 V OUT	maximum 200 mA	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 45 mA	maximum 50 mA

Article Number and Miscellaneous

Artikel number	20-051-101	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	UL 508 (E247993)	
Approvals	UL, cUL, CE	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Digital Output Module
EZ 102

with 10 digital outputs

The S-DIAS EZ 102 digital output module has 10 short-circuit proof, galvanically isolated, digital outputs in 2 groups (+24 V/100 mA). The power supply for each group is monitored for under voltage.

The EZ 102 is used for the implementation of the Euromap interface.

Digital Output Specifications

Number	10
Short-circuit proof	yes
Maximum continuous current load allowed per channel	0,1 A
Maximum total current (entire module)	1 A
Maximum braking energy of outputs (inductive load)	maximum 0,1 Joule/channel
Residual current (off)	≤ 12 µA
Turn-on delay	< 200 µs
Turn-off delay	< 200 µs
Galvanic separation	yes (isolation voltage 300 V)

Electrical Requirements

	+24 V supply voltage/1-2	+18-36 V DC	
	Current consumption of voltage supply +24 V/1-2	corresponds to the load on the digital outputs	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 45 mA	maximum 50 mA

Voltage Monitor

	+ 24 V/1-2 supply voltage	supply voltage > 18 V (DC OK-LED lights green)

Article Number and Miscellaneous

	Article number	20-051-102
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Digital Output Module
EZ 122

with 12 digital outputs

The S-DIAS EZ 122 digital output module has 12 short-circuit proof, galvanically isolated, digital outputs in 2 groups (+24 V/100 mA). The power supply for each group is monitored for under voltage.

The EZ 122 is used for the implementation of the Euromap interface.

Digital Output Specifications

Number	12
Short-circuit proof	yes
Maximum continuous current load allowed per channel	0,1 A
Maximum total current (entire module)	1.2 A
Maximum braking energy of outputs (inductive load)	maximum 0,1 Joule/channel
Residual current (off)	≤ 12 µA
Turn-on delay	< 200 µs
Turn-off delay	< 200 µs
Galvanic separation	yes (isolation voltage 300 V)

Electrical Requirements

	+24 V supply voltage/1-2	+18-36 V DC	
	Current consumption of voltage supply +24 V/1-2	corresponds to the load on the digital outputs	
	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 45 mA	maximum 50 mA

Voltage Monitor

	+ 24 V/1-2 supply voltage	supply voltage > 18 V (according DC OK-LED lights green)

Article Number and Miscellaneous

	Article number	20-051-122
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Power Supply
KL 090

with 9, +24 V terminals
9, 0 V terminals

The S-DIAS KL 090 power supply module has a connection for a +24 V supply with GND and distributes power over nine outgoing +24 V supplies with GND, seperated into four supply groups.

+24 V Power Supplies

	Number of +24 V supplies	9 (distributed over 4 supply groups)
	Short-circuit proof	yes
	Maximum allowable continuous load current/supply connection	2 A
	Maximum allowable continuous load current/supply group	2 A
	Maximum total current /module	6 A
	Safety functions	short circuit current limit per supply group typically 12 A over temperature cut-off cut-off with supply under voltage

Electrical Requirements

	Supply voltage +24 V	18-30 V DC

Voltage Monitor

	Supply voltage +24 V	supply voltage > 18 V (DC OK-LED lights green)

Article Number and Miscellaneous

Article number	20-024-090	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	UL 508 (E247993)	
Approvals	UL, cUL, CE, UKCA	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Power Supply
KL 091

with 9, +24 V terminals
9, 0 V terminals

The S-DIAS KL 091 power supply module has a connection for a +24 V supply with GND and distributes power over nine +24 V, power outputs split over four connector supply groups.

+24 V Power Supplies

	Number of +24 V supplies	9 (distributed over 4 supply groups)
	Short-circuit proof	yes
	Maximum allowable continuous load current/supply connection	2 A
	Maximum allowable continuous load current/supply group	2 A
	Maximum total current /module	6 A
	Safety functions	short circuit current limit per supply group typically 12 A over temperature cut-off cut-off with supply under voltage

Electrical Requirements

	Supply voltage +24 V	18-30 V DC

Voltage Monitor

	Supply voltage +24 V	supply voltage > 18 V (DC OK-LED lights green)

Article Number and Miscellaneous

Article number	20-024-091	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	UL 508 (E247993)	
Approvals	UL, cUL, CE, UKCA	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS 0 V Potential Distributor Module
KL 180

with 18, 0 V terminals

The KL 180 S-DIAS 0 V potential distributor module has 18 terminals. The voltage tap is possible without an additional series terminal.

0 V Supplies

Number of 0 V supplies	2
Short-circuit proof	no
Internal fuse	no
Maximum continuous current load allowed/connection	8 A
Maximum total current	16 A (The incoming and outgoing supplies cannot exceed the maximum current of 8 A per connection!)

Electrical Requirements

0 V supply voltage	0 V DC

Article Number and Miscellaneous

Article number	20-024-180
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Standard	UL 508 (E247993)
Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS +24 V Potential Distributor Module
KL 181

with 18, +24 V terminals

The S-DIAS KL 181 +24 V potential distributor module has 18 terminals. The voltage tap is possible without an additional series terminal.

+24 V Power Supplies

Number of +24 V supplies	2
Short-circuit proof	no
Internal fuse	no
Maximum continuous current load allowed/connection	8 A
Maximum total current	16 A (The incoming and outgoing supplies cannot exceed the maximum current of 8 A per connection!)

Electrical Requirements

Power supply +24 V	18-30 V DC

Article Number and Miscellaneous

Article number	20-024-181
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Standard	UL 508 (E247993)
Approvals	UL, cUL, CE, UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Pixel LED Module
PL 221

with control for 2x RGB pixel LED stripes and 2x 24 V PWM LED stripes

With the S-DIAS Pixel LED module PL 221, two pixel LED stripes with a maximum of 512 pixel RGB LEDs each and two +24 V PWM dimmable white LED stripes can be controlled.

Pixel LED Outputs Specifications

Number of channels	2
Short-circuit and overload protection	yes (short-circuit or overload can be read from software through a latched status bit)
Supported pixel LEDs	WS2812B, WS2813
Maximum number of pixel LEDs	512 pixel LEDs
Data rate Pixel LED control	800 kB/s
Update frequency	circa 115 Hz @ 288 pixel LEDs, 800 kB/s
Data width per LED	24 bit (8 bit red/green/blue)
Maximum load capacity +5 V	max. 4.5 A at 50 °C environmental temperature max. 4.0 A at 55 °C environmental temperature

24 V PWM LED Outputs Specifications

Number	2	
Short-circuit and overload protection	yes (short-circuit or overload can be read from software through a latched status bit)	
Maximum permissible continuous load current/channel	2.0 A	
Maximum total current	4 A (100% of on-time)	
PWM pulse width	0-100 % adjustable in 1 % increments	
PWM frequency	adjustable 100 Hz - 2 kHz	
Residual current output (off)	≤ 10 µA	

Electrical Requirements

External +24 V supply	+18-30 V DC	
External current consumption +24 V	max. total current 5.4 A (2x pixel LED total current max. 1.4 A, 2x PWM output total current max. 4 A)	
Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V supply)	typically 90 mA	maximum 100 mA
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V supply)	typically 6 mA	maximum 8 mA

Article and Miscellaneous

Article number	20-018-221
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Approvals	CE, UKCA

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +55 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Power Boost Module
PSB 001

with 1 +24 V/1.6 A voltage supply for S-DIAS bus
1 +5 V/1.6 A voltage supply for S-DIAS bus
1 voltage monitor +24 V supply

The S-DIAS power boost module PSB 001 is used to power the voltage supply for the S-DIAS bus. The module can be integrated into an S-DIAS system and provides the following S-DIAS modules with voltage supply of +24 V/1.6 A and +5 V/1.6 A on the S-DIAS bus. The module therewith allows a configuration of the S-DIAS system with up to 64 participants.

Voltage Monitor

	Power supply +24 V	Supply voltage > 18 V (corresponding DC OK-LED lights green)

Electrical Requirements

	Supply voltage	+18-30 V DC UL: Class 2 or LVLC			
	Current consumption of the voltage supply	the current consumption is dependent on the connected loads (max. 2,2 A)			
	Current consumption on the S-DIAS bus (IN) with +24 V supply missing.	+5 V		+24 V	
		typically 40 mA	maximum 50 mA	typically 5 mA	maximum 10 mA
	Current output on the S-DIAS bus (OUT) to power the I/O/P modules	+5 V		+24 V	
		maximum 1.6 A		maximum 1.6 A	

Article and Miscellaneous

Article number	20-002-001	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	UL 508 (E247993)	
Approvals	UL, cUL, CE	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS RealTimeClock Module
RC 001

with 1 RealTimeClock battery buffered

The S-DIAS RealTimeClock module provides battery buffered date and time information for processor modules on the bus, which have no integrated real-time clock. Buffering of the RealTimeClock without supply is realized with a Lithium battery.

Performance Data

Real-time clock	yes (battery buffered)	
Precision	-50 ppm to +25 ppm (typ. -5 ppm) @ 0 °C ambient temperature -50 ppm to +25 ppm (typ. -20 ppm) @ 25 °C ambient temperature -95 ppm to +15 ppm (typ. -70 ppm) @ 45 °C ambient temperature -150 ppm to -20 ppm (typ. -120 ppm) @ 60 °C ambient temperature	

Electrical Requirements

Voltage supply from S-DIAS bus	+5 V	
Current consumption on the S-DIAS bus (+5 V supply)	typically 40 mA	maximum 50 mA

Article Number and Miscellaneous

Article number	20-012-001
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Standard	UL 508 (in preparation)

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS VARAN Analyzer
VA 011

with 1 VARAN In
1 VARAN Out
1 Ethernet

The VA 011 S-DIAS VARAN Analyzer module allows the analysis of communication in a real-time Ethernet VARAN bus network. The connection is made over a free VARAN port. If no port is available, an existing VARAN bus connection can simply be removed and the VARAN Analyzer inserted. The data to analyze are output through a Gigabit Ethernet port and can be evaluated with the VARAN Service Tool. The option is also available to analyze the data via Wireshark and protocol plug-in from SIGMATEK.

Performance Data

Interfaces	1x Gigabit Ethernet 10/100/1000 1x VARAN In (RJ45) 1x VARAN Out (RJ45)
Control Elements	1x mode button (front)
Status LEDs	1x RUN 1x Link/Speed Gigabit Ethernet 1x Active Gigabit Ethernet 3x Modus (shows the current operating mode) 2x VARAN Link (1x VARAN In and Out each) 2x VARAN Active (1x VARAN In and Out each) 1x DC OK

Elektrische Anforderungen

Supply voltage	+18-30 V DC UL: Class 2 or LVLC
Current consumption of +24 V power supply	typically 130 mA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Article Number and Miscellaneous

	Article number	20-027-011
	Dimensions	25 x 104.2 x 72 mm (W x H x D)
	Standard	CE
	Approvals	UKCA

S-DIAS Dummy Module
BL 011

The S-DIAS BL 011 dummy module can be used as a placeholder for a later system expansion. The dummy module is an active module on the S-DIAS bus.

Electrical Requirements

	Voltage supply from S-DIAS bus	+5 V	
	Current consumption on the S-DIAS bus (+5 V supply)	typically 35 mA	maximum 40 mA

Article Number and Miscellaneous

	Article number	20-015-011
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Energy Measuring Module
DEE 021

The DEE 021 energy measuring module is used to measure the energy directly on the machine. The voltages from the three input phases (L1, L2 and L3) are measured and up to 12 currents are recorded. The DEE 021 has a real-time Ethernet VARAN as well as a CAN bus interface and can therefore communicate with the automation world perfectly.

With the DEE 021, input voltages, phase sequences, phase positions and the frequency are monitored. It can also detect short power disruptions and registers the 0-crossing point. The module has 12 independent channels for measuring current.

Performance Data

	Interfaces	1x VARAN In (RJ45) 1x VARAN Out (optional Ethernet (VtE)) (RJ45) 1x CAN 2x DIAS 3x voltage 12x current

Electrical Requirements

	Supply voltage	18-30 V DC	
	Current consumption of power supply at +24 V DC	typically 110 mA	maximum 130 mA
	Current consumption of power supply at +24 V DC (UL)	maximum 120 mA	

Voltage Inputs

Number of channels	3
Measurement range	up to 500 V AC
Measurement value	-8000 ... +8000
Resolution	14-bit
Scan rate	50 µs
Analog measurement precision	0,65 % of maximum measurement value

Current Inputs

Number of channels	12
Measurement range	up to 1 A rms
Measurement value	-8000 ... +8000
Resolution	14-bit
Scan rate	50 µs
Analog measurement precision	0,6 % of maximum measurement value

Connection Requirements

Required terminal module	DKL 361, article number: 05-024-361
Mechanical coding	| 1 | 2 | 3 | 4 | 5 | | 7 | |

Article Number and Miscellaneous

Article number	05-068-021
Standard	UL 508 (E247993)

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
EMC stability	in accordance with EN 61000-6-2 (industrial area)	
Shock resistance	EN 60068-2-27	150 m/s²
Protection type	EN 60529	IP20
Protection Type (UL)	open type device	
pollution degree	2	


A200
S
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A202
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U
X1
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4
X2
5
6
7
8
X3
9
10
11
A203
S
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X1
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A
B
15
16
X5

S-DIAS SAFETY

S-DIAS SAFETY

With S-DIAS Safety, a slim and economic safety system is provided that can be flexibly adapted to specific application needs. The Safety systems can be combined with standard modules as desired. In addition, S-DIAS Safety can be used as a stand-alone solution.

The Safety system is TÜV-certified and complies with SIL 3 in accordance with EN / IEC 62061 and EN ISO 13849-1/-2, Category 4, PL e.

S-DIAS Safety CPU Module
SCP 011

with 1 Safety Interface
1 USB Device
1 microSD Slot

The S-DIAS 011 Safety CPU module supports up to 16 Safe I/O modules. In addition, the SCP 011 can operate handheld devices with Emergency Stop and/or confirmation buttons. The Safety CPU component has the safety integrity level SIL3 or SIL CL 3 (EN / IEC 62061) or Performancelevel e (PL e) (EN ISO 13849-1/-2).
The safety-related SCP 011 is ideal for use in systems with optional modules and interface variables. The SCP 011 module alone is already a minimal system of a safety control.

Performance Data

	Interfaces	1x Safety Interface
	Program interfaces	1x USB device
	Bus connection possible	yes
	Miscellaneous	microSD slot
	Supply voltage	+24 V

Electrical Requirements

Module Supply (Input)

	Supply voltage	+18-30 V DC, typically +24 V DC UL: Class 2 or LVLC			
	Current, internal consumption	typically 90 mA internal consumption			
	Current consumption	maximum 1.4 A			
	Current consumption from the S-DIAS bus		+5 V		+24 V
		with missing +24 V connection (X3)	typically 170 mA	maximum 200 mA	0 A	0 A
		with existing +24 V connection (X3)	0 A	0 A	0 A	0 A

S-DIAS Bus/Safety Supply (Output)				
	Voltage supply	in the S-DIAS bus	+5 V	+24 V
			0 A	0 A
		in the S-DIAS Safety bus (supply of the I/O modules)	+12 V	+24 V
			max. 0.8 A	max. 0.8 A

Article Number and Miscellaneous

	Article number	20-890-011
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C (UL) 0 ... +60 °C starting with HW version 1.70 (CE)	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with 61000-6-7 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2 (industrial area) (increased requirements in accordance with IEC 62061)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Safety CPU Module
SCP 111

with 1 Safety Interface
1 USB Device
1 microSD Slot
800 mA for supply of E/A modules

The S-DIAS 011 Safety CPU module supports up to 16 Safe I/O modules. In addition, the SCP 111 can operate handheld devices with Emergency Stop and/or confirmation buttons. The Safety CPU component has the safety integrity level SIL3 or SIL CL 3 (EN / IEC 62061) or Performancelevel e (PL e) (EN ISO 13849-1/-2).

With the SCP 111, the safe process data is transmitted with its own safety protocol (FSoE).

Performance Data

CPU	ARM Cortex M µController		
Addressable safety I/O modules	S-DIAS Safety Bus: 16		
Data memory	Type	SRAM	
	Memory	24 kbytes	
Program memory	Type	Flash	
	Memory	224 kbytes	
Remnant memory for parameter lists	-		
Remnant memory for variables	-		
Interfaces	1x microSD card holder 1x Safety interface 1x S-DIAS IN/OUT 1x Safety bus OUT		
Programming interfaces	1x USB device		
Bus connection possible	yes		
Status LEDs	yes		

Electrical Requirements

Module Supply (Input)					
	Supply voltage	+18-30 V DC, typically +24 V DC UL: Class 2 or LVLC			
	Current, internal consumption	typically 90 mA internal consumption			
	Current consumption	maximum 1.4 A			
	Current consumption from the S-DIAS bus		+5 V		+24 V
		with missing +24 V connection (X3)	typically 170 mA	maximum 200 mA	0 A	0 A
		with existing +24 V connection (X3)	0 A	0 A	0 A	0 A
S-DIAS Bus/Safety Supply (Output)					
	Voltage supply	in the S-DIAS bus	+5 V		+24 V	
			0 A		0 A	
		in the S-DIAS Safety bus (supply of the I/O modules)	+12 V		+24 V	
			max. 0.8 A		max. 0.8 A	

Article Number and Miscellaneous

	Article number	20-890-111
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C (UL) 0 ... +60 °C starting with HW version 1.10 (CE)	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with 61000-6-7 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2 (industrial area) (increased requirements in accordance with IEC 62061)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Safety CPU Module
SCP 211

with 1 Safety Interface
1 USB Device
1 microSD Slot
1600 mA for supply of I/O modules

The S-DIAS SCP 211 Safety CPU module supports up to 16 Safe I/O modules. In addition, the SCP 211 can operate handheld devices with Emergency stop switch, consent button and key switch. The Safety CPU component has the safety integrity level SIL3 (EN / IEC 62061) or Performancelevel e (PL e), Category 4 (EN ISO 13849-1).

With the SCP 211, the safe process data is transmitted with its own safety protocol (FSoE).

Performance Data

CPU	ARM Cortex M µController	
Addressable safety I/O modules	S-DIAS Safety Bus: 16	
Data memory	Type	SRAM
	Memory	500 kbytes
Program memory	Type	Flash
	Memory	1 Mbyte
Remnant memory for parameter lists	Type	SPI-Flash
	Memory	64 kbytes
	Life span	min. 100.000 write access
Remnant memory for variables	Type	EERAM
	Memory	1000 byte
Interfaces	1x microSD card holder 1x Safety interface 1x S-DIAS IN/OUT 1x Safety bus OUT	
Programming interfaces	1x USB device	
Bus connection possible	yes	
Status LEDs	yes	

Electrical Requirements

Module Supply (Input)					
	Supply voltage	+19.2-28.8 V DC, typically +24 V DC SELV/PELV			
	Current, internal consumption	typically 90 mA internal consumption			
	Current consumption	maximum 2.4 A			
	Current consumption from the S-DIAS bus		+5 V		+24 V
		with missing +24 V connection (X3)	typically 250 mA	maximum 300 mA	0 A	0 A
		with existing +24 V connection (X3)	0 A	0 A	0 A	0 A
S-DIAS Bus/Safety Supply (Output)					
	Voltage supply	in the S-DIAS bus	+5 V		+24 V	
			0 A		0 A	
		in the S-DIAS Safety bus (supply of the I/O modules)	+12 V		+24 V	
			max. 0.8 A		max. 1.6 A	

Article Number and Miscellaneous

	Article number	20-890-211
	Dimensions	25 x 104.2 x 72 mm (W x H x D)
	Approvals	CE, TÜV EC type approved

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with 61000-6-7 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2 (industrial area) (increased requirements in accordance with IEC 62061)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Safety Analog Input Current Module
SAI 041

with 4 secure inputs (4-20 mA)

The S-DIAS safety analog input module provides the values of four analog current inputs from the Safe CPU (Safety CPU). The analog inputs can also be read by the functional control CPU via the S-DIAS bus from the safety CPU. The four current inputs have an input range of 4-20 mA with a resolution of 16 bits. A 24 V sensor supply is provided for the analog inputs, which must be powered externally.
Safe evaluation of the analog inputs is ensured by two independent diversitary evaluations with mutual monitoring.

Input Specifications

Number of channels	4
Measurement range	4-20 mA
Measurement value	12,000-60,000
Measurement range Overrange and Under range	0.5-21.6 mA
Measurement range Overrange and Under range	1500-64,800
Input type	differential input
Galvanic separation	none
Measurement range resolution	16 bits ca. 0.371 µA/LSB
Conversion time for all channels	1 ms
Common mode range	±10 V
Load	typically 55 W
Cable break monitor	configurable min. 0.5 mA
Input filter hardware	1 kHz, low pass 3rd order (common mode)
Input filter software	low pass 1st order (configurable or can be deactivated)
Input delay	dependent on software filter

	Measurement precision, 1-channel	±1.0 %/200 µA (0-60 °C)
	Measurement precision, 2-channel	±2.0%/400 µA (0-60 °C)
	Linearity	0.006 %
	Status display	1x green status LED per channel, 1x red error LED per channel

Electrical Requirements

	Supply voltage sensor supply	typically +24 V DC ±20 % (SELV/PELV) UL: Class 2 or LVLC			
	Protection class	III			
	Current consumption X5	typically 3.5 mA internal consumption			
		maximum 5 mA internal consumption + connected sensors (maximum 500 mA for sensor supply)			
	Current consumption from the S-DIAS bus	+12 V		+24 V	
	with missing +24 V connection	typically 100 mA	maximum 120 mA	typically 55 mA	maximum 65 mA

Article Number and Miscellaneous

	Article number	20-897-041
	Dimensions	25 x 104.2 x 72 mm (W x H x D)
	Approvals	CE, TÜV EG type tested

Environmental Conditions

	Storage temperature	-40 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	EN 61000-6-7 (noise immunity requirements for devices with functional safety) EN 61000-6-2 (industrial area)	
	EMC noise generation	EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Safety Digital Input Module
SDI 101

with 10 secure inputs
1 redundant output signal (short-circuit proof)

The S-DIAS SDI 101 Safety digital input module has the safety integrity level SIL3 (EN / IEC 62061) or Performancelevel e (PL e) (EN ISO 13849-1/-2).

To test inputs and detect cross circuits (e.g. Emergency Stop), the SDI 101 has two non-safe signal outputs, TA and TB.

Input Specifications

	Number	10	
	Input voltage	+24 V DC	
	Input voltage range	minimum +18 V	maximum +30 V
	Signal level	low: ≤ +5 V	high: ≥ +15 V
	Switching threshold	typically +11 V	
	Input current	3 mA at +24 V	
	Input delay	0.5 ms	

Signal Output Cross-Circuit Detection Specifications

	Number	5x signal A	5x signal B
	Rated output voltage	+24 V DC	
	Output voltage range	minimum +18 V	maximum +30 V
	Output current	100 mA at +24 V	
	Miscellaneous	short-circuit proof	

Electrical Requirements

	Voltage supply from Safety bus	+12 V	
	Current consumption on the Safety bus (+12 V power supply)	typically 12 mA	maximum 15 mA
	Voltage supply from Safety bus	+24 V	
	Current consumption on the Safety bus (+24 V power supply)	typically 44 mA	maximum 50 mA

Article Number and Miscellaneous

	Article number	20-891-101
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C (UL) 0 ... +60 °C (CE)	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with 61000-6-7 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2 (industrial area) (increased requirements in accordance with IEC 62061)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Safety Digital Mixed Module
SDM 081

with 6 safe inputs
2 safe outputs
1 redundant output signal (short-circuit proof)

The S-DIAS Safety SDM 081 digital mixed module has the safety integrity level SIL3 in accordance with EN / IEC 62061 or Performancelevel e (PL e) in accordance with EN ISO 13849-1/-2. The safe outputs are used for the safety-oriented output of two actuator signals to, for example, control relays, valves, etc. The safety inputs are used for reading six actuator signals. To test inputs and detect cross circuits the SDM 081 has two non-safe signal outputs, A and B.

Input Specifications

	Number	6	
	Input voltage	+24 V DC	
	Input voltage range	minimum +18 V	maximum +30 V
	Signal level	low: ≤ +5 V	high: ≥ +15 V
	Switching threshold	typically +11 V	
	Input current	3 mA at +24 V	
	Input delay	0.5 ms	

Signal Output Cross-Circuit Detection Specifications

	Number	3x signal A	3x signal B
	Rated output voltage	+24 V DC	
	Output voltage range	minimum +18 V	maximum +30 V
	Output current	100 mA at +24 V	
	Miscellaneous	short-circuit proof	

Output Specifications

	Number	2	
	Rated output voltage	+24 V DC	
	Output voltage range	minimum +18 V	maximum +30 V
	Maximum output current	2 A	
	Maximum total current (2 outputs)	4 A up to a max. environmental temperature of 55 °C	
	Brake voltage with switching-off inductive loads	typically 0.85 V	
	Maximum switch-off energy of the outputs (inductive load)	maximum 0.4 Joule per channel	
	Turn-on delay	< 200 µs	
	Turn-off delay	< 1 ms	
	Miscellaneous	short-circuit proof	
	Cut-off test signal	< 1.5 ms	
	Cutoff test pulse width (t_1)	minimum 0.1 ms	maximum 1.5 ms
	Cutoff test pulse interval bet. FET Test and HSS Test (t_2)	minimum 112 ms	maximum 6450 ms
	Cutoff test pulse interval (t_3)	60 s	

Electrical Requirements

	Voltage supply from Safety bus	+12 V
	Current consumption on the Safety bus (+12 V power supply)	maximum 34 mA
	Voltage supply from Safety bus	+24 V
	Current consumption on the Safety bus (+24 V power supply)	maximum 21 mA

Article Number and Miscellaneous

	Article number	20-895-081
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	cULUS, CE, TÜV Austria EG type-tested

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C (UL) 0 ... +60 °C (CE)	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with 61000-6-7 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2 (industrial area) (increased requirements in accordance with IEC 62061)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz 5 g from 8 Hz-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Notes

S-DIAS Safety SNC Incremental Encoder Module
SNC 021

with 2 Incremental encoder inputs

The S-DIAS Safety SNC incremental encoder module SNC 021 provides the values of two incremental encoders, the Safety CPU as well as the non-Safe CPU (standard PLC).

The two-channel safety function “monitors” the increments in the incremental encoder interfaces and processes the so-called Safety core in two micro controllers with cross-communication.

I-encoder Specifications

Number of channels	2
Encoder	Incremental encoder with RS422 Interface with null position trace.
Input frequency	0.75 MHz
Counter frequency	3 MHz
Signal analysis	4x
Encoder resolution	maximum 12 bits
Encoder power supply	+5 V supply, short-circuit proof with monitoring function and current measurement (+ 5 V is generated from +24 V at X3)
Status LED	yes
I-encoder current consumption	maximum 300 mA per encoder

Electrical Requirements

Supply voltage for the encoder supply	+18-30 V	
Current consumption of supply voltage for the encoder supply	typically 162 mA/24 V	maximum 200 mA/30 V
Voltage supply from Safety bus	+12 V	
Current consumption on the Safety bus (+12 V supply)	typically 75 mA	maximum 90 mA
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V supply)	typically 33 mA	maximum 40 mA

Article Number and Miscellaneous

Article number	20-896-021
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
Standard	Two-channel application: EN 62061 SIL 3 EN ISO 13849-1 PL e/Cat. 4 One-channel application: EN 62061 SIL 3 EN ISO 13849-1 PL d/Cat. 2 UL 508 (E247993)
Approvals	CE, $_{c}$UL$_{us}$, TÜV Austria EG type-tested

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +50 °C (UL) 0 ... +60 °C (CE)	
Humidity	0-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with 61000-6-7 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2 (industrial area) (increased requirements in accordance with IEC 62061)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz 5 g from 8 Hz-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Safety Relay Output Module
SRO 021

with 2 safe outputs

The S-DIAS Safety SRO 021 relay output module has the safety integrity level SIL3 (EN/IEC 62061) or Performancelevel e (PL e) (EN ISO 13849-1/-2).

The safe outputs are used for the safety related output of two actuator signals, for example to control relays, valves, etc.

Relay Output Specifications

Number	2	
Configuration	two-channel	
Voltage range	maximum +30 V	
Contact current	maximum 6 A by 55 °C maximum 4 A by 60 °C	
Miscellaneous	no protective circuit	

Electrical Requirements

Voltage supply from Safety bus	+12 V	
Current consumption on the Safety bus (+12 V power supply)	typically 30 mA	maximum 40 mA
Voltage supply from Safety bus	+24 V	
Current consumption on the Safety bus (+24 V power supply)	typically 90 mA	maximum 100 mA

Article Number and Miscellaneous

Article number	20-893-021	
Dimensions	25 x 104.2 x 72 mm (W x H x D)	
Standard	EN 62061 SIL 3 EN ISO 13849-1 PL e/Kat. 4 UL 508 (E247993)	
Approvals	CE, TÜV EG-Baumustergeprüft, $_{c}UL_{us}$	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +55 °C (UL) +55 ... +60 °C with derating since HW version 3.10 (CE)	
Humidity	0-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with 61000-6-7 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2 (industrial area) (increased requirements in accordance with IEC 62061)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Safety Relay Output Module
SRO 022

with 2 safe outputs

The S-DIAS Safety SRO 022 relay output module has the safety integrity level SIL3 (EN / IEC 62061) or Performancelevel e (PL e) (EN ISO 13849-1/-2).

Both outputs are used for the Safety-oriented closing (NO) of an electric circuit with a permissible rated voltage of 24 V DC / 230 V AC and a maximum continuous current of 6 A.

Relay Output Specifications

	Number	2	
	Configuration	two-channel	
	Contact	normally open	
	Relay type	SIS212 21VDC SEN	
	Nominal voltage	+24 V DC	230 V AC
	Switching voltage	maximum +30 V DC	maximum 250 V AC
	Maximum continuous current /channel	maximum 6 A at 55 °C maximum 4 A at 60 °C	maximum 6 A at 55 °C maximum 4 A at 60 °C
	Short-circuit and overload protection	external fuse category gG, maximum 6 A	
	Concurrence of all outputs	100 %	
	Response time	typically 10 ms	
	fall time	typically 3 ms	
	Miscellaneous	no protective circuit	
	Voltage range	maximum +30 V	
	Contact current	maximum 6 A	
	Miscellaneous	no protective circuit	

Electrical Requirements

	Voltage supply from Safety bus	+12 V	
	Current consumption on the Safety bus (+12 V power supply)	typically 30 mA	maximum 40 mA
	Voltage supply from Safety bus	+24 V	
	Current consumption on the Safety bus (+24 V power supply)	typically 90 mA	maximum 110 mA

Article Number and Miscellaneous

	Article number	20-893-022
	Dimensions	25 x 104.2 x 72 mm (W x H x D)
	Standard	EN 62061 SIL 3 EN ISO 13849-1 PL e/Cat. 4
	Approvals	CE, designed according to UL, TÜV-Austria EG type tested

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C (UL) +55 ... +60 °C with derating (CE)	
	Humidity	0-95 %, non-condensing	
	Operating conditions	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m Over voltage category II (up to 5000 hm) Over voltage category III (only up to 2000 hm)	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with 61000-6-7 (Generic standards – immunity requirements for equipment designed to perform functions in safety-based systems (functional safety) at industrial facilities) according to EN 61000-6-2 (industrial area) (increased requirements in accordance with IEC 62061)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

S-DIAS Safety SSI Absolute Value Encoder
SSI 021

with 2 SSI encoder

The S-DIAS Safety SSI absolute value encoder module SSI 021 provides the values of two absolute value encoders, the Safety CPU as well as the non-Safe CPU (standard PLC). Since hardware version 2.0 rotary encoders are supported.
The 2-channel Safety function is implemented by processing the position values in the so-called Safety core (two micro controllers with cross communication). The safety-related component of the module meets the requirements for SIL3 in accordance with EN / IEC 62061 and PL e, cat. 4 in accordance with EN ISO 13849-1/-2 (with two-channel use).

SSI Encoder Specifications

Number	2	
Encoder	absolute encoder with RS422 interface	
Data transfer speed	125 kHz, 250 kHz, 500 kHz, 1 MHz (configurable)	
Encoder resolution	maximum 32 bits	
Coding	binary/gray	
Encoder power supply	+24 V supply, maximum 300 mA internal voltage monitor +24 V (+20 %/-15 %)	
Status LED	yes	

Electrical Requirements

Voltage supply from Safety bus	+12 V	
Current consumption on the Safety bus (+12 V supply)	typically 70 mA	maximum 100 mA
Voltage supply from S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus (+24 V supply)	typically 30 mA	maximum 50 mA

Article Number and Miscellaneous

Article number	20-894-021	
Dimensions	12.5 x 104.2 x 72 mm (W x H x D)	
Standard	2-channel application: 1-channel application: UL 508 (E247993)	EN 62061 SIL 3 EN ISO 13849-1 PL e/Cat. 4 EN 62061 SIL 2 EN ISO 13849-1 PL c /Cat. 2
Approvals	CE, cULus, TÜV Austria EG type-tested	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +55 °C (UL) 0 ... +60 °C starting with HW version 3.10 (CE)	
Humidity	0-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	Pollution degree 2	
EMC resistance	in accordance with 61000-6-7 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2 (industrial area) (increased requirements in accordance with IEC 62061)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

S-DIAS Safety Digital Output Module
STO 081

with 8 secure outputs

The S-DIAS Safety 081 digital output module has the safety integrity level SIL3 (EN / IEC 62061) or Performancelevel e (PL e) (EN ISO 13849-1/-2).

The safe outputs are used for the safety-oriented output of eight actuator signals to, for example, control relays, valves, etc.

Output Specifications

Number	8			
Rated output voltage	+24 V DC			
Output voltage range	minimum +18 V		maximum +30 V	
Maximum output current	2 A			
Maximum total currentPer output group (2 outputs)	5 A			
Maximum total current (complete module)	10 A up to a max. of 45 °C Ambient temperature	8 A up to a max. of 55 °C Ambient temperature	6 A up to a max. of 60 °C Ambient temperature	
Brake voltage with switching-off inductive loads	typically 0.85 V			
Maximum switch-off energy of the outputs (inductive load)	maximum 0.4 Joule per channel maximum 1.2 Joule (entire module)			
Turn-on delay	< 200 µs			
Turn-off delay	< 1 ms			
Miscellaneous	short-circuit proof			
Cut-off test signal	< 1.5 ms			

	Cutoff test pulse width (t_1)	minimum 0.1 ms	maximum 1.5 ms
	Cutoff test pulse interval bet. FET Test and HSS Test (t_2)	minimum 112 ms	maximum 6450 ms
	Cutoff test pulse interval (t_3)	60 s	

Electrical Requirements

	Voltage supply from Safety bus	+12 V	
	Current consumption on the Safety bus (+12 V power supply)	typically 42 mA	maximum 50 mA
	Voltage supply from Safety bus	+24 V	
	Current consumption on the Safety bus (+24 V power supply)	typically 36 mA	maximum 40 mA

Article Number and Miscellaneous

	Article number	20-892-081
	Dimensions	12.5 x 104.2 x 72 mm (W x H x D)
	Standard	UL 508 (E247993)
	Approvals	cULUS, CE, TÜV Austria EG type-tested

Environmental Conditions

	Storage temperature	-20 ... +85 °C
	Environmental temperature	0 ... +55 °C (UL) 0 ... +60 °C (CE)
	Humidity	0-95 %, non-condensing
	Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m
	Operating conditions	Pollution degree 2
	EMC resistance	in accordance with 61000-6-7 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2 (industrial area) (increased requirements in accordance with IEC 62061)
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20

Safety Input Box
SIB 061

with 6 safe inputs
1 double clock output signal (short circuit proof)

The Safety Input Box SIB 061 has the Safety integrity level SIL3 (EN / IEC 62061) or Performance-level e (PL e) (EN ISO 13849-1/-2). The Safety inputs are used for reading 6 actuator signals (Emergency Stop, confirmation button etc.).

To test inputs and detect crossed circuits (e.g. Emergency Stop), the SIB 061 has 2 non-safe signal outputs, TA and TB.

Input Specifications

	Number	6	
	Input voltage	+24 V DC	
	Input voltage range	minimum +18 V	maximum +30 V
	Signal level	low: ≤ +5 V	high: ≥ +15 V
	Switching threshold	typically +13 V	
	Input current	3 mA at +24 V	
	Input delay	0.5 ms	

Signal Output Cross-Circuit Detection Specifications

	Number	3x signal A	3x signal B
	Rated output voltage	+24 V DC	
	Output voltage range	minimum +18 V	maximum +30 V
	Output current	100 mA at +24 V	
	Miscellaneous	short-circuit proof	

Electrical Requirements

	Supply voltage	+24 V DC
	Supply voltage (UL)	+24-30 V DC (Class 2)
	Supply voltage range	+18-30 V DC
	Current consumption (+24 V power supply, own consumption)	typically 35 mA

CAN Bus

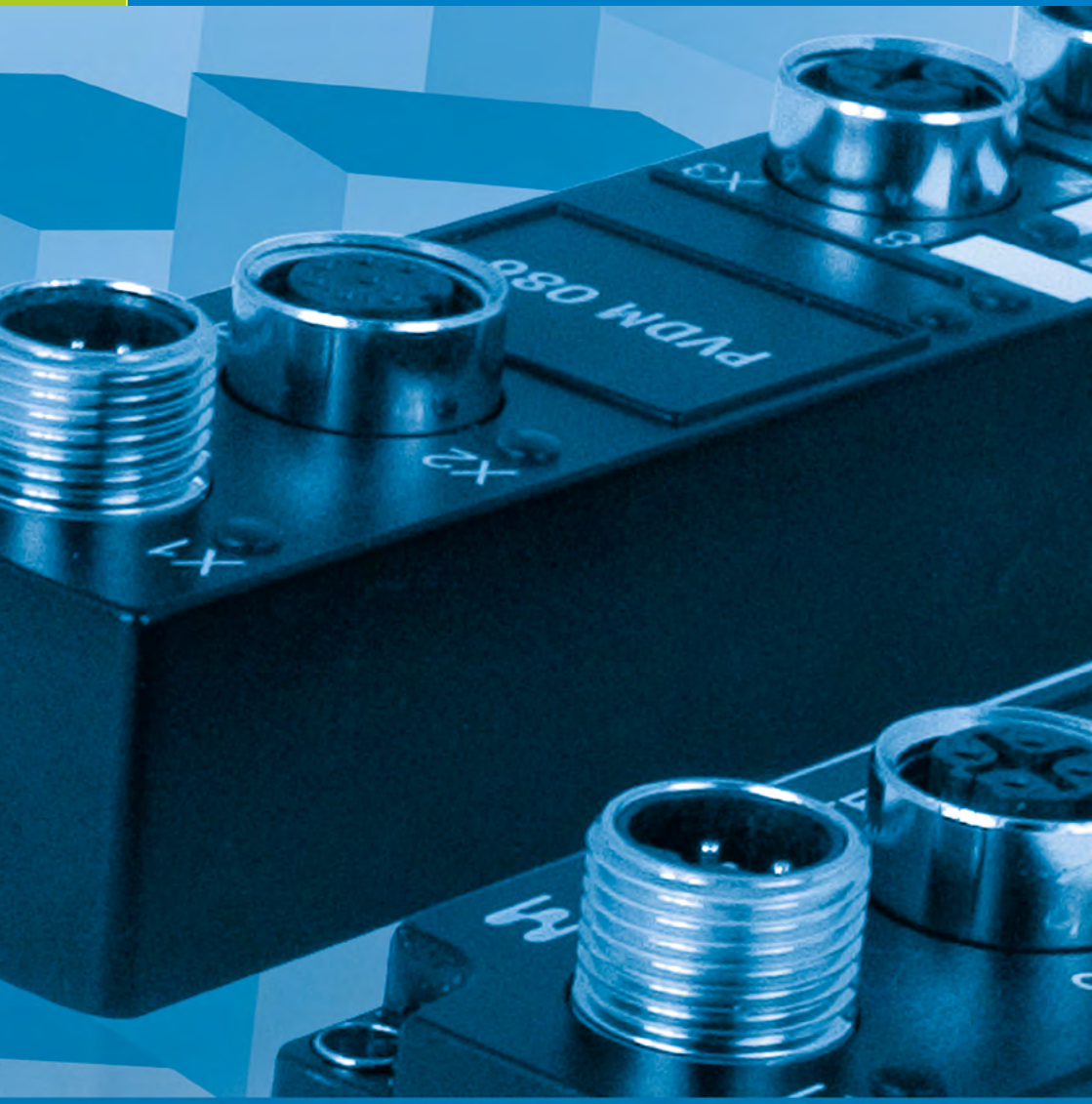
	Baud rate	500 kBit/s
	Max. cable length	80 m
	Terminating resistor	120 Ω internal

Article Number and Miscellaneous

	Article number	20-895-081
	Dimensions	95.5 x 73.5 x 16 mm (W x H x D)
	Standard	designed according to UL
	Approvals	CE, TÜV Austria EG type-tested

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	-10 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with 61000-6-7 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2 (industrial area) (increased requirements in accordance with IEC 62061)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP20



P-DIAS I/O

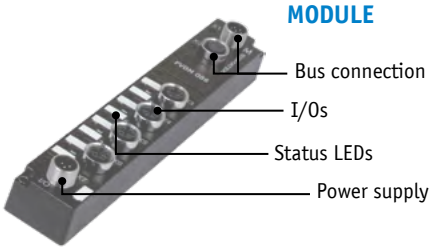
O System (IP67)

System P-DIAS

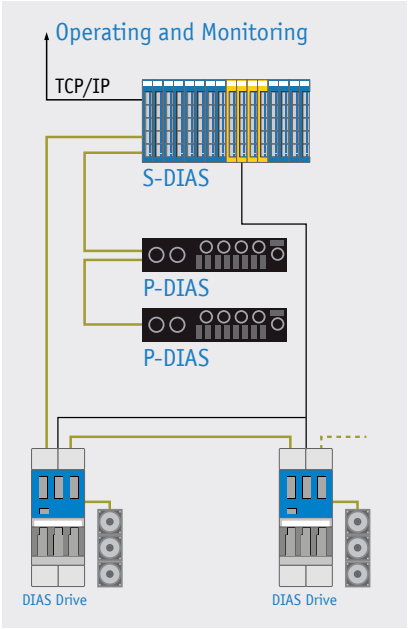
The P-DIAS family completes the DIAS control system in the IP67 protected area. It is ideal for modular, decentralized control system configurations and can be combined with other SIGMATEK component series as desired. In the field, data can be collected or distributed.

Application flexibility is an important feature of the P-DIAS series. The digital modules are equipped with 8 channels that can be used as in- or outputs.

The peripheral components are connected with M12 connector plugs, which are optimized for use under harsh operating conditions.

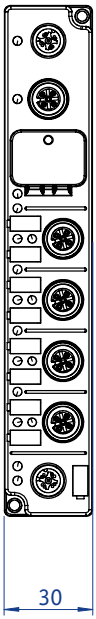


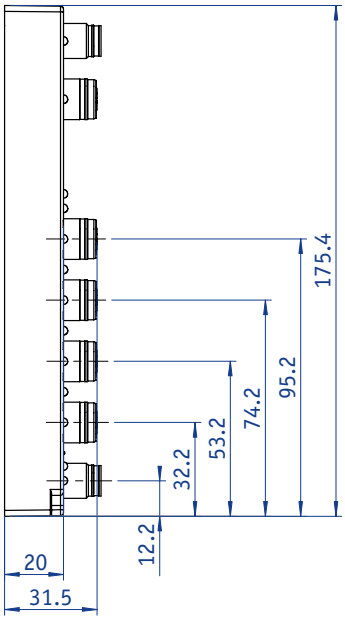
Possible Configuration

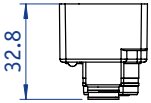


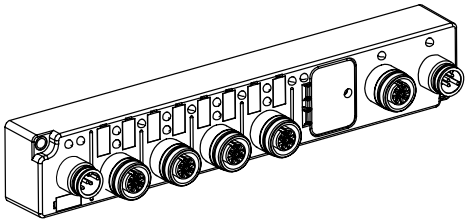
For decentralized control system configurations, the P-DIAS components are used in areas where IP67 protection is needed.

Mechanical Dimensions









P-DIAS Modules

Digital I/Os

Analog I/Os

Protected VARAN Digital Mixed Module
PVDM 086

The PVDM 086 Protected VARAN Digital Mixed Module has eight +24 V/2 A digital outputs (positive switching) that are back-readable and therefore can be used as inputs. In addition, the outputs are short-circuit protected. There are also diverse diagnostic functions available in this module:

- The status of the outputs is back readable.
- Each I/O socket is monitored for current surges in the sensor supply.

The status is shown with red LEDs and can be read back. Input filters are available to suppress noise signals occurring in the signal lines.

Interfaces

Interfaces	1x VARAN In (M12) 1x VARAN Out (M12)

Digital Outputs

Number of outputs	8
Short-circuit proof	yes
Back readable	yes
Maximum continuous current load allowed per channel	2 A
Maximum total current per group of 4 (I/O 1-4 or 5-8)	2 A
Maximum total current (all 8-channels)	4 A (100 % of on-time)
Voltage drop over power supply (output active)	≤ 1 V
Residual current (output inactive)	≤ 1 mA
Turn-on delay	< 200 µs
Turn-off delay	< 200 µs
Status display	yellow LEDs

Digital Inputs (back readable output)

	Number of inputs	8	
	Input voltage	typically +24 V	maximum +30 V
	Sensor supply current limit	maximum 100 mA per I/O socket	
	Signal level	low: < 4.5 V	high: > +14 V
	Switching threshold	typically +11 V	
	Input current	typically 5 mA at +24 V	
	Input delay	typically 5 ms	
	Status display	yellow LEDs	

Electrical Requirements

	Bus supply voltage	18-30 V DC	
	I/O supply	18-30 V DC	
	Current consumption of the bus supply	typically 85 mA	maximum 100 mA
	Current consumption of I/O supply	depends on the load of the digital outputs and the current capacity on the sensor supply: maximum 4 A	

Article Number and Miscellaneous

	Article number	14-108-086
	Dimensions	30 x 175 x 32.8 mm (W x H x D)

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	EMC stability	in accordance with EN 61131-2	
	Shock resistance	EN 60068-2-27	150 m/s²
	Protection type	EN 60529	IP67

Protected VARAN Digital Mixed Module
PVDM 087

The protected VARAN Digital Mixed Module PVDM 087 has four digital outputs +24 V/2 A (positive switching and four digital inputs. In- and outputs are galvanically separated from the VARAN bus. Inputs and outputs have a separate supply. The outputs are also back-readable. There are also diverse diagnostic functions available in this module. Input filters are available to suppress noise signals occurring in the signal lines.

Next to the I/O connectors, LEDs show the signal status as well as the error status. The VARAN Out port allows the construction of the VARAN bus in a line structure. The component has IP67 protections.

Interfaces

Interfaces	1x VARAN In (M12) (maximum length: 100 m) 1x VARAN Out (M12) (maximum length: 100 m)

Digital Outputs

Number of outputs	4
Short-circuit proof	yes
Galvanic isolation	yes (60 V)
Maximum continuous current load/ channel	4 A (50 % of on time)
Maximum total current	4 A (50 % of on time) 2 A (100 % of on time)
Voltage drop over power supply (output current 4 A)	≤ 1 V
Residual current (inactive)	≤ 0.1 mA
Turn-on delay	< 300 µs
Turn-off delay	< 300 µs
Status display	yellow LEDs

Digital Inputs

Number of inputs	4	
Galvanic isolation	yes (60 V)	
Input voltage	typically +24 V	maximum +30 V
Maximum sensor supply current	80 mA per input	
Signal level	low: < +5 V	high: > +15 V
Switching threshold	typically +11 V	
Input current	typically 6 mA at +24 V	
Maximum allowable residual current	0.1 mA	
Input delay	typically 6 ms	
Status display	yellow LEDs	

Electrical Requirements

Bus supply voltage	18-30 V DC	
I/O supply	18-30 V DC	
Current consumption of the bus supply	typically 85 mA	maximum 100 mA
Current consumption of I/O supply	depends on the load of the digital outputs and the current capacity on the sensor supply: maximum 4 A	

Article Number and Miscellaneous

Article number	14-108-087
Software macro	PVDM0850_IM
Dimensions	30 x 175 x 32.8 mm (W x H x D)
Standard	UL 508 (E247993)

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Mounting position	any	
EMC stability	in accordance with EN 61131-2	
Shock resistance	EN 60068-2-27	150 m/s²
Protection type	EN 60529	IP67

Protected VARAN DMS Module
PVAI 011

A bridge circuit with a resolution of 1.1 mV/V can be connected using 4-wire technology. The supply voltage for the bridge is 10 V. The minimum bridge resistance is 100 Ω.

Interfaces

	Interfaces	1x VARAN In (M12)

Input Specifications

	Number of channels	1 (4-wire connection)	
	Measurement range	1.1 mV/V	
	Measurement value	0-4000	
	Resolution	12-bit	
	Conversion time per channel	≤ 1 ms	
	Input filter	cutoff frequency 1 kHz (1 ms)	low pass class 3 system
	Excitation voltage	10 V/±2.5 %	
	Maximum voltage supply capacity	100 mA maximum, short-circuit proof	
	Min. Bridge resistance	100 Ω	
	Precision of analog channel measurement	±0.35 % of maximum measurement value	
	Repeating accuracy	1.1 mV/V ±0.3 %	
	Linearity error	1.1 mV/V ±0.35 %	

Electrical Requirements

	Bus supply voltage	18-30 V	
	Current consumption of the bus supply	typically 75 mA/+24 V	maximum 130 mA/24 V

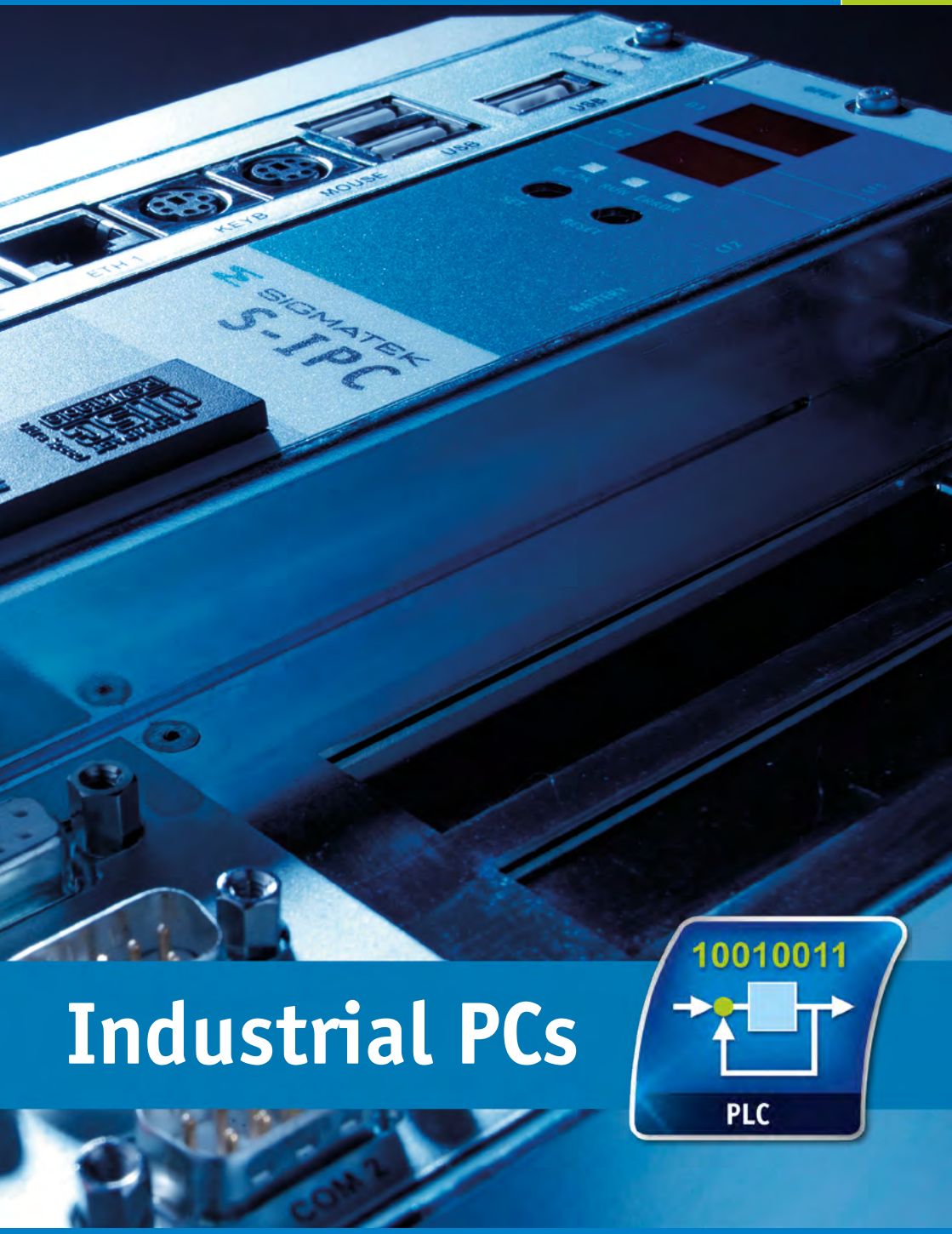
Article Number and Miscellaneous

	Article number	14-109-011
	Hardware version	1.x
	Standard	designed according to UL
	Dimensions	148.4 x 79.4 x 55 mm (W x H x D)

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
	Shock resistance	EN 60068-2-27	150 m/s²
	Protection type	EN 60529	IP65


S-DVI



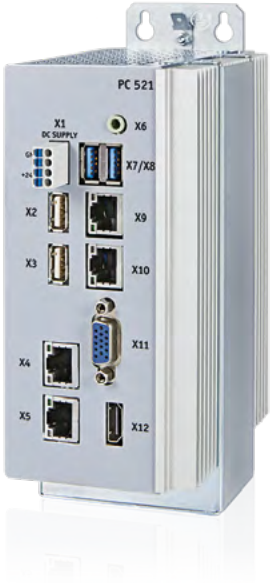
Industrial PCs

Industrial PCs

The SIGMATEK industrial PCs combine control and visualization tasks. The optimal processor is available for any application.

Numerous interface connections, ranging from USB and Ethernet over VARAN to CAN are available for communication with the control. An S-DVI connection provides a cost effective connection for terminals.

Low maintenance, extremely high reliability and long-term availability are strong arguments for choosing IPCs from SIGMATEK.


PC 521
X1
DC SUPPLY
X6
X7/X8
X2
X9
X3
X10
X11
X4
X5
X12

Industrial PCs

IPC

IPC Accessories

Control Cabinet PC
PC 444-W

The PC 444-W is a control cabinet PC with an Intel Celeron G3900 Skylake processor that is completely PC-compatible and operates with a standard PC BIOS.

Using the HMI-Link G2 Expansion, HMI-Link (G2) terminals can be connected to the PC 444-W. This allows USB and display signals to be transmitted up to 100 m.

Inclusive WIN 10 MUI.

Performance Data

Processor	Intel Celeron G3900
Hard drive	128-Gbyte Solid State Disk
Main memory (DDR-RAM)	4-Gbyte DDR4 RAM (SODIMM)
Graphics	Intel HD Graphics
Interfaces	2x Ethernet 10/100/1000 Mbit 3x USB 2.0 2x USB 3.0 1x RS232 1x Audio (Line In, Line Out) 1x PS/2 Mouse 1x PS/2 Keyboard 1x DVI interface 1x Displayport 1x Local OUT (HMI-Link G2)
Real-time clock	yes

Electrical Requirements

	Supply voltage	+18-30 V DC (Class 2 or SELV and Limited Energy) (connection: 4-pin Phoenix)
	IDLE consumption without HMI-Link	24 W
	IDLE consumption with HMI-Link	26 W
	Max. consumption with HMI-Link	43 W
	Start current	2.5 A peak – 15 ms

Mechanical Dimensions

	PC 444-W	80 x 223.7 x 193 mm (W x H x D)

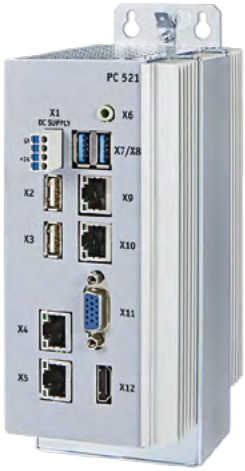
Article Number and Miscellaneous

	Article number	01-310-444-W
	Standard	designed according to UL

Environmental Conditions

	Storage temperature	-20 ... +60 °C	
	Environmental temperature	0 ... +50 °C	
	Humidity	10-95 %, non-condensing	
	EMC tolerance	EN 61000-6-2 (industrial area): EMC resistance EN 61000-6-4: noise emission	
	Vibration tolerance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
	Shock resistance	EN 60068-2-27	15 g (150 m/s²), duration 11 ms, 18 Shocks
	Protection Type	EN 60529: protected through the housing	IP20

Data Recording PC
PC 521



The PC 521 is a data recording PC with an Intel Celeron J1900 processor that is PC-compatible and operates with a standard PC BIOS.

For better heat dissipation, a ventilator can be mounted onto the PC 521.

Performance Data

Processor	INTEL Celeron J1900
Hard drive	128-Gbyte Solid State Disk
Main memory (DDR-RAM)	4-Gbyte DDR3 RAM (SODIMM)
Graphics	Intel Graphics DX 11
Interfaces	4x Ethernet 10/100/1000 Mbit 2x USB 2.0 2x USB 3.0 1x VGA 1x Audio (Line Out) 1x HDMI
Real-time clock	yes (battery buffered)

Electrical Requirements

	Supply voltage	typically +24 V DC (SELV/PELV)	
		minimum +18 V DC	maximum +30 V DC
	Supply voltage (UL)	+18-30 V DC (NEC Class 2 or LVLC)	
	Current consumption Power supply +24 V	typically 1 A (without externally connected devices)	maximum 1.6 A (with external devices connected)
	Inrush current with 24 V/10 A fixed voltage supply	maximum 12.5 A (for 108 µs, load-dependent)	
	Inrush current without current-limiting supply	maximum 30 A (for 23.5 µs, load-dependent)	
	USB current load	maximum 0.5 A	

Mechanical Dimensions

	PC 521 incl. mount	72.2 x 195.0 x 112.6 mm (W x H x D)

Article Number and Miscellaneous

	Article number	20-018-221
	Operating system	Windows 10 IoT
	Standard	UL (247993)
	Approvals	CE, $_{c}$UL$_{us}$

Environmental Conditions

	Storage temperature	-20 ... +60 °C	
	Environmental temperature (without fan)	0 ... +50 °C	
	Environmental temperature (with fan)	0 ... +60 °C	
	Humidity	10-95 %, non-condensing	
	Operating conditions	pollution degree 2 indoor use altitude up to 2000 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
	Shock resistance	EN 60068-2-27	15 g (150 m/s²)
	Protection type	EN 60529: protected through the housing	IP20

Control Panel VARAN
ETV 1591

mit 15" XGA TFT-Farbdisplay

The control panel is an intelligent terminal for programming and visualization of automated processes. A touch screen serves as the input medium for process data and parameters. The output is shown on a 15" XGA TFT color display.
To safely back up the data before the panel is shut down, an integrated UPS is used to buffer the +24 V power supply.
With the integrated VARAN manager, the ETV 1591 offers the possibility to construct a high-performance VARAN system to operate for example, decentralized I/O modules, drive systems or communication modules. Operating system Windows 7 embedded.

Performance Data

Processor	1.4 GHz Intel® Celeron B827E
Intel® Smart Cache	1.5 Mbytes
BIOS	AMI
SDRAM 50-DIMM 20-pin	2-Gbyte DDR3
SRAM	512-Kbyte
Internal storage device	100-Gbyte SATA HDD
Interfaces	5x USB 2.0, Type A (High Speed 480 Mbit/s) 2x Gbit Ethernet 1x VARAN Out
Internal interface connections and devices	1x TFT LCD color display 1x touch 1x CF card socket 1x interface for connectable UPS
Display Resolution	15" TFT color display 1024 x 768 pixels
Control panel	5-wire touch screen (analog resistive)

Data buffer	yes	
Signal generator	yes	
Status LEDs	no	
Real-time clock	yes (battery buffered)	
Cooling	active (fan)	

Elecrical Requirements

Supply voltage	typically +24 V DC	
	minimum +20 V DC	maximum +30 V DC
Supply voltage (UL)	20-30 V DC (Class 2)	
Current consumption Power supply +24 V	1.25 A (without externally connected devices/100 % CPU load) (WIN7 embedded)/75 % brightness display)	
Inrush current	maximum 28 A for 170 µs	

Terminal

Dimensions with battery Dimensions without battery	358 x 313 x 109 mm (W x H x D) 358 x 313 x 81 mm (W x H x D)	
Material	plastic housing: ASA	
Weight	5.3 kg	

Environmental Conditions

Storage temperature	-10 ... +85 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
EMC stability	EN 61000-6-2: EMC resistance EN 61000-6-4: noise emission	
Vibration tolerance	EN 60068-2-27	150 m/s²
Shock resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
Protection type	EN 60529 protected through the housing	front: IP54 rear panel: IP20

Display

Type	15″ TFT color display
Resolution	1024 x 768 pixels
Color depth	18-bit (262 144 colors)
Pixel grid	0.297 mm x 0.297 mm
Active surface	304.128 mm x 228.096 mm
Backlighting	LED
Contrast	typically 700: 1
Brightness	typically 400 cd/m²
Angle CR > 10 from	left and right 80°, above and below 70°

Control Unit

Touch panel	analog resistive film-glass touch panel
Resolution	12-bit Controller (USB)
Connection technology	5-wire

Article Number and Miscellaneous

Article number	12-230-1591
Operating system	Windows Embedded Standard 7
Project backup	100-Gbyte SATA HDD
Hardware version	2.x
Standard	UL 508 (E247993)

Notes

Uninterruptible Current Supply
USV 011

The USV 011 uninterruptible current supply is used to buffer the +24 V supply voltage of an industrial PC.

Normally, the +24 V supply is switched to the +24 V output and loads the internal battery. In the event of a power failure, the internal battery assumes the current from the +24 V output.

A settable USV-time enables a flexible buffer time that is used as a controlled shutdown of the IPC.

Performance Data

Internal power storage (battery)	2x +12 V/1.2 Ah maintenance-free lead gel battery
USV-time	configurable through software and DIP switches 4 to 692 seconds
Charging circuit	constant current/voltage current: 270 to 350 mA voltage: temperature controlled
Interfaces	1x RS232 (2x connections) 2x +24 V (input & output)
Status LEDs	3x battery status 3x USV status

Electrical Requirements

Supply voltage (+24 V input)	typically +24 V DC +18 ... +30 V DC
Current consumption (+24 V input)	corresponds to the load on the +24 V output internal current consumption: maximal 500 mA
Supply voltage (+24 V output)	typically +24 V DC +18 ... +30 V DC
Current load (+24 V output)	maximum 3.0 A

Article Number and Miscellaneous

Article number	with SIGMATEK foil: 01-470-011 without foil 01-470-011-0	
Hardware version	1.x	
Weight	typically 2.2 kg (with 2 batteries)	

Environmental Conditions

Storage temperature	-20 ... +60 °C	
Environmental temperature	0 ... +40 °C At low temperatures, the available capacity of the battery sinks and the charging process takes significantly longer. At high temperatures, the self-discharge increases and the battery can be damaged through fluid loss. self discharge at 50 °C: 0.5 % (capacity per day) self discharge at 60 °C: 1.0 % (capacity per day)	
Humidity	0-95 %, non-condensing	
EMC stability	in accordance with EN 61000-6-2 (industrial area)	
Shock resistance	EN 60068-2-27	150 m/s²
Protection type	EN 60529	IP20

HMI-Link Expansion

Using the HMI-Link Expansion, HMI-Link terminals can be connected to the PC32X. This allows USB and display signals to be transmitted up to 100 m.

With the quick installation of the PC insert card, the PC32x can be easily equipped with an HMI-Link interface.

Performance Data

Interfaces	1x HMI-Link (maximum length: 100 m) 1x USB 2.0 (Type B) 1x Display Port	

Electrical Requirements

Supply voltage	+5 V DC (from PC32x)	
Current consumption	maximum 1.25 A	

Environmental Conditions

Storage temperature	-20 ... +60 °C	
Environmental temperature	0-45 °C	
Humidity	10-95 %, non-condensing	
EMC tolerance	EN 61000-6-2 (industrial area): EMC resistance EN 61000-6-4 noise emission(only when installed)	
Vibration tolerance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
Shock resistance	EN 60068-2-27	15 g (150 m/s²), duration 11 ms, 18 shocks

Article Number and Miscellaneous

	Article number	01-311-012
	Hardware version	1.x

HMI-Link G2 Device
PC 301-E8

Using the HMI-Link G2 Device, HMI-Link (G2) terminals can be connected to the PC 3XX. USB and display signals can therewith be transmitted up to 100 m.

Performance Data

	Interfaces	1x HMI Local OUT (HMI-Link G2) 1x USB 2.0 (Type B) 1x display port 1x +24 V

Electrical Requirements

	Supply voltage	18-30 V DC
	Current consumption at 24 V	maximum 170 mA

Article Number and Miscellaneous

	Article number	01-310-301-E8
	Mechanical dimensions	25.1 x 210.1 x 83 mm (W x H x D)

Environmental Conditions

	Storage temperature	-20 ... +60 °C	
	Environmental temperature	0 ... +50 °C	
	Humidity	10-95 %, non-condensing	
	EMC tolerance	EN 61000-6-2 (industrial area): EMC resistance EN 61000-6-4: noise emission	
	Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
	Shock resistance	EN 60068-2-27	15 g (150 m/s²), duration 11 ms, 18 shocks

HMI-Link G2 Device
PC 301-E12

Using HMI-Link G2 Device allows HMI-Link G2 display units to be connected with a SIGMATEK IPC. This allows the transmission of USB and display signals up to 100 m.

Performance Data

	Interfaces	1x HMI Local OUT (HMI-Link G2) 1x USB 2.0 (Type B) IN 1x DisplayPort IN

Electrical Requirements

	Supply voltage	typically +24 V DC ±20 % (SELV/PELV)
	Supply voltage (UL)	+24 V DC ±20 % (NEC Class 2 or LVLC)
	Current consumption at 24 V DC	maximum 170 mA

Article Number and Miscellaneous

	Article number	01-310-301-E12
	Approvals	CE, designed according to UL
	Mechanical dimensions	25 x 204.5 x 83 mm (W x H x D)
	Material	housing: Aluminum anodized Natural C0
	Weight	0.20 kg

Environmental Conditions

	Storage temperature	-20 ... +60°C	
	Environmental temperature	0 ... +50°C	
	Humidity	10-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	2-9 Hz amplitude 3.5 mm 9-200 Hz 1 g (10 m/s²)
	Shock resistance	EN 60068-2-27	15 g (150 m/s²)
	Protection type	EN 60529	IP20

PCI Insert Module
PCV 521

The PCV 521 PCI insert module can be used in any standard PC and serves as an interface between the PC and the VARAN bus. With the PVC 521, VARAN modules can be controlled by the PC directly.

Performance Data

PCI-Bus	32-bit PCI bus card/33 MHz Vendor ID: 5112 Device ID: 0C00	
VARAN bus	2x VARAN Out (Manager)	
Status display	green: link yellow: active	

Electrical Requirements

Supply voltage	+5 V DC (from PCI bus)	
Current consumption on the PCI bus (+5 V)	typically 1 mA	maximum 5 mA
Supply voltage	+3.3 V DC (from PCI bus)	
Current consumption on the PCI bus (+3.3 V)	typically 400 mA	maximum 450 mA

Article Number and Miscellaneous

Article number	01-320-521	
Hardware version	1.x	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
EMC stability	EN 61000-6-1	
Shock resistance	EN 60068-2-27	150 m/s²

PCI Insert Module
PCV 522

The insertable PVC 522 PCI module can be used in any standard PC. The module provides a VARAN Manager and is used as an interface between the PC and VARAN bus. With the PCV 522, VARAN modules can be controlled directly from the PC.

In addition, the PCV 522 has a battery-buffered SRAM as well as a status LED.

Performance Data

PCI bus	32-Bit PCI bus card/33 MHz Vendor ID: 5112 Device ID: 2200	
VARAN bus	2x VARAN Out (Manager)	
Status display	green: Run	
Internal remnant data memory	1024-kbyte SRAM (battery buffered)	

Electrical Requirements

Supply voltage	+5 V DC (from PCI bus)	
Current consumption on the PCI bus (+5 V power supply)	typically 25 mA	maximum 30 mA
Supply voltage	+3.3 V DC (from PCI bus)	
Current consumption on the PCI bus (+3.3 V supply)	typically 250 mA	maximum 300 mA

Article Number and Miscellaneous

Article number	01-320-522	
Hardware version	1.x	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP20

PCI Insert Module
PCV 531

The PCI insert module, PVC 531 with integrated VEB 031, can be used in any standard PC. A VARAN Manager is available on the PC and serves as an interface between the PC and VARAN bus.

With the PVC 531, VARAN modules can be controlled by the PC directly.

Performance Data

PCI bus	32-Bit PCI bus card/33 MHz Vendor ID: 5112 Device ID: 0C00	
VARAN bus	2x VARAN Out (Manager)	
Status display	green: Link yellow: Active	

Electrical Requirements

Supply voltage	+3.3 V DC (from PCI bus)	
Current consumption on the PCI bus (+3.3 V supply)	typically 400 mA	maximum 450 mA

Article Number and Miscellaneous

Article number	01-320-531	
Hardware version	1.x	

Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
EMC noise generation	in accordance with EN 61000-6-1	
Shock resistance	EN 60068-2-27	150 m/s²

Interface Card
PCD 101

with 1 electrical DIAS bus (14-pins)

The PCD 101 interface card can be used in every standard PC.

It electrically connects an interface to the DIAS bus.

DIAS modules can therefore be controlled directly from the PC and a DIAS processor module is unnecessary.

Performance Data

AT bus	16-bit AT bus card	
Interfaces	1x DIAS bus (14-pins)	
I/O range	16 bytes (16#200-16#3F0)	
Interrupt	1 IRQ (5, 7, 10, 11, 12 or 15)	
Status LEDs	yes	

Electrical Requirements

Supply voltage	+5 V DC (from AT bus)	
Current consumption of voltage supply	typically 100 mA	maximum 2.5 A (load on the DIAS bus)
Output voltage (DIAS bus supply)	minimum +4.95 V *)	maximum +5.35 V *)
Total current of connected DIAS modules	maximum 2 A *)	

*) depending on the internal power supply of the PC used. For the supply voltage on the DIAS bus, it is important to ensure that the supply voltage is in the specified range. Additionally, the maximum current capacity of the internal PC supply must be observed!

Article Number and Miscellaneous

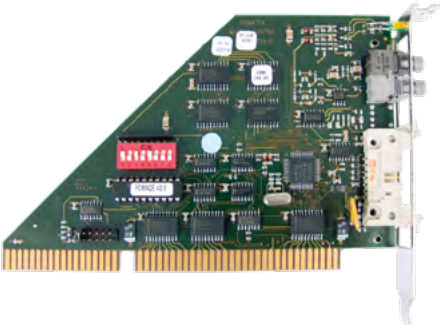
Article number	01-320-101
Software macro	SIGMATEK DLL
Hardware version	2.x

Environmental Conditions

Storage temperature	-20 ... +85 °C
Environmental temperature	0 ... +60 °C
Humidity	0-95 %, non-condensing
EMC stability	in accordance with EN 61000-6-2 (industrial area) Can only be guaranteed when the PC used also fulfills this norm!

Interface Card
PCD 111

with 1 electrical DIAS bus (14-pin)
1 HP fiber optic DIAS bus



The PCD 111 interface card can be used in every standard PC.

It connects an interface to the electrical DIAS bus, as well as a HP fiber optic connection.

DIAS modules can therefore be controlled directly from the PC and a DIAS processor module is unnecessary.

Performance Data

AT bus	16-bit AT bus card
Interfaces	1x DIAS bus (14-pins) 1x HP fiber optic
I/O range	16 bytes (16#200-16#3F0)
Interrupt	1 IRQ (5, 7, 10, 11, 12 or 15)
Status LEDs	yes

Electrical Requirements

Supply voltage	+5 V DC (from AT bus)	
Current consumption of voltage supply	typically 100 mA	maximum 2.5 A (load on the DIAS bus)
Output voltage (DIAS bus supply)	minimum +4.95 V *)	maximum +5.35 V *)
Total current of connected DIAS modules	maximum 2 A *)	

*) depending on the internal power supply of the PC used. For the supply voltage on the DIAS bus, it is important to ensure that the supply voltage is in the specified range. Additionally, the maximum current capacity of the internal PC supply must be observed!

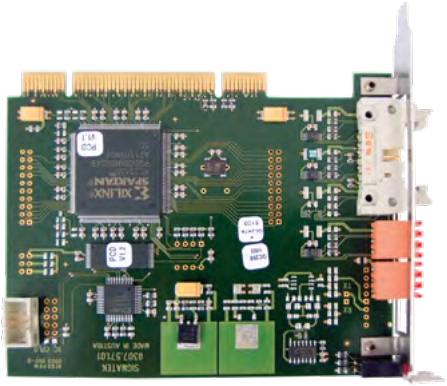
Article Number and Miscellaneous

Article number	01-320-111
Software macro	SIGMATEK DLL
Hardware version	2.x

Environmental Conditions

Storage temperature	-20 ... +85 °C
Environmental temperature	0 ... +60 °C
Humidity	0-95 %, non-condensing
EMC stability	in accordance with EN 61000-6-2 (industrial area) Can only be guaranteed when the PC used also fulfills this norm!

Interface Card
PCD 403



with 3 electrical DIAS bus
(2x 6-pins and 1x 14-pins)

The PCD 403 interface card can be used with every standard PC.

It electrically connects an interface to the DIAS bus.

DIAS modules can therefore be selected directly from the PC and a DIAS processor module is not required.

Performance Data

PCI bus	32-bit PCI insert module Vendor ID: 5112 Device ID: 0100	
DIAS bus	electrical: 2x socket 6-pin (Weidmüller S2L 3.5/6/90G) 1x blade terminal 14-pin (DIN 41651)	
Status LEDs	yes	

Electrical Requirements

Supply voltage	+3.3 V DC (from PCI bus)	
Current consumption of voltage supply	typically 100 mA	maximum 150 mA
Supply voltage	+5 V DC (from PCI bus)	
Current consumption of voltage supply	typically 200 mA	maximum 800 mA (with 500 mA load on the DIAS bus)
Output voltage (DIAS bus supply)	minimum +4.95 V *)	maximum +5.35 V *)
Total current of connected DIAS modules	maximum 500 mA *)	

*) depending on the internal power supply of the PC used. For the supply voltage on the DIAS bus, it is important to ensure that the supply voltage is in the specified range. Additionally, the maximum current capacity of the internal PC supply must be observed!

Article Number and Miscellaneous

Article number	01-320-403
Hardware version	2.x

Environmental Conditions

Storage temperature	-20 ... +85 °C
Environmental temperature	0 ... +60 °C
Humidity	0-95 %, non-condensing
EMC stability	in accordance with EN 61000-6-2 (industrial area) can only be guaranteed when the PC used also fulfills this norm!

Interface Card
PCD 412

with 1 optical DIAS bus (HP fiber optic)
2 electrical DIAS bus (6-pin and 14-pin)

The PCD 412 interface card can be used in every standard PC.

It connects an interface to the electrical DIAS bus as well as an HP fiber optic connection.

DIAS modules can therefore be controlled directly from the PC and a DIAS processor module is unnecessary.

Performance Data

PCI bus	32-bit PCI insert module Vendor ID: 5112 Device ID: 0100	
DIAS bus	optisch: 1x HP fiber optic electrical: 1x socket 6-pin (Weidmüller S2L 3.5/6/90G) 1x multipoint connector 14-pins (DIN 41651)	
Status LEDs	yes	

Electrical Requirements

Supply voltage	+3.3 V DC (from PCI bus)	
Current consumption of voltage supply	typically 100 mA	maximum 150 mA
Supply voltage	+5 V DC (from PCI bus)	
Current consumption of voltage supply	typically 200 mA	maximum 800 mA (with 500 mA load on the DIAS bus)
Output voltage (DIAS bus supply)	minimum +4.95 V *)	maximum +5.35 V *)
Total current of connected DIAS modules	maximum 500 mA *)	

*) depending on the internal power supply of the PC used. For the supply voltage on the DIAS bus, it is important to ensure that the supply voltage is in the specified range. Additionally, the maximum current capacity of the internal PC supply must be observed!

Article Number and Miscellaneous

Article number	01-320-412
Hardware version	2.x

Environmental Conditions

Storage temperature	-20 ... +85 °C
Environmental temperature	0 ... +60 °C
Humidity	0-95 %, non-condensing
EMC stability	in accordance with EN 61000-6-2 (industrial area) Can only be guaranteed when the PC used also fulfills this norm!


New Programm
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HMIs

HMIs

With the HMIs from SIGMATEK, our machines cut a good figure in any situation. Our human-machine interfaces are compactly designed and fanless. Your have the choice between panels with a processor and remote operating units without a processor (HMI-Link up to 100 M).

Regardless of whether single, dual or multi-touch screens – we put the main focus on all our human-machine interfaces to ensure that you can work intuitively, quickly and safely.

Our selection of HMIs include built-in units, panels for the carrier arm and mobile Panels for use directly on-site. All HMIs equipped with a processor are fit for the Smart Factory (OPC-UA communication).

From the HMIs with resistive touch screens, ranging is sizes from 3.5 - 12.1 inches, you can choose between classic operating panels and all-in-one control panels of the ETV series; which with simple applications can also assume control tasks.


BIGMATEK

HMIs

Touch Operating Panel
ETT 732

with 7" WVGA TFT color display

The ETT 732 is an intelligent terminal for programming and visualization of automated processes. A resistive touch screen serves as the input medium for process data and parameters. The output is shown on a 7" WVGA TFT color display with an LED backlight. With the LSE mask editor, graphics can be created on the PC, then stored and displayed on the terminal. The available interfaces can be used to exchange process data or configure the build-in terminal. In the internal Flash memory, the operating system, application and application data are stored.

Performance Data

Processor	EDGE2 Technology
Processor cores	1
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	256-Mbyte
Internal remnant data memory	256-kbyte SRAM (battery buffered)
Internal storage device	512-Mbyte NAND Flash
Internal I/O	no
Interfaces	1x USB 2.0 (Type A) 1x Ethernet 10/100 (RJ45) 2x CAN bus (6-pin Weidmüller) 1x RS232 (9-pin D-Sub)
Internal interface connections and devices	1x TFT LCD color display 1x touch
Display Resolution	7" TFT color display 800 x 480 pixels

Control panel	touch screen (projective capacitive)	
Signal generator	no	
Status LEDs	no	
Real-time clock	yes	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC (+18-30 V DC)	
Current consumption of power supply at +24 V	typically 200 mA (without externally connected devices)	maximum 340 mA (with externally connected devices)
Current consumption of stand-by voltage at +24 V	typically 110 mA (without externally connected devices)	maximum 180 mA (with externally connected devices)
Inrush current	600 mA (1 ms)	
UL standard	for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy.	

Terminal

Dimensions	183.6 x 138.8 x 41.9 mm (W x H x D)	
Material	front plate: 4 mm aluminum	
Weight	circa 600 g	

Environmental Conditions

Storage temperature	-10 ... +80 °C	
Environmental temperature	0 ... +60 °C	
Humidity	10-95 %, non-condensing	
EMC stability	in accordance with product standard EN 60730-1	
Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
Shock resistance	EN 60068-2-27	15 g (150 m/s²) duration 11 ms, 18 Shocks
Protection type	EN 60529 protection through housing	front: IP54 (no UL-rating) cover: IP20 (no UL-rating)

7″ VGA Display incl. Touch

Type	7″ TFT LCD color display
Resolution	WVGA 800 x 480 pixels
Color depth	16-bit RGB (65K colors)
LCD mode	normal white
LCD polarizer	transmissive
Pixel size	0.1926 mm x 0.1790 mm
Number of pixels	800*3 (RGB) x 480
Active surface	154.08 mm x 85.92 mm
Backlighting	LED
Contrast	500:1
Brightness	typically 280 cd/m²
Visible field	left and right 70°, below 70°, above 50°
Touch panel	projective capacitive touch
Sensor type	glass-glass
Surface	1.0 mm hardened glass front with black frame
Surface hardness	7H pencil hardness according to JIS K5400
Transparency	≥ 85 %

Article Number and Miscellaneous

Article number	01-230-732
Standard	UL 61010-2-201
Approvals	UL, cUL, CE, UKCA

Notes

Carrier Arm Touch Terminal
ETT 7321

The ETT 7321 is used to visualize automated process. Process diagnosis, operating and monitoring automated functions are simplified using this terminal.
A projective capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 7" WVGA TFT color display.
With the LASAL visualization tool, graphics can be created on the PC, then stored and displayed on the terminal.
The available interfaces can be used to exchange process data or configure the terminal. In the internal Flash memory, the operating system, application and application data are stored.

Performance Data

Processor	EDGE2 Technology
Processor cores	1
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	256 Mbytes
Internal remnant data memory	256-kByte SRAM (battery buffered)
Internal storage device	512 Mbyte NAND-Flash
Internal I/O	no
Interfaces	1x USB 2.0 (Type A) 1x M12 connector supply, Ethernet and CAN
Internal interface connections and devices	1x TFT LCD color display 1x touch screen
Display Resolution	7" TFT LCD color display 800 x 480 Pixels

Control panel	touch screen (projective capacitive)	
Signal generator	no	
Status LEDs	no	
Real-time clock	yes	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	+24 V DC ±20 % (SELV/PELV))	
Protection class	III	
Current consumption of (+24 V) power supply	typically 270 mA	maximum 400 mA
Inrush current	700 mA (2 ms)	

Control Unit

Touch panel	projective capacitive touch panel	

Environmental Conditions

Storage temperature	-10 ... +80 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	5-150 Hz: amplitude 3.5 mm Transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²),
Protection type	EN 60529	front: IP65 cover: IP54 (only with all protective caps fitted)

7″ VGA Display incl. Touch

Type	7″ TFT LCD color display
Resolution	800 x 480 Pixels
Color depth	16-bit RGB
LCD mode	normally white
LCD Polarizer	transmissive
Pixel size	0.1926 x 0.1790 mm
Active range	154.08 x 85.92 mm
Backlighting	LED
Contrast ratio	500:1
Brightness	typically 280 cd/m²
Angle CR ≥ 10	left, right, below 70°, above 50°
Life span	by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness

Article Number and Miscellaneous

Article number	01-230-7321
Operating system	Salamander
Approvals	CE, UKCA

Notes

Touch Operating Panel
ETT 736

with 7" WVGA TFT color display

The ETT 736 is an intelligent panel for visualizing, operating and monitoring automated processes. Process diagnosis, operating and monitoring automated functions are simplified using this terminal.
An analog resistive touch screen serves as the input medium for process data and parameters. The output is shown on a 7" WVGA TFT color display.
With the LASAL visualization tool, graphics can be created on the PC, then stored and displayed on the terminal. In the internal Flash memory, the operating system, application and application data are stored.

Performance Data

Processor	EDGE2-Technology
Processor cores	2
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache
Internal program and data memory (RAM)	512-Mbyte DDR3
Internal remnant data memory	512-kbyte SRAM (battery buffered)
Internal storage device	512-Mbyte microSD
Internal I/O	yes
Interfaces	1x USB 2.0 (Type A) 1x USB-OTG (host/device), type Mini B 2x Ethernet 10/100 (RJ45) 1x CAN bus (6-pin Weidmüller) 8x dig. I/Os (8-pin Phoenix)
Internal interfaces	1x TFT-LCD color display 1x Touch
Display Resolution	7" TFT color display WVGA 800 x 480 pixels

Operating panel	4-wire touch screen (analog resistive)	
Signal generator	no	
Real-time clock	yes (battery buffered)	
Cooling	passive (fanless)	

Digital Inputs

Number	8	
Input voltage	typically +24 V	maximum +30 V
Signal level	low: < +4.5 V	high: > +14 V
Switching threshold	typically +11 V	
Input current	typically 5 mA at +24 V	
Input delay	typically 5 ms	

Digital Outputs

Number	8
Short-circuit proof	yes
Maximum permissible continuous load current/channel	0.5 A
Maximum total current (all 8 channels)	2 A (100 % of on time)
Voltage drop over power supply (output active)	≤ 1 V
Residual current output (off)	≤ 12 µA
Turn-on delay	< 400 µs
Turn-off delay	< 400 µs
Max. braking energy of inductive loads	1 channel 0.12 [Joules]

Electrical Requirements

Supply voltage	typically +24 V DC ±20 % (SELV/PELV) UL: Class 2 or LVLC	
Protection class	III	
Current consumption of (+24 V) power supply	typically 350 mA (without externally connected devices)	maximum 560 mA (with external devices connected)
Inrush current	maximum 2 A (for 10 µs)	

Display

Type	7″ TFT LCD color display
Resolution	WVGA 800 x 480 pixels
Color depth	16 Bit RGB (65K colors)
LCD mode	normal white
LCD Polarizer	transmissive
Pixel size	0.1926 x 0.1790 mm
Active range	154.08 x 85.92 mm
Backlighting	LED
Contrast ratio	typically 500:1
Brightness	typically 280 cd/m²
Angle CR ≥ 10	left and right 70°, below 70°, above 50°
Life span	by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness

Input

Input	resistive touch screen

Control Unit

Operating panel	Touch screen (analog resistive)
Maximum number of fingers	1
Operation with thin gloves	yes
SIGMATEK touch pen (passive)	yes
Handwriting recognition	no
Palm recognition	no
Spray water detection	yes
Moisture detection	no
Cleaning	See chapter: Cleaning and Disinfecting the Touch Screen

Environmental Conditions

	Storage temperature	-10 ... +85 °C	
	Environmental temperature	0 ... +45 °C	
	Humidity	10-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	according to EN 61000-6-2 (industrial area)	
	EMC noise generation	according to EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g (150 m/s²)
	Protection type	EN 60529 protected through the housing	front: IP65 cover: IP20

Article Number and Miscellaneous

	Article number	01-230-736
	Operating system	Salamander
	Standard	designed according to UL
	Approvals	CE

Touch Operating Panel
ETT 764

with 7" TFT color display

The ETT 764 is an intelligent panel for visualizing, operating and monitoring automated processes. Process diagnostics is therewith simplified.

A projective capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 7" TFT color display.

The available interfaces can be used to exchange process data or configure the multitouch terminal.

Performance Data

Processor	EDGE3 Technology
Processor cores	4
Internal program and data memory (RAM)	2-GByte (DDR4)
Internal remnant data memory	128-kByte FRAM
Internal storage device	8-GByte eMMC
Optional memory expansion	microSD
Graphic	integrated in EDGE processor
Interfaces	2x Ethernet (10/100/1000) 2x USB 2.0 Type A 1x USB 2.0 Type Mini-B OTG 1x microSD card holder (SD 3.0)
Internal interface connections and devices	no
Operating components	no

Signal generator	no	
Display Resolution	7“ TFT color display WSVGA 1024 x 600 pixels	
Operating field	Touch screen (multi-touch, projective capacitive)	
Status LEDs	yes (1x red/1x green)	
Real-time clock	yes (battery buffered)	
Cooling	passive	

Electrical Requirements

Supply voltage	+24 V DC ±20 % (SELV/PELV) UL: Class 2 of LVLC	
Protection class	III	
Current consumption of power supply at +24 V	typically 320 mA (with no external devices connected)	maximum 530 mA (with external devices connected)
Inrush current without currentlimiting supply	30 A for max. 20 µs	
Inrush current with 24 V/10 A fixed voltage supply	1 A for max. 30 ms	

Terminal

Dimensions	191 x 128 x 33 mm (W x H x D)	
Material	Housing: aluminium/steel chromated Color: black Front: glass 1.1 mm	
Weight	0.60 kg	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +60 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	according to EN 61000-6-3 (Household area) according to EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	5-150 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
Shock resistance	EN 60068-2-27	15 g (147.15 m/s2)
Protection type	EN 60529/NEMA 250 protection through housing	Front: IP65/Type4 Cover: IP20/Type1

Display

Type	7" TFT color display
Resolution	WSVGA 1024 x 600 pixels
Color depth	24-Bit RGB
LCD mode	normally black
LCD polarizer	transmissive
Pixel size	0.1506 x 0.1432 mm
Active range	154.08 mm x 85.92 mm
Backlighting	LED
Contrast	typically 800:1
Brightness	typically 400 cd/m²
Visible field	left, right, top, bottom typically 80°
Touch panel	projective capacitive touch panel
Life span	By compliance with the ambient conditions, the brightness of the display sinks after 20,000 operating hours to 50 % of the original brightness.

Article Number and Miscellaneous

Article number	01-230-764
Operating system	Gecko
Standard	designed according to UL
Approvals	CE, UKCA

Notes

Multi-touch Operating Panel
ETT 0833

with 8.4" SVGA TFT color display

The multi-touch operating panel is used for visualizing, operating and monitoring automated processes. A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on an 8.4" SVGA TFT color display.

The available interfaces can be used to exchange process data or configure the multi touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	EDGE2 Technology
Processor cores	2
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	512-Mbyte
Internal remnant data memory	512-kbyte SRAM (battery buffered)
Internal storage device	1-Gbyte microSD card
Internal I/O	yes
Interfaces	2x USB-Host 2.0, type A 1x USB-OTG (host/device), type Mini B 2x Ethernet 1x CAN bus (not galvanically separated)
Internal interface connections and devices	1x TFT-color display 1x USB (touch connection)
Display Resolution	8.4" TFT color display 800 x 600 pixels
Control panel	Touch screen (projective capacitive)
Logo backlighting	optional (RGB)

Real-time clock	yes (battery buffered)	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC (+18-30 V DC)	
Current consumption Power supply +24 V	typically 350 mA (without ext. connected devices)	maximum 560 mA (with externally connected devices)
Inrush current	maximum 2 A for 10 µs	
UL standard	for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy.	

Terminal

Dimensions	230.4 x 200.3 x 45.9 mm (W x H x D)	
Material	front plate: 4 mm glass on 1 mm aluminium frame	
Weight	typically 1.8 kg	

Environmental Conditions

Storage temperature	-10 ... +75 °C	
Environmental temperature	0 ... +55 °C	
Humidity	10-95 %, non-condensing	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	2-9 Hz: Amplitude 3,5 mm 9-200 Hz: 1 g (10 m/s²)
Shock resistance	EN 60068-2-27	15 g (150 m/s²) duration 11 ms, 18 shocks
Protection type	EN 60529 protected through the housing	front: IP65 cover: IP20

Display

Type	8.4" TFT color display
Resolution	SVGA 800 x 600 pixels
Color depth	24 Bit RGB
LCD mode	normally white
LCD polarizer	transmissive
Pixel size	0.213 x 0.213 mm
Active surface	170.40 x 127.80 mm
Backlighting	LED
Contrast	typically 450
Brightness	typically 330 cd/m²
Angle CR ≥ 10	left and right 65°, above 60° , below 55°
Lifespan	by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness

Control Unit

Touch panel	projective capacitive touch panel
Surface	4 mm front glass with black frame + SIGMATEK logo

Digital Outputs

Number	8
Short-circuit proof	yes
Maximum permitted continuous load current/channel	0.5 A
Maximum total current (all 8-channels)	2 A (100 % of on time)
Voltage drop over power supply (output active)	≤ 1 V
Residual current (off)	≤ 12 µA
Turn-on delay	< 400 µs
Turn-off delay	< 400 µs
Max. braking energy of inductive loads	1 channel 0.12 [Joules]

Digital Inputs

Number	8	
Input voltage	typically +24 V	maximum +30 V
Signal level	low: < +4.5 V	high: > +14 V
Switching threshold	typically +11 V	
Input current	typically 5 mA at + 24 V	
Input delay	typically 5 ms	

Article Number and Miscellaneous

Article number	01-230-0833
Operating system	Salamander
Standard	UL 61010-2-201
Approvals	UL, cUL, CE, UKCA

Multi-touch Operating Panel
ETT 1033

with 10.4" XGA TFT color display

The multi-touch operating panel is used for visualizing, operating and monitoring automated processes. A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on an 10.4" XGA TFT color display.

The available interfaces can be used to exchange process data or configure the multi touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	EDGE2 Technology
Processor cores	2
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	512-Mbyte
Internal remnant data memory	512-kbyte SRAM (battery buffered)
Internal storage device	512-Mbyte microSD card
Internal I/O	yes
Interfaces	2x USB-Host 2.0, type A 1x USB-OTG (host/device), type Mini B 2x Ethernet 1x CAN bus (not galvanically separated)
Internal interface connections and devices	1x TFT-color display 1x USB (touch connection)
Display Resolution	10.4" TFT color display 1024 x 768 pixels
Control panel	Touch screen (projective capacitive)
Logo backlighting	optional (RGB)

Real-time clock	yes (battery buffered)	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC (+18-30 V DC)	
Current consumption Power supply +24 V	typically 760 mA (without ext. connected devices)	maximum 920 mA (with ext. connected devices)
Inrush current	maximum 2 A for 10 µs	
UL standard	for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy.	

Terminal

Dimensions	279.2 x 233.4 x 48.9 mm (W x H x D)
Material	front plate: 4 mm glass on 1.5 mm aluminium frame
Weight	typically 2.7 kg

Environmental Conditions

Storage temperature	-10 ... +75 °C	
Environmental temperature	0 ... +55 °C	
Humidity	10-95 %, non-condensing	
Operating conditions	pollution degree 2 indoor use altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	2-9 Hz: Amplitude 3,5 mm 9-200 Hz: 1 g (10 m/s²)
Shock resistance	EN 60068-2-27	15 g (150 m/s²) duration 11 ms, 18 shocks
Protection type	EN 60529 protected through the housing	front: IP65 (no UL-rating) cover: IP20 (no UL-rating)

Display

Type	10.4" TFT color display
Resolution	XGA 1024 x 768 pixels
Color depth	24 Bit RGB
LCD mode	normally black
LCD polarizer	transmissive
Pixel size	0.0685 x 0.2055 mm
Active surface	210.40 x 157.80 mm
Backlighting	LED
Contrast	typically 1000
Brightness	typically 500 cd/m²
Angle CR ≥ 10	left, right 65°, above, below 88°
Lifespan	by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness

Control Unit

Touch panel	projective capacitive touch panel
Surface	4 mm front glass with black frame + SIGMATEK logo

Digital Outputs

Number	8
Short-circuit proof	yes
Maximum permitted continuous load current/channel	0.5 A
Maximum total current (all 8-channels)	2 A (100 % of on time)
Voltage drop over power supply (output active)	≤ 1 V
Residual current (off)	≤ 12 µA
Turn-on delay	< 400 µs
Turn-off delay	< 400 µs
Max. braking energy of inductive loads	1 channel 0.12 [Joules]

Digital Inputs

Number	8	
Input voltage	typically +24 V	maximum +30 V
Signal level	low: < +4.5 V	high: > +14 V
Switching threshold	typically +11 V	
Input current	typically 5 mA at + 24 V	
Input delay	typically 5 ms	

Article Number and Miscellaneous

Article number	01-230-1033
Operating system	Salamander
Standard	UL 61010-2-201
Approvals	UL, cUL, CE, UKCA

Build-in Touch Terminal
ETT 1034

The ETT 1034 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 10.1“ TFT color display.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	EDGE2-Technology
Processor cores	2
Internal cache	32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache
Internal program and data memory (RAM)	1-Gbyte DDR3
Internal remnant data memory	512 kByte SRAM (battery buffered)
Internal storage device	1-Gbyte microSD
Internal I/O	no
Interfaces	1x USB-Host 2.0, Typ A (1x back) 1x Online-USB (Device), Typ Mini-B 2x Ethernet
Internal interfaces	1x IPS color display 1x USB (touch connection) 1x Panel Interface Connector

Display Resolution	10.1“ TFT color display WXGA 1280 x 800 pixels	
Operating panel	Touch screen (projective capacitive)	
Signal generator	no	
Status LEDs	2 (red & green)	
Real-time clock	yes	
Cooling	passiv (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC	
	minimum +18 V DC	maximum +30 V DC
Current consumption of (+24 V) power supply	typically 600 mA (without external devices connected)	maximum 750 mA (with external devices connected)
Inrush current with 24 V/10 A fixed voltage supply	maximum 1.5 A (für 15 ms, load-dependent)	
Inrush current without current limiting supply	maximum 65 A (für 25 µs, load-dependent)	

Terminal

Dimensions	264 x 183 x 48 mm (W x H x D)	
Material	front plate: 1.1 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel	
Weight	ca. 1.5 kg	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating, > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	according to EN 61000-6-2 (industrial area)	
EMC noise generation	according to EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (9.81 m/s²)
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²) duration 11 ms, 18 shocks
Protection type	EN 60529 protected through the housing	front: IP65 cover: IP20

10.1“ WXGA Display

Type	10.1” IPS color display
Resolution	WXGA 1280 x 800 pixles
Color depth	18-bit RGB
LCD mode	normally black
LCD Polarizer	transmissive
Pixel size	0.1695 x 0.1695 mm
Active surface	216.96 x 135.60 mm
Backlighting	LED
Contrast	typically 1000
Brightness	typically 500 cd/m²
Blickwinkel	left, right, top, bottom typically 85°

Article Number and Miscellaneous

Article number	01-230-1034
Operating system	Salamander
Approvals	CE, UKCA ETT 1034 consists of TP 1061 und PIM 031, both UL certified $_{c}UL_{us}$(E247993)

Notes

Build-in Touch Terminal
ETT 1044

The ETT 1044 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 10.1" TFT color display.

Via the high-performance processor, complex HTML5 applications can be displayed without problems.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. An M.2 SSD serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	Intel® Celeron® J4005
Processor cores	2
Processor clock	2.0-2.7 GHz
Internal cache	4 Mbytes
Internal program and data memory (RAM)	2-Gbyte DDR4 (SODIMM)
Graphics	Intel® UHD Graphics 600
Hard drive	64-Gbyte SATA M.2 SSD
Interfaces	4x USB 2.0 (Type A) 1x DisplayPort output V1.2a (max. 1920 x 1200 px at 60 Hz) 2x Ethernet (Gbit)
Internal interfaces	1x Panel Interface Connector
Signal generator	no
Display Resolution	10.1" TFT color display WXGA 1280 x 800 pixels

Operating panel	touch screen (projective capacitive)	
Status LEDs	1x red, 1x green	
Real-time clock	yes	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	+18-30 V DC (SELV/PELV), typically +24 V DC UL: Class 2 or LVLC	
Current consumption of (+24 V) power supply	typically 800 mA (without externally connected devices)	maximum 1300 mA (with external devices connected)
Inrush current with 24 V/10 A fixed voltage supply	maximum 2.2 A (for 1.8 ms, load-dependent)	
Inrush current without current limiting supply	maximum 3.5 A (for 6 µs, load-dependent)	

Terminal

Dimensions	264 x 183 x 83 mm (W x H x D)	
Material	front plate: 1.1 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel Heat sink anodized aluminum	
Weight	2.3 kg	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating, > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	5-200 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²)
Protection type	EN 60529 protected through the housing	front: IP65 cover IP20

Display

Type	10.1" IPS color display
Resolution	WXGA 1280 x 800 pixles
Color depth	18-bit RGB
LCD mode	normally black
LCD Polarizer	transmissive
Pixel size	0.1695 x 0.1695 mm
Active surface	216.96 x 135.60 mm
Backlighting	LED
Contrast ratio	typically 1000:1
Brightness	typically 500 cd/m²
Angle CR ≥ 10	left, right, top, bottom typically 85°
Life span	by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness

Article Number and Miscellaneous

Article number	01-230-1044
Operating system	Gecko
Approvals	CE the ETT 1044 consists of a TP 1061 (cULus (E247993)) and a PIM 041 (designed according to UL)

Notes

Build-in Touch Terminal
ETT 1054-W

The ETT 1054-W is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 10.1" TFT color display.

Via the high-performance processor, complex HTML5 applications can be displayed without problems.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. An M.2 SSD serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	Intel® Celeron® J5005
Processor cores	4
Processor clock	1.5-2.8 GHz
Internal cache	4 Mbytes
Internal program and data memory (RAM)	4-Gbyte DDR4 (SODIMM)
Graphics	Intel® UHD Graphics 605
Hard drive	64-Gbyte SATA M.2 SSD
Interfaces	4x USB 2.0 (Type A) 1x DisplayPort output V1.2a (max. 1920 x 1200 px at 60 Hz) 2x Ethernet (Gbit)
Internal interfaces	1x Panel Interface Connector
Signal generator	no
Display Resolution	10.1" TFT color display WXGA 1280 x 800 pixels

Operating panel	touch screen (projective capacitive)	
Status LEDs	1x red, 1x green	
Real-time clock	yes	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	+18-30 V DC (SELV/PELV), typically +24 V DC UL: Class 2 or LVLC	
Current consumption of (+24 V) power supply	typically 950 mA (without externally connected devices)	maximum 1450 mA (with external devices connected)
Inrush current with 24 V/10 A fixed voltage supply	maximum 2.2 A (for 1.8 ms, load-dependent)	
Inrush current without current limiting supply	maximum 3.5 A (for 6 µs, load-dependent)	

Terminal

Dimensions	264 x 183 x 83 mm (W x H x D)	
Material	front plate: 1.1 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel Heat sink anodized aluminum	
Weight	2.3 kg	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating, > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	5-200 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²)
Protection type	EN 60529 protected through the housing	front: IP65 cover IP20

Display

Type	10.1" IPS color display
Resolution	WXGA 1280 x 800 pixles
Color depth	18-bit RGB
LCD mode	normally black
LCD Polarizer	transmissive
Pixel size	0.1695 x 0.1695 mm
Active surface	216.96 x 135.60 mm
Backlighting	LED
Contrast ratio	typically 1000:1
Brightness	typically 500 cd/m²
Angle CR ≥ 10	left, right, top, bottom typically 85°
Life span	by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness

Article Number and Miscellaneous

Article number	01-230-1054-W
Operating system	Windows IoT
Approvals	CE the ETT 1054-W consists of a TP 1061 (cULus (E247993)) and a PIM 051-W (designed according to UL)

Notes

Touch Operating Panel
ETT 1064

with 10.1" TFT color display

The ETT 1064 is an intelligent panel for visualizing, operating and monitoring automated processes. Process diagnostics is therewith simplified.

A projective capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 10.1" TFT color display.

The available interfaces can be used to exchange process data or configure the multitouch terminal.

Performance Data

Processor	EDGE3 Technology
Processor cores	4
Internal program and data memory (RAM)	2-GByte (DDR4)
Internal remnant data memory	128-kByte FRAM
Internal storage device	8-GByte eMMC
Optional memory expansion	microSD
Graphic	integrated in EDGE processor
Interfaces	2x Ethernet (10/100/1000) 2x USB 2.0 Type A 1x USB 2.0 Type Mini-B OTG 1x microSD card holder (SD 3.0)
Internal interface connections and devices	no
Operating components	no

Signal generator	no	
Display Resolution	10.1“ TFT color display WXGA 1280 x 800 pixels	
Operating field	Touch screen (multi-touch, projective capacitive)	
Status LEDs	yes (1x red/1x green)	
Real-time clock	yes (battery buffered)	
Cooling	passive	

Electrical Requirements

Supply voltage	+24 V DC ±20 % (SELV/PELV) UL: Class 2 of LVLC	
Protection class	III	
Current consumption of power supply at +24 V	typically 450 mA (with no external devices connected)	maximum 580 mA (with external devices connected)
Inrush current without currentlimiting supply	30 A for max. 20 µs	
Inrush current with 24 V/10 A fixed voltage supply	1 A for max. 30 ms	

Terminal

Dimensions	264 x 183 x 38 mm (W x H x D)	
Material	Housing: aluminium/steel chromated Color: black Front: glass 1.1 mm	
Weight	1.24 kg	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +55 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	according to EN 61000-6-2 (industrial area)	
EMC noise generation	according to EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8,4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g (147.15 m/s2)
Protection type	EN 60529/NEMA 250 protection through housing	front: IP65/Type4 cover: IP20/Type1

Display

Type	10.1" TFT color display
Resolution	WXGA 1280 x 800 pixels
Color depth	18-Bit RGB
LCD mode	normally black
LCD polarizer	transmissive
Pixel size	0.1695 x 0.1695 mm
Active range	216.96 x 135.60 mm
Backlighting	LED
Contrast	typically 1000:1
Brightness	typically 500 cd/m²
Visible field	left, right, top, bottom typically 85°
Life span	By compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness.

Article Number and Miscellaneous

Article number	01-230-1064
Operating system	Gecko
Standard	designed according to UL
Approvals	CE

Notes

Touch Operating Panel
ETT 1264

with 12.1" TFT color display

The ETT 1264 is an intelligent panel for visualizing, operating and monitoring automated processes. Process diagnostics is therewith simplified.

A projective capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 12.1" TFT color display.

The available interfaces can be used to exchange process data or configure the multitouch terminal.

Performance Data

Processor	EDGE3 Technology
Processor cores	4
Internal program and data memory (RAM)	2-GByte (DDR4)
Internal remnant data memory	128-kByte FRAM
Internal storage device	8-GByte eMMC
Optional memory expansion	microSD
Graphic	integrated in EDGE processor
Interfaces	2x Ethernet (10/100/1000) 2x USB 2.0 Type A 1x USB 2.0 Type Mini-B OTG 1x microSD card holder (SD 3.0)
Internal interface connections and devices	no
Operating components	no

Signal generator	no	
Display Resolution	12.1“ TFT color display WXGA 1280 x 800 pixels	
Operating field	Touch screen (multi-touch, projective capacitive)	
Status LEDs	yes (1x red/1x green)	
Real-time clock	yes (battery buffered)	
Cooling	passive	

Electrical Requirements

Supply voltage	+24 V DC ±20 % (SELV/PELV) UL: Class 2 of LVLC	
Protection class	III	
Current consumption of power supply at +24 V	typically 500 mA (with no external devices connected)	maximum 760 mA (with external devices connected)
Inrush current without currentlimiting supply	30 A for max. 20 µs	
Inrush current with 24 V/10 A fixed voltage supply	1 A for max. 30 ms	

Terminal

Dimensions	313 x 215 x 44 mm (W x H x D)	
Material	Housing: aluminium/steel chromated Color: black Front: glass 1.1 mm	
Weight	1.8 kg	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +55 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	according to EN 61000-6-2 (industrial area)	
EMC noise generation	according to EN 61000-6-3 (residential area) according to EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8,4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g (147.15 m/s2)
Protection type	EN 60529/NEMA 250 protection through housing	front: IP65/Type4 cover: IP20/Type1

Display

Type	12.1" TFT color display
Resolution	WXGA 1280 x 800 pixels
Color depth	18-Bit RGB
LCD mode	normally black
LCD polarizer	transmissive
Pixel size	0.2040 x 0.2040 mm
Active range	0.2040 x 0.2040 mm
Backlighting	LED
Contrast	typically 1000:1
Brightness	typically 400 cd/m²
Visible field	left, right, top, bottom typically 89°
Life span	By compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness.

Article Number and Miscellaneous

Article number	01-230-1264
Operating system	Gecko
Standard	designed according to UL
Approvals	CE

Notes

Build-in Touch Terminal
TAE 1044

The multi-touch operating panel TAE 1044 is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.
The projective capacitive touch screen is used to enter process data and parameters. The output is shown on a 10.1“ TFT color display with LED backlighting.
This module operates with SIGMATEK HMI-LINK generation 2.1 (G2.1). This allows a transmission from the display, as well as USB signals using standard cables (CAT-5e or CAT-6) from a remote PC to a terminal (up to 100 m). With the 2 integrated USB connection, external end devices (mouse, keyboard ...) or memory (USB stick) can be connection on the HMI side.

Performance Data

Interfaces	1x HMI Remote IN (HMI-Link G2.1) 2x USB 2.0 Type A OUT 1x Panel Interface Connector (for connecting a SIGMATEK TP)
Internal interfaces (via Panel Interface Connector)	USB 2.0 (for touch and front USB, if available on the TP)
Status LEDs	1x green 1x red (depends on OS)
Display Resolution	10.1“ TFT color display WXGA 1280 x 800 pixels
Operating field	touch screen (projective capacitive)
Cooling	passive (fanless)

Electrical Requirements

	Supply voltage	+24 V DC ±20 % (SELV/PELV) UL: Class 2 or LVLC	
	Current consumption of (+24 V) power supply	typically 700 mA (with no external devices connected)	maximum 900 mA (with external devices connected)
	Inrush current with 24 V/10 A fixed voltage supply	maximum 3 A (for 14 ms, load-dependent)	
	Inrush current without current-limiting supply	maximum 71 A (for 1.5 ms, load-dependent)	

Terminal

	Dimensions	264 x 183 x 48 mm (W x H x D)
	Material	front plate: 1.1 mm glass (touch screen) in black anodized aluminum frame
	Weight	1.5 kg

Environmental Conditions

	Storage temperature	-25 ... +85 °C	
	Environmental temperature	0 ... +50 °C	
	Humidity	10-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area) in accordance with EN 61000-6-1 (living area)	
	EMC noise emission	in accordance with EN 61000-6-4 (industrial area) in accordance with EN 61000-6-3 (living area)	
	Vibration resistance	EN 60068-2-6	5-200 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
	Shock resistance	EN 60068-2-27	15 g (147.15 m/s²)
	Protection type	EN 60529 protection through housing	front: IP65 cover: IP20 (not UL-listed)

Display

Type	10.1" IPS color display
Resolution	WXGA 1280 x 800 pixels
Color depth	18-bit RGB
LCD mode	normally black
LCD Polarizer	transmissive
Pixel size	0.1695 x 0.1695 mm
Active range	216.96 x 135.60 mm
Backlighting	LED
Contrast ratio	typically 1000:1
Brightness	typically 500 cd/m²
Angle CR ≥ 10	all directions typically 85°
Life span	By compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness.

Article Number and Miscellaneous

Article number	12-200-1044
Operating system	–
Standard	designed according to UL
Approvals	CE

Notes

Multi-touch Operating Panel
ETT 1233

with 12.1" XGA TFT color display

The multi-touch operating panel is used for visualizing, operating and monitoring automated processes. A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on an 12.1" XGA TFT color display.

The available interfaces can be used to exchange process data or configure the multi touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	EDGE2 Technology
Processor cores	2
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	512-Mbyte
Internal remnant data memory	512-kbyte SRAM (battery buffered)
Internal storage device	512-Mbyte microSD card
Internal I/O	yes
Interfaces	2x USB-Host 2.0, type A 1x USB-OTG (host/device), type Mini B 2x Ethernet 1x CAN bus (not galvanically separated)
Internal interface connections and devices	1x TFT-color display 1x USB (touch connection)
Display Resolution	12.1" TFT color display 1024 x 768 pixels
Control panel	Touch screen (projective capacitive)
Logo backlighting	optional (RGB)

Real-time clock	yes (battery buffered)	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC (+18-30 V DC)	
Current consumption Power supply +24 V	typically 840 mA (without ext. connected devices)	maximum 870 mA (with ext. connected devices)
Inrush current	maximum 2 A for 10 µs	
UL standard	for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy.	

Terminal

Dimensions	317 x 265.5 x 47.9 mm (W x H x D)	
Material	front plate: 4 mm glass on 1.5 mm aluminium frame	
Weight	typically 3.4 kg	

Environmental Conditions

Storage temperature	-10 ... +75 °C	
Environmental temperature	0 ... +55 °C	
Humidity	10-95 %, non-condensing	
Operating conditions	pollution degree 2 indoor use altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	2-9 Hz: Amplitude 3,5 mm 9-200 Hz: 1 g (10 m/s²)
Shock resistance	EN 60068-2-27	15 g (150 m/s²) duration 11 ms, 18 shocks
Protection type	EN 60529 protected through the housing	front: IP65 (no UL-rating) cover: IP20 (no UL-rating)

Display

Type	12.1" TFT color display
Resolution	XGA, 1024 x 768 pixels
Color depth	24 Bit RGB
LCD mode	normally white
LCD polarizer	transmissive
Pixel size	0.24 x 0.24 mm
Active surface	245.76 x 184.32 mm
Backlighting	LED
Contrast	typically 700
Brightness	typically 500 cd/m²
Angle CR ≥ 10	left, right 80°, above, below 70°
Lifespan	by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness

Control Unit

Touch panel	projective capacitive touch panel
Surface	4 mm front glass with black frame + SIGMATEK logo

Digital Outputs

Number	8
Short-circuit proof	yes
Maximum permitted continuous load current/channel	0.5 A
Maximum total current (all 8-channels)	2 A (100 % of on time)
Voltage drop over power supply (output active)	≤ 1 V
Residual current (off)	≤ 12 µA
Turn-on delay	< 400 µs
Turn-off delay	< 400 µs
Max. braking energy of inductive loads	1 channel 0.12 [Joules]

Digital Inputs

Number	8	
Input voltage	typically +24 V	maximum +30 V
Signal level	low: < +4.5 V	high: > +14 V
Switching threshold	typically +11 V	
Input current	typically 5 mA at + 24 V	
Input delay	typically 5 ms	

Article Number and Miscellaneous

Article number	01-230-1233
Operating system	Salamander
Standard	UL 61010-2-201
Approvals	UL, cUL, CE

Build-in Touch Terminal
ETT 1234

The ETT 1234 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 12.1“ TFT color display.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	EDGE2-Technology
Processor cores	2
Internal cache	32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache
Internal program and data memory (RAM)	1-Gbyte DDR3
Internal remnant data memory	512 kByte SRAM (battery buffered)
Internal storage device	1-Gbyte microSD
Internal I/O	no
Interfaces	1x USB-Host 2.0, Typ A (1x back) 1x Online-USB (Device), Typ Mini-B 2x Ethernet
Internal interfaces	1x IPS color display 1x USB (touch connection) 1x Panel Interface Connector

Display Resolution	12.1“ TFT color display WXGA 1280 x 800 pixels	
Operating panel	Touch screen (projective capacitive)	
Signal generator	no	
Status LEDs	2 (red & green)	
Real-time clock	yes	
Cooling	passiv (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC	
	minimum +18 V DC	maximum +30 V DC
Current consumption of (+24 V) power supply	typically 700 mA (without external devices connected)	maximum 850 mA (without external devices connected)
Inrush current with 24 V/10 A fixed voltage supply	maximum 1.5 A (für 15 ms, load-dependent)	
Inrush current without current limiting supply	maximum 65 A (für 25 µs, load-dependent)	

Terminal

Dimensions	313 x 215 x 50 mm (W x H x D)	
Material	front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel	
Weight	ca. 2.1 kg	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating, > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	according to EN 61000-6-2 (industrial area)	
EMC noise generation	according to EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (9.81 m/s²)
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²) duration 11 ms, 18 shocks
Protection type	EN 60529 protected through the housing	front: IP65 cover: IP20

12.1“ WXGA Display

Type	12.1” IPS color display
Resolution	WXGA 1280 x 800 pixles
Color depth	18-bit RGB
LCD mode	normally black
LCD Polarizer	transmissive
Pixel size	0.204 x 0.204 mm
Active surface	261.12 x 163.2 mm
Backlighting	LED
Contrast	typically 1000
Brightness	typically 400 cd/m²
Blickwinkel	left, right, top, bottom typically 89°

Article Number and Miscellaneous

Article number	01-230-1234
Operating system	Salamander
Approvals	CE, UKCA ETT 1234 consists of TP 1261 und PIM 031, both UL certified $_{c}UL_{us}$(E247993)

Notes

Build-in Touch Terminal
ETT 1244

The ETT 1244 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 12.1" TFT color display.

Via the high-performance processor, complex HTML5 applications can be displayed without problems.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. An M.2 SSD serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	Intel® Celeron® J4005
Processor cores	2
Processor clock	2.0-2.7 GHz
Internal cache	4 Mbytes
Internal program and data memory (RAM)	2-Gbyte DDR4 (SODIMM)
Graphics	Intel® UHD Graphics 600
Hard drive	64-Gbyte SATA M.2 SSD
Interfaces	4x USB 2.0 (Type A) 1x DisplayPort output V1.2a (max. 1920 x 1200 px at 60 Hz) 2x Ethernet (Gbit)
Internal interfaces	1x Panel Interface Connector
Signal generator	no
Display Resolution	12.1" TFT color display WXGA 1280 x 800 pixels
Operating panel	touch screen (projective capacitive)

Status LEDs	1x red, 1x green	
Real-time clock	yes	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	+18-30 V DC (SELV/PELV), typically +24 V DC UL: Class 2 or LVLC	
Current consumption of (+24 V) power supply	typically 900 mA (without externally connected devices)	maximum 1400 mA (with external devices connected)
Inrush current with 24 V/10 A fixed voltage supply	maximum 2.2 A (for 1.8 ms, load-dependent)	
Inrush current without current limiting supply	maximum 4 A (for 6 µs, load-dependent)	

Terminal

Dimensions	313 x 215 x 85 mm (W x H xD)	
Material	front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel heat sink: anodized aluminum	
Weight	2.9 kg	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating, > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 5-200 Hz: amplitude 3.5 mm Transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²)
Protection type	EN 60529 protected through the housing	front: IP65 cover: IP20

Display

Type	12.1" TN color display
Resolution	WXGA 1280 x 800 pixles
Color depth	18-bit RGB
LCD mode	normally black
LCD Polarizer	transmissive
Pixel size	0.204 x 0.204 mm
Active surface	261.12 x 163.2 mm
Backlighting	LED
Contrast ratio	typically 1000:1
Brightness	typically 500 cd/m²
Angle CR ≥ 10	left, right, top, bottom typically 89°

Article Number and Miscellaneous

Article number	01-230-1244
Operating system	Gecko
Approvals	CE, UKCA the ETT 1244 consists of a TP 1261 (cULus (E247993)) and a PIM 041 (designed according to UL)

Notes

Build-in Touch Terminal
TAE 1244

The multi-touch operating panel TAE 1244 is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.
The projective capacitive touch screen is used to enter process data and parameters. The output is shown on a 12.1“ TFT color display with LED backlighting.
This module operates with SIGMATEK HMI-LINK generation 2.1 (G2.1). This allows a transmission from the display, as well as USB signals using standard cables (CAT-5e or CAT-6) from a remote PC to a terminal (up to 100 m). With the 2 integrated USB connection, external end devices (mouse, keyboard ...) or memory (USB stick) can be connection on the HMI side.

Performance Data

Interfaces	1x HMI Remote IN (HMI-Link G2.1) 2x USB 2.0 Type A OUT 1x Panel Interface Connector (for connecting a SIGMATEK TP)
Internal interfaces (via Panel Interface Connector)	USB 2.0 (for touch and front USB, if available on the TP)
Status LEDs	1x green 1x red (depends on OS)
Display Resolution	12.1“ TFT color display WXGA 1280 x 800 pixels
Operating field	touch screen (projective capacitive)
Cooling	passive (fanless)

Electrical Requirements

	Supply voltage	+24 V DC ±20 % (SELV/PELV) UL: Class 2 or LVLC	
	Current consumption of (+24 V) power supply	typically 800 mA (with no external devices connected)	maximum 1000 mA (with external devices connected)
	Inrush current with 24 V/10 A fixed voltage supply	maximum 3.1 A (for 17 ms, load-dependent)	
	Inrush current without current-limiting supply	maximum 76 A (for 1.2 ms, load-dependent)	

Terminal

	Dimensions	313 x 215 x 50 mm (W x H x D)
	Material	front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame
	Weight	2.1 kg

Environmental Conditions

	Storage temperature	-25 ... +85 °C	
	Environmental temperature	0 ... +50 °C	
	Humidity	10-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area) in accordance with EN 61000-6-1 (living area)	
	EMC noise emission	in accordance with EN 61000-6-4 (industrial area) in accordance with EN 61000-6-3 (living area)	
	Vibration resistance	EN 60068-2-6	5-200 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
	Shock resistance	EN 60068-2-27	15 g (147.15 m/s²)
	Protection type	EN 60529 protection through housing	front: IP65 cover: IP20 (not UL-listed)

Display

Type	12.1" TN color display
Resolution	WXGA 1280 x 800 pixels
Color depth	18-bit RGB
LCD mode	normally black
LCD Polarizer	transmissive
Pixel size	0.204 x 0.204 mm
Active range	261.12 x 163.2 mm
Backlighting	LED
Contrast ratio	typically 1000:1
Brightness	typically 400 cd/m²
Angle CR ≥ 10	all directions typically 89°
Life span	By compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness.

Article Number and Miscellaneous

Article number	12-200-1244
Operating system	–
Standard	designed according to UL
Approvals	CE

Notes

Touch Operating Panel
ETT 312

The ETT 312 is a touch operating panel with a 3.5" TFT color display. The resistive touch screen serves as the input medium for process data and parameters. To save energy, the display is deactivated in sleep mode. When the screen surface is touched, the terminal is activated and then deactivated a few minutes after the last input.

With the LASAL SCREEN mask editor, graphics can be created on the PC, then stored and displayed on the terminal. Data is exchanged over CAN bus.

Performance Data

	SDRAM	8-Mbyte
	Flash	8-Mbyte
	Interfaces	1x CAN bus
	Data rate	maximum 1 Mbit/s
	Display Resolution	3.5" TFT color display 320 x 240 pixels

Electrical Requirements

	Supply voltage	typically +24 V (+18-30 V DC) UL: Class 2 or LVLC	
	Current consumption	typically 60 mA	maximum 100 mA
	Inrush current	typically 0.9 A for 10 ms	maximum 1.2 A for 20 ms
	UL standard	for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy.	

Terminal

Operating unit dimensions	103.6 x 99.6 x 38.1 mm (W x H x D) with opposing connector 111.8 x 107.8 x 38.1 mm (W x H x D) with opposing connector and fastening clips	
Control cabinet cutout	minimum 92.2 x 88.2 mm (W x H) maximum 93.5 x 89.5 mm (W x H)	
Material	front plate: 3 mm anodized aluminum	
Weight	ca. 250 g	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +55 °C	
Humidity	10-95 %, non-condensing	
Operating conditions	pollution degree 2 Indoor use altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	front: IP65 cover: IP20

Display

Type	3.5" LC graphic display
Resolution	320(RGB) x 240
Pixel size	0.219 x 0.219 mm
Number of pixels	320*3 (RGB) x 240 pixels
Active surface	70.08 x 52.56 mm
Color depth	24 bits
Backlighting	6x LED, white, regulatable
Contrast	400:1
Touch	resistive
Brightness	typically 350 cd/m²
Visible field	left and right 70°, below 70°, above 60°

Article Number and Miscellaneous

Article number	01-230-312
Standard	UL 61010-2-201
Approvals	UL, cUL, CE, UKCA

Touch Operating Panel
ETT 352

The ETT 352 is a touch operating panel with a 3.5" TFT color display. The resistive touch screen serves as the input medium for process data and parameters. To save energy, the display is deactivated in sleep mode. When the screen surface is touched, the terminal is activated and then deactivated a few minutes after the last input.

With the LASAL SCREEN mask editor, graphics can be created on the PC, then stored and displayed on the terminal. Data is exchanged over CAN bus.

Performance Data

SDRAM	8-Mbyte
Flash	1-Mbyte
Interfaces	1x CAN bus (fixed terminal strip)
Terminating resistor	120 Ω settable with DIP-Switch
Data rate	maximum 1 Mbit/s
Display Resolution	3.5" TFT color display 320 x 240 pixels
Control panel	4-wire touch screen (analog resistive)

Electrical Requirements

Supply voltage	typically +24 V DC (+18-30 V DC)	
Current consumption	typically 50 mA	maximum 100 mA
UL standard	for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy.	

Terminal

Operating unit dimensions	93.3 x 93.3 x 12.1 mm (W x H x D)
Installation measurements with panel mounting	52 x 52 x 30 mm (W x H x D) Corner hole clearance 81.3
Material	plastic
Weight	circa 120 g

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +55 °C	
Humidity	10-95 %, non-condensing	
Operating conditions	pollution degree 2 indoor use altitude up to 2000 m	
EMC product norm	EN 60730-1	
EMC stability	in accordance with EN 61000-6-2 (industrial area)	
EMC stability	in accordance with EN 61000-6-3 (living area)	
Protection type	EN 60529	
	mounting in a panel	IP30 (no UL-rating)

Display

Type	3.5" LC graphic display
Resolution	320(RGB) x 240
Pixel size	0.219 x 0.219 mm
Number of pixels	320*3 (RGB) x 240 pixels
Active surface	70.08 x 52.56 mm
Color depth	24 bits
Backlighting	6x LED, white, regulatable
Contrast	400:1
Touch	resistive
Brightness	typically 350 cd/m²
Visible field	left and right 70°, below 70°, above 60°

Article Number and Miscellaneous

Article number	01-230-352-1
Standard	UL 61010-2-201
Approvals	UL, cUL, CE

Touch Operating Panel
ETT 353

The ETT 353 is a touch operating panel with a 3.5" TFT color display. The resistive touch screen serves as the input medium for process data and parameters.

With the LASAL SCREEN mask editor, graphics can be created on the PC, then stored and displayed on the terminal. Data is exchanged over CAN bus.

Performance Data

Interfaces	1x CAN bus	
Data rate	maximum 1 Mbit/s	

Electrical Requirements

Supply voltage	typically +24 V (+18-30 V DC) supplied from Class 2 or LVLC	
Current consumption	typically 65 mA	maximum 100 mA

Controller

Controller	Cortex-M3
Internal data memory for visualization (SDRAM)	8-Mbyte
Internal data memory for visualization (flash)	8-Mbyte

Terminal

Operating unit dimensions	110 x 157 x 59 mm (W x H x D)	
Material	plastic color: RAL7035	
Weight	circa 300 g	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +50 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	pollution degree 2 indoor use altitude up to 2000 m	
EMC stability	in accordance with EN 61000-6-2 (industrial area)	
EMC stability	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP54

Display

Type	3.5" LC graphic display	
Resolution	320(RGB) x 240	
Pixel size	0.219 x 0.219 mm	
Number of pixels	320*3 (RGB) x 240 pixels	
Active surface	70.08 x 52.56 mm	
Color depth	24 bits	
Backlighting	6x LED, white, regulatable	
Contrast	400:1	
Touch	resistive	
Brightness	typically 350 cd/m²	
Visible field	left and right 70°, below 70°, above 60°	

Article Number and Miscellaneous

Article number	01-230-353	
Connection cable	05-980-020 (2 m) 05-980-050 (5 m) 05-980-100 (10 m)	
Standard	UL 508 (E247993)	
Approvals	UL, cUL, CE	

Touch Operating Panel
ETT 412

The ETT 412 is used to visualize automated processes. Process diagnostics as well as operating and monitoring automated procedures are simplified using this control. A projected capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 4.3“ TFT color display.

With a LASAL visualization tool, graphics can be created on the PC, then stored and displayed on the terminal. Data is exchanged with the CPU via the CAN bus.

The display is constructed with a black anodized aluminum front.

Performance Data

	Interfaces	1x CAN bus Data rate maximum 1 MBit/s

Electrical Requirements

	Supply voltage	typically +24 V (+18-30 V DC)	
	Current consumption at +24 V DC	typically 75 mA	maximum 130 mA
	Inrush current	typically 0.8 A für 10 ms	maximum 1.2 A für 20 ms

Controller

	Controller	Cortex M3
	Internal data memory for visualization (SDRAM)	8-Mbyte
	Internal data memory for visualization (flash)	8-Mbyte

Terminal

Operating unit dimensions	132 x 94 x 35.5 mm (W x H x D) (with opposing connector)	
Material	front: 0.7 mm glass (touch screen) in black anodized 3 mm aluminum frame cover: 0.8 mm chromed sheet steel	
Weight	300 g	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +55 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating, > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2 indoor use	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	3.5 mm von 5-8.4 Hz 1 g von 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	front: IP65 cover: IP20

Display

Type	4.3" TFT-LCD color display
Resolution	480 x 272
Pixel size	0.198 x 0.198 mm
Number of pixels	480*3 (RGB) x 272 pixels
Active surface	95.04 x 53.86 mm
Color depth	24-bit
Backlighting	10x LED, white, adjustable
Contrast	600:1
Touch	projective capacitive
Brightness	typically 400 cd/m²
Visible field	left, right 80, above 70° and below 60°

Article Number and Miscellaneous

Article number	01-230-412
Standard	CE
Approvals	UKCA

Touch Operating Panel
ETT 731

with 7" WVGA TFT color display

The ETT 731 is an intelligent terminal for programming and visualization of automated processes. A resistive touch screen serves as the input medium for process data and parameters. The output is shown on a 7" WVGA TFT color display with an LED backlight. With the LSE mask editor, graphics can be created on the PC, then stored and displayed on the terminal. The available interfaces can be used to exchange process data or configure the build-in terminal. In the internal Flash memory, the operating system, application and application data are stored.

Performance Data

Processor	EDGE2-Technology
Processor cores	1
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	256-Mbyte
Internal remnant data memory	256-kbyte SRAM (battery buffered)
Internal storage device	512-Mbyte NAND Flash
Internal I/O	no
Interfaces	2x USB 2.0, Type A (1x front, 1x back) 1x Ethernet 10/100 (RJ45) 2x CAN bus (6-pin Weidmüller) 1x RS232 (9-pin DSub)
Internal interface connections and devices	1x TFT LCD color display 1x touch
Display Resolution	7" TFT color display 800 x 480 pixels

Control panel	4-wire touch screen (analog resistive)	
Signal generator	no	
Status LEDs	1 front green LED (controllable through the application)	
Real-time clock	yes	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC (+18-30 V DC)	
Current consumption of power supply at +24 V	typically 210 mA (without externally connected devices)	maximum 360 mA (with externally connected devices)
Current consumption of stand-by voltage at +24 V	typically 110 mA (without externally connected devices)	maximum 180 mA (with externally connected devices)
Inrush current	600 mA (1 ms)	
UL standard	for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy.	

Terminal

Dimensions	180 x 135 x 40.9 mm (W x H x D)	
Material	front plate: 3 mm aluminum, black anodized	
Weight	circa 600 g	

Environmental Conditions

Storage temperature	-10 ... +80 °C	
Environmental temperature	0 ... +60 °C	
Humidity	10-95 %, non-condensing	
Operating conditions	pollution degree 2 indoor use altitude up to 2000 m	
EMC stability	in accordance with product standard EN 60730-1	
Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
Shock resistance	EN 60068-2-27	15 g (150 m/s²) duration 11 ms, 18 Shocks
Protection type	EN 60529 protection through housing	front: IP54 (no UL-rating) cover: IP20 (no UL-rating)

7″ VGA Display incl. Touch

Type	7″ TFT LCD color display
Resolution	WVGA 800 x 480 pixels
Color depth	16-bit RGB (65K colors)
LCD mode	normal white
LCD polarizer	transmissive
Pixel size	0.1926 mm x 0.1790 mm
Number of pixels	800*3 (RGB) x 480
Active surface	154.08 mm x 85.92 mm
Backlighting	LED
Contrast	500:1
Brightness	typically 280 cd/m²
Visible field	left and right 70°, below 70°, above 50°

Article Number and Miscellaneous

Article number	01-230-731
Standard	UL 61010-2-201
Approvals	UL, cUL, CE, UKCA

Notes

Touch Operating Panel
ETT 771

with 7" WVGA TFT color display

The build-in touch terminal is an intelligent panel for visualizing, operating and monitoring automated processes. A resistive touch screen serves as the input medium for process data and parameters. The output is shown on a 7" WVGA TFT color display.
With the LSE mask editor, graphics can be created on the PC, then stored and displayed on the build-in touch terminal. The available interfaces can be used to exchange process data or configure the build-in touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	EDGE2 Technology
Processor cores	1
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	256-Mbyte
Internal remnant data memory	256-kbyte SRAM (battery buffered)
Internal storage device	512-Mbyte microSD card
Internal I/O	no
Interfaces	1x USB-OTG (Host/Device) (for service purposes only) 1x Ethernet 10/100 (RJ45) 1x CAN bus (6-pin Weidmüller) 1x RS485/Modbus (6-pin Weidmüller) 1x RS232 (9-pin D-Sub)
Internal interface connections and devices	1x TFT LCD color display 1x touch
Display Resolution	7" TFT color display 800 x 480 pixels

Control panel	4-wire touch screen (analog resistive)	
Signal generator	no	
Status LEDs	1x front LED bi-color RED/GREEN (controllable through the application)	
Real-time clock	yes	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC (+18-30 V DC)	
Current consumption of power supply at +24 V	typically 180 mA (without externally connected devices)	maximum 290 mA (with externally connected devices)
Current consumption of standby voltage at +24 V	typically 110 mA (without externally connected devices)	maximum 180 mA (with externally connected devices)
Inrush current	600 mA (1 ms)	
UL standard	for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy.	

Terminal

Dimensions	180 x 135 x 50 mm (W x H x D)
Material	front plate: 3 mm aluminum, unadulterated
Weight	circa 591 g

Environmental Conditions

Storage temperature	-10 ... +80 °C	
Environmental temperature	0 ... +60 °C	
Humidity	10-95 %, non-condensing	
Operating conditions	pollution degree 2 indoor use altitude up to 2000 m	
EMC stability	in accordance with product standard EN 60730-1	
Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
Shock resistance	EN 60068-2-27	15 g (150 m/s²) duration 11 ms, 18 Shocks
Protection type	EN 60529 protection through housing	front: IP54 (no UL-rating) cover: IP20 (no UL-rating)

7″ VGA Display incl. Touch

Type	7″ TFT LCD color display
Resolution	WVGA 800 x 480 pixels
Color depth	16-bit RGB (65K colors)
LCD mode	normal white
LCD polarizer	transmissive
Pixel size	0.1926 mm x 0.1790 mm
Number of pixels	800*3 (RGB) x 480
Active surface	154.08 mm x 85.92 mm
Backlighting	LED
Contrast	500:1
Brightness	typically 280 cd/m²
Visible field	left and right 70°, below 70°, above 50°

Article Number and Miscellaneous

Article number	01-230-771
Standard	UL 61010-2-201
Approvals	UL, cUL, CE

Notes

Touch Operating Panel
ETT 775

with 7" WVGA TFT color display

The build-in touch terminal is an intelligent panel for visualizing, operating and monitoring automated processes. A resistive touch screen serves as the input medium for process data and parameters. The output is shown on a 7" WVGA TFT color display. With a LASAL visualization tool, graphics can be created on the PC, then stored and displayed on the build-in touch terminal. The available interfaces can be used to exchange process data or configure the build-in touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	EDGE2-Technology
Processor core	1
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	256-MByte
Internal remnant data memory	256 kbyte SRAM (battery buffered)
Internal storage device	1-Gbyte microSD card
Internal I/O	no
Interfaces	1x USB 2.0 (Type A front) 1x USB device 1.1, Type Mini-B (back) 1x Ethernet 10/100 1x CAN bus 1x RS485 / Modbus 1x RS232 1x TTY for a max. of 6 participants
Internal interface connections and devices	1x TFT LCD color display 1x touch

Display Resolution	7“ TFT color display 800 x 480 pixels	
Control panel	4-wire touch screen (analog resistive)	
Signal generator	no	
Status LEDs	1x front LED bi-color RED / GREEN (controllable through the application)	
Real-time clock	yes	
Cooling	passive (fanless)	

TTY Specifications

Number of interfaces	1		
Adjustable data transfer rate	2400 Baud, 4800 Baud, 9600 Baud		
Over voltage protection	TTY	Pin 20 mA	70 V
Voltage drop	Rx < 3 V	Tx < 2 V	
Maximum number of TTY participants	depends on the voltage drop on the participants, cables and connectors (maximum of 6)		
Short-circuit proof	yes		

Electrical Requirements

Supply voltage	typically +24 V DC	
	minimum +18 V DC	maximum +30 V DC
Current consumption of power supply at +24 V	typically 260 mA (without externally connected devices)	maximum 390 mA (with external devices connected)
Current consumption of standby voltage at +24 V	typically 160 mA (without externally connected devices)	maximum 265 mA (with external devices connected)
Inrush current	maximum 16.9 A for 50 µs	

Terminal

Dimensions	180 x 135 x 50 mm (W x H x D)
Material	front plate: 3 mm aluminum, natural
Weight	circa 591 g

Environmental Conditions

	Storage temperature	-10 ... +80 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	10-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating, > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
	Shock resistance	EN 60068-2-27	15 g (150 m/s²) duration 11 ms, 18 Shocks
	Protection type	EN 60529 protection through housing	front: IP54 cover: IP20

7" WVGA Display incl. Touch

	Type	7" TFT LCD color display
	Resolution	WVGA 800 x 480 Pixel
	Color depth	16 Bit RGB (65K colors)
	LCD mode	normal white
	LCD Polarizer	transmissive
	Pixel size	0.1926 x 0.1790 mm
	Number of pixels	800*3 (RGB) x 480
	Active surface	154.08 x 85.92 mm
	Backlighting	LED
	Contrast	500:1
	Brightness	typically 280 cd/m²
	Visible field	left and right 70°, below 70°, above 50°

Article Number and Miscellaneous

	Article number	01-230-775
	Standard	designed according to UL
	Approvals	CE

Notes

Multi-touch Operating Panel
ETT 1533

with 15" XGA TFT color display

The multi-touch operating panel is used for visualizing, operating and monitoring automated processes. A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on an 15" XGA TFT color display.

The available interfaces can be used to exchange process data or configure the multi touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	EDGE2 Technology
Processor cores	2
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	512-Mbyte
Internal remnant data memory	512-kbyte SRAM (battery buffered)
Internal storage device	1 Gbyte microSD card
Internal I/O	yes
Interfaces	2x USB-Host 2.0, type A 1x USB-OTG (host/device), type Mini B 2x Ethernet 1x CAN bus (not galvanically separated)
Internal interface connections and devices	1x TFT-color display 1x USB (touch connection)
Display Resolution	15" TFT color display 1024 x 768 pixels
Control panel	Touch screen (projective capacitive)
Logo backlighting	optional (RGB)

Real-time clock	yes (battery buffered)	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC (+18-30 V DC)	
Current consumption Power supply +24 V	typically 730 mA (without ext. connected devices)	maximum 890 mA (with ext. connected devices)
Inrush current	maximum 2 A for 10 µs	
UL standard	for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy.	

Terminal

Dimensions	376.1 x 310.1 x 47.9 mm (W x H x D)	
Material	front plate: 4 mm glass on 1.5 mm aluminium frame	
Weight	typically 4.7 kg	

Environmental Conditions

Storage temperature	-10 ... +75 °C	
Environmental temperature	0 ... +55 °C	
Humidity	10-95 %, non-condensing	
Operating conditions	pollution degree 2 indoor use altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	2-9 Hz: Amplitude 3,5 mm 9-200 Hz: 1 g (10 m/s²)
Shock resistance	EN 60068-2-27	15 g (150 m/s²) duration 11 ms, 18 shocks
Protection type	EN 60529 protected through the housing	front: IP65 (no UL-rating) cover: IP20 (no UL-rating)

Display

Type	15" TFT color display
Resolution	XGA, 1024 x 768 pixels
Color depth	24 Bit RGB
LCD mode	normally black
LCD polarizer	transmissive
Pixel size	0.297 x 0.297 mm
Active surface	304.1 x 228.1 mm
Backlighting	LED
Contrast	typically 1500:
Brightness	typically 400 cd/m²
Angle CR ≥ 10	left, right, below, above 85°
Lifespan	by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness

Control Unit

Touch panel	projective capacitive touch panel
Surface	4 mm front glass with black frame + SIGMATEK logo

Digital Outputs

Number	8
Short-circuit proof	yes
Maximum permitted continuous load current/channel	0.5 A
Maximum total current (all 8-channels)	2 A (100 % of on time)
Voltage drop over power supply (output active)	≤ 1 V
Residual current (off)	≤ 12 µA
Turn-on delay	< 400 µs
Turn-off delay	< 400 µs
Max. braking energy of inductive loads	1 channel 0.12 [Joules]

Digital Inputs

Number	8	
Input voltage	typically +24 V	maximum +30 V
Signal level	low: < +4.5 V	high: > +14 V
Switching threshold	typically +11 V	
Input current	typically 5 mA at + 24 V	
Input delay	typically 5 ms	

Article Number and Miscellaneous

Article number	01-230-1533
Operating system	Salamander
Standard	UL 61010-2-201
Approvals	UL, cUL, CE

Build-in Touch Terminal
ETT 1534

The ETT 1534 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 15.6“ TFT color display.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	EDGE2-Technology
Processor cores	2
Internal cache	32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache
Internal program and data memory (RAM)	1-Gbyte DDR3
Internal remnant data memory	512 kByte SRAM (battery buffered)
Internal storage device	1-Gbyte microSD
Internal I/O	no
Interfaces	1x USB-Host 2.0, Typ A (1x back) 1x Online-USB (Device), Typ Mini-B 2x Ethernet
Internal interfaces	1x IPS color display 1x USB (touch connection) 1x Panel Interface Connector

Display Resolution	15.6“ TFT color display WXGA 1366 x 768 pixels	
Operating panel	Touch screen (projective capacitive)	
Signal generator	no	
Status LEDs	2 (red & green)	
Real-time clock	yes	
Cooling	passiv (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC	
	minimal +18 V DC	maximum +30 V DC
Current consumption of (+24 V) power supply	typically 850 mA (without external devices connected)	maximum 1 A (with external devices connected)
Inrush current with 24 V/10 A fixed voltage supply	maximum 1.5 A (für 15 ms, load-dependent)	
Inrush current without current limiting supply	maximum 65 A (für 25 µs, load-dependent)	

Terminal

Dimensions	399 x 248 x 58 mm (W x H x D)	
Material	front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel	
Weight	ca. 3.4 kg	

Environmental Conditions

Storage temperature	-10 ... +60 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating, > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	according to EN 61000-6-2 (industrial area)	
EMC noise generation	according to EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (9.81 m/s²)
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²) duration 11 ms, 18 shocks
Protection type	EN 60529 protected through the housing	front: IP65 cover: IP20

15.6“ WXGA Display

Type	15.6” TN color display
Resolution	WXGA 1366 x 768 pixles
Color depth	24-bit RGB
LCD mode	normally white
LCD Polarizer	transmissive
Pixel size	0.252 x 0.252 mm
Active surface	344.23 x 193.54 mm
Backlighting	LED
Contrast	typically 500
Brightness	typically 300 cd/m²
Angle CR ≥ 10	all directions typically 80°

Article Number and Miscellaneous

Article number	01-230-1534
Operating system	Salamander
Approvals	CE, UKCA ETT 1534 consists of TP 1561 und PIM 031, both UL certified $_{c}UL_{us}$(E247993)

Notes

Build-in Touch Terminal
ETT 1544

The ETT 1544 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 15.6" TFT color display.

Via the high-performance processor, complex HTML5 applications can be displayed without problems.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. An M.2 SSD serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	Intel® Celeron® J4005
Processor cores	2
Processor clock	2.0-2.7 GHz
Internal cache	4 Mbytes
Internal program and data memory (RAM)	2-Gbyte DDR4 (SODIMM)
Graphics	Intel® UHD Graphics 600
Hard drive	64-Gbyte SATA M.2 SSD
Interfaces	4x USB 2.0 (Type A) 1x DisplayPort output V1.2a (max. 1920 x 1200 px at 60 Hz) 2x Ethernet (Gbit)
Internal interfaces	1x Panel Interface Connector
Signal generator	no
Display Resolution	15.6" TFT color display WXGA 1366 x 768 pixels

Operating panel	touch screen (projective capacitive)	
Status LEDs	1x red, 1x green	
Real-time clock	yes	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	+18-30 V DC (SELV/PELV), typically +24 V DC UL: Class 2 or LVLC	
Current consumption of (+24 V) power supply	typically 1100 mA (without externally connected devices)	maximum 1600 mA (with external devices connected)
Inrush current with 24 V/10 A fixed voltage supply	maximum 2.2 A (for 1.8 ms, load-dependent)	
Inrush current without current limiting supply	maximum 3.7 A (for 6 µs, load-dependent)	

Terminal

Dimensions	398.5 x 248 x 93 mm (W x H x D)	
Material	front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel heat sink: anodized aluminum	
Weight	4.2 kg	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating; > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	5-200 Hz: amplitude 3.5 mm Transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²)
Protection type	EN 60529 protected through the housing	front: IP65 cover: IP20

Display

Type	15.6" TN color display
Resolution	WXGA 1366 x 768 pixles
Color depth	24-bit RGB
LCD mode	normally white
LCD Polarizer	transmissive
Pixel size	0.252 x 0.252 mm
Active surface	344.23 x 193.54 mm
Backlighting	LED
Contrast ratio	typically 500:1
Brightness	typically 300 cd/m²
Angle CR ≥ 10	all directions typically 80°
Life span	by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness

Article Number and Miscellaneous

Article number	01-230-1544
Operating system	Gecko
Approvals	CE; the ETT 1544 consists of a TP 1561 (cULus (E247993)) and a PIM 041 (designed according to UL)

Notes

Build-in Touch Terminal
TAE 1544

The multi-touch operating panel TAE 1544 is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.
The projective capacitive touch screen is used to enter process data and parameters. The output is shown on a 15.6“ TFT color display with LED backlighting.
This module operates with SIGMATEK HMI-LINK generation 2.1 (G2.1). This allows a transmission from the display, as well as USB signals using standard cables (CAT-5e or CAT-6) from a remote PC to a terminal (up to 100 m). With the 2 integrated USB connection, external end devices (mouse, keyboard ...) or memory (USB stick) can be connection on the HMI side.

Performance Data

Interfaces	1x HMI Remote IN (HMI-Link G2.1) 2x USB 2.0 Type A OUT 1x Panel Interface Connector (for connecting a SIGMATEK TP)
Internal interfaces (via Panel Interface Connector)	USB 2.0 (for touch and front USB, if available on the TP)
Status LEDs	1x green 1x red (depends on OS)
Display Resolution	15.6“ TFT color display WXGA 1366 x 768 pixels
Operating field	touch screen (projective capacitive)
Cooling	passive (fanless)

Electrical Requirements

	Supply voltage	+24 V DC ±20 % (SELV/PELV) UL: Class 2 or LVLC	
	Current consumption of (+24 V) power supply	typically 1000 mA (with no external devices connected)	maximum 1200 mA (with external devices connected)
	Inrush current with 24 V/10 A fixed voltage supply	maximum 3 A (for 16 ms, load-dependent)	
	Inrush current without current-limiting supply	maximum 67 A (for 1.5 ms, load-dependent)	

Terminal

	Dimensions	398.5 x 248 x 58 mm (W x H x D)
	Material	front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame
	Weight	3.4 kg

Environmental Conditions

	Storage temperature	-25 ... +85 °C	
	Environmental temperature	0 ... +50 °C	
	Humidity	10-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area) in accordance with EN 61000-6-1 (living area)	
	EMC noise emission	in accordance with EN 61000-6-4 (industrial area) in accordance with EN 61000-6-3 (living area)	
	Vibration resistance	EN 60068-2-6	5-200 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
	Shock resistance	EN 60068-2-27	15 g (147.15 m/s²)
	Protection type	EN 60529 protection through housing	front: IP65 cover: IP20 (not UL-listed)

Display

Type	15.6″ TN color display
Resolution	WXGA 1366 x 768 pixels
Color depth	24-bit RGB
LCD mode	normally white
LCD Polarizer	transmissive
Pixel size	0.252 x 0.252 mm
Active range	344.23 x 193.54 mm
Backlighting	LED
Contrast ratio	typically 500:1
Brightness	typically 300 cd/m²
Angle CR ≥ 10	all directions typically 80°
Life span	By compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness.

Article Number and Miscellaneous

Article number	12-200-1544
Operating system	–
Standard	designed according to UL
Approvals	CE

Notes

Build-in Touch Terminal
ETT 1834

The ETT 1834 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 18.5“ TFT color display.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	EDGE2-Technology
Processor cores	2
Internal cache	32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache
Internal program and data memory (RAM)	1-Gbyte DDR3
Internal remnant data memory	512 kByte SRAM (battery buffered)
Internal storage device	1-Gbyte microSD
Internal I/O	no
Interfaces	1x USB-Host 2.0, Typ A (1x back) 1x Online-USB (Device), Typ Mini-B 2x Ethernet
Internal interfaces	1x TN color display 1x USB (touch connection) 1x Panel Interface Connector

Display Resolution	18.5“ TFT color display WXGA 1366 x 768 pixels	
Operating panel	Touch screen (projective capacitive)	
Signal generator	no	
Status LEDs	2 (red & green)	
Real-time clock	yes	
Cooling	passiv (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC	
	minimal +18 V DC	maximum +30 V DC
Current consumption of (+24 V) power supply	typically 850 mA (without external devices connected)	maximum 1 A (with external devices connected)
Inrush current with 24 V/10 A fixed voltage supply	maximum 1.5 A (für 15 ms, load-dependent)	
Inrush current without current limiting supply	maximum 65 A (für 25 µs, load-dependent)	

Terminal

Dimensions	464 x 285 x 54 mm (W x H x D)	
Material	front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel	
Weight	ca. 4.1 kg	

Environmental Conditions

Storage temperature	-10 ... +60 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating, > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	according to EN 61000-6-2 (industrial area)	
EMC noise generation	according to EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (9.81 m/s²)
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²) duration 11 ms, 18 shocks
Protection type	EN 60529 protected through the housing	front: IP65 cover: IP20

18.5“ WXGA Display

Type	18.5” TFT color display
Resolution	WXGA 1366 x 768 pixles
Color depth	18 Bit RGB + Hi-FRC
LCD mode	normally white
LCD Polarizer	transmissive
Pixel size	0.3 x 0.3 mm
Active surface	409.8 x 230.4 mm
Backlighting	LED
Contrast	typically 1000
Brightness	typically 450 cd/m²
Angle CR ≥ 10	left right: 85°/ top down: 80°

Article Number and Miscellaneous

Article number	01-230-1834
Operating system	Salamander
Approvals	CE, UKCA ETT 1834 consists of TP 1861 und PIM 031, both UL certified $_{c}UL_{us}$(E247993)

Notes

Build-in Touch Terminal
ETT 1844

The ETT 1844 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 18.5" TFT color display.

Via the high-performance processor, complex HTML5 applications can be displayed without problems.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. An M.2 SSD serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	Intel® Celeron® J4005
Processor cores	2
Processor clock	2.0-2.7 GHz
Internal cache	4 Mbytes
Internal program and data memory (RAM)	2-Gbyte DDR4 (SODIMM)
Graphics	Intel® UHD Graphics 600
Hard drive	64-Gbyte SATA M.2 SSD
Interfaces	4x USB 2.0 (Type A) 1x DisplayPort output V1.2a (max. 1920 x 1200 px at 60 Hz) 2x Ethernet (Gbit)
Internal interfaces	1x Panel Interface Connector
Signal generator	no
Display Resolution	18.5" TFT color display WXGA 1366 x 768 pixels

Operating panel	touch screen (projective capacitive)	
Status LEDs	1x red, 1x green	
Real-time clock	yes	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	+18-30 V DC (SELV/PELV), typically +24 V DC UL: Class 2 or LVLC	
Current consumption of (+24 V) power supply	typically 1200 mA (without externally connected devices)	maximum 1700 mA (with external devices connected)
Inrush current with 24 V/10 A fixed voltage supply	maximum 2.2 A (for 1.8 ms, load-dependent)	
Inrush current without current limiting supply	maximum 5.2 A (for 6 µs, load-dependent)	

Terminal

Dimensions	464 x 285 x 89 mm (W x H x D)	
Material	front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel heat sink: anodized aluminum	
Weight	4.9 kg	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	5-200 Hz: amplitude 3.5 mm Transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²)
Protection type	EN 60529 protected through the housing	front: IP65 cover: IP20

Display

Type	18.5" TN color display
Resolution	WXGA 1366 x 768 pixles
Color depth	18 Bit RGB + Hi-FRC
LCD mode	normally white
LCD Polarizer	transmissive
Pixel size	0.3 x 0.3 mm
Active surface	409.8 x 230.4 mm
Backlighting	LED
Contrast ratio	typically 1000:1
Brightness	typically 450 cd/m²
Angle CR ≥ 10	left right: 85°/ top down: 80°
Life span	by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness

Article Number and Miscellaneous

Article number	01-230-1844
Operating system	Gecko
Default IP address Intel Ethernet (X3) Realtek Ethernet (X4)	 automatic (DHCP) automatic (DHCP)
Approvals	CE; the ETT 1844 consists of a TP 1861 (cULus (E247993)) and a PIM 041 (designed according to UL)

Notes

Build-in Touch Terminal
TAE 1844

The multi-touch operating panel TAE 1844 is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.
The projective capacitive touch screen is used to enter process data and parameters. The output is shown on a 18.5“ TFT color display with LED backlighting.
This module operates with SIGMATEK HMI-LINK generation 2.1 (G2.1). This allows a transmission from the display, as well as USB signals using standard cables (CAT-5e or CAT-6) from a remote PC to a terminal (up to 100 m). With the 2 integrated USB connection, external end devices (mouse, keyboard ...) or memory (USB stick) can be connection on the HMI side.

Performance Data

Interfaces	1x HMI Remote IN (HMI-Link G2.1) 2x USB 2.0 Type A OUT 1x Panel Interface Connector (for connecting a SIGMATEK TP)
Internal interfaces (via Panel Interface Connector)	USB 2.0 (for touch and front USB, if available on the TP)
Status LEDs	1x green 1x red (depends on OS)
Display Resolution	18.5“ TFT color display WXGA 1366 x 768 pixels
Operating field	touch screen (projective capacitive)
Cooling	passive (fanless)

Electrical Requirements

	Supply voltage	+24 V DC ±20 % (SELV/PELV) UL: Class 2 or LVLC	
	Current consumption of (+24 V) power supply	typically 1000 mA (with no external devices connected)	maximum 1200 mA (with external devices connected)
	Inrush current with 24 V/10 A fixed voltage supply	maximum 3 A (for 17 ms, load-dependent)	
	Inrush current without current-limiting supply	maximum 69 A (for 1.5 ms, load-dependent)	

Terminal

	Dimensions	464 x 285 x 54 mm (W x H x D)
	Material	front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame
	Weight	4.1 kg

Environmental Conditions

	Storage temperature	-25 ... +85 °C	
	Environmental temperature	0 ... +50 °C	
	Humidity	10-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area) in accordance with EN 61000-6-1 (living area)	
	EMC noise emission	in accordance with EN 61000-6-4 (industrial area) in accordance with EN 61000-6-3 (living area)	
	Vibration resistance	EN 60068-2-6	5-200 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
	Shock resistance	EN 60068-2-27	15 g (147.15 m/s²)
	Protection type	EN 60529 protection through housing	front: IP65 cover: IP20 (not UL-listed)

Display

Type	18.5" TN color display
Resolution	WXGA 1366 x 768 pixels
Color depth	18-bit RGB + Hi-FRC
LCD mode	normally white
LCD Polarizer	transmissive
Pixel size	0.3 x 0.3 mm
Active range	409.8 x 230.4 mm
Backlighting	LED
Contrast ratio	typically 1000:1
Brightness	typically 450 cd/m²
Angle CR ≥ 10	left, right 85° / top, below 80°
Life span	By compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness.

Article Number and Miscellaneous

Article number	12-200-1844
Operating system	–
Standard	designed according to UL
Approvals	CE

Notes

Multi-touch Operating Panel
ETT 1933

with 19" SXGA TFT color display

The multi-touch operating panel is used for visualizing, operating and monitoring automated processes. A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on an 19" SXGA TFT color display.

The available interfaces can be used to exchange process data or configure the multi touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	EDGE2 Technology
Processor cores	2
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	512-Mbyte
Internal remnant data memory	512-kbyte SRAM (battery buffered)
Internal storage device	512-Mbyte microSD card
Internal I/O	yes
Interfaces	2x USB-Host 2.0, type A 1x USB-OTG (host/device), type Mini B 2x Ethernet 1x CAN bus (not galvanically separated)
Internal interface connections and devices	1x TFT-color display 1x USB (touch connection)
Display Resolution	19" TFT color display 1280 x 1024 pixels
Control panel	Touch screen (projective capacitive)
Logo backlighting	optional (RGB)

Real-time clock	yes (battery buffered)	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC (+18-30 V DC)	
Current consumption Power supply +24 V	typically 940 mA (without ext. connected devices)	maximum 980 mA (with ext. connected devices)
Inrush current	maximum 2 A for 10 µs	
UL standard	for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy.	

Terminal

Dimensions	446.3 x 383.1 x 47.9 mm (W x H x D)	
Material	front plate: 4 mm glass on 1.5 mm aluminium frame	
Weight	typically 7.5 kg	

Environmental Conditions

Storage temperature	-10 ... +75 °C	
Environmental temperature	0 ... +55 °C	
Humidity	10-95 %, non-condensing	
Operating conditions	pollution degree 2 indoor use altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	2-9 Hz: Amplitude 3,5 mm 9-200 Hz: 1 g (10 m/s²)
Shock resistance	EN 60068-2-27	15 g (150 m/s²) duration 11 ms, 18 shocks
Protection type	EN 60529 protected through the housing	front: IP65 (no UL-rating) cover: IP20 (no UL-rating

Display

Type	19″ TFT color display
Resolution	SXGA, 1280 x 1024 pixels
Color depth	24 Bit RGB
LCD mode	normally black
LCD polarizer	transmissive
Pixel size	0.294 x 0.294 mm
Active surface	376.32 x 301.06 mm
Backlighting	LED
Contrast	typically 1500
Brightness	typically 350 cd/m²
Angle CR ≥ 10	left, right, below, above 85°
Lifespan	by compliance with the ambient conditions, the brightness of the display sinks after 70,000 operating hours to 50 % of the original brightness

Control Unit

Touch panel	projective capacitive touch panel
Surface	4 mm front glass with black frame + SIGMATEK logo

Digital Outputs

Number	8
Short-circuit proof	yes
Maximum permitted continuous load current/channel	0.5 A
Maximum total current (all 8-channels)	2 A (100 % of on time)
Voltage drop over power supply (output active)	≤ 1 V
Residual current (off)	≤ 12 µA
Turn-on delay	< 400 µs
Turn-off delay	< 400 µs
Max. braking energy of inductive loads	1 channel 0.12 [Joules]

Digital Inputs

Number	8	
Input voltage	typically +24 V	maximum +30 V
Signal level	low: < +4.5 V	high: > +14 V
Switching threshold	typically +11 V	
Input current	typically 5 mA at + 24 V	
Input delay	typically 5 ms	

Article Number and Miscellaneous

Article number	01-230-1933
Operating system	Salamander
Standard	UL 61010-2-201
Approvals	UL, cUL, CE

Build-in Touch Terminal
ETT 2134

The ETT 2134 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 21.5“ TFT color display.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	EDGE2-Technology
Processor cores	2
Internal cache	32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache
Internal program and data memory (RAM)	1-Gbyte DDR3
Internal remnant data memory	512 kByte SRAM (battery buffered)
Internal storage device	1-Gbyte microSD
Internal I/O	no
Interfaces	1x USB-Host 2.0, Typ A (1x back) 1x Online-USB (Device), Typ Mini-B 2x Ethernet
Internal interfaces	1x TN color display 1x USB (touch connection) 1x Panel Interface Connector

Display Resolution	21.5“ TFT color display FullHD 1920 x 1080 pixels	
Operating panel	Touch screen (projective capacitive)	
Signal generator	no	
Status LEDs	2 (red & green)	
Real-time clock	yes	
Cooling	passiv (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC	
	minimal +18 V DC	maximum +30 V DC
Current consumption of (+24 V) power supply	typically 1.5 A (without external devices connected)	maximum 1.65 A (with external devices connected)
Inrush current with 24 V/10 A fixed voltage supply	maximum 1.5 A (für 15 ms, load-dependent)	
Inrush current without current limiting supply	maximum 65 A (für 25 µs, load-dependent)	

Terminal

Dimensions	539 x 331 x 55 mm (W x H x D)	
Material	front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel	
Weight	ca. 5.7 kg	

Environmental Conditions

Storage temperature	-10 ... +60 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating, > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	according to EN 61000-6-2 (industrial area)	
EMC noise generation	according to EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (9.81 m/s²)
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²) duration 11 ms, 18 shocks
Protection type	EN 60529 protected through the housing	front: IP65 cover: IP20

12.1“ WXGA Display

Type	12.1” IPS color display
Resolution	WXGA 1280 x 800 pixles
Color depth	24-bit RGB
LCD mode	normally black
LCD Polarizer	transmissive
Pixel size	0.204 x 0.204 mm
Active surface	261.12 x 163.2 mm
Backlighting	LED
Contrast	typically 1000
Brightness	typically 400 cd/m²
Blickwinkel	left, right, top, bottom typically 89°

Article Number and Miscellaneous

Article number	01-230-2134
Operating system	Salamander
Approvals	CE, UKCA ETT 2134 consists of TP 2161 und PIM 031, both UL certified $_{c}UL_{us}$(E247993)

Notes

Build-in Touch Terminal
ETT 2144

The ETT 2144 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 21.5" TFT color display.

Via the high-performance processor, complex HTML5 applications can be displayed without problems.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. An M.2 SSD serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	Intel® Celeron® J4005
Processor cores	2
Processor clock	2.0-2.7 GHz
Internal cache	4 Mbytes
Internal program and data memory (RAM)	2-Gbyte DDR4 (SODIMM)
Graphics	Intel® UHD Graphics 600
Hard drive	64-Gbyte SATA M.2 SSD
Interfaces	4x USB 2.0 (Type A) 1x DisplayPort output V1.2a (max. 1920 x 1200 px at 60 Hz) 2x Ethernet (Gbit)
Internal interfaces	1x Panel Interface Connector
Signal generator	no
Display Resolution	21.5" TFT color display Full HD 1920 x 1080 pixels

Operating panel	touch screen (projective capacitive)	
Status LEDs	1x red, 1x green	
Real-time clock	yes	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	+18-30 V DC (SELV/PELV), typically+24 V DC UL: Class 2 or LVLC	
Current consumption of (+24 V) power supply	typically 1500 mA (without externally connected devices)	maximum 2000 mA (with external devices connected)
Inrush current with 24 V/10 A fixed voltage supply	maximum 2.2 A (for 1.8 ms, load-dependent)	
Inrush current without current limiting supply	maximum 3.5 A (for 6 µs, load-dependent)	

Terminal

Dimensions	539 x 331 x 90 mm (W x H x D)	
Material	front plate: 2.8 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel heat sink: anodized aluminum	
Weight	6.5 kg	

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	5-200 Hz: amplitude 3.5 mm Transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²)
Protection type	EN 60529 protected through the housing	front: IP65 cover: IP20

Display

Type	21.5" TN color display
Resolution	FullHD 1920 x 1080 pixels
Color depth	24-bit RGB
LCD mode	normally black
LCD Polarizer	transmissive
Pixel size	0.248 x 0.248 mm
Active surface	476.64 x 268.11
Backlighting	LED
Contrast ratio	typically 5000:1
Brightness	typically 300 cd/m²
Angle CR ≥ 10	left, right, top, bottom typically 89°
Life span	by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness

Article Number and Miscellaneous

Article number	01-230-2144
Operating system	Gecko
Approvals	CE; the ETT 2144 consists of a TP 2161 (cULus (E247993)) and a PIM 041 (designed according to UL)

Notes

Build-in Touch Terminal
ETT 2154-W

The ETT 2154-W is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 21.5" TFT color display.

Via the high-performance processor, complex HTML5 applications can be displayed without problems.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. An M.2 SSD serves as the storage medium for the operating system, application and application data.

Performance Data

Processor	Intel® Celeron® J5005
Processor cores	4
Processor clock	2.0-2.7 GHz
Internal cache	4 Mbytes
Internal program and data memory (RAM)	4-Gbyte DDR4 (SODIMM)
Graphics	Intel® UHD Graphics 605
Hard drive	64-Gbyte SATA M.2 SSD
Interfaces	4x USB 2.0 (Type A) 1x DisplayPort output V1.2a (max. 1920 x 1200 px at 60 Hz) 2x Ethernet (Gbit)
Internal interfaces	1x Panel Interface Connector
Signal generator	no

Display Resolution	21.5“ TFT color display Full HD 1920 x 1080 pixels	
Operating panel	touch screen (projective capacitive)	
Status LEDs	1x red, 1x green	
Real-time clock	yes	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	+24 V DC ±20 % (SELV/PELV) UL Class 2 or LVLC	
Current consumption of (+24 V) power supply	typically 1650 mA (without externally connected devices)	maximum 2150 mA (with external devices connected)
Inrush current with 24 V/10 A fixed voltage supply	maximum 2.2 A (for 1.8 ms, load-dependent)	
Inrush current without current limiting supply	maximum 3.5 A (for 6 µs, load-dependent)	

Terminal

Dimensions	539 x 331 x 90 mm (W x H x D)
Material	front plate: 2.8 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel heat sink: anodized aluminum
Weight	6.5 kg

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	5-200 Hz: amplitude 3.5 mm Transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²)
Protection type	EN 60529 protected through the housing	front: IP65 cover IP20

Display

Type	21.5" TN color display
Resolution	FullHD 1920 x 1080 pixels
Color depth	24-bit RGB
LCD mode	normally black
LCD Polarizer	transmissive
Pixel size	0.248 x 0.248 mm
Active surface	476.64 x 268.11
Backlighting	LED
Contrast ratio	typically 5000:1
Brightness	typically 300 cd/m²
Angle CR ≥ 10	left, right, top, bottom typically 89°
Life span	by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness

Article Number and Miscellaneous

Article number	01-230-2154-W
Operating system	Windows 10 IOT
Approvals	CE; ETT 2154-W consists of a TP 2161 ($_{c}$UL$_{us}$ (E247993)) and a PIM 051-W (designed according to UL)

Notes

Build-in Touch Terminal
TAE 2144

The multi-touch operating panel TAE 2144 is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.
The projective capacitive touch screen is used to enter process data and parameters. The output is shown on a 21.5“ TFT color display with LED backlighting.
This module operates with SIGMATEK HMI-LINK generation 2.1 (G2.1). This allows a transmission from the display, as well as USB signals using standard cables (CAT-5e or CAT-6) from a remote PC to a terminal (up to 100 m). With the 2 integrated USB connection, external end devices (mouse, keyboard ...) or memory (USB stick) can be connection on the HMI side.

Performance Data

Interfaces	1x HMI Remote IN (HMI-Link G2.1) 2x USB 2.0 Type A OUT 1x Panel Interface Connector (for connecting a SIGMATEK TP)
Internal interfaces (via Panel Interface Connector)	USB 2.0 (for touch and front USB, if available on the TP)
Status LEDs	1x green 1x red (depends on OS)
Display Resolution	21.5“ TFT color display FullHD 1920 x 1080 pixels
Operating field	touch screen (projective capacitive)
Cooling	passive (fanless)

Electrical Requirements

	Supply voltage	+24 V DC ±20 % (SELV/PELV) UL: Class 2 or LVLC	
	Current consumption of (+24 V) power supply	typically 1500 mA (with no external devices connected)	maximum 1700 mA (with external devices connected)
	Inrush current with 24 V/10 A fixed voltage supply	maximum 3.1 A (for 17 ms, load-dependent)	
	Inrush current without current-limiting supply	maximum 63 A (for 1.5 ms, load-dependent)	

Terminal

	Dimensions	539 x 331 x 55 mm (W x H x D)
	Material	front plate: 2.8 mm glass (touch screen) in black anodized aluminum frame
	Weight	5.7 kg

Environmental Conditions

	Storage temperature	-25 ... +85 °C	
	Environmental temperature	0 ... +50 °C	
	Humidity	10-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area) in accordance with EN 61000-6-1 (living area)	
	EMC noise emission	in accordance with EN 61000-6-4 (industrial area) in accordance with EN 61000-6-3 (living area)	
	Vibration resistance	EN 60068-2-6	5-200 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
	Shock resistance	EN 60068-2-27	15 g (147.15 m/s²)
	Protection type	EN 60529 protection through housing	front: IP65 cover: IP20 (not UL-listed)

Display

Type	21.5" TN color display
Resolution	FullHD 1920 x 1080 pixels
Color depth	24-bit RGB
LCD mode	normally black
LCD Polarizer	transmissive
Pixel size	0.248 x 0.248 mm
Active range	476.64 x 268.11 mm
Backlighting	LED
Contrast ratio	typically 5000:1
Brightness	typically 300 cd/m²
Angle CR ≥ 10	all directions typically 89°
Life span	By compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness.

Article Number and Miscellaneous

Article number	12-200-2144
Operating system	–
Standard	designed according to UL
Approvals	CE

Notes

Multi-touch Operating Panel
TT 1533

with 15" XGA TFT color display

The TT 1533 is an intelligent terminal for programming and visualization of automated processes and designed for a carrier arm mount. Process diagnostics as well as operating and monitoring automated procedures are simplified using this terminal. A projective capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 15" XGA TFT color display.

The available interfaces can be used to exchange process data or configure the terminal. In the internal Flash memory, the operating system, application and application data are stored.

Performance Data

Processor	EDGE2 Technology
Processor cores	2
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-Kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	512-Mbyte
Internal remnant data memory	512-kbyte MRAM
Internal storage device	1-Gbyte microSD
Internal I/O	no
Interfaces	4x USB 2.0, Type A 2x Ethernet 1x CAN bus not galvanically separated
Internal interface connections and devices	1x TFT LCD color display 1x USB (touch connection)
Display Resolution	15" TFT color display 1024 x 768 pixels
Control panel	Touch screen (projective capacitive)

Real-time clock	no	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC	
	minimum +18 V DC	maximum +30 V DC
Supply voltage (UL)	18-30 V DC (Class 2, LVLC) in preparation	
Current consumption of power supply at +24 V	typically 500 mA (without externally connected devices)	maximum 1.2 A (with externally connected devices)
Inrush current	maximum 33 A for 25 µs	

Terminal

Dimensions	357.9 x 342.2 x 47.7 mm (W x H x D)	
Material	Frame und front: aluminum/glass Backside: sheet steel	
Weight	typically 5.1 kg	

Environmental Conditions

Storage temperature	-10 ... +80 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
Shock resistance	EN 60068-2-27	15 g (150 m/s²) duration 11 ms, 18 shocks
Protection type	Carrier arm mount with VESA75 whose connection also meets IP54	
	EN 60529 protected through the housing	front: IP54 rear panel: IP54

Display

Type	15" TFT color display
Resolution	XGA, 1024 x 768 pixels
Color depth	262K colors
LCD mode	normally black
LCD polarizer	transmissive
Pixel size	0.297 x 0.297 mm
Number of pixels	1024*3 (RGB) x 768
Active surface	304.1 x 228.1 mm
Backlighting	LED
Contrast	typically 1500:1
Brightness	typically 400 cd/m²
Angle CR ≥ 10	left, right, below, above 85°
Life span	by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness

Control Unit

Touch panel	Projective capacitive glass touch panel
Sensor type	Film glass

Article Number and Miscellaneous

Article number	01-270-1533
Operating system	Salamander
Standard	designed according to UL
Approvals	UL, cUL, CE, UKCA

Notes

Multi-touch Operating Panel
TT 1933-S

with 18.5" WXGA TFT color display

The TT 1933-S is an intelligent terminal for programming and visualization of automated processes. Process diagnostics as well as operating and monitoring automated procedures are simplified using this terminal. A projective capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 18.5" TFT color display.

The available interfaces can be used to exchange process data or configure the terminal. In the internal Flash memory, the operating system, application and application data are stored.

Performance Data

Processor	EDGE2 Technology
Processor cores	2
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-Kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	512-Mbyte
Internal remnant data memory	512-kbyte MRAM
Internal storage device (IDE)	1-Gbyte microSD
Internal I/O	no
Interfaces	3x USB 2.0, Type A 2x Ethernet
Internal interface connections and devices	1x TFT LCD color display 1x USB (touch connection)
Display Resolution	18.5" TFT color display 1366 x 768 pixels
Control panel	Touch screen (projective capacitive)

Real-time clock	no	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC (+18-30 V DC)	
Current consumption of power supply at +24 V	typically 650 mA (without externally connected devices)	maximum 850 mA (with externally connected devices)
Inrush current	maximum 30 A for 35 µs	
UL-Standard	For UL: must be powered with SELV / PELV and limited energy; digital outputs must also be powered with SELV / limited energy	

Terminal

Dimensions	471.6 x 344.5 x 44 mm (W x H x D)
Material	Frame und front: aluminum/glass Backside: sheet steel ESD lacquer
Weight	typically 5 kg

Environmental Conditions

Storage temperature	-10 ... +60 °C	
Environmental temperature	0 ... +45 °C	
Humidity	10-95 %, non-condensing	
Operating conditions	pollution degree 2 Indoor areas only altitude up to 2000 m	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
Shock resistance	EN 60068-2-27	15 g (150 m/s²) duration 11 ms, 18 shocks
Protection type	VESA100 carrier arm mount: IP54 VESA75 carrier arm mount: IP54, whereby the VESA100 mounting holes must be closed with protective caps or screws	
	EN 60529 protected through the housing	front: IP54 (not UL-listed) rear panel: IP54 (not UL-listed)

Display

Type	18.5" TFT color display
Resolution	WXGA 1366 x 768 pixels
Color depth	16.7M (6-bit RGB + Hi_FRC)
LCD mode	normally black
LCD polarizer	transmissive 2
Pixel size	0.3 x 0.3 mm
Active surface	409.8 x 230.4 mm
Backlighting	LED
Contrast	typically 1000:1
Brightness	typically 250 cd/m²
Typical angle CR = 10	left, right 85° bottom, top 80°
Life span	by compliance with the ambient conditions, the brightness of the display sinks after 30,000 operating hours to 50 % of the original brightness

Control Unit

Touch panel	Projective capacitive glass touch panel
Sensor type	Film glass

Article Number and Miscellaneous

Article number	01-270-1933-S
Operating system	Salamander
Standard	designed according to UL
Approvals	UL, cUL, CE

Notes

Multi-touch Operating Panel
TAE 2343

The TAE 2343 multi-touch operating panel is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.
The projective capacitive touch screen is used to enter process data and parameters. The output is displayed on a 23.8" full HD TFT color display with LED backlighting.

On the PC side, a SIGMATEK HMI-Link G2 is required, which processes the display and USB signal feeds and transmits them to the terminal over a standard Ethernet cable (CAT-5e or CAT-6). A secure connection over distance of up to 100 m between the PC and terminal is therewith possible.

Performance Data

Interfaces	1x HMI Remote IN (HMI-Link G2) 1x USB 2.0 Typ A OUT (left or right) 1x RFID reader HF (13,56 MHz) - multi-Iso protocol-capable
Internal interface connections and devices	1x TFT color display 1x projective capacitive touch screen
Control panel	Touch screen (projective capacitive)
Display	23.8" TFT color display Full HD, 1920 x 1080 Pixels LED Backlight

Electrical Requirements

Supply voltage	typically +24 V DC (+18-30 V DC)	
Supply voltage (UL)	+18-30 V DC Class 2	
Current consumption Power supply +24 V	typically 1.45 A	maximum 2 A
UL standard	for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy.	

Terminal

Material	front: glass rear panel including covers: Powder coated steel sheet wrap-around aluminum boarders	
Dimensions	385 x 664.6 x 49.3 mm (W x H x D)	
Weight incl. mounting bracket	11.5 kg	

Environmental Conditions

Storage temperature	-20 ... +60 °C	
Environmental temperature	0 ... +45 °C	
Humidity	10-95 %, non-condensing	
Operating conditions	pollution degree 2 indoor use altitude up to 2000 m	
EMC resistance	according to EN 61000-6-2 (industrial area)	
EMC noise generation	according to EN 61000-6-4 (industrial area)	
Radio Communication Conformity Europe	according to ETSI EN 300 330 (2014/53/EU, RED Directive)	
Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
Shock resistance	EN 60068-2-27	15 g (150 m/s²), duration 11 ms, 18 Shocks
Protection type	EN 60529: protected through the housing	front: IP54 (no UL-rating) cover: IP20 (no UL-rating)

Display

Type	23.8" TFT color display
Resolution	Full HD, 1920 x 1080 pixels
Color depth	6 Bit + AFRC
LCD mode	normally black
LCD Polarizer	transmissive
Pixel size	0.2745 x 0.2745 mm
Active surface	527.04 x 296.46 mm
Backlighting	LED backlight
Contrast	typically 1000
Brightness	typically 250 cd/m²
Angle CR ≥ 10	left, right, below, above 178°
Life span	after 30,000 hours at an ambient temperature of 25 °C, the brightness reduces to 50% or less of the original power.

Control Unit

	Touch panel	projective capacitive glass touch panel
	Sensor type	Film glass

Article Number and Miscellaneous

	Article number	12-200-2343
	Touch pen	01-690-059-3
	Standard	UL (E247993)
	Approvals	CE, $_{c}$UL$_{us}$

Notes

Touch Display Panel
TAE 151

with 15" XGA TFT color display

The TAE 151 Build-in touch terminal is used for the visualization of automated processes. Process diagnosis, operating and monitoring automated functions are simplified using this terminal.

A touch foil serves as the input medium for process data and parameters.

The output is shown on a 15" XGA TFT color display.

Performance Data

Display	15" TFT color (6-bit RGB)	
Control Unit	Touch pad	
Interfaces	front side: 3x USB V1.1 back side: S-DVI 1x USB Typ-A V1.1 1x CAN with 2 connections	

Electrical Requirements

Supply voltage	minimum +18 V DC	maximum +30 V DC	
Supply voltage (UL)	+18-30 V DC Class 2		
Current consumption of voltage supply	typically 825 mA (at +24 V) (measured without connected external devices)		

(the supply voltage is provided by the IPC over the S-DVI cable, which is available in lengths of 0.3 m/2 m/3 m/5 m/10 m/and 15 m.)

Terminal

Dimensions	358 x 313 x 62 mm (W x H x D)	
Material	housing: ASA Plastic	
Weight	typically 4.2 kg	

Control Unit

Touch pad	analog resistant film-glass touch panel
Dimensions	325.5 x 249.3 x 2.2 mm (W x H x D)
Active surface	304.1 mm x 228.1 mm
Resolution	12-bit controller (USB)
Data wheel	no
Buttons	no
LEDs	no
Signal generator	yes
Automatic display detection	yes

Display

Type	15" TFT color (6-bit RGB)
Resolution	1024 x 768 pixels
Color depth	18-bit (262 144 colors)
Pixel grid	0.297 mm x 0.297 mm
Active area	304.128 mm x 228.096 mm
Background lightning	LED
Brightness	typically 350 cd/m²
Contrast	typically 700 : 1
Perspective of	left and right 80°, above and below 70°

Article Number and Miscellaneous

Article number	12-200-151 without foil: 12-200-151-0
Hardware version	9.x
Standard	UL (E247993)
Approvals	CE, $_{c}$UL$_{us}$

Environmental Conditions

Storage temperature	-20 ... +60 °C	
Environmental temperature	0 ... +50 °C	
Humidity	20-95 %, non condensing	
EMC stability	EN 61000-6-2 (industrial area)	
Shock resistance	EN 60068-2-27	150 m/s²
Protection type	EN 60529	front: IP54 with USB covers back panel: IP20 without cable channel cover (with cable channel cover IP54)

Touch Operating Terminal
ETT 1561

with 15" XGA TFT color display

The ETT 1561 is an intelligent terminal for programming and visualization of automated processes. Process diagnostics as well as operating and monitoring automated procedures are simplified using this terminal. A resistive touch screen serves as the input medium for process data and parameters. The output is shown on a 15" XGA TFT color display. With the LSE mask editor, graphics can be created on the PC, then stored and displayed on the terminal.

In the internal Flash memory, the operating system, application and application data are stored.

Performance Data

Processor	EDGE2 Technology
Processor cores	2
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	512-Mbyte
Internal remnant data memory	512-kbyte SRAM (battery buffered)
Internal storage device	1-Gbyte microSD card
Interfaces	3x USB 2.0 Type A (front) 2x Ethernet 10/100 (RJ45) 1x CAN bus (6-pin Weidmüller) not galvanically separated
Internal interface connections and devices	1x TFT LCD color display 1x USB (touch connection)
Display Resolution	15" TFT color display 1024 x 768 pixels
Control panel	Touch screen (resistive touch)
Real-time clock	yes
Cooling	passive (fanless)

Electrical Requirements

	Supply voltage	typically +24 V DC	
		minimum +18 V DC	maximum +30 V DC
	Supply voltage (UL)	18-30 V DC (Class 2, LVLC)	
	Current consumption of power supply at +24 V	typically 700 mA (without externally connected devices)	maximum 1.2 A (with externally connected devices)
	Inrush current	2 A (10 ms)	

Terminal

	Dimensions	358 x 313 x 62 mm (W x H x D)
	Material	housing: ASA Plastic
	Weight	typically 4.2 kg

Display

	Type	15" TFT color display
	Resolution	XGA, 1024 x 768 pixels
	Color depth	262K colors
	LCD mode	normal white
	LCD Polarizer	transmissive
	Pixel size	0.297 x 0.297 mm
	Active surface	304.1 x 228.1 mm
	Touch panel	analog resistive glass touch panel
	Backlighting	LED
	Contrast	typically 700:1
	Brightness	typically 400 cd/m²
	Visible field	left, right 70, above 60° and below 55°

Article Number and Miscellaneous

	Article number	01-230-1561
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-10 ... +80 °C				
	Environmental temperature	0 ... +45 °C				
	Humidity	10-95 %, non-condensing				
	EMC stability	in accordance with product standard EN 61131-2				
	Vibration resistance	EN 60068-2-6		2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)		
	Shock resistance	EN 60068-2-27		15 g (150 m/s²) duration 11 ms, 18 Shocks		
	Protection type		Control cabinet mount with USB cover	Control cabinet mount without USB cover	Carrier arm mount with USB cover	Carrier arm mount without USB cover
		EN 60529	front: IP54 rear panel: IP20 With IP43 cable channel, if the cable outlet is located on the bottom	front: IP20 rear panel: IP20 With IP43 cable channel, if the cable outlet is located on the bottom	front: IP54 rear panel: IP20 With IP43 cable channel, if the cable outlet is located on the bottom	front: IP20 rear panel: IP20 With IP43 cable channel, if the cable outlet is located on the bottom
		NEMA 250 (UL50)	Type 12	Type 1	Type 1	Type 1

Notes

Touch Operating Panel
ETT 1962

with 19" SXGA TFT color display

The ETT 1962 is an intelligent terminal for programming and visualization of automated processes. Process diagnostics as well as operating and monitoring automated procedures are simplified using this terminal. A resistive glass touch screen serves as the input medium for process data and parameters. The output is shown on a 19" SXGA TFT color display. With the LSE mask editor, graphics can be created on the PC, then stored and displayed on the terminal. The available interfaces can be used to exchange process data or configure the terminal. In the internal Flash memory, the operating system, application and application data are stored.

Performance Data

Processor	EDGE2 Technology
Processor cores	2
Internal Cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	512-Mbyte
Internal remnant data memory	512-kbyte SRAM (battery buffered)
Internal storage device	1-Gbyte microSD card
Internal I/O	no
Interfaces	1x USB Host 2.0, Type A (front) 1x USB Host 2.0, Type A (rear, on circuit board) 2x Ethernet 10/100 (RJ45)
Internal interface connections and devices	1x TFT LCD color display 1x USB (touch connection)
Display Resolution	19" TFT color display 1280 x 1024 pixels

Control panel	Glass touch screen (resistive touch)	
Real-time clock	yes	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC	
	minimum +18 V DC	maximum +30 V DC
Current consumption of power supply at +24 V	0.85 A (without externally connected devices)	1 A (without externally connected devices)
Inrush current	1.2 A (3 ms)	

Terminal

Dimensions	360 x 462 x 57 mm (W x H x D)	
Weight incl. Mounting brackets	typically 7 kg	

Environmental Conditions

Storage temperature	-20 ... +60 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
EMC tolerance	EN 61000-6-2 (industrial area): EMC resistance EN 61000-6-4: Noise emission	
Vibration resistance	EN 60068-2-6	2-9 Hz: Amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
Shock resistance	EN 60068-2-27	15 g (150 m/s²), duration 11 ms, 18 Shocks
Protection type	EN 60529 protected through the housing	Front: IP54 Cover: IP20

Display

Type	19" TFT color display
Resolution	SXGA, 1280 x 1024 pixels
Color depth	24-bit (16 777 216 colors)
Pixel size	0.294 x 0.294 mm
Active surface	376.3 x 301.1 mm
Backlighting	LED
Contrast	typically 2000 : 1
Brightness	typically 300 cd/m²
Angle CR > 10 from	left and right 89°, above and below 89°

Control Unit

Touch pad	resistive glass foil glass touch panel
Active surface	376.3 x 301.1 mm
Resolution	12-bit (4096 x 4096)
Touch precision	< 1.5 % of maximum value (5.6 mm)

Article Number and Miscellaneous

Article number	01-230-1962
Hardware version	1.x
Software macro	LSE LASAL operating system
Project backup	internally on the microSD card

Notes

Touch Display Panel
TAE 1921

The TAE 1921 touch display unit is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.
A touch screen serves as the input medium for process data and parameters. The output is shown on a 19" SXGA TFT color display with LED backlighting.

A signal extender is required on the PC, which processes the display and USB signals, and sends them to the terminal over a standard Ethernet cable. Therewith, a connection over distance of 100 m between the PC and terminal is possible.

Performance Data

	Interfaces	1x Display IN (HMI-Link) 2x USB2.0 Type A (front + back side) 1x chip card reader (optional)
	Internal interface connections and devices	1x TFT color display 1x Touch
	Control panel	Touch-Screen (resistive)
	Display	19" TFT color display SXGA, 1280 x 1024 pixels LED backlight
	LEDs	Status display

Electrical Requirements

	Supply voltage	minimum +18 V DC	maximum +30 V DC
	Supply voltage (UL)	+18-30 V DC Class 2	
	Current consumptionsupply voltage	1.7 A at 24 V	
	Inrush current	maximum 43 A	

Terminal

	Dimensions	360 x 462 x 57 mm (W x H x D)
	Weight incl. mounting bracket	typically 7 kg

Display

	Type	19" TFT color display
	Resolution	SXGA, 1280 x 1024 pixels
	Backlighting	LED backlight
	Lifespan	after 50.000 hours at 25 °C ambient temperature, the brightness is reduced by 50 % of the original power

Control Unit

	Touch panel	analog resistive glass touch panel
	Active surface	376.3 mm x 301.1 mm

Article Number and Miscellaneous

	Article number	12-200-1921
	Standard	UL (E247993)
	Approvals	CE, $_{c}$UL$_{us}$

Environmental Conditions

	Storage temperature	-20 ... +60 °C	
	Environmental temperature	0 ... +50 °C	
	Humidity	10-95 %, non-condensing	
	EMC tolerance	EN 61000-6-2 (industrial area): EMC resistance EN 61000-6-4 noise emission	
	Vibration tolerance	EN 60068-2-6	2-9 Hz: Amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
	Shock resistance	EN 60068-2-27	15 g (150 m/s²), duration 11 ms, 18 shocks
	Protection type	EN 60529: protected through the housing	Front: IP54 Cover: IP20

Touch Display Panel
TAE 1931

The TAE 1931 touch display unit is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.
A touch screen serves as the input medium for process data and parameters. The output is shown on a 19" SXGA TFT color display with LED backlighting.

The display signals are exchanged through the Display port interface. To implement the USB connection, an A to B – USB cable is required.

Performance Data

	Interfaces	1x Displayport-IN (maximum cable length: 20 m) 1x USB2.0 Type B IN (maximum cable length: 5 m) 2x USB2.0 Type A OUT (front + backside) 1x Chip card reader (optional)
	Internal interface connections and devices	1x TFT color display 1x Touch
	Control panel	Touch-Screen (resistive)
	Display	19" TFT color display SXGA, 1280 x 1024 pixels LED backlight
	LEDs	Status display

Electrical Requirements

	Supply voltage	minimum +18 V DC	maximum +30 V DC
	Current consumptionsupply voltage	1.3 A at 24 V	
	Inrush current	maximum 28 A for < 1 ms	

Terminal

	Dimensions	360 x 462 x 57 mm (W x H x D)
	Weight incl. mounting bracket	typically 7 kg

Display

	Type	19" TFT color display
	Resolution	SXGA, 1280 x 1024 pixels
	Backlighting	LED backlight
	Lifespan	after 50.000 hours at 25 °C ambient temperature, the brightness is reduced by 50 % of the original power

Control Unit

	Touch panel	analog resistive glass touch panel
	Active surface	376.3 mm x 301.1 mm

Article Number and Miscellaneous

	Article number	12-200-1931
	Hardware version	1.x

Environmental Conditions

	Storage temperature	-20 ... +60 °C	
	Environmental temperature	0 ... +50 °C	
	Humidity	10-95 %, non-condensing	
	EMC tolerance	EN 61000-6-2 (industrial area): EMC resistance EN 61000-6-4 noise emission	
	Vibration tolerance	EN 60068-2-6	2-9 Hz: Amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
	Shock resistance	EN 60068-2-27	15 g (150 m/s²), duration 11 ms, 18 shocks
	Protection type	EN 60529: protected through the housing	Front: IP54 Cover: IP20

Touch Display Panel
TAE 1941

The TAE 1941 touch display unit is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.

A touch screen serves as the input medium for process data and parameters. The output is shown on a 19" SXGA TFT color display with LED backlighting.

On the PC side, a SIGMATEK HMI-Link G2 is required, which processes the display and USB signal feeds and transmits them to the terminal over a stand-ard Ethernet cable (CAT-5e or CAT-6). A secure connection over distance of up to 100 m between the PC and terminal is therewith possible.

Performance Data

Interfaces	1x HMI Remote IN (HMI-Link G2) 2x USB2.0 Type A
Internal interface connections and devices	1x TFT color display 1x Touch
Control panel	Touch-Screen (resistive)
Display	19" TFT color display SXGA, 1280 x 1024 pixels LED backlight
LEDs	Status display (HMI-Link G2)

Electrical Requirements

Supply voltage	typically +24 V DC (+18-30 V DC)	
Current consumption of power supply at +24 V	typically 1.45 A	maximum 2 A

Terminal

	Dimensions	360 x 462 x 57 mm (W x H x D)
	Weight incl. mounting bracket	typically 7 kg

Display

	Type	19" TFT color display
	Resolution	SXGA, 1280 x 1024 pixels
	Color depth	24 Bit (16 777 216 colors)
	Pixel size	0.294 x 0.294 mm
	Active surface	376.3 x 301.1 mm
	Backlighting	LED
	Contrast	typically 2000 : 1
	Brightness	typically 300 cd/m²
	Angle CR > 10 from	left and right 89°, above and below 89°
	Life span	after 50,000 hours at an ambient temperature of 25 °C, the brightness reduces to 50 % of the original power.

Control Unit

	Touch panel	analog resistive glass touch panel
	Active surface	376.3 mm x 301.1 mm

Article Number and Miscellaneous

	Article number	12-200-1941
	Hardware version	1.x

Environmental Conditions

	Storage temperature	-20 ... +60 °C	
	Environmental temperature	0 ... +50 °C	
	Humidity	10-95 %, non-condensing	
	EMC tolerance	EN 61000-6-2 (industrial area): EMC resistance EN 61000-6-4 noise emission	
	Vibration tolerance	EN 60068-2-6	2-9 Hz: Amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
	Shock resistance	EN 60068-2-27	15 g (150 m/s²), duration 11 ms, 18 shocks
	Protection type	EN 60529: protected through the housing	Front: IP54 Cover: IP20

Handheld Control Panel 8.4”
HGT 835

with 8.4” SVGA TFT color display

The HGT 835 Control Panel is an intelligent handheld control panel used for programming and visualization of automated processes. Process diagnosis, operating and monitoring functions are thereby simplified. A touch screen serves as the input medium for process data and parameters. The output is shown on an 8.4” SVGA TFT color display.

With the LSE mask editor, graphics can be created on the PC, then stored and displayed on the handheld control panel. The available interfaces can be used to exchange process data or configure the handheld control panel. On the Flash card, the operating system, application and application data are stored.

Performance Data

Processor	EDGE2 Technology
Processor cores	2
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	256-Mbyte
Internal remnant data memory	128-kbyte MRAM
Internal storage device	1024-Mbyte microSD card
Interfaces	1x Ethernet 1x USB 2.0 Type A 1x Safety Interface (safety specific) 1x VARAN
Internal interface connections and devices	1x TFT LCD color display 1x touch

Control panel	touch screen (analog resistive, 4-wire) confirmation switch (2 normally open, 3-stage) key switch (2 normally open) emergency stop switch (2 normally closed)	
DisplayResolution	8.4" TFT color display 800 x 600 pixels	
Signal generator	no	
Real-time clock	yes (buffering approximately 10 days)	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC (PELV)	
	minimum +24 V DC (PELV)	maximum +30 V DC (PELV)
Supply voltage (UL)	+24-30 V DC (NEC Class 2 or LVLC)	
Current consumption Power supply +24 V	typically 0.35 A (without externally connected devices)	typically 0.45 A (with external devices connected)
Inrush current	maximum 10 A for < 50 µs	
USB current load	maximum 0.5 A	

Terminal

Dimensions	217.4 x 187.7 x 72 mm (W x H x D) (without emergency stop switch/key switch)	
Material	housing: PC/ASA color: RAL7024	
Weight	typically, circa 0.95 kg without connector cable	

Environmental Conditions

Storage temperature	-10 ... +60 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
Operating conditions	pollution degree 2 altitude up to 2000 m	
EMC stability	EN 61000-6-2, EN 62061: EMC resistance EN 61000-6-4: noise emission	
Shock resistance	EN 60068-2-27	150 m/s²
Vibration tolerance	10 m/s²	
Protection Type	EN 60529	IP54 (with USB cover only)
Free fall (without packaging)	DIN EN 60068-2-32	500 mm

Display

Type	8.4" TFT LCD color display
Resolution	SVGA 800 x 600 pixels
Color depth	18-bit RGB (262K colors)
LCD mode	TN/normal white
LCD polarizer	transmissive
Pixel size	0.213 mm x 0.213 mm
Active surface	170.40 mm x 127.80 mm
Backlighting	LED
Contrast	typically 600 : 1
Brightness	typically 250 cd/m²
Angle CR ≥ 10	left and right 75, above 70° and below 60°

Connection Requirements

Connection technology	M16 plug
	special connector cable minimum bend radius: 147 mm

Article Number and Miscellaneous

Article number	01-245-835
Hardware version	1.x
Connector cable	optionally available
Standard	UL 508 (E247993)
Approvals	UL, cUL, CE

Notes

Handheld Control Panel 10.4”
HGT 1035

The HGT 1035 Control Panel is an intelligent handheld control panel used for programming and visualization of automated processes. Process diagnosis, operating and monitoring functions are thereby simplified.

A touch screen serves as the input medium for process data and parameters. The output is shown on a 10.4” XGA TFT color display.

Performance Data

Processor	EDGE2-Technology
Processor cores	2
Internal cache	32-kbyte L1 instruction cache 32-kbyte L1 data cache 512-kbyte L2 cache
Internal program and data memory (DDR3 RAM)	256-Mbyte
Internal remnant data memory	128-kbyte MRAM
Internal storage device	1024-Mbyte microSD card
Internal I/O	no
Interfaces	1x Ethernet 1x USB 2.0 Type A 1x Safety Interface (safety specific) 1x VARAN
Internal interface connections and devices	1x TFT LCD color display 1x touch

Control panel	touch screen (analog resistive) confirmation switch (2 normally open, 3-stage) key switch (2 normally open) emergency stop switch (2 normally closed)	
Display Resolution	10.4" TFT color display 1024 x 768 pixels	
Control panel	5-wire touch screen (analog resistive)	
Signal generator	no	
Real-time clock	yes (buffering approximately 10 days)	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC (PELV)	
	minimum +24 V DC (PELV)	maximum +30 V DC (PELV)
Supply voltage (UL)	+24-30 V DC (NEC Class 2 or LVLC)	
Current consumption Power supply +24 V	typically 0.5 A (without externally connected devices)	typically 0.6 A (with external devices connected)
Inrush current	maximum 10 A for < 50 ms	
USB current load	maximum 0.5 A	

Terminal

Dimensions	264 x 226 x 73.3 mm (W x H x D) (without key switch)	
Material	housing: PC/ASA color: RAL7024	
Weight	typically, circa 1.1 kg without connector cable	

Display

Type	10.4" TFT LCD color display	
Resolution	XGA, 1024 x 768 pixels	
Color depth	18-bit RGB (262K colors)	
LCD mode	normal black	
LCD polarizer	transmissive	
Pixel size	0.0685 mm x 0.2055 mm	
Backlighting	LED	
Contrast	typically 1000 : 1	
Brightness	typically 350 cd/m²	
Angle CR ≥ 10	88° from all sides	

Terminal Requirements

	Connection technology	M16 plug
		special connector cable minimum bend radius: 147 mm

Article Number and Miscellaneous

	Artikel number	01-245-1035
	Hardware version	1.x
	Connector cable	optionally available
	Standard	UL 508 (E247993)
	Approvals	UL, cUL, CE

Environmental Conditions

	Storage temperature	-10 ... +60 °C	
	Environmental temperature	0 ... +50 °C	
	Humidity	10-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC stability	EN 61000-6-2, EN 62061: EMC resistance EN 61000-6-4: noise emission	
	Shock resistance	EN 60068-2-27	150 m/s²
	Vibration resistance	10 m/s²	
	Protection type	EN 60529	IP54 (with USB cover only)
	Free fall (without packaging)	DIN EN 60068-2-31	500 mm

Notes

Handheld Control Panel 10.1”
HGT 1051

The HGT 1051 Control Panel is an intelligent handheld control panel used for programming and visualization of automated processes. Process diagnosis, operating and monitoring functions are thereby simplified.

A touch screen serves as the input medium for process data and parameters. The output is shown on a 10.1” WXGA TFT color display.

Performance Data

Processor	EDGE2-Technology
Processor cores	2
Internal cache	32-kbyte L1 instruction cache 32-kbyte L1 data cache 512-kbyte L2 cache
Internal program and data memory (DDR3 RAM)	512-Mbyte
Internal remnant data memory	128-kbyte MRAM
Internal storage device	1024-Mbyte microSD card
Internal I/O	no
Interfaces	2x Ethernet 1x USB 2.0 Type A 1x Safety interface
Internal interface connections and devices	1x TFT LCD color display 1x USB (touch connection)

Control panel	touch screen (projective capacitive) confirmation switch (2 normally open, 3-stage) key switch (2 normally open) emergency stop switch (2 normally closed)	
Display Resolution	10.1" TFT color display 800 x 1200 pixels	
Signal generator	no	
Real-time clock	yes (buffered circa 10 days via gold foil capacitor)	
Cooling	passive (fanless)	

Electrical Requirements

Supply voltage	typically +24 V DC (PELV)	
	minimum +24 V DC (PELV)	maximum +30 V DC (PELV)
Supply voltage (UL)	+24-30 V DC (NEC Class 2 or LVLC)	
Current consumption Power supply +24V	typically 408 mA (without externally connected devices)	maximium 464 mA (with external devices connected)
Inrush current	maximum 12.4 A for < 60 µs	
USB current load	maximum 0.5 A	

Terminal

Dimensions	226 x 264 x 76 mm (W x H x D) (without emergency/key switch)	
Material	housing: PC/ASA color: RAL7024	
Weight	typically, circa 1.1 kg without connector cable	

Display

Type	10.1" TFT LCD color display	
Resolution	WXGA, 800 x 1024 pixels	
Color depth	24-bit RGB	
LCD mode	normal black	
LCD polarizer	transmissive	
Pixel size	0.1695 x 0.1695 mm	
Backlighting	LED	
Contrast	typically 800 : 1	
Brightness	typically 300 cd/m²	
Angle CR ≥ 10	85° from all sides	

Terminal Requirements

	Connection technology	M16 plug
		special connector cable minimum bend radius: 147 mm

Article Number and Miscellaneous

	Artikel number	01-245-1051
	Hardware version	1.x
	Connector cable	optionally available
	Standard	UL 508 (E247993) in preparation
	Approvals	CE, TÜV EC type tested, $_{c}UL_{us}$ in preparation

Environmental Conditions

	Storage temperature	-10 ... +60 °C	
	Environmental temperature	0 ... +50 °C	
	Humidity	10-95 %, non-condensing	
	Operating conditions	pollution degree 2 altitude up to 2000 m	
	EMC stability	EN 61000-6-2, EN 62061: EMC resistance EN 61000-6-4: noise emission	
	Shock resistance	EN 60068-2-27	150 m/s²
	Vibration resistance	10 m/s²	
	Protection type	EN 60529	IP54 (with USB cover only)
	Free fall (without packaging)	DIN EN 60068-2-31	500 mm

Notes

Handheld Control Panel 10.1”
HGT 1053

The HGT 1053 Control Panel is an intelligent panel for visualizing, operating and monitoring automated processes. Process diagnostics is therewith simplified. The projected capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 10.1-inch TFT color display (WXGA 800 x 1280) with LED backlighting.

Performance Data

Processor	EDGE3-Technology
Processor cores	4
Internal program and data memory (RAM)	2-GByte (DDR4)
Internal remnant data memory	128-kByte FRAM
Internal storage device	8-GByte eMMC
Optional memory expansion	microSD
Graphic	integrated in EDGE processor
Interfaces	1x Ethernet (10/100/1000) 1x USB 2.0 Type A 1x Safety Interface
Internal interface connections and devices	1x TFT color display 1x USB 2.0 Type A 1x USB (touch connection) 1x microSD card holder (SD 3.0)

Operating components	Confirmation switch (2 normally open contacts, 3-stage) Key switch (2 normally open contacts) Emergency stop switch (2 normally closed contacts)	
Signal generator	no	
Display Resolution	10.1" TFT color display WXGA 800 x 1280 pixels	
Operating field	Touch screen (multi-touch, projective capacitive)	
Status LEDs	Multi-LED (red/green)	
Real-time clock	yes (battery buffered)	
Cooling	semi-passive (fan activated only when required)	

Electrical Requirements

Supply voltage	+24 V DC ±20 % (SELV/PELV) UL: Class 2 of LVLC	
Protection class	III	
Supply voltage (UL)	+24-30 V DC (NEC Class 2 or LVLC)	
Current consumption Power supply +24V	typically 600 mA (without externally connected devices)	maximium 700 mA (with external devices connected)
Inrush current	maximum 9 A for < 110 µs	
USB current load	maximum 0.5 A	

Terminal

Dimensions	226 x 264 x 76 mm (W x H x D) (without emergency/key switch)	
Material	housing: PC/ASA color: RAL7024	
Weight	typically, circa 1.25 kg without connector cable	

Display

Type	10.1" TFT LCD color display	
Resolution	WXGA, 800 x 1280 pixels	
Color depth	24-bit RGB	
LCD mode	normal black	
LCD polarizer	transmissive	
Pixel size	0.1695 x 0.1695 mm	
Backlighting	LED	
Contrast	typically 800 : 1	
Brightness	typically 300 cd/m²	
Angle CR ≥ 10	85° from all sides	

Article Number and Miscellaneous

Artikel number	01-245-1053
Connector cable	optionally available
Operating system	Gecko
Approvals	CE, TÜV-Austria EG-type-examined, UKCA

Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
Operating conditions	pollution degree 2	
EMC resistance	according to EN61000-6-2 (industrial area) (increased requirements according to EN 62061)	
EMC noise generation	according to EN 61000-6-3 (Household area) according to EN 61000-6-4 (industrial area)	
Shock resistance	EN 60068-2-27	15 g (147.15 m/s2)
Vibration resistance	EN 60068-2-6	5-150 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
Protection type	EN 60529 protection through housing	IP54 (only with all protective in place)
Free fall (with rough handling)	DIN EN 60068-2-31	1000 mm
Free fall (with packaging)	IEC 60068-2-32	1000 mm

Notes

Wireless Handheld Operating Panel 10.1"
HGW 1033

In combination with a BWH 001 base station, the HGW 1033 is a wireless, intelligent manual operating unit with emergency stop function that enables the programming, visualization and diagnosis of processes and systems control.

The HGW 1033 can be coupled with machines via base stations, which allows the flexible application of the operating station.

The interfaces can be used to configure the terminal. The integrated battery pack enables 2 hours of operation at full capacity.

The output is shown on a 10.1" WXGA TFT color display.

Performance Data

Processor	EDGE2 Technology
Processor cores	2
Internal cache	32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache
Internal program and data memory (DDR3 RAM)	2048-Mbyte
Internal remnant data memory	512-kbyte MRAM
Internal storage device	1-Gbyte microSD card
Internal I/O	no
Battery	4170 mAh Lithium-Ion Runtime: > 2 h continuous operation with new battery Charge/status display via the on/off button
Charging time	3 h via USB-C as well as base station at 25 °C with a rising temperature and active use of the device, the charge time may increase
Interfaces	1x USB 2.0 Type-A (Host) 1x USB 2.0 Type-C (Dual Role Port, charging) 1x WLAN dual-band (2.4 GHz, 5 GHz simultaneously)

	Internal interface connections and devices	1x TFT color display 1x USB (touch connection)
	Control Elements	Touch screen (multi-touch, projective capacitive) 1x illuminated on/off button (with application interface)
	Display Resolution	10.1" TFT color display, 16:10, portrait mode WXGA 800 x 1280 pixels
	Status LEDs	2x front (controllable via application) 1x rear (boot status/controllable via the application) 1x normally open gate (shows power and charge status)
	Signal generator	yes (at least 83 dB at 30 cm)
	Real-time clock	yes (buffered circa 3 days via internal battery)
	Temperature sensors	4 (2x LP, 1x CPU, 1x battery)
	Cooling	passive (fanless)
	Input voltage measurement	yes

Electrical Requirements

	Charging voltage magnetic connector	typically +19 V DC	
		minimum +15 V DC	maximum +24 V
	Charging current	via base station: up to 2.5 A at 15.5 V	
	USB host current load	maximum 0.5 A	

Display

	Type	10.1" TFT LCD color display
	Active range	135.6 (V) x 216.96 (H) mm
	Resolution	WXGA 800 x 1280 pixels
	Color depth	18-bit RGB (16.7 million colors)
	LCD mode	normal black
	LCD polarizer	transmissive
	Pixel size	0.1695 x 0.1695 mm
	Backlighting	LED, adjustable
	Contrast	typically 800 : 1
	Brightness	typically 300 cd/m²
	Angle CR ≥ 10	85° from all sides

Input

Input	Multi-touch screen (PCAP)	
Power button	1	

Environmental Conditions

Storage temperature	-5 ... +50 °C (in transport mode)	
Environmental temperature discharging	0 ... +50 °C	
Environmental temperature charging	0 ... +40 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100m	
Operating conditions	pollution degree 2	
EMC resistance	EN 61000-6-2 (industrial area) (increased requirements according to IEC/EN 62061)	
EMC noise generation	EN 60068-2-6	
Shock resistance	EN 60068-2-27	150 m/s²
Vibration resistance	10 m/s²	
Protection type	EN 60529	IP54 (with USB cover only)
Free fall (rough handling)	DIN EN 60068-2-31	1000 mm
Free fall (with packaging)	IEC 60068-2-32	1000 mm

WLAN 2.4 GHz

Frequency range	2399.5-2484.5 MHz
Transmission power max.	20 dBm (100 mW) EIRP
Channels	1-13 (2412-2472 MHz)

WLAN 5 GHz

Frequency range	5150-5350 MHz 5470-5725 MHz
Transmission power max.	23 dBm (200 mW) EIRP
Channels	36-48 (5180-5240 MHz) 149-165 (5745-5825 MHz)

Antennae

Number	2
Frequency range	2.4/5 GHz
Transmission power max.	25 W
Antenna gain	2.4 GHz-4 dBi Peak Gain 5 GHz-4 dBi Peak Gain
Impedance	50 Ω
Transmission angle/characteristic	Transmission characteristic: omnidirectional Polarization: linear

Article Number and Miscellaneous

Article number	12-246-1033
Operating system	Salamander
Approvals	CE
Dimensions	226 x 266 x 76 mm (W x H x D)
Material	housing: PC/ASA color: RAL7024 front: glass 1.1 mm
Weight	1.27 kg

Wireless Handheld Operating Panel 10.1"
HGW 1033-01

In combination with a BWH 001 base station, the HGW 1033-01 is a wireless, intelligent manual operating unit with emergency stop function that enables the programming, visualization and diagnosis of processes and systems control.

The HGW 1033-01 can be coupled with machines via base stations, which allows the flexible application of the operating station.

The interfaces can be used to configure the terminal. The integrated battery pack enables 2 hours of operation at full capacity.

The output is shown on a 10.1" WXGA TFT color display.

Performance Data

Processor	EDGE2 Technology
Processor cores	2
Internal cache	32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache
Internal program and data memory (DDR3 RAM)	2048-Mbyte
Internal remnant data memory	512-kbyte MRAM
Internal storage device	1-Gbyte microSD card
Internal I/O	no
Battery	4170 mAh Lithium-Ion Runtime: > 2 h continuous operation with new battery Charge/status display via the on/off button
Charging time	3 h via USB-C as well as base station at 25 °C with a rising temperature and active use of the device, the charge time may increase
Interfaces	1x USB 2.0 Type-A (Host) 1x USB 2.0 Type-C (Dual Role Port, charging) 1x WLAN dual-band (2.4 GHz, 5 GHz simultaneously)

Internal interface connections and devices	1x TFT color display 1x USB (touch connection)
Control Elements	Touch screen (multi-touch, projective capacitive) 1x illuminated on/off button (with application interface)
Display Resolution	10.1" TFT color display, 16:10, landscape mode WXGA 1280 x 800 pixels
Status LEDs	2x front (controllable via application) 1x rear (boot status/controllable via the application) 1x power switch(shows power and charge status)
Signal generator	yes (at least 83 dB at 30 cm)
Real-time clock	yes (buffered circa 3 days via internal battery)
Temperature sensors	4 (2x LP, 1x CPU, 1x battery)
Cooling	passive (fanless)
Input voltage measurement	yes

Electrical Requirements

Charging voltage magnetic connector	typically +19 V DC	
	minimum +15 V DC	maximum +24 V
Charging current	via base station: up to 2.5 A at 15.5 V	
USB host current load	maximum 0.5 A	

Display

Type	10.1" TFT LCD color display
Active range	135.6 (V) x 216.96 (H) mm
Resolution	WXGA 1280 x 800 pixels
Color depth	18-bit RGB (16.7 million colors)
LCD mode	normal black
LCD polarizer	transmissive
Pixel size	0.1695 x 0.1695 mm
Backlighting	LED, adjustable
Contrast	typically 800 : 1
Brightness	typically 300 cd/m²
Angle CR ≥ 10	85° from all sides

Input

Input	Multi-touch screen (PCAP)
Power button	1

Environmental Conditions

Storage temperature	-5 ... +50 °C (in transport mode)	
Environmental temperature discharging	0 ... +50 °C	
Environmental temperature charging	0 ... +40 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100m	
Operating conditions	pollution degree 2	
EMC resistance	EN 61000-6-2 (industrial area) (increased requirements according to IEC/EN 62061)	
EMC noise generation	EN 60068-2-6	
Shock resistance	EN 60068-2-27	150 m/s²
Vibration resistance	10 m/s²	
Protection type	EN 60529	IP54 (with USB cover only)
Free fall (rough handling)	DIN EN 60068-2-31	1000 mm
Free fall (with packaging)	IEC 60068-2-32	1000 mm

WLAN 2.4 GHz

Frequency range	2399.5-2484.5 MHz
Transmission power max.	20 dBm (100 mW) EIRP
Channels	1-13 (2412-2472 MHz)

WLAN 5 GHz

Frequency range	5150-5350 MHz 5470-5725 MHz
Transmission power max.	23 dBm (200 mW) EIRP
Channels	36-48 (5180-5240 MHz) 149-165 (5745-5825 MHz)

Antennae

Number	2
Frequency range	2.4/5 GHz
Transmission power max.	25 W
Antenna gain	2.4 GHz-4 dBi Peak Gain 5 GHz-4 dBi Peak Gain
Impedance	50 Ω
Transmission angle/characteristic	Transmission characteristic: omnidirectional Polarization: linear

Article Number and Miscellaneous

Article number	12-246-1033-01
Operating system	Salamander
Approvals	CE
Dimensions	266 x 226 x 76 mm (W x H x D)
Material	housing: PC/ASA color: RAL7024 front: glass 1.1 mm
Weight	1.27 kg

Wireless Handheld Operating Panel 10.1"
HGW 1033-3

In combination with a BWH 001 base station and a safety-related PLC, the HGW 1033-3 is a wireless, intelligent manual operating unit with emergency stop function that enables the programming, visualization and diagnosis of processes and systems control.

The HGW 1033-3 can be coupled with machines via base stations, which allows the flexible application of the operating station.

The interfaces can be used to configure the terminal. The integrated battery pack enables 2 hours of operation at full capacity.

The output is shown on a 10.1" WXGA TFT color display.

Performance Data

Processor	EDGE2 Technology
Processor cores	2
Internal cache	32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache
Internal program and data memory (DDR3 RAM)	2048-Mbyte
Internal remnant data memory	512-kbyte MRAM
Internal storage device	512-Mbyte microSD card, expandable
Internal I/O	no
Battery	4170 mAh Lithium-Ion Runtime: > 2 h continuous operation with new battery Charge/status display via the on/off button
Charging time	3 h via USB-C as well as base station at 25 °C with a rising temperature and active use of the device, the charge time may increase
Interfaces	1x USB 2.0 Type-A (Host) 1x USB 2.0 Type-C (Dual Role Port, charge: USB-PD Profile 4: 20V, 3 A, 60 W) 1x WLAN dual-band (2.4 GHz, 5 GHz simultaneously)

	Internal interface connections and devices	1x TFT color display 1x USB (touch connection)
	Control Elements	Touch screen (multi-touch, projective capacitive) 1x confirmation switch (2 normally open, 3-stage) 1x key switch (2 normally open) 1x illuminated emergency stop switch (2 normally closed) 1x illuminated on/off button (with application interface)
	Display Resolution	10.1" TFT color display, 16:10, portrait mode WXGA 800 x 1280 pixels
	Status LEDs	3x front (controllable via application) 1x rear (boot status/controllable via the application) 1x normally open gate (shows power and charge status)
	Signal generator	yes (at least 83 dB at 30 cm)
	Real-time clock	yes (buffered circa 3 days via internal battery)
	Temperature sensors	4 (2x LP, 1x CPU, 1x battery)
	Cooling	passive (fanless)
	Coupling display	7-segment LED, two-digit
	Input voltage measurement	yes

Electrical Requirements

	Charging voltage magnetic connector	typically +19 V DC	
		minimum +15 V DC	maximum +24 V
	Charging current	via base station: up to 2.5 A at 15.5 V	
	USB host current load	maximum 0.5 A	

Display

	Type	10.1" TFT LCD color display
	Active range	135.6 (V) x 216.96 (H) mm
	Resolution	WXGA 800 x 1280 pixels
	Color depth	18-bit RGB (16.7 million colors)
	LCD mode	normal black
	LCD polarizer	transmissive
	Pixel size	0.1695 x 0.1695 mm
	Backlighting	LED, adjustable
	Contrast	typically 800 : 1
	Brightness	typically 300 cd/m²
	Angle CR ≥ 10	85° from all sides

Input

Input	Multi-touch screen (PCAP)
Emergency stop switch	1
Confirmation switch	1 (3 switch positions with panic function)
Key switch	1 (2 switch positions)
Power button	1

Environmental Conditions

Storage temperature	-5 ... +50 °C (in transport mode)	
Environmental temperature discharging	0 ... +50 °C	
Environmental temperature charging	0 ... +40 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100m	
Operating conditions	pollution degree 2	
EMC resistance	EN 61000-6-2 (industrial area); EN 61000-6-7 (immunity industrial functional safety) (increased requirements according to IEC/EN62061)	
EMC noise generation	EN 61000-6-4	
Shock resistance	EN 60068-2-27	150 m/s²
Vibration resistance	10 m/s²	
Protection type	EN 60529	IP54 (with USB cover only)
Free fall (rough handling)	DIN EN 60068-2-31	1000 mm
Free fall (with packaging)	IEC 60068-2-32	1000 mm

WLAN 2.4 GHz

Frequency range	2399.5-2484.5 MHz
Transmission power max.	20 dBm (100 mW) EIRP
Channels	1-13 (2412-2472 MHz)

WLAN 5 GHz

Frequency range	5150-5350 MHz 5470-5725 MHz
Transmission power max.	23 dBm (200 mW) EIRP
Channels	36-48 (5180-5240 MHz) 149-165 (5745-5825 MHz)

Antennae

Number	2
Frequency range	2.4/5 GHz
Transmission power max.	25 W
Antenna gain	2.4 GHz-4 dBi Peak Gain 5 GHz-4 dBi Peak Gain
Impedance	50 Ω
Transmission angle/characteristic	Transmission characteristic: omnidirectional Polarization: linear

Article Number and Miscellaneous

Article number	12-246-1033-3
Operating system	Salamander
Approvals	CE, TÜV-Austria EG-type-examined
Safety	SIL 3, PL e, Kat 4
Dimensions	226 x 276 x 76 mm (W x H x D)
Material	housing: PC/ASA color: RAL7024 front: glass 1.1 mm
Weight	1.35 kg

Wireless Handheld Operating Panel 10.1"
HGW 1033-32

In combination with a BWH 001 base station and a safety-related PLC, the HGW 1033-32 is a wireless, intelligent manual operating unit with emergency stop function that enables the programming, visualization and diagnosis of processes and systems control.

The HGW 1033-32 can be coupled with machines via base stations, which allows the flexible application of the operating station.

The interfaces can be used to configure the terminal. The integrated battery pack enables 2 hours of operation at full capacity.
The output is shown on a 10.1" WXGA TFT color display. Additionally, three rotary encoders are integrated into the front of the HGW 1033-32.

Performance Data

Processor	EDGE2 Technology
Processor cores	2
Internal cache	32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache
Internal program and data memory (DDR3 RAM)	2048-Mbyte
Internal remnant data memory	512-kbyte MRAM
Internal storage device	512-Mbyte microSD card, expandable
Internal I/O	no
Battery	4170 mAh Lithium-Ion Runtime: > 2 h continuous operation with new battery Charge/status display via the on/off button
Charging time	3 h via USB-C as well as base station at 25 °C with a rising temperature and active use of the device, the charge time may increase
Interfaces	1x USB 2.0 Type-A (Host) 1x USB 2.0 Type-C (Dual Role Port charge: USB-PD Profile 4: 20 V, 3 A, 60 W) 1x WLAN dual-band (2.4 GHz, 5 GHz simultaneously)

Internal interface connections and devices	1x TFT color display 1x USB (touch connection)
Control Elements	Touch screen (multi-touch, projective capacitive) 1x confirmation switch (2 normally open, 3-stage) 1x key switch (2 normally open) 1x illuminated emergency stop switch (2 normally closed) 1x illuminated on/off button (with application interface) 3x rotary encoder (analyzable via the application)
Display Resolution	10.1" TFT color display, 16:10, portrait mode WXGA 800 x 1280 pixels
Status LEDs	3x front (controllable via application) 1x rear (boot status/controllable via the application) 1x normally open gate (shows power and charge status)
Signal generator	yes (at least 83 dB at 30 cm)
Real-time clock	yes (buffered circa 3 days via internal battery)
Temperature sensors	4 (2x LP, 1x CPU, 1x battery)
Cooling	passive (fanless)
Coupling display	7-segment LED, two-digit
Input voltage measurement	yes

Electrical Requirements

Charging voltage magnetic connector	typically +19 V DC	
	minimum +15 V DC	maximum +24 V
Charging current	via base station: up to 2.5 A at 15.5 V	
USB host current load	maximum 0.5 A	

Display

Type	10.1" TFT LCD color display
Active range	135.6 (V) x 216.96 (H) mm
Resolution	WXGA 800 x 1280 pixels
Color depth	18-bit RGB (16.7 million colors)
LCD mode	normal black
LCD polarizer	transmissive
Pixel size	0.1695 x 0.1695 mm
Backlighting	LED, adjustable
Contrast	typically 800 : 1
Brightness	typically 300 cd/m²
Angle CR ≥ 10	85° from all sides

Input

Input	Multi-touch screen (PCAP)
Emergency stop switch	1
Confirmation switch	1 (3 switch positions with panic function)
Key switch	1 (2 switch positions)
Power button	1
Rotary encoder	3

Environmental Conditions

Storage temperature	-5 ... +50 °C (in transport mode)	
Environmental temperature discharging	0 ... +50 °C	
Environmental temperature charging	0 ... +40 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100m	
Operating conditions	pollution degree 2	
EMC resistance	EN 61000-6-2 (industrial area); EN 61000-6-7 (immunity industrial functional safety) (increased requirements according to IEC/EN62061)	
EMC noise generation	EN 61000-6-4	
Shock resistance	EN 60068-2-27	150 m/s²
Vibration resistance	10 m/s²	
Protection type	EN 60529	IP54 (with USB cover only)
Free fall (rough handling)	DIN EN 60068-2-31	1000 mm
Free fall (with packaging)	IEC 60068-2-32	1000 mm

WLAN 2.4 GHz

Frequency range	2399.5-2484.5 MHz
Transmission power max.	20 dBm (100 mW) EIRP
Channels	1-13 (2412-2472 MHz)

WLAN 5 GHz

Frequency range	5150-5350 MHz 5470-5725 MHz
Transmission power max.	23 dBm (200 mW) EIRP
Channels	36-48 (5180-5240 MHz) 149-165 (5745-5825 MHz)

Antennae

Number	2
Frequency range	2.4/5 GHz
Transmission power max.	25 W
Antenna gain	2.4 GHz-4 dBi Peak Gain 5 GHz-4 dBi Peak Gain
Impedance	50 Ω
Transmission angle/characteristic	Transmission characteristic: omnidirectional Polarization: linear

Article Number and Miscellaneous

Article number	12-246-1033-32
Operating system	Salamander
Approvals	CE, TÜV-Austria EG-type-examined
Safety	SIL 3, PL e, Kat 4
Dimensions	226 x 276 x 96 mm (W x H x D)
Material	housing: PC/ASA color: RAL7024 front: glass 1.1 mm
Weight	1.39 kg

WLAN HGW Base Station
BWH 001

The BWH 001 base station acts as a gateway and establishes a connection between an HGW and a machine control. Depending on the S-DIAS controller used (e.g. CP/SCP 111), both safety data (via black channel) and non-safety data can be transmitted redundantly. In addition, the BWH 001 serves as a receiving and charging station for the HGW.

The signal lamp allows a simple coupling between HGW and machine. States can be made visible via programmable pictogram LEDs. The base station can also communicate with other controllers over an Ethernet interface.

Performance Data

Processor	EDGE2 Technology
Processor cores	1
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-Kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	256-Mbyte
Internal remnant data memory	no
Internal storage device	1-Gbyte microSD card
Internal I/O	no
Interfaces	1x magnetic connector for charging the battery 1x M12 connector supply and Ethernet 1x M12 connector Ethernet 1x USB 2.0 Type-C (Dual Role Port) 1x WLAN dual-band (2.4 GHz, 5 GHz simultaneously)
Status LEDs	1x Power 1x HGW-Link (freely programmable) 2x Network (freely programmable) 1x application-/RUN-LED

Signal generator	no	
Cooling	passive (fanless)	
Coupling confirmation	signal light	
Input voltage measurement	no	

Electrical Requirements

Supply voltage	typically +24 V DC (SELV/PELV)	
	minimum +20 V DC	maximum +30 V DC
Protection class	3	
Inrush current	16.1 A for 1 ns	
Current consumption of +24 V power supply	ca. 200 mA in CLI maximum 2.5 A charging at full capacity at +24 V	
USB Host current load	maximum 0.5 A	

Environmental Conditions

Storage temperature	-5 ... +60 °C	
Environmental temperature	0 ...+50 °C	
Humidity	10-95 %, non-condensing	
EMC resistance	EN 61000-6-2 (industrial area)	
EMC noise generation	EN 61000-6-4	
Shock resistance	EN 60068-2-27	150 m/s²
Vibration resistance	10 m/s²	
Protection type	EN 60529	IP54
Free fall (with packaging)	IEC 60068-2-32	500 mm

WLAN 2.4 GHz

Frequency range	2399.5-2484.5 MHz
Transmission power max.	20 dBm (100 mW) EIRP
Channels	1-13 (2412-2472 MHz)
Standards	IEEE 802.11 b/g/n

WLAN 5 GHz

Frequency range	5150-5350 MHz 5470-5725 MHz
Transmission power max.	23 dBm (200 mW) EIRP
Channels	36-48 (5180-5240 MHz) 149-165 (5745-5825 MHz)
Standards	IEEE 802.11 a/n/ac

Antennae

Number	2
Frequency range	2.4/5 GHz
Transmission power max.	25 W
Antenna gain	2.4 GHz-4 dBi Peak Gain 5 GHz-5.2 dBi Peak Gain
Impedance	50 Ω
Transmission angle/ characteristics	transmission characteristics: omnidirectional Polarization: linear

Article Number and Miscellaneous

Article number	12-246-001
Approvals	CE, UKCA
Dimensions	175 x 267.4 x 52.9 mm (W x H x D)
Material	housing: steel color: RAL7024 (powder coated) front: plexiglass
Weight	typically 1.55 kg

Notes

WLAN HGW Base Station
BWH 011

The BWH 011 base station serves as the gateway of a connection between an HGW and a machine control. Safety (via Black Channel), as well as non-Safety data can be redundantly transmitted – independent of the S-DIAS control used (e.g. CP/SCP 111).

States can be displayed via programmable LEDs The base station can also communicate with other controls over Ethernet interfaces.

Performance Data

Processor	EDGE2 Technology
Processor cores	1
Internal cache	32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache
Internal program and data memory (DDR3 RAM)	256 Mbytes
Internal remnant data memory	no
Internal storage device	1-Gbyte microSD card
Internal I/O	no
Interfaces	1x M12 connector supply and Ethernet 1x M12 connector Ethernet 1x USB 2.0 Type-C (Dual Role Port) 1x WLAN dual-band (2.4 GHz, 5 GHz simultaneously) 1x LED connection for the blink-code output

Status LEDs	1x Power 1x HGW-Link (freely programmable) 2x Network (freely programmable) 1x application/RUN-LED
Signal generator	no
Cooling	passive (fanless)
Coupling confirmation	by means of a signal light: either via external control with digital output (e.g.: CP 111 with TO 161) or via the internal LED connection
Input voltage measurement	no

Electrical Requirements

Supply voltage	+24 V DC ±20 % (SELV/PELV)
Protection class	3
Inrush current	16.1 A for 1 ns
Current consumption of +24 V power supply	ca. 200 mA in CLI
USB Host current load	maximum 0.5 A

Environmental Conditions

Storage temperature	-5 ... +60 °C	
Environmental temperature	0 ...+50 °C	
Humidity	10-95 %, non-condensing	
Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
Operating conditions	pollution degree 2	
EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN 60068-2-6	5-150 Hz: amplitude 3.5 mm Transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute
Shock resistance	EN 60068-2-27	15 g (147.15 m/s2),
Protection type	EN 60529	IP54
Free fall(with packaging)	IEC 60068-2-32	1000 mm

WLAN 2.4 GHz

Frequency range	2399.5-2484.5 MHz
Transmission power max.	20 dBm (100 mW) EIRP
Channels	1-13 (2412-2472 MHz)
Standards	IEEE 802.11 b/g/n

WLAN 5 GHz

Frequency range	5150-5350 MHz 5470-5725 MHz
Transmission power max.	23 dBm (200 mW) EIRP
Channels	36-48 (5180-5240 MHz) 149-165 (5745 – 5825 MHz)
Standards	IEEE 802.11 a/n/ac

Antennae

Number	2
Frequency range	2.4/5 GHz (Dual-Band)
Transmission power max.	25 W
Antenna gain	2.4 GHz-4 dBi Peak Gain 5 GHz-5.2 dBi Peak Gain
Impedance	50 Ω
Transmission angle/characteristic	transmission characteristics omnidirectional Polarization: linear

Article Number and Miscellaneous

Article number	12-246-011
Approvals	CE
Dimensions	175 x 267.4 x 52.9 mm (W x H x D)
Material	housing: aluminum Color: anodized natural
Weight	typically 0.4 kg

Notes

Handheld Control Panel 10.1”
HBG 1012

In combination with the SIGMATEK HMI-Link Gen 2 and a safety-related PLC, the HBG 1012 is a cable-connected (permanently installed hybrid cable, 20 m) handheld operating unit with an emergency stop function that enables the programming, visualization and diagnosis of processes and systems control.

Process data, procedures and parameters are comfortably presented on the 10.1” display and can be entered or changed via the touch screen.

Performance Data

Interfaces	1x HMI-Link Gen 2 1x USB 2.0 Type A 1x Safety interface
Internal interface connections and devices	1x TFT color display 1x USB (touch connection)
Control elements	1x confirmation switch (2 normally open, 3-stage) 1x key switch (2 normally open) 1x emergency stop switch (2 normally closed contacts)
Signal generator	no
Display Resolution	10.1” TFT color display, 16:10, landscape mode WXGA 1280 x 800 pixels
Operating field	Touch screen (multi-touch, projective capacitive)
Status LEDs	1x back
Real-time clock	no
Temperature sensors	none
Cooling	passive (fanless)

Electrical Requirements

	Supply voltage	typically +24 V DC ±20 % (SELV/PELV), UL: NEC Class 2	
	Current consumption Power supply +24 V	typically 480 mA (without externally connected devices)	maximum 560 mA (with externally connected devices)
	Protection class	III	
	Inrush current	maximum 26 A for < 50 µs	
	USB current load	maximum 0.5 A	

Display

	Type	10.1" TFT LCD color display
	Active area	135.6 x 216.96 mm
	Resolution	WXGA 1280 x 800 pixels
	Color depth	18-bit RGB (16.7 million colors)
	LCD mode	normally black
	LCD polarizer	transmissive
	Pixel size	0.1695 x 0.1695 mm
	Backlighting	LED, adjustable
	Contrast	typically 800:1
	Brightness	typically 300 cd/m²
	Angle CR ≥ 10	85° from all sides

Input

	Input	Multi-touch screen (PCAP)
	Emergency stop switch	1
	Confirmation switch	1 (3 switch positions with panic function)
	Key switch	1 (2 switch positions)

Environmental Conditions

	Storage temperature	-5 ... +60 °C	
	Ambient temperature	0 ... +45 °C	
	Humidity	10-95 %, non-condensing	
	Installation altitude above sea level	0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m	
	Operating conditions	pollution degree 2	
	Noise emissions	≤ 70 dB	
	EMC resistance	according to EN 61000-6-2 (industrial area) according to 61000-6-7 (noise immunity industry-functional Safety) (increased requirements according to EN IEC 62061)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm of 5-8.4 Hz 1 g of 8,4-150 Hz
	Shock resistance	EN 60068-2-27	115 g (147.15 m/s²)
	Protection type	EN 60529/NEMA 250	IP54/Type12 (only with all protective caps in place) (not evaluated by UL)
	Free fall (with rough handling)	DIN EN 60068-2-31	1000 mm
	Free fall (with packaging)	IEC 60068-2-32	500 mm

Article Number and Miscellaneous

	Article number	12-245-1012
	Standards	designed according to UL
	Approvals	CE, TÜV-Austria EG Type Tested
	Dimensions	264 x 236 x 76 mm (W x H x D)
	Material	Housing: PC/ASA Color: RAL7024 Front: Glass 1.1 mm
	Weight	3.30 kg incl. connector cable (permanently installed hybrid cable, 20 m)

Notes

Keypad SIGMATEK
TE 891

The keypad has a CAN bus interface and can be connected directly to a TAE display unit.

A customer-specific foil is placed on the TE 891. The buttons can be assigned as desired.

Performance Data

	Interfaces	left or right: chip card reader chip card reader back panel: emergency stop connection 1x CAN with 2 connections
	Control panel	89x function buttons /1x emergency stop
	Signal generator	no

Electrical Requirements

	Emergency stop	maximum +24 V AC/2 A	
	Supply voltage	minimum +18 V DC	maximum +30 V DC
	Current consumption of voltage supply	250 mA at +24 V	

Terminal

	Dimensions	358 x 313 x 62 mm (W x H x D)	
	Material	housing: ASA Plastic	front plate: aluminum sheet with laminated foil
	Weight	typically 2.5 kg	

Article Number and Miscellaneous

Article number	12-210-891
Hardware version	1.x
Standard	UL (E247993)

Environmental Conditions

Storage temperature		-20 ... +85 °C			
Environmental temperature		0 ... +60 °C			
Humidity		0-95 %, non-condensing			
EMC stability		EN 61000-6-2 (industrial area)			
Shock resistance		EN 60068-2-27		150 m/s²	
Protection type		control box mount without chip card reader	control box mount with chip card reader	support arm mount without chip card reader	support arm mount with chip card reader
	EN 60529	front: IP54 back panel: IP20, with IP43 cable, if the cable outlet is located below.	front: IP30 back panel: IP20, with IP43 cable, if the cable outlet is located below.	front: IP54 back panel: IP20, with IP43 cable, if the cable outlet is located below.	front: IP30 back panel: IP20, with IP43 cable, if the cable outlet is located below.
	NEMA 250 (UL50)	type 12	type 1	type 1	type 1

Keypad

TE 401

The TE 401 keypad has 40 buttons and 40 LEDs. These buttons are read by the software and can then be used for any desired function. The LEDs indicate the operating status.

In addition, four external switching elements can be connected.

Performance Data

Interfaces	12-pin connector for 4x 3 switching elements 2-pin power connector 1x CAN with 2 connections	
Control panel	40x function buttons/4x switch recesses	
Signal generator	no	

Electrical Requirements

Supply voltage	minimum +18 V DC	maximum +30 V DC
Current consumption Supply voltage	127 mA-175 mA	

Terminal

Dimensions	240 x 220 x 40.1 mm (W x H x D)	
Material	housing: aluminum	front plate: aluminum

Article Number and Miscellaneous

Article number	12-210-401-T	
Hardware version	1.x	

Environmental Conditions

Storage temperature	-20 ... +80 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
Shock resistance	EN 60068-2-27	150 m/s²
Protection type	IP20 in accordance with EN 60529	

Keypad

TE 501

The TE 501 keypad has 50 buttons and 50 LEDs. These buttons are read by the software and can then be used for any desired function. The LEDs indicate the operating status.

In addition, four external switching elements can be connected.

Performance Data

Interfaces	12-pin connector for 4x 3 switching elements 2-pin power connector 1x CAN with 2 connections	
Control panel	50x function buttons/4x switch recesses	
Signal generator	no	

Electrical Requirements

Supply voltage	minimum +18 V DC	maximum +30 V DC
Current consumption Supply voltage	148 mA-207 mA	

Terminal

Dimensions	320 x 260 x 46.7 mm (W x H x D)	
Material	housing: aluminum	front plate: aluminum

Article Number and Miscellaneous

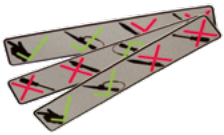
Article number	12-210-501-T
Hardware version	1.x

Environmental Conditions

Storage temperature	-20 ... +80 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
Shock resistance	EN 60068-2-27	150 m/s²
Protection type	IP20 in accordance with EN 60529	

Accessories HMI

Available Products

	Description	Article number
	HGT 835-Z1 Wall Mount for HGT 835, HBG 0811 HGT 1035-Z2 Wall Mount for HGT 1035, HBG 1011	01-245-835-Z1 01-245-1035-Z2
	Floppy drive DL 350 1.44 MB, 3.5”	01-690-031
	USB Stick 2-Gbytes	12-620-203
	Sticker "Instructions for touch operation"	on request

Available Products

	Description	Article number
	Touch protection foil	on request
	Touch pen V2 with holder for resistive touch	01-690-059-2
	Touch pen V3 with holder for capacitive touch	01-690-059-3

Motion

Control System

MOTION

Motion Control System

Modern machines and systems demand more efficient drive technology with greater flexibility, higher precision and reliability. With the Motion Control System from SIGMATEK, a high performance, operator-friendly and economic complete solution is provided that offers a great deal of freedom when implementing your machine and plant concepts.

Integrated Drive Technology

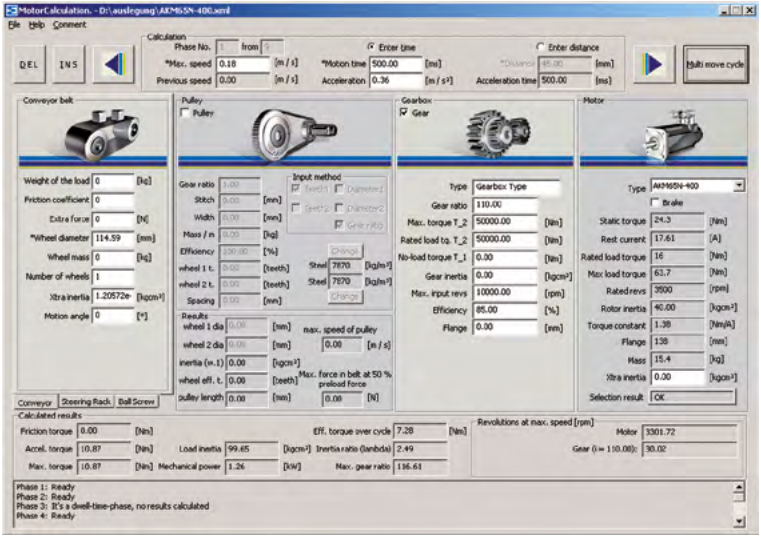
Motors, servo drive systems and software are fully integrated into the SIGMATEK automation system. Motion control tasks can therefore be solved simply and flexibly. The Dias Drives of the 2000 series and the servo motors are designed for special requirements. In combination with the engineering tool LASAL MOTION, highly dynamic, synchronized and reliable servo applications are provided from one source. The open, Ethernet-based VARAN bus ensures extremely fast, hard real-time and nearly jitter-free communication.

Synchronous Servomotors and Planetary Gears

The synchronous servomotors of the AKM series are compact power packages for highly dynamic motion tasks seven sizes with standstill torques from 0.18 to 53 Nm and peak torques up to 143 Nm are available. The AKM servomotors can be combined into compact coaxially constructed drive units using planetary gears from the PEII series.
For the low voltage range, low-voltage synchronous servo motors from the AKM and SM series are available in various sizes. The compact low-voltage motors can be easily integrated into existing machines and systems.

Dimensioning, Construction of Motors and Drives

For any application: With an appropriately customized and optimized drive concept, the energy efficiency can be increased. Important thereby, are need-based dimensioning and the professional construction of the drives and motors.

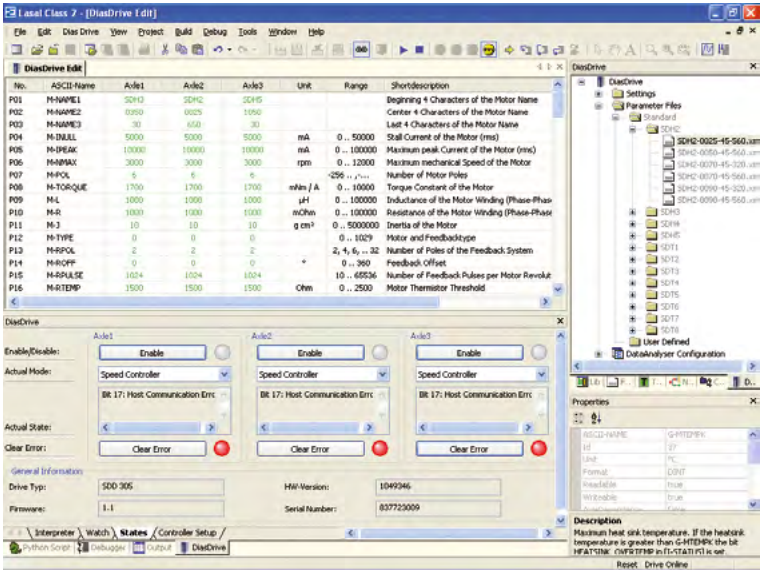


Comfortable, Simple Start-up and Maintenance

The integration of the initial start-up and parametrization software LASAL DRIVE into the object oriented project development tool LASAL, simplifies programming, parametrization and operation. No additional software is necessary and the time required for the initial start-up is reduced significantly.

In combination with LASAL MOTION, the connection to virtual lead axes, the creation and execution of profiles as well as the coupling of several axes and the use of various motion control functions is possible.

Parameters sets that can be simply linked to the application and edited are available for all SIGMATEK motors. All the parameters can be stored in the control, which guarantees that the drive always has the correct data. The servo amplifier can therefore be exchanged without additional effort and without a software tool.



LASAL MOTION

LASAL MOTION is a component of the engineering tool LASAL, which enables the seamless integration of the drive technology into the control system.

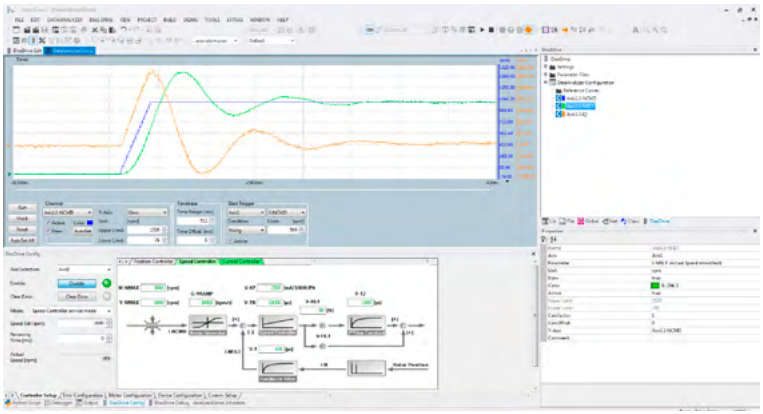
Simple, comfortable and clearly organized
LASAL MOTION's modular construction allows drive concepts to be implemented flexibly and efficiently. With this software package, the most complex axis control and regulation tasks can be solved with high precision, dynamics and little effort.

Large library with motion control and technology functions.
In the library provided, a large selection of standard motion functions is available such as absolute, relative and endless positioning as well as CNC functions, coordinated movements such as linear interpolation with up to 6 axes, circular interpolation, CAM discs, gear functions, flying saws, electronic CAMs and tracked movements. Furthermore, numerous referencing types and NC applications are available in addition to standard functions.

Data Analyzer, Graphic Representation of Controller Start-Up

The DIAS Drives have an internal data analyzer that can record data with a scan rate of 62.5 µs. This data is recorded in the converter in real time and displayed through the software tool.

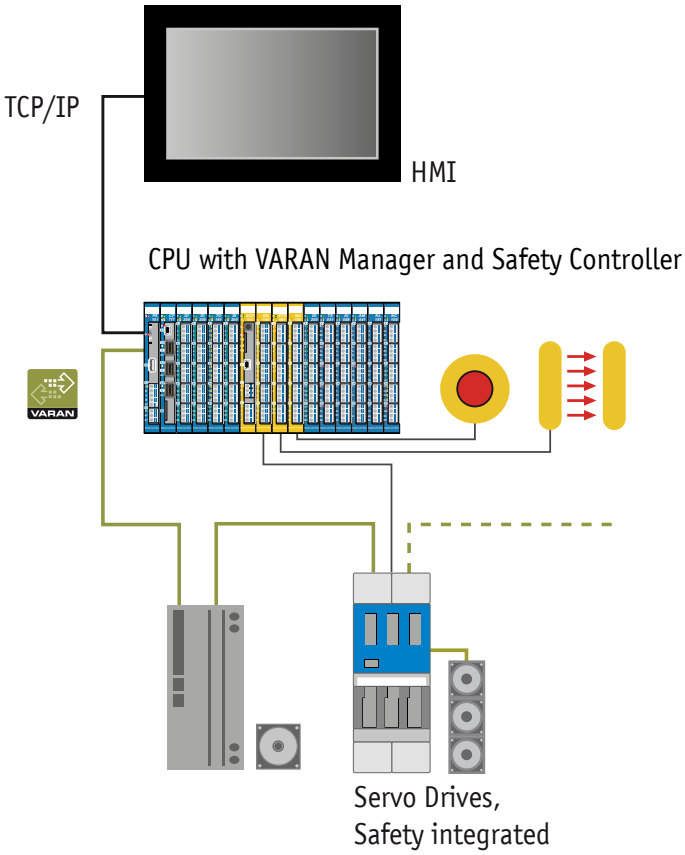
Current, rotation speed and position control are graphically displayed in the software, which ensures a clear overview at any time. All respective control parameters are visible at a glance and can be set individually.



Optimizing the controllers and displaying the data analyzer can be done in the same screen view.

Examples of Automation with DIAS Drives

With the combination of the DIAS Drives and the real-time Ethernet bus system VARAN, the user achieves high performance and safety with drive control. The DIAS Drives can be integrated into the VARAN bus network in a tree, star or linear structure.




X11
X12
X13
X10
A1
A2
A3
X1
X2
X3
SIGMATEK
MDP 2100
CAUTION!

Motion Control System

DIAS Drives

Servo Motors

Planetary Gears

Cables

Interface Cards

DIAS Drive

MDD 2000

The DIAS-Drive 2000 series contains the power/axis modules and axis modules for a power input voltage of 400/480 V AC. The system is currently available in 2 different sizes.

In the power/axis modules (MDP), as well as the axis modules (MDD), up to 3 servo amplifiers are integrated. With a power/axis module, several axis modules can be powered.

The DIAS-Drive 2000 is a complete servo drive system for the low to mid power range, which can also be used for applications high control performance. It is completely integrated into the LASAL design environment.

Available Models

Short Description	Type	Safety	Universal Encoder	Article Number
MDP2102-DDD-00	Power/axis module with 3 x 5/15 A (230 V)	yes	yes	in preparation
MDP2100-DDD-03	Power/axis module with 3 x 5/15 A	yes	yes	09-83-100-DDD-03
MDD2100-DDD-03	Axis module with 3 x 5/15 A	yes	yes	09-84-100-DDD-03
MDP2200-HHH-03	Power/axis module with 3 x 10/30 A	yes	yes	09-83-200-HHH-03
MDD2200-HHH-03	Axis module with 3 x 10/30 A	yes	yes	09-84-200-HHH-03
MDP2100-DDD-00	Power/axis module with 3 x 5/15 A	yes	no	09-83-100-DDD-00
MDP2200-HHH-00	Power/axis module with 3 x 10/30 A	yes	no	09-83-200-HHH-00
MDD2100-DDD-00	Axis module with 3 x 5/15 A	yes	no	09-84-100-DDD-00

DC-link Circuit

Module	MDP/MDD 2102*		MDP/MDD 2100		MDP/MDD 2200		MDP/MDD 2300*	
Intermediate circuit nominal voltage	1.3 kW	2.6 kW for 10 s	4 kW	8 kW for 10 s	9 kW	18 kW for 10 s	18 kW	36 kW for 10 s
Intermediate circuit nominal voltage	325 V		565 V					
Maximum DC-link voltage	430 V		850 V					
DC-link capacitance	1320 µF (MDP) 1980 µF (MDD)		330 µF (MDP) 495 µF (MDD)		660 µF		1155 µF	
Maximum current via DCB	40 A							

+24 V Auxiliary Voltage

Module	MDP/MDD 210X	MDP/MDD 2200	MDP/MDD 2300*
Rated input voltage	+24 V		
Input voltage range	+22-30 V SELV/PELV		
Current consumption per module	1 A + brake current		
Input capacitance	1 mF		
Maximum current via BCB	20 A		
Maximum cable length	30 m		

Axis/Motor Connection

Module	MDP/MDD 210X	MDP/MDD 2200	MDP/MDD 2300*
Maximum number of drives	3		
Switching frequency	8 kHz		
Derating	2,5 %/°C over 45 °C (axis current and DC-link power are affected)		
Continuous current/peak current for 1 s per axis	5/15 A	10/30 A	A1: 30/90 A A2: 22/66 A
Maximum total current	15 A	30 A	45 A
Maximum output frequency	599 Hz		
Maximum cable length	30 m		

Safe/Capture Inputs

Type	Safe input (Input 1-4)	Capture input (Input 5-6)
Number	6	
Rated input voltage:	+24 V	
Input voltage range	+18-30 V	
Signal level	low: ≤ +5 V	low: ≤ +5 V, high ≥ +15 V
Switching threshold	typically +11 V	
Input current	typically 3.6 mA at +24 V	
Input delay	typically 0.5 ms at +24 V	typically 3 µs at +24 V

* in preparation

Signal Output for Cross-Circuit Detection

Module	MDP/MDD 210X	MDP/MDD 2200	MDP/MDD 2300*
Number	1x signal A per module 1x signal B per module		
Rated output voltage	+24 V		
Output voltage range	+22-30 V		
Output current	maximum 100 mA		
Short-circuit proof	yes		

Encoder Interface

Module		MDP/MDD 210X	MDP/MDD 2200	MDP/MDD 2300*
On-board	Maximum amount	3		
	Type	Hiperface DSL		
	Connection type	Single cable solution		
	Power supply	12 V		
Optional	Maximum amount	3		
	Type	Resolver/Sin-Cos/TTL/Hiperface/EnDAT 2.1/Tamagawa/BiSS-C		
	Voltages	5 V (with Remote Sensing)/9 V		
	Maximum cable length	30 m		

Power Supply

Modules	MDP 2102*	MDP 2100	MDP 2200	MDP 2300*
Rated supply voltage	1x 230 V AC	3x 400 V AC		
Supply voltage range	1x 230 V AC ±10%	3x 380-480 V AC ±10 %		
Over voltage category	III			
Power supply frequency	45-65 Hz			
Rated connection load	2.8 kVA	8.5 kVA	17.25 kVA	27.6 kVA
Input current	12 A	12 A	25 A	40 A
Inrush current	maximum 15 A	maximum 35 A		maximum 45 A
Neutral point	grounded			
Maximum permissible short-circuit current	5 kA			
Net	TN-S, TN-C-S (with grounded star point)			
	IT (on request)			
Integrated power filter in compliance with EN 61800-3, category C3	yes			
Maximum fuse	Line protection: 13 A Type C		Line protection: 25 A Type C	Line protection: 40 A Type C
	Operating class gG (gL): 13 A		Operating class gG (gL): 25 A	Operating class gG (gL): 40 A

Ballast Resistance

Module	MDP 2102*	MDP 2100	MDP 2200	MDP 2300*
Internal braking resistor value	yes (25 Ω)			yes (20 Ω)
peak output int./ext.	7.4 kW/12.3 kW	28.9 kW/28.9 kW	28.9 kW/36.1 kW	37 kW/48.1 kW
continuous output int./ext.	50 W/500 W		200 W/1000 W	400 W/2000 W
Minimum permissible braking resistance (ext.)	15 Ω	25 Ω	20 Ω	15 Ω
Overload protection	yes			
Short circuit protection	yes			
Ground fault protection	no			
Maximum cable length	3 m			

Communication

Module	MDP/MDD 210X	MDP/MDD 2200	MDP/MDD 2300*
Bus	VARAN		

Motor Holding Brake

Module	MDP/MDD 210X	MDP/MDD 2200	MDP/MDD 2300*
Maximum continuous current	1.5 A		
Overload and short-circuit protection	yes		
Low-voltage monitor	yes		
Cable break monitor	yes		
Braking voltage reduction	yes (12-24 V)		

Mechanics

Module	MDP/MDD 210X	MDP/MDD 2200	MDP/MDD 2300*
Cooling	Air, cold-plate in preparation		
Backplane	none required		
Mounting position	vertical, hanging		
Clearance above and below	at least 3 cm		
Fan	yes, exchangeable		
Dimensions (W x H x D)	75 x 242 x 219 mm	150 x 242 x 219 mm	225 x 242 x 219 mm
Weight	3 kg	5.2 kg	7.2 kg

* in preparation

Environmental Conditions

Module	MDP/MDD 210X	MDP/MDD 2200	MDP/MDD 2300*
Storage temperature	-25 ... +70 °C		
Nominal environmental temperature	0 ... +45 °C		
Environmental temperature max.	0 ... +55 °C (with derating 2.5 %/°C above 45 °C)		
Humidity	maximum relative humidity 85 %, non-condensing		
Altitude	up to 1000 m above NN at rated values 1000-3000 m above NN with reduction by 1.5 % / 100 m (rated output current and rated input power affected)		
Operating conditions	pollution degree 2		
Vibration resistance	frequency: 5-150 Hz acceleration: 1 g amplitude: 0.075 mm (0.15 mm pp)		
Shock resistance	acceleration: 15 g		
Protection type	IP20		

Miscellaneous

Module	MDP/MDD 210X	MDP/MDD 2200	MDP/MDD 2300*
Normung	designed according to UL		
Approvals	CE, TÜV-Austria EG-type-examined		

* in preparation

Notes

VARAN Stepper Module
VST 012

The VST 012 is a VARAN module designed for the control of a stepper motor up to a maximum 10 A RMS. The available operating modes are full step, half step and micro step. The maximum switching frequency of the output stage is 50 kHz.

The motor output is released through the Enable input. An incremental encoder input is available for position control of the stepper motor.

The module also provides four digital inputs and four digital outputs. The VARAN Out port allows the configuration of the VARAN bus in a linear structure.

Interfaces

	Interfaces	1x VARAN In (RJ45) 1x VARAN Out (RJ45) (maximum length: 100 m)

Incremental Encoder Input

	Number of channels	1
	Input signals	Incremental encoder signals (A, /A, B, /B, R, /R) RS422 level 150 Ω termination
	Input frequency	maximum 250 kHz
	Counter frequency	maximum 1 MHz
	Signal evaluation	4X
	Counter resolution	16-bit
	Power supply	+5 V/±5 %/0.2 A short-circuit protected
	Encoder cable length	maximum 30 m

Enable Input

Number of inputs	1	
Input voltage	typically +24 V	maximum +30 V
Signal level	low: < +5 V	high: > +14 V
Switching threshold	typically +9.5 V	
Input current	typically 5 mA at +24 V	
Input delay	typically 5 ms	
Status display	green LEDs	

Digital Inputs

Number of inputs	4	
Input voltage	typically +24 V	maximum +30 V
Signal level	low: < +5 V	high: > +14 V
Switching threshold	typically +9.5 V	
Input current	typically 5 mA at +24 V	
Input delay	typically 10 µs	
Status display	green LEDs	

Digital Outputs

Number of outputs	4
Short-circuit proof	yes
Maximum permittedcontinuous load current/channel	2 A
Maximum total current (entire module)	6 A (100 % of on time)
Residual current (off)	≤ 12 mA
Turn-on delay	< 400 ms
Turn-off delay	< 400 ms
Status display	yellow LEDs

Stepper Motor Output

Number of phases	2
Output voltage	dependent on the supply (18-60 V)
Controller frequency	maximum 50 kHz
Output current	maximum 10 A continuous current in full step mode maximum 10 A continuous current in half step mode maximum 10 A RMS continuous current in micro step mode
Output current over the environmental temperature	maximum 10 A RMS continuous current at 45 °C maximum 8.6 A RMS continuous current at 50 °C maximum 6.3 A RMS continuous current at 55 °C maximum 5 A RMS continuous current at 60 °C

	Intermediate circuit capacitance	440 µF
	Step resolution	32 micro steps per full step
	Voltage measurement	15-73 V with an under voltage < 15 V or over voltage > 73 V, the motor output is shut down through the hardware.
	Temperature measurement	45-125 °C using an NTC at the mounting bracket Temperature warning at 85 °C => software warning over temperature at 95 °C => hardware shutdown of the motor output
	Motor cable length	maximum 30 m

Electrical Requirements

	Power supply +24 V	18-30 V DC
	Current consumption power supply +24 V	maximum 300 mA (electronic supply) + load on the digital outputs
	Supply voltage stepper motor	18-60 V DC
	Current consumption of stepper motor supply	corresponds to the load on the stepper motor

Voltage Monitor

	Power supply +24 V	supply voltage > 18 V (DC OK-LED lights green)
	Supply voltage stepper motor	supply voltage > 18 V and < 60 V (DC OK-LED lights green)

Article Number and Miscellaneous

	Article number	16-014-012
	Approval	CE, $_{c}$UL$_{us}$
	Mechanical dimensions	26 x 151 x 121.5 mm (W x H x D)

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	Operating conditions	pollution degree 2	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Shock resistance	EN 60068-2-27	150 m/s²
	Protection Type	EN 60529	IP20

Notes

Servo Motors
Series AKM

The synchronous servomotors from the AKM series are brushless, rotary current motors with three-phase windings for demanding servo applications. These motors have permanent magnets in the rotor. These motors have permanent magnets in the rotor. The neodymium magnet material and the low inertial moment contribute significantly to making these motors highly dynamic and allow them to have a very low cogging. The robust, compact motors with high power density are available in seven sizes and fine graduations, whereby customization is possible.

Motors are available with idling torques from 0.18 to 53 Nm and a peak torque of up to 143 Nm.

Motor and sensor cables in standard 5 m/10 m/15 m/20 m/25 m lengths are also available.

Standard Configuration:
Smooth wave, IP65 protection, 2-pin resolver, temperature sensors in the stator windings for monitoring the temperature, UL-conforming configuration

Options:
Fitted key, holding brake (AKM2-7), shaft seal (IP67), rotatable plug, various sensor systems

Technical Data

Motor	Motor - Data											Brake - Data			Drive	
	Motor standstill torque	Rated torque	Peak torque	Rated rotation speed	Rated power	Standstill current	Rated current	Peak current	Torque constant	Rotor inertial torque	Motor weight	Holding torque	Holding brake torque	Holding brake weight	Rated supply voltage 230 V	Rated supply voltage 400 V
	M_0 (Nm)	M_n (Nm)	M_{max} (Nm)	n_n (min^{-1})	P_n (kW)	I_0 (A)	I_n (A)	I_{max} (A)	K_T (Nm/A)	J ($kgcm^2$)	G (kg)	M_{br} (Nm)	J_{br} ($Kgcm^2$)	G_{br} (kg)		
AKM1																
AKM11B	0.18	0.17	0.61	8000	0.14	1.16	1.06	4.6	0.16	0.017	0.35	-	-	-	X	
AKM12C	0.31	0.28	1.08	8000	0.23	1.51	1.33	6	0.21	0.031	0.49	-	-	-	X	
AKM13C	0.41	0.36	1.46	8000	0.30	1.48	1.29	5.9	0.28	0.045	0.63	-	-	-	X	
AKM2																
AKM21C	0.48	0.39	1.47	8000	0.32	1.58	1.30	6.3	0.30	0.11	0.82	1.42	0.011	0.27	X	
AKM22C	0.84	0.78	2.73	3500	0.29	1.39	1.28	5.6	0.61	0.16	1.1	1.42	0.011	0.27	X	
AKM22C	0.84	0.68	2.73	8000	0.57	1.39	1.11	5.6	0.61	0.16	1.1	1.42	0.011	0.27		X
AKM22E	0.87	0.70	2.76	8000	0.59	2.73	2.19	11	0.32	0.16	1.1	1.42	0.011	0.27	X	
AKM23C	1.13	1.08	3.77	2500	0.28	1.41	1.35	5.6	0.80	0.22	1.38	1.42	0.011	0.27	X	
AKM23C	1.13	0.99	3.77	5500	0.57	1.41	1.24	5.6	0.80	0.22	1.38	1.42	0.011	0.27		X
AKM23D	1.16	1.03	3.84	5000	0.54	2.19	1.98	8.8	0.52	0.22	1.38	1.42	0.011	0.27	X	
AKM23D	1.16	0.92	3.84	8000	0.77	2.19	1.77	8.8	0.52	0.22	1.38	1.42	0.011	0.27		X
AKM23F	1.18	0.94	3.88	8000	0.79	4.31	3.48	17.2	0.27	0.22	1.38	1.42	0.011	0.27	X	
AKM24C	1.38	1.32	4.67	2000	0.28	1.42	1.36	5.7	0.97	0.27	1.66	1.42	0.011	0.27	X	
AKM24C	1.38	1.25	4.67	4500	0.59	1.42	1.29	5.7	0.97	0.27	1.66	1.42	0.011	0.27		X
AKM24D	1.41	1.29	4.76	4000	0.54	2.21	2.05	8.8	0.63	0.27	1.66	1.42	0.011	0.27	X	
AKM24D	1.41	1.11	4.76	8000	0.93	2.21	1.76	8.8	0.63	0.27	1.66	1.42	0.011	0.27		X
AKM24F	1.42	1.12	4.82	8000	0.94	3.89	3.11	15.6	0.36	0.27	1.66	1.42	0.011	0.27	X	
AKM3																
AKM31C	1.15	1.12	3.88	2500	0.29	1.37	1.32	5.5	0.85	0.33	1.55	2.5	0.011	0.35	X	
AKM31C	1.15	1.0	3.88	5000	0.52	1.37	1.18	5.5	0.85	0.33	1.55	2.5	0.011	0.35		X
AKM31E	1.20	0.95	4.0	6000	0.60	2.99	2.32	12	0.41	0.33	1.55	2.5	0.011	0.35	X	
AKM32C	2.0	1.95	6.92	1500	0.31	1.44	1.39	5.8	1.40	0.59	2.23	2.5	0.011	0.35	X	
AKM32C	2.0	1.86	6.92	3000	0.58	1.44	1.33	5.8	1.40	0.59	2.23	2.5	0.011	0.35		X

Technical Data

Motor	Motor - Data											Brake - Data			Drive	
	Motor standstill torque	Rated torque	Peak torque	Rated rotation speed	Rated power	Standstill current	Rated current	Peak current	Torque constant	Rotor inertial torque	Motor weight	Holding torque	Holding brake torque	Holding brake weight	Rated supply voltage 230 V	Rated supply voltage 400 V
	M_0 (Nm)	M_n (Nm)	M_{0max} (Nm)	n_n (min^{-1})	P_n (kW)	I_0 (A)	I_n (A)	I_{max} (A)	K_T (Nm/A)	J ($kgcm^2$)	G (kg)	M_{br} (Nm)	J_{br} ($Kgcm^2$)	G_{br} (kg)		
AKM32D	2.04	1.93	7.1	2500	0.51	2.23	2.10	8.9	0.92	0.59	2.23	2.5	0.011	0.35	X	
AKM32D	2.04	1.65	7.1	5500	0.95	2.23	1.79	8.9	0.92	0.59	2.23	2.5	0.011	0.35		X
AKM32E	2.04	1.87	7.11	3500	0.69	2.82	2.56	11.3	0.73	0.59	2.23	2.5	0.011	0.35	X	
AKM32E	2.04	1.41	7.11	7000	1.03	2.82	1.93	11.3	0.73	0.59	2.23	2.5	0.011	0.35		X
AKM32H	2.10	1.45	7.26	7000	1.06	5.50	3.72	22	0.39	0.59	2.23	2.5	0.011	0.35	X	
AKM33C	2.71	2.64	9.76	1000	0.28	1.47	1.42	5.9	1.86	0.85	2.9	2.5	0.011	0.35	X	
AKM33C	2.71	2.54	9.76	2000	0.53	1.47	1.37	5.9	1.86	0.85	2.9	2.5	0.011	0.35		X
AKM33E	2.79	2.62	9.96	2000	0.55	2.58	2.38	10.3	1.10	0.85	2.9	2.5	0.011	0.35	X	
AKM33E	2.79	2.34	9.96	4500	1.10	2.58	2.13	10.3	1.10	0.85	2.9	2.5	0.011	0.35		X
AKM33H	2.88	2.27	10.22	5500	1.31	5.62	4.37	22.5	0.52	0.85	2.9	2.5	0.011	0.35	X	
AKM4																
AKM41C	1.95	1.88	6.12	1200	0.24	1.46	1.40	5.8	1.34	0.81	2.44	6	0.068	0.63	X	
AKM41C	1.95	1.77	6.12	3000	0.56	1.46	1.32	5.8	1.34	0.81	2.44	6	0.068	0.63		X
AKM41E	2.02	1.82	6.28	3000	0.57	2.85	2.56	11.4	0.71	0.81	2.44	6	0.068	0.63	X	
AKM41E	2.02	1.58	6.28	6000	0.99	2.85	2.23	11.4	0.71	0.81	2.44	6	0.068	0.63		X
AKM41H	2.06	1.62	6.36	6000	1.02	5.60	4.38	22.4	0.37	0.81	2.44	6	0.068	0.63	X	
AKM42C	3.35	3.10	11.3	1500	0.49	1.40	1.29	5.6	2.40	1.5	3.39	6	0.068	0.63		X
AKM42E	3.42	3.12	11.3	1800	0.59	2.74	2.48	11	1.26	1.5	3.39	6	0.068	0.63	X	
AKM42E	3.42	2.81	11.3	3500	1.03	2.74	2.23	11	1.26	1.5	3.39	6	0.068	0.63		X
AKM42G	3.53	2.90	11.5	3500	1.06	4.80	3.92	19.2	0.74	1.5	3.39	6	0.068	0.63	X	
AKM42G	3.53	2.35	11.5	6000	1.48	4.80	3.18	19.2	0.74	1.5	3.39	6	0.068	0.63		X
AKM42J	3.56	2.38	11.6	6000	1.5	8.4	5.53	33.6	0.43	1.5	3.39	6	0.068	0.63	X	
AKM43E	4.70	4.24	15.9	1500	0.67	2.76	2.47	11	1.72	2.1	4.35	6	0.068	0.63	X	
AKM43E	4.70	3.92	15.9	2500	1.03	2.76	2.28	11	1.72	2.1	4.35	6	0.068	0.63		X
AKM43G	4.80	4.00	16.1	2500	1.05	4.87	4.04	19.5	0.99	2.1	4.35	6	0.068	0.63	X	
AKM43G	4.80	3.01	16.1	5000	1.58	4.87	3.04	19.5	0.99	2.1	4.35	6	0.068	0.63		X

Technical Data

Motor	Motor - Data											Brake - Data			Drive	
	Motor standstill torque	Rated torque	Peak torque	Rated rotation speed	Rated power	Standstill current	Rated current	Peak current	Torque constant	Rotor inertial torque	Motor weight	Holding torque	Holding brake torque	Holding brake weight	Rated supply voltage 230 V	Rated supply voltage 400 V
	M_0 (Nm)	M_n (Nm)	M_{0max} (Nm)	n_n (min^{-1})	P_n (kW)	I_0 (A)	I_n (A)	I_{max} (A)	K_T (Nm/A)	J ($kgcm^2$)	G (kg)	M_{br} (Nm)	J_{br} ($Kgcm^2$)	G_{br} (kg)		
AKM43K	4.9	2.62	16.4	6000	1.65	9.6	5.04	38.4	0.52	2.1	4.35	6	0.068	0.63	X	
AKM44E	5.76	5.22	19.9	1200	0.66	2.90	2.55	11.4	2.04	2.7	5.30	6	0.068	0.63	X	
AKM44E	5.76	4.80	19.9	2000	1.01	2.90	2.35	11.4	2.04	2.7	5.30	6	0.068	0.63		X
AKM44G	5.88	4.90	20.3	2000	1.03	5.0	4.12	20	1.19	2.7	5.30	6	0.068	0.63	X	
AKM44G	5.88	3.76	20.3	4000	1.57	5.0	3.16	20	1.19	2.7	5.30	6	0.068	0.63		X
AKM44J	6.00	2.75	20.4	6000	1.73	8.80	3.99	35.2	0.69	2.7	5.30	6	0.068	0.63		X
AKM5																
AKM51E	4.70	4.41	11.6	1200	0.55	2.75	2.56	8.2	1.72	3.4	4.2	14.5	0.173	1.1	X	
AKM51E	4.70	3.98	11.6	2500	1.04	2.75	2.31	8.2	1.72	3.4	4.2	14.5	0.173	1.1		X
AKM51G	4.75	4.02	11.7	2500	1.05	4.84	4.07	14.5	0.99	3.4	4.2	14.5	0.173	1.1	X	
AKM51G	4.75	2.62	11.7	5000	1.37	4.84	2.65	14.5	0.99	3.4	4.2	14.5	0.173	1.1		X
AKM51H	4.79	3.87	11.7	3000	1.22	6	4.84	18	0.8	3.4	4.2	14.5	0.173	1.1	X	
AKM51H	4.79	1.95	11.7	6000	1.23	6	2.44	18	0.8	3.4	4.2	14.5	0.173	1.1		X
AKM51K	4.9	2.35	11.9	5500	1.35	9.4	4.52	28.2	0.52	3.4	4.2	14.5	0.173	1.1	X	
AKM52E	8.34	7.61	21.3	1500	1.20	2.99	2.73	9	2.79	6.2	5.8	14.5	0.173	1.1		X
AKM52G	8.43	7.69	21.5	1500	1.21	4.72	4.30	14.2	1.79	6.2	5.8	14.5	0.173	1.1	X	
AKM52G	8.43	7.06	21.5	2500	1.85	4.72	3.94	14.2	1.79	6.2	5.8	14.5	0.173	1.1		X
AKM52H	8.48	7.53	21.6	1800	1.42	5.9	5.22	17.7	1.44	6.2	5.8	14.5	0.173	1.1	X	
AKM52H	8.48	6.26	21.6	3500	2.3	5.9	4.35	17.7	1.44	6.2	5.8	14.5	0.173	1.1		X
AKM52K	8.60	3.90	21.9	5500	2.25	9.3	4.19	27.9	0.93	6.2	5.8	14.5	0.173	1.1		X
AKM52L	8.67	6.40	30.1	3500	2.35	11.6	8.53	58	0.75	6.2	5.8	14.5	0.173	1.1	X	
AKM52L	8.67	3.27	30.1	6000	2.06	11.6	4.36	58	0.75	6.2	5.8	14.5	0.173	1.1		X
AKM52M	8.6	5.2	21.9	4500	2.45	13.1	7.88	39.4	0.66	6.2	5.8	14.5	0.173	1.1	X	
AKM53G	11.4	10.7	29.7	1000	1.12	4.77	4.48	14.3	2.39	9.1	7.4	14.5	0.173	1.1	X	
AKM53G	11.4	9.85	29.7	2000	2.06	4.77	4.12	14.3	2.39	9.1	7.4	14.5	0.173	1.1		X
AKM53H	11.5	8.83	30.0	3000	2.77	6.6	5.05	19.8	1.75	9.1	7.4	14.5	0.173	1.1		X

Technical Data

Motor	Motor - Data											Brake - Data			Drive	
	Motor standstill torque	Rated torque	Peak torque	Rated rotation speed	Rated power	Standstill current	Rated current	Peak current	Torque constant	Rotor inertial torque	Motor weight	Holding torque	Holding brake torque	Holding brake weight	Rated supply voltage 230 V	Rated supply voltage 400 V
	M_0 (Nm)	M_n (Nm)	M_{0max} (Nm)	n_n (min^{-1})	P_n (kW)	I_0 (A)	I_n (A)	I_{max} (A)	K_T (Nm/A)	J ($kgcm^2$)	G (kg)	M_{br} (Nm)	J_{br} ($Kgcm^2$)	G_{br} (kg)		
AKM53K	11.6	7.65	30.3	4000	3.20	9.4	6.17	28.2	1.24	9.1	7.4	14.5	0.173	1.1		X
AKM53M	11.4	8.72	29.7	3000	2.74	13.4	10.26	40.2	0.85	9.1	7.4	14.5	0.173	1.1		X
AKM53P	11.4	5.88	29.8	5000	3.08	19.1	9.8	57.4	0.6	9.1	7.4	14.5	0.173	1.1		X
AKM54G	14.3	12.9	38.0	1500	2.03	5.0	4.48	15	2.88	12	9	14.5	0.173	1.1		X
AKM54H	14.2	12.6	37.5	1500	2.38	5.5	4.9	16.5	2.57	12	9	14.5	0.173	1.1		X
AKM54K	14.4	10.0	38.4	3500	3.68	9.7	6.73	29.2	1.50	12	9	14.5	0.173	1.1		X
AKM54L	14.1	8.13	37.5	4500	3.83	12.5	7.19	37.5	1.13	12	9	14.5	0.173	1.1		X
AKM54N	14.1	9.85	37.6	3500	3.61	17.8	12.31	53.4	0.8	12	9	14.5	0.173	1.1	X	
AKM6																
AKM62G	11.9	10.4	29.7	1800	1.96	4.9	4.33	14.7	2.47	17	8.9	25	0.61	2		X
AKM62K	12.2	9.00	30.2	3500	3.30	9.6	7.04	28.8	1.28	17	8.9	25	0.61	2		X
AKM62M	12.2	5.70	30.2	6000	3.58	13.4	6.31	40.3	0.91	17	8.9	25	0.61	2		X
AKM62P	12.3	8.1	30.3	4500	3.82	18.8	12.27	56.4	0.66	17	8.9	25	0.61	2	X	
AKM63G	16.5	14.9	42.1	1200	1.87	4.5	4.14	13.5	3.70	24	11.1	25	0.61	2		X
AKM63K	16.8	12.9	42.6	3000	4.05	9.9	7.54	29.7	1.71	24	11.1	25	0.61	2		X
AKM63M	17.0	11.3	43.0	4000	4.73	13.8	9.11	41.4	1.24	24	11.1	25	0.61	2		X
AKM63N	17.0	9.60	43.0	5000	5.03	17.4	9.80	52.2	0.98	24	11.1	25	0.61	2		X
AKM64K	20.8	17.2	53.5	2000	3.60	9.2	7.54	27.6	2.28	32	13.3	25	0.61	2		X
AKM64L	21.0	15.6	54.1	3000	4.90	12.8	9.40	38.4	1.66	32	13.3	25	0.61	2		X
AKM64P	20.4	11.9	52.9	4500	5.61	18.6	10.82	55.9	1.10	32	13.3	25	0.61	2		X
AKM64Q	20	15.3	53.2	3000	4.81	20.7	15.3	62.1	1	32	13.3	25	0.61	2	X	
AKM64Q	20	10.7	53.2	5000	6.45	20.7	10.7	62.1	1	32	13.3	25	0.61	2		X
AKM65K	24.8	20.2	64.5	2000	4.23	9.8	7.95	29.1	2.54	40	15.4	25	0.61	2		X
AKM65M	25.0	19.2	65.2	2500	5.03	13.6	10.38	40.8	1.85	40	15.4	25	0.61	2		X
AKM65N	24.3	16.0	63.7	3500	5.86	17.8	11.59	53.4	1.38	40	15.4	25	0.61	2		X

Technical Data

Motor	Motor - Data											Brake - Data			Drive	
	Motor standstill torque	Rated torque	Peak torque	Rated rotation speed	Rated power	Standstill current	Rated current	Peak current	Torque constant	Rotor inertial torque	Motor weight	Holding torque	Holding brake torque	Holding brake weight	Rated supply voltage 230 V	Rated supply voltage 400 V
	M_0 (Nm)	M_n (Nm)	M_{0max} (Nm)	n_n (min^{-1})	P_n (kW)	I_0 (A)	I_n (A)	I_{max} (A)	K_T (Nm/A)	J ($kgcm^2$)	G (kg)	M_{br} (Nm)	J_{br} ($Kgcm^2$)	G_{br} (kg)		
AKM65P	24.5	19.1	64.1	2400	4.8	19.8	14.69	59.3	1.3	40	15.4	25	0.61	2	X	
AKM65P	24.5	14.9	64.1	4000	6.24	19.8	11.46	59.3	1.3	40	15.4	25	0.61	2		X
AKM7																
AKM72K	29.7	25.1	79.4	1500	3.94	9.3	7.77	27.9	3.23	65	19.7	53	1.64	2.1		X
AKM72M	30.0	23.6	79.8	2000	4.94	13.0	10.13	39.0	2.33	65	19.7	53	1.64	2.1		X
AKM72P	29.4	20.1	78.5	3000	6.31	18.7	12.72	56.1	1.58	65	19.7	53	1.64	2.1		X
AKM72Q	29.5	23.2	78.4	2000	4.86	23.5	17.85	70.5	1.3	65	19.7	53	1.64	2.1	X	
AKM72Q	29.5	16.3	78.4	4000	6.83	23.5	12.54	70.5	1.3	65	19.7	53	1.64	2.1		X
AKM73M	42.0	33.8	112	1500	5.31	13.6	10.90	40.8	3.10	92	26.7	53	1.64	2.1		X
AKM73P	41.6	28.5	111	2400	7.16	19.5	13.38	58.6	2.13	92	26.7	53	1.64	2.1		X
AKM73Q	41.5	33.4	111	1500	5.25	24.5	19.65	73.5	1.7	92	26.7	53	1.64	2.1	X	
AKM73Q	41.5	25.2	111	3000	7.92	24.5	14.82	73.5	1.7	92	26.7	53	1.64	2.1		X
AKM74L	53.0	43.5	143	1200	5.47	12.9	10.99	38.7	4.14	120	33.6	53	1.64	2.1		X
AKM74P	52.5	39.6	142	1800	7.46	18.5	13.24	55.5	2.84	120	33.6	53	1.64	2.1		X
AKM74Q	52.2	41.9	141	1300	5.71	26.1	20.95	78.3	2	120	33.6	53	1.64	2.1	X	
AKM74Q	52.2	31.5	141	2500	8.25	26.1	15.75	78.3	2	120	33.6	53	1.64	2.1		X

Servo Motors
Series AKM Low Voltage

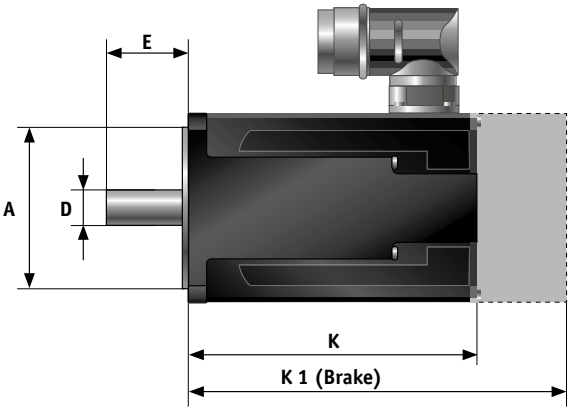
Technical Data

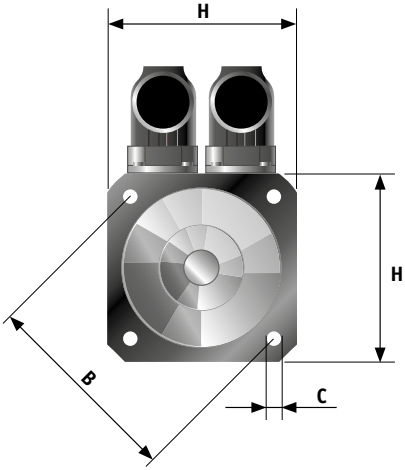
Motor	Motor - Data											Drive	
	Motor standstill torque	Rated torque	Peak torque	Rated rotation speed	Rated power	Standstill current	Rated current	Peak current	Torque constant	Rotor inertial torque	Motor weight	Rated supply voltage 24 V	Rated supply voltage 48 V
	M_0 (Nm)	M_n (Nm)	M_{0max} (Nm)	n_n (min^{-1})	P_n (kW)	I_0 (A)	I_n (A)	I_{max} (A)	K_T (Nm/A)	J ($kgcm^2$)	G (kg)		
AKM 1 Low Voltage													
AKM11F	0.18	0.18	0.59	1000	0.02	3.87	3.95	15.5	0.0456	0.017	0.35	X	
AKM11F	0.18	0.17	0.59	5000	0.09	3.87	3.73	15.5	0.0456	0.017	0.35		X
AKM12E	0.31	0.30	1.05	1500	0.05	2.73	2.67	10.9	0.1125	0.031	0.49		X
AKM 2 Low Voltage													
AKM21J	0.43	0.42	1.38	1200	0.05	7.3	6.93	28.5	0.0606	0.11	0.82	X	
AKM21J	0.43	0.39	1.38	4500	0.18	7.3	6.44	28.5	0.0606	0.11	0.82		X
AKM22H	0.88	0.85	2.80	1500	0.13	5.41	5.21	21.6	0.1632	0.16	1.10		X
AKM 3 Low Voltage													
AKM31K	1.25	1.23	4.12	2000	0.26	9.1	8.82	36.4	0.1395	0.33	1.55		X

Notes

Servo Motors

Mechanical Dimensions AKM





Mechanical Dimensions										
Motor type	A	B	C	D	E	H	K (Resolver)	K1 (Resolver)	K (Hiperface)	K1 (Hiperface)
AKM1										
AKM11	30h7	46	4.3	8h7	25	40	69.6	106.6	79	116
AKM11F	30h7	46	4.3	8h7	25	40	69.6	-	79	-
AKM12	30h7	46	4.3	8h7	25	40	88.6	125.6	98	135
AKM12E	30h7	46	4.3	8h7	25	40	88.6	-	98	-
AKM13	30h7	46	4.3	8h7	25	40	107.6	144.6	117	154
AKM1 with Y-TEC plug										
AKM11	30h7	46	4.3	8h7	25	40	79	116	87.5	124.5
AKM11F	30h7	46	4.3	8h7	25	40	79	-	87.5	-
AKM12	30h7	46	4.3	8h7	25	40	98	135	107.5	144.5
AKM12E	30h7	46	4.3	8h7	25	40	98	-	107.5	-
AKM13	30h7	46	4.3	8h7	25	40	117	154	126.5	163.5

Mechanical Dimensions

Motor type	A	B	C	D	E	H	K (Resolver)	K1 (Resolver)	K (Hiperface)	K1 (Hiperface)
AKM2										
AKM21	40j6	63	4.8	9k6	20	58	95.4	129.5	113.4	147.1
AKM21J	40j6	63	4.8	9k6	20	58	95.4	-	113.4	-
AKM22	40j6	63	4.8	9k6	20	58	114.4	148.5	132.4	166.1
AKM22H	40j6	63	4.8	9k6	20	58	114.4	-	132.4	-
AKM23	40j6	63	4.8	9k6	20	58	133.4	167.5	151.4	185.1
AKM24	40j6	63	4.8	9k6	20	58	152.4	186.5	170.4	204.1
AKM3										
AKM31	60j6	75	5.8	14k6	30	70	109.8	141.3	125.3	159.3
AKM31K	60j6	75	5.8	14k6	30	70	109.8	-	125.3	-
AKM32	60j6	75	5.8	14k6	30	70	140.8	172.3	156.3	190.3
AKM33	60j6	75	5.8	14k6	30	70	171.8	203.3	187.3	221.3
AKM4										
AKM41	80j6	100	7	19k6	40	84	118.8	152.3	136.8	170.3
AKM42	80j6	100	7	19k6	40	84	147.8	181.3	165.8	199.3
AKM43	80j6	100	7	19k6	40	84	176.8	210.3	194.8	228.3
AKM44	80j6	100	7	19k6	40	84	205.8	239.3	223.8	257.3
AKM5										
AKM51	110j6	130	9	24k6	50	108	127.5	172.5	146	189
AKM52	110j6	130	9	24k6	50	108	158.5	203.5	177	220
AKM53	110j6	130	9	24k6	50	108	189.5	234.5	208	251
AKM54	110j6	130	9	24k6	50	108	220.5	265.5	239	282
AKM6										
AKM62	130j6	165	11	32k6	58	138	153.7	200.7	172.2	219.7
AKM63	130j6	165	11	32k6	58	138	178.7	225.7	197.2	244.7
AKM64	130j6	165	11	32k6	58	138	203.7	250.7	222.2	269.7
AKM65	130j6	165	11	32k6	58	138	228.7	275.7	247.2	294.7
AKM7										
AKM72	180j6	215	13.5	38k6	80	188	192.5	234.5	201.7	253.3
AKM73	180j6	215	13.5	38k6	80	188	226.5	268.8	235.7	287.3
AKM74	180j6	215	13.5	38k6	80	188	260.5	302.5	269.7	321.3

Order Code AKM

AKM 4 4 J-AN C N GB B0

Flange size:
1 40 mm
2 58 mm
3 70 mm
4 84 mm
5 108 mm
6 138 mm
7 188 mm

Rotor length:
1
2
3
4
5

Winding type:
A ... Z
S special

Flange:
A IEC
B NEMA
C alternative IEC standard
D other standard
G alternative IEC standard
H alternative IEC standard
R IEC with tolerance R

Shaft:
C feather key groove
K open feather key groove
N smooth shaft
S special

Shaft sealing:
B0 standard
B1 with shaft sealing
xx special

Feedback unit:
DA EnDat 2.1 (AKM2...7) ENC-1113/1313 (Single Turn opt.)
DB EnDat 2.1 (AKM2...7) EQN-1125/1325 (Multi Turn opt.)
LA EnDat 2.1 (AKM2...7) ECI-1118/1319 (Single Turn ind.)
LB EnDat 2.1 (AKM2...7) EQI-1130/1331 (Multi Turn ind.)
GA Hiperface SKS36 (Single Turn opt.)
GB Hiperface (AKM2...7) SKM36 (Multi Turn opt.)
GD Hiperface (AKM1) SEL34 (Multi Turn kap.)
R resolver (Single Turn ind.)
S special

Brake:
2 24 V holding brake
N without brake
S special

Connections:
B angled connector, rotable (AKM2)
C 0.5 m shielded cable with IP65 connector, (AKM1/2) angled connector, rotable (AKM3...7)
Y y-tec plug IP65 (AKM1)
S special

Example Servo Motor AKM 4 4 J-AN C N GB B0:
Motortype AKM 44J, flange according to IEC standard, smooth shaft, rotable connectors, without brake, multiturn encoder SKM36

Detailed motor data can be found in the technical documentation.

Notes

Low Voltage Synchronous Servo Motors
Series SM

The low-voltage synchronous servomotors from the SM series are brushless, rotary current motors with have permanent magnets in the rotor and three-phase windings for special servo applications. The neodymium magnet material and the low inertial moment contribute significantly to making these motors highly dynamic and allow them to have a very low cogging. The robust and compact motor with high power density is available in three performance classes 60, 100 and 200 watts.

Motors are available in two flange sizes with idling torques from 0.2 to 0.68 Nm and peak torques of up to 1.8 Nm.

Motor and sensor cables in standard 1.5 m/3 m/5 m/10 m lengths can also be obtained.

Standard configuration:
Shaft with keyway, IP65 protection, 2-pin optical incremental encoder (2500 ppr)

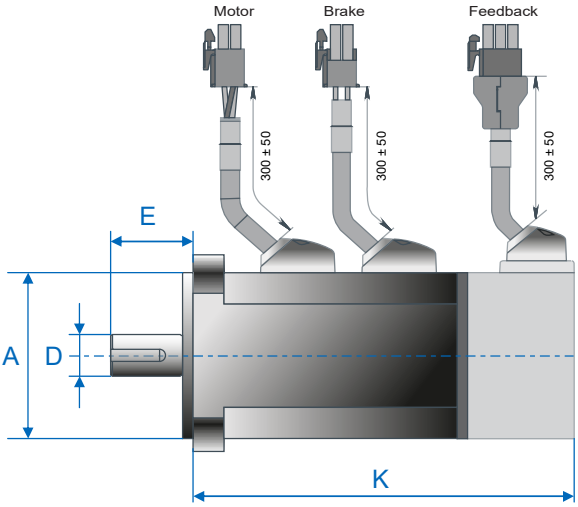
Optional:
Holding brake

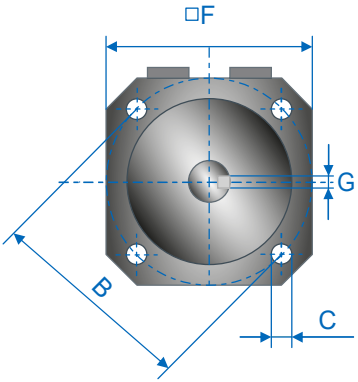
Technical Data

Motor	Motor - Data												Brake - Data			Drive DC 062
	Motor standstill torque	Rated torque	Peak torque	Rated rotation speed	Rated power	Standstill current	Rated current	Peak current	Torque constant	Rotor inertial torque	Flange size	Motor weight	Holding torque	Inertial torque of the holding brake	Holding brake weight	Rated supply voltage 24-48 V DC
	M_0 (Nm)	M_n (Nm)	M_{0max} (Nm)	n_n (min^{-1})	P_n (kW)	I_0 (A)	I_n (A)	I_{max} (A)	K_t (Nm/A)	J ($kgcm^2$)	L (mm)	G (kg)	M_{br} (Nm)	J_{br} ($Kgcm^2$)	G_{br} (kg)	
Series SM																
SM0401	0.2	0.19	0.46	3000	0.06	5.7	5.4	13.5	0.035	0.0232	40	0.4	0.35	0.048	0.25	X
SM0402	0.34	0.32	0.91	3000	0.1	5.6	5.2	15.6	0.061	0.0422	40	0.55	0.35	0.048	0.25	X
SM0601	0.68	0.64	1.8	3000	0.2	5.2	4.9	15	0.133	0.094	60	1.1	2	0.046	0.5	X

Servo Motors

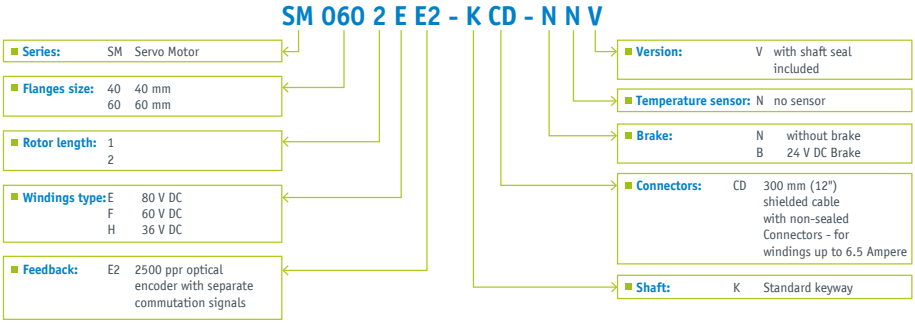
Mechanical Dimensions SM





Mechanical Dimensions									
Motor type	A	B	C	D	E	F	G	K (without brake)	K (with) brake
SM Series									
SM0401	30h7	46	4.2	8h6	25	40	3h9	92	129
SM0402	30h7	46	4.2	8h6	25	40	3h9	109	147
SM0601	50h7	70	5.5	14h6	30	60	5h9	98	138

Order Code SM



AC Servo Motors
Series DSM5

The synchronous servo motors of the DSM5 series are brushless AC motors with three-phase winding for high-quality servo applications. In combination with our digital servo drives, they are ideal for industrial robot positioning tasks, machine tools and transfer lines with high dynamics and stability requirements.

The compact servo motors have permanent magnets in the rotor. The neodymium magnet material plays an essential role in making the motors highly dynamic. The DSM5 motors are available in 7 sizes for optimal tuning to the respective servo application.

Standard features:
For the encoder system, resolver or Hiperface and Hiperface DSL are available.

Technical Data

Motor		Motor - Data											Brake - Data			Drive	
	Winding code	Motor standstill torque	Rated torque	Peak torque	Rated rotation speed	Rated power	Standstill current	Rated current	Peak current	Torque constant	Rotor inertial torque	Weight standard	Holding torque at 20 °C	Holding brake torque	Brake weight	Rated supply voltage 230 V	Rated supply voltage 400 V
		M_0 (Nm)	M_n (Nm)	M_{0max} (Nm)	n_n (min^{-1})	P_n (kW)	I_0 (A)	I_n (A)	I_{max} (A)	K_T (Nm/A)	J ($kgcm^2$)	G (kg)	M_{br} (Nm)	J_{br} ($Kgcm^2$)	G_{br} (kg)		
DSM5-0																	
DSM504	1	0.19	0.15	0.6	8000	0.126	0.78	0.60	3.1	0.24	0.037	0.53	0.4	0.02	0.2	X	
DSM505	1	0.38	0.29	1.3	8000	0.243	1.21	0.09	4.8	0.31	0.061	0.68	0.4	0.02	0.2	X	
DSM5-2																	
DSM521	1	0.7	0.58	2.4	6200	0.38	1.57	1.29	6.4	0.45	0.13	1.2	2	0.1	0.3	X	
DSM521	2	0.7	0.65	2.4	3600	0.25	0.96	0.89	3.9	0.73	0.13	1.2	2	0.1	0.3	X	
DSM521	1	0.7	0.52	2.4	8000	0.44	1.57	1.16	6.4	0.45	0.13	1.2	2	0.1	0.3		X
DSM521	2	0.7	0.6	2.4	6000	0.38	0.96	0.82	3.9	0.73	0.13	1.2	2	0.1	0.3		X
DSM522	1	1.4	0.9	4.6	6300	0.59	2.8	1.80	11	0.5	0.23	1.7	2	0.1	0.3	X	
DSM522	2	1.4	1.1	4.6	3900	0.45	1.73	1.34	6.6	0.81	0.23	1.7	2	0.1	0.3	X	
DSM522	1	1.4	0.8	4.6	8000	0.67	2.8	1.60	11	0.5	0.23	1.7	2	0.1	0.3		X
DSM522	2	1.4	1	4.6	6000	0.63	1.73	1.22	6.6	0.81	0.23	1.7	2	0.1	0.3		X
DSM5-3																	
DSM531	1	1.5	1.22	5.1	3100	0.4	1.65	1.34	6.6	0.91	0.92	2.4	9	0.6	1.0	X	
DSM531	2	1.5	1.38	4.8	1800	0.26	1.1	0.97	4	1.42	0.92	2.4	9	0.6	1.0	X	
DSM531	3	1.5	1.11	6.4	5000	0.58	2.6	1.91	13	0.58	0.92	2.4	9	0.6	1.0	X	
DSM531	1	1.5	1.1	5.1	6000	0.69	1.65	1.21	6.6	0.91	0.92	2.4	9	0.6	1.0		X
DSM531	2	1.5	1.3	4.8	3500	0.48	1.1	0.92	4	1.42	0.92	2.4	9	0.6	1.0		X
DSM531	3	1.5	1.8	6.4	6500	0.74	2.6	1.86	13	0.58	0.92	2.4	9	0.6	1.0		X
DSM532	1	2.9	2.31	10	3200	0.77	3.2	2.54	12.8	0.91	1.72	3.5	9	0.6	1.0	X	
DSM532	2	2.9	2.5	10	1900	0.5	2	1.72	8	1.46	1.72	3.5	9	0.6	1.0	X	
DSM532	8	2.9	2.05	10	5400	1.16	5.2	3.66	21	0.56	1.72	3.5	9	0.6	1.0	X	
DSM532	1	2.9	1.95	10	6000	1.23	3.2	2.14	12.8	0.91	1.72	3.5	9	0.6	1.0		X
DSM532	2	2.9	2.3	10	3500	0.84	2	1.59	8	1.46	1.72	3.5	9	0.6	1.0		X
DSM532	8	2.9	1.89	10	6500	1.29	5.2	3.38	21	0.56	1.72	3.5	9	0.6	1.0		X

Technical Data

Motor		Motor - Data											Brake - Data			Drive	
	Winding code	Motor standstill torque	Rated torque	Peak torque	Rated rotation speed	Rated power	Standstill current	Rated current	Peak current	Torque constant	Rotor inertial torque	Weight standard	Holding torque at 20 °C	Holding brake torque	Brake weight	Rated supply voltage 230 V	Rated supply voltage 400 V
		M_0 (Nm)	M_n (Nm)	M_{0max} (Nm)	n_n (min^{-1})	P_n (kW)	I_0 (A)	I_n (A)	I_{max} (A)	K_T (Nm/A)	J ($kgcm^2$)	G (kg)	M_{br} (Nm)	J_{br} ($Kgcm^2$)	G_{br} (kg)		
DSM533	1	4.2	3.22	14	3300	1.113	4.6	3.54	18	0.91	2.53	4.6	9	0.6	1.0	X	
DSM533	2	4.2	3.6	14	2000	0.75	2.9	2.48	11	1.46	2.53	4.6	9	0.6	1.0	X	
DSM533	4	4.2	2.38	14	5200	1.54	7.1	4.80	28	0.6	2.53	4.6	9	0.6	1.0	X	
DSM533	1	4.2	2.65	14	6000	1.665	4.6	2.91	18	0.91	2.53	4.6	9	0.6	1.0		X
DSM533	2	4.2	3.35	14	3500	1.228	2.9	2.31	11	1.46	2.53	4.6	9	0.6	1.0		X
DSM533	4	4.2	2.53	14	6500	1.722	7.1	4.29	28	0.6	2.53	4.6	9	0.6	1.0		X
DSM534	1	5.3	4	18	3300	1.38	5.8	4.40	23	0.91	3.33	5.7	9	0.6	1.0	X	
DSM534	2	5.3	4.4	18	1900	0.88	3.4	2.86	14	1.54	3.33	5.7	9	0.6	1.0	X	
DSM534	4	5.3	3.56	18	4700	1.75	8	5.39	32	0.66	3.33	5.7	9	0.6	1.0	X	
DSM534	1	5.3	3.6	18	5000	1.885	5.8	3.96	23	0.91	3.33	5.7	9	0.6	1.0		X
DSM534	2	5.3	4.1	18	3000	1.288	3.4	2.66	14	1.54	3.33	5.7	9	0.6	1.0		X
DSM534	4	5.3	3.08	18	5000	1.613	8	4.67	32	0.66	3.33	5.7	9	0.6	1.0		X

DSM5-4

DSM541	1	4	3.21	14	3200	1.08	4.4	3.53	18	0.91	5	5.6	22	2.4	1.4	X	
DSM541	2	4	3.46	14	1800	0.65	2.5	2.18	10	1.59	5	5.6	22	2.4	1.4	X	
DSM541	3	4	3.17	14	4100	1.36	5.4	4.34	23	0.73	5	5.6	22	2.4	1.4	X	
DSM541	1	4	2.7	14	6000	1.7	4.4	2.97	18	0.91	5	5.6	22	2.4	1.4		X
DSM541	2	4	3.35	14	3000	1.05	2.5	2.11	10	1.59	5	5.6	22	2.4	1.4		X
DSM541	3	4	2.77	14	6000	1.74	5.4	3.79	23	0.73	5	5.6	22	2.4	1.4		X
DSM542	1	7.6	5.84	26	3200	1.96	7.8	5.96	32	0.98	9.6	8.5	22	2.4	1.4	X	
DSM542	2	7.6	6.43	26	1800	1.21	4.7	3.97	19	1.62	9.6	8.5	22	2.4	1.4	X	
DSM542	4	7.6	6.72	26	1000	0.70	2.8	2.46	11	2.73	9.6	8.5	22	2.4	1.4	X	
DSM542	1	7.6	5	26	5000	2.62	7.8	5.10	32	0.98	9.6	8.5	22	2.4	1.4		X
DSM542	2	7.6	6	26	3000	1.89	4.7	3.70	19	1.62	9.6	8.5	22	2.4	1.4		X
DSM542	4	7.6	6.38	26	1900	1.27	2.8	2.34	11	2.73	9.6	8.5	22	2.4	1.4		X

Technical Data

Motor		Motor - Data											Brake - Data			Drive	
	Winding code	Motor standstill torque	Rated torque	Peak torque	Rated rotation speed	Rated power	Standstill current	Rated current	Peak current	Torque constant	Rotor inertial torque	Weight standard	Holding torque at 20 °C	Holding brake torque	Brake weight	Rated supply voltage 230 V	Rated supply voltage 400 V
		M_0 (Nm)	M_n (Nm)	M_{0max} (Nm)	n_n (min^{-1})	P_n (kW)	I_0 (A)	I_n (A)	I_{max} (A)	K_T (Nm/A)	J ($kgcm^2$)	G (kg)	M_{br} (Nm)	J_{br} ($Kgcm^2$)	G_{br} (kg)		
DSM543	1	11.3	8.56	40	3300	2.96	12	8.73	48	0.98	14	11.4	22	2.4	1.4	X	
DSM543	2	11.3	9.54	39	1800	1.80	7	5.89	29	1.62	14	11.4	22	2.4	1.4	X	
DSM543	3	11.3	7.29	39	4800	3.66	17	10.72	68	0.68	14	11.4	22	2.4	1.4	X	
DSM543	1	11.3	7.5	40	5000	3.927	12	7.65	48	0.98	14	11.4	22	2.4	1.4		X
DSM543	2	11.3	8.8	39	3000	2.764	7	5.43	29	1.62	14	11.4	22	2.4	1.4		X
DSM543	3	11.3	6.27	39	6000	3.94	17	9.22	68	0.68	14	11.4	22	2.4	1.4		X
DSM5-5																	
DSM551	1	10	8.1	35	3000	2.54	9.8	7.94	41	1.03	22	11	40	13.7	3.1	X	
DSM551	2	10	8.1	35	1900	1.61	6.5	5.26	27	1.54	22	11	40	13.7	3.1	X	
DSM551	3	10	7.47	35	3800	2.97	12	9.22	51	0.81	22	11	40	13.7	3.1	X	
DSM551	1	10	7	35	5000	3.67	9.8	6.86	41	1.03	22	11	40	13.7	3.1		X
DSM551	2	10	7.8	35	3000	2.45	6.5	5.06	27	1.54	22	11	40	13.7	3.1		X
DSM551	3	10	6	35	6000	3.77	12	7.41	51	0.81	22	11	40	13.7	3.1		X
DSM552	1	19	10	64	4000	4.1	16	8.3	64	1.19	43	16	40	13.7	3.1		X
DSM552	2	19	15.2	64	3000	4.8	12	9.87	50	1.54	43	16	40	13.7	3.1		X
DSM552	3	19	10.2	64	4000	4.27	21	10.97	82	0.93	43	16	40	13.7	3.1		X
DSM553	1	27	16	94	3000	5	21	12.30	84	1.29	65	21	40	13.7	3.1		X
DSM553	2	27	15.4	94	3000	4.8	15	8.80	62	1.75	65	21	40	13.7	3.1		X
DSM553	3	27	10	94	4000	4.19	25	9.09	104	1.09	65	21	40	13.7	3.1		X
DSM553	4	27	21.4	118	1900	4.26	9.6	7.64	42	2.81	65	21	40	13.7	3.1		X
DSM554	1	35	20.8	118	2500	5.4	25	14.80	100	1.41	87	26	40	13.7	3.1		X
DSM554	2	35	20.8	118	2500	5.4	20	12.00	80	1.75	87	26	40	13.7	3.1		X
DSM5-6																	
DSM561	1	15	10.6	40	3000	3.33	11	8.10	37	1.31	54	17	70	43.6	6.9		X
DSM561	2	15	12.1	40	2000	2.53	9.1	7.33	27	1.65	54	17	70	43.6	6.9		X

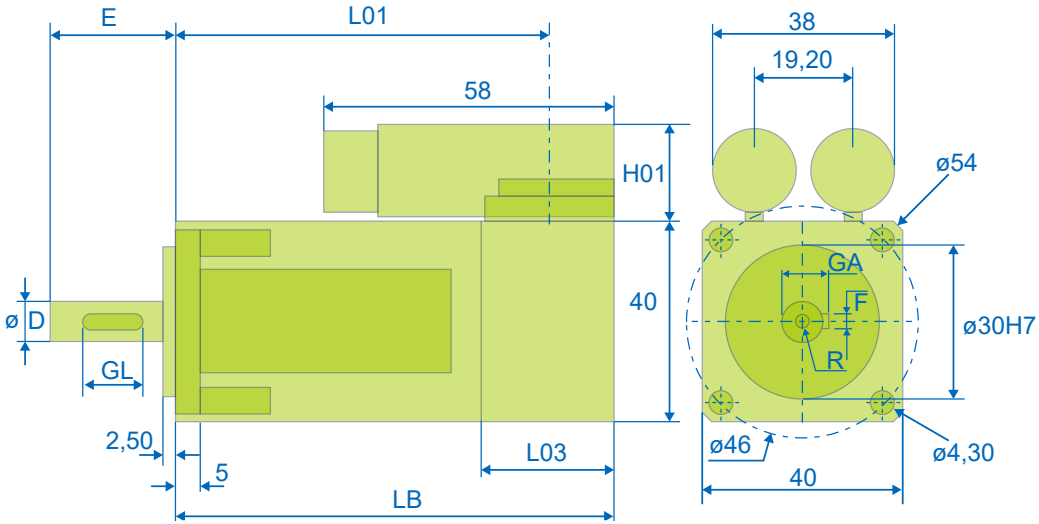
Technical Data

Motor		Motor - Data											Brake - Data			Drive	
	Winding code	Motor standstill torque	Rated torque	Peak torque	Rated rotation speed	Rated power	Standstill current	Rated current	Peak current	Torque constant	Rotor inertial torque	Weight standard	Holding torque at 20 °C	Holding brake torque	Brake weight	Rated supply voltage 230 V	Rated supply voltage 400 V
		M_0 (Nm)	M_n (Nm)	M_{0max} (Nm)	n_n (min^{-1})	P_n (kW)	I_0 (A)	I_n (A)	I_{max} (A)	K_T (Nm/A)	J ($kgcm^2$)	G (kg)	M_{br} (Nm)	J_{br} ($Kgcm^2$)	G_{br} (kg)		
DSM562	1	28	17.7	72	3000	5.56	24	15.10	72	1.17	91	23	70	43.6	6.9		X
DSM562	2	28	21.7	72	2000	4.55	13	9.8	38	2.22	91	23	70	43.6	6.9		X
DSM563	2	50	27.4	130	2000	5.74	18	9.79	55	2.8	177	36	70	43.6	6.9		X
DSM563	3	50	43.2	177	500	2.26	5	4.35	16	9.92	177	36	70	43.6	6.9		X
DSM564	3	70	58	180	350	2.1	5	4.36	16	13.2	264	50	70	43.6	6.9		X
DSM5-7																	
DSM571	2	76	44.3	200	1800	8.35	25	14.7	73	3.03	484	50	120	82.0	13		X

Notizen

Servo Motors

Mechanical Dimensions

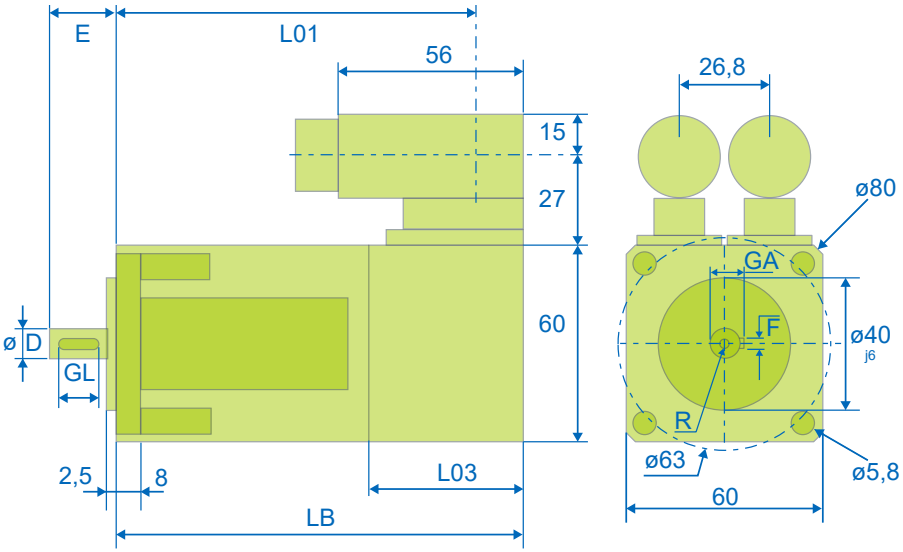


DSM5-0 - Dimension in mm

ENCODER	RESOLVER			HIPERFACE		
Dimensions of	LB	L01	L03	LB	L01	L03
DSM5.04	87.5	74.5	26.5	104	91	43
DSM5.05	105.5	92.5		122	109	
DSM5.04 brake	119.5	106.5		136	123	
DSM5.05 brake	137.5	124.5		154	141	

SHAFT, dimension in mm

D	8h6
E	25
GL	12
GA	9.2
F	3
R	M3x8

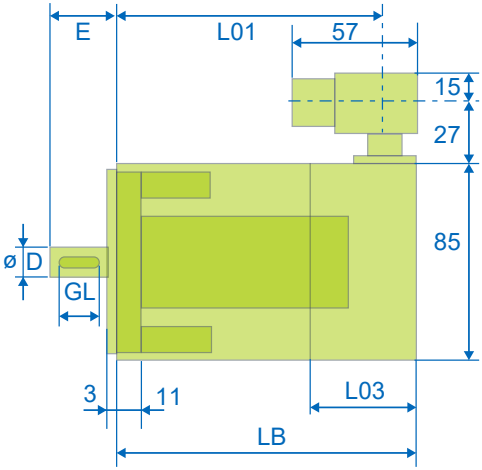


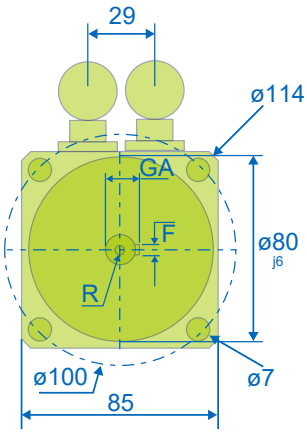
DSM5-2 - Dimension in mm

ENCODER	RESOLVER			HIPERFACE		
Dimensions of	LB	L01	L03	LB	L01	L03
DSM5.21	104	90	28	122	106	46
DSM5.22	132	118		150	134	
DSM5.21 brake	134.5	120.4		152.4	136.4	
DSM5.22 brake	162.4	148.4		180.4	164.4	

SHAFT, dimension in mm

D	9j6 (Option 62)	11j6 (Default)
E	20	23
GL	12	15
GA	10.2	12.5
F	3	4
R	-	M4x10



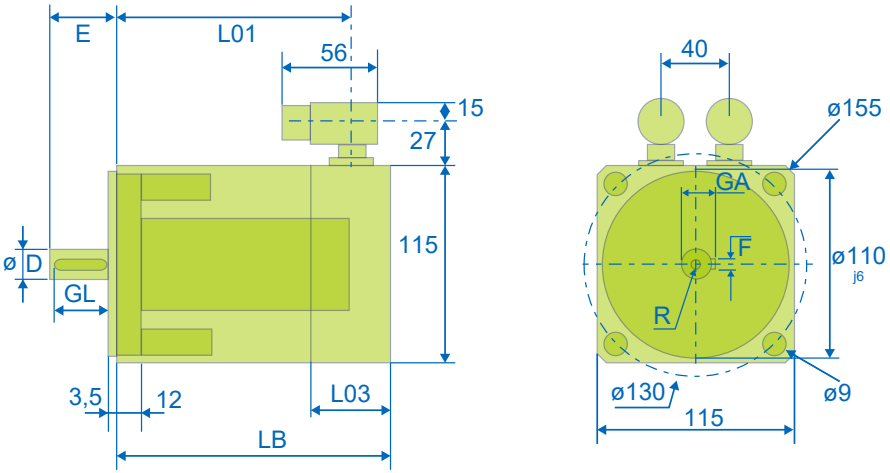


DSM5-3 - Dimension in mm

ENCODER	RESOLVER			HIPERFACE		
Dimensions of	LB	L01	L03	LB	L01	L03
DSM5.31	115	101	31	130	116	46
DSM5.32	145	131		160	146	
DSM5.33	175	161		190	176	
DSM5.34	205	191		220	206	
DSM5.31 brake	163	149		178	164	
DSM5.32 brake	193	179		208	194	
DSM5.33 brake	223	209		238	224	
DSM5.34 brake	253	283		268	254	

SHAFT, dimension in mm

D	14j6
E	30
GL	20
GA	16
F	5
R	M5x15

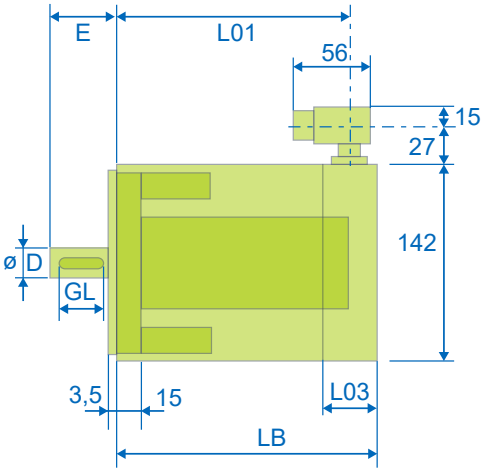


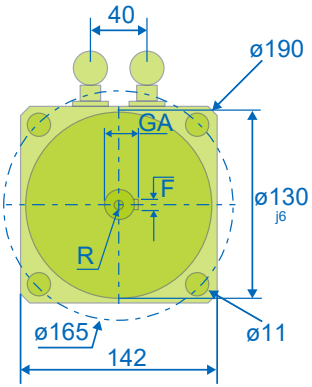
DSM5-4 - Dimension in mm

ENCODER	RESOLVER			HIPERFACE		
Dimensions of	LB	L01	L03	LB	L01	L03
DSM5.41	146.5	123.5	32	160.5	137.5	46
DSM5.42	186.5	163.5		200.5	177.5	
DSM5.43	226.5	203.5		240.5	217.5	
DSM5.41 brake	195.5	172.5		209.5	186.6	
DSM5.42 brake	235.5	212.5		249.5	226.5	
DSM5.43 brake	275.5	232.5		289.5	246.5	

SHAFT, dimension in mm

D	19j6
E	40
GL	32
GA	21.5
F	6
R	M6x16



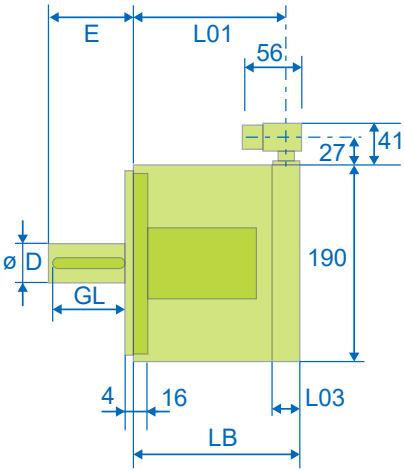


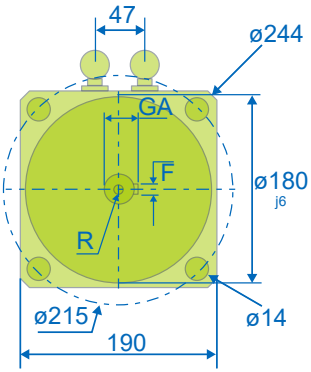
DSM5-5 - Dimension in mm

ENCODER	RESOLVER			HIPERFACE		
Dimensions of	LB	L01	L03	LB	L01	L03
DSM5.51	174	154	27	187	167	40
DSM5.52	224	204		237	217	
DSM5.53	274	254		287	267	
DSM5.54	324	304		337	317	
DSM5.51 brake	227.5	207.5		240.5	220.5	
DSM5.52 brake	277.5	257.5		290.5	270.5	
DSM5.53 brake	327.5	307.5		340.5	320.5	
DSM5.54 brake	377.5	357.5		390.5	370.5	

SHAFT, dimension in mm

D	24j6
E	50
GL	32
GA	27
F	8
R	M8x15



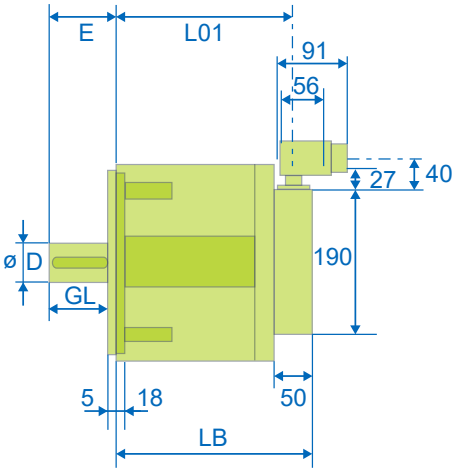


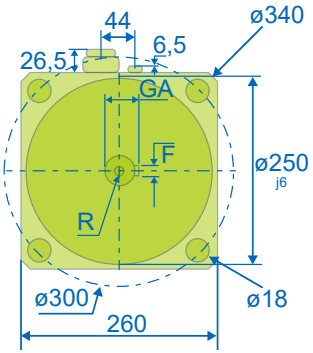
DSM5-6 - Dimension in mm

ENCODER	RESOLVER			HIPERFACE		
Dimensions of	LB	L01	L03	LB	L01	L03
DSM5.61	163	139.5	27	183	159.5	47
DSM5.62	198	174.5		218	194.5	
DSM5.63	288	264.5	47	288	264.5	
DSM5.64	334.5	334.5		334.5	334.5	
DSM5.61 brake	233.5	210	27	253.5	230	
DSM5.62 brake	268.5	245		288.5	265	
DSM5.63 brake	358.5	335	47	358.5	335	
DSM5.64 brake	428.5	405		428.5	405	

SHAFT, dimension in mm

D	38k6
E	80
GL	70
GA	41
F	10
R	M12x28





DSM5-7 - Dimension in mm

ENCODER	RESOLVER			HIPERFACE		
Dimensions of	LB	L01	L03	LB	L01	L03
DSM5.71	261	214	47	261	214	47
DSM5.71 brake	314	267		314	267	

SHAFT, dimension in mm

D	48k6
E	82
GL	70
GA	51.5
F	14
R	M16x25

Order Code

DSM522 . 2 0 9 6 . 26 62 66

- **Product:** DSM5 Synchronous motor self-cooling
- **Motor size:** Size 0-7
- **Motor length:** Length 1-4
- **Voltage configuration:** Winding Code 1-8
- **Brake:**
  - 0 without brake
  - 1 with brake 24 VDC
- **Options:**
  - 26 Smooth shaft
  - 62 Thin shaft 9x20 flange 40/63 (motor size 2 only)
  - 66 Shaft seal Multi-response possible
  - G8 SIL2 encoder

  If 26 is not specified, the default shaft version with key is provided.
  If 62 is not specified, the default shaft diameter (11x23 with size 2) is provided.
  The option G8 (SIL2 encoder) can be selected in combination with the encoder types W, Y and Z and motor sizes 2-7.
- **Connector type:**
  - 6 M23 motor connector, M23 Encoder/Resolver
  - 9 M40 motor connector, M23 Encoder/Resolver
  - J ytec M15 round connector with size 0 ytec possible only

  If DSL encoders are used (W, Y), variant 6 with a single M23 round connector and variant 9 with a single M40 round connector are provided (single-cable solution).
  M40 motor connectors should be used for a continuous current larger than 20 A. Motors with an M40 connector are longer.
  ytec round connectors are available up to size 2 (continous current < 10 A).
- **Encoder system:**
  - 9 Resolver size 15 2p 7V 10kHz
  - W Sick encoder EKS36 17bit NO SIL, DSL
  - Y Sick encoder EKM36 18bit Multi-turn NO SIL, DSL
  - Z Sick encoder SKM36 Hiperface 128i PPT Multi-turn

  Motors with resolvers (9) have a different length than motors with encoders (W, Y, Z).
  The DSL variants (W, Y) are for single-cable solutions.
  The encoder system W, Y and Z are available by request with SIL2/SIL3 safety class.

Planetary Gears
Series PEII

The servomotors can be combined into compact coaxially constructed drive units using planetary gears from the PEII-series. The gears are built into the A side of the servomotor.

The gears assigned to the individual motors as well as the available i gear ratios for these motor gear combinations are listed in the selection tables. During selection, the maximum allowable input speed of the gear (equal to the maximum speed of the motor) must be considered.

PEII series

- Straight gearing
- Geometric 50/70/90/120/155 flange size
- Backlash to < 10 angular minutes
- High torsional stiffness

Standard Configuration:
IP65, lifetime lubrication, double center mounting

Options:
Food grease lubrication, low backlash classes, stainless steel motor adapter plates

Technical Data

	Gear ratio	Stages	Nominal output torque	Emergency stop torque	Max. acceleration torque	Backlash	Torsional stiffness	Nominal input speed	Max. input speed	Running noise	Moment of inertia	Weight	Input shaft diameter
	i		T_{2N} (Nm)	T_{2NOT} (Nm)	T_{2B} (Nm)	Δφ2 (arcmin)	C2 (Nm/arcmin)	n_{1N} (rpm)	n_{1B} (rpm)	LPA (dB)	J ($kg.cm^2$)	kg	Ø(A) (mm)
PEII 050													
	3	1	16	48	28.8	≤ 8	0.9	4500	8000	≤ 60	0.1-0.2	0.7	8-14
	4	1	16	48	28.8	≤ 8	0.9	4500	8000	≤ 60	0.1-0.2	0.7	8-14
	5	1	15	45	27	≤ 8	0.9	4500	8000	≤ 60	0.1-0.2	0.7	8-14
	7	1	12	36	21.6	≤ 8	0.9	4500	8000	≤ 60	0.1-0.2	0.7	8-14
	10	1	10	30	18	≤ 8	0.9	4500	8000	≤ 60	0.1-0.2	0.7	8-14
	15	2	15	45	27	≤ 10	0.9	4500	8000	≤ 60	0.1-0.2	0.9	8-14
	16	2	16	48	28.8	≤ 10	0.9	4500	8000	≤ 60	0.1-0.2	0.9	8-14
	20	2	16	48	28.8	≤ 10	0.9	4500	8000	≤ 60	0.1-0.2	0.9	8-14
	25	2	15	45	27	≤ 10	0.9	4500	8000	≤ 60	0.1-0.2	0.9	8-14
	30	2	15	45	27	≤ 10	0.9	4500	8000	≤ 60	0.1-0.2	0.9	8-14
	35	2	12	36	21.6	≤ 10	0.9	4500	8000	≤ 60	0.1-0.2	0.9	8-14
	40	2	16	48	28.8	≤ 10	0.9	4500	8000	≤ 60	0.1-0.2	0.9	8-14
	50	2	15	45	27	≤ 10	0.9	4500	8000	≤ 60	0.1-0.2	0.9	8-14
	70	2	12	36	21.6	≤ 10	0.9	4500	8000	≤ 60	0.1-0.2	0.9	8-14
	100	2	10	30	18	≤ 10	0.9	4500	8000	≤ 60	0.1-0.2	0.9	8-14
PEII 070													
	3	1	42	126	75.6	≤ 7	2.2	4000	6000	≤ 62	0.1-1.53	1.9	8-19
	4	1	42	126	75.6	≤ 7	2.2	4000	6000	≤ 62	0.1-1.53	1.9	8-19
	5	1	40	120	72	≤ 7	2.2	4000	6000	≤ 62	0.1-1.53	1.9	8-19
	7	1	35	105	63	≤ 7	2.2	4000	6000	≤ 62	0.1-1.53	1.9	8-19
	10	1	27	81	48.6	≤ 7	2.2	4000	6000	≤ 62	0.1-1.53	1.9	8-19
	15	2	40	120	72	≤ 9	2.2	4000	6000	≤ 62	0.1-1.53	2.3	8-19
	16	2	42	126	75.6	≤ 9	2.2	4000	6000	≤ 62	0.1-1.53	2.3	8-19
	20	2	42	126	75.6	≤ 9	2.2	4000	6000	≤ 62	0.1-1.53	2.3	8-19
	25	2	40	120	72	≤ 9	2.2	4000	6000	≤ 62	0.1-1.53	2.3	8-19
	30	2	40	120	72	≤ 9	2.2	4000	6000	≤ 62	0.1-1.53	2.3	8-19
	35	2	35	105	63	≤ 9	2.2	4000	6000	≤ 62	0.1-1.53	2.3	8-19

Technical Data

	Gear ratio	Stages	Nominal output torque	Emergency stop torque	Max. acceleration torque	Backlash	Torsional stiffness	Nominal input speed	Max. input speed	Running noise	Moment of inertia	Weight	Input shaft diameter
	i		T_{2N} (Nm)	T_{2NOT} (Nm)	T_{2B} (Nm)	$\Delta\varphi 2$ (arcmin)	C2 (Nm/arcmin)	n_{1N} (rpm)	n_{1B} (rpm)	LPA (dB)	J (kg.cm^2)	kg	Ø$^{(A)}$ (mm)
	40	2	43	129	77.4	≤ 9	2.2	4000	6000	≤ 62	0.1-1.53	2.3	8-19
	50	2	40	120	72	≤ 9	2.2	4000	6000	≤ 62	0.1-1.53	2.3	8-19
	70	2	35	105	63	≤ 9	2.2	4000	6000	≤ 62	0.1-1.53	2.3	8-19
	100	2	27	81	48.6	≤ 9	2.2	4000	6000	≤ 62	0.1-1.53	2.3	8-19
PEII 090													
	3	1	110	330	198	≤ 6	8	3600	6000	≤ 64	0.2-2.68	3.4	14-28
	4	1	113	339	203.4	≤ 6	8	3600	6000	≤ 64	0.2-2.68	3.4	14-28
	5	1	118	354	212.4	≤ 6	8	3600	6000	≤ 64	0.2-2.68	3.4	14-28
	7	1	96	288	172.8	≤ 6	8	3600	6000	≤ 64	0.2-2.68	3.4	14-28
	10	1	68	204	122.4	≤ 6	8	3600	6000	≤ 64	0.2-2.68	3.4	14-28
	15	2	109	327	196.2	≤ 8	8	3600	6000	≤ 64	0.2-2.68	4.3	14-28
	16	2	116	348	208.8	≤ 8	8	3600	6000	≤ 64	0.2-2.68	4.3	14-28
	20	2	116	348	208.8	≤ 8	8	3600	6000	≤ 64	0.2-2.68	4.3	14-28
	25	2	123	369	221.4	≤ 8	8	3600	6000	≤ 64	0.2-2.68	4.3	14-28
	30	2	108	324	194.4	≤ 8	8	3600	6000	≤ 64	0.2-2.68	4.3	14-28
	35	2	100	300	180	≤ 8	8	3600	6000	≤ 64	0.2-2.68	4.3	14-28
	40	2	117	351	210.6	≤ 8	8	3600	6000	≤ 64	0.2-2.68	4.3	14-28
	50	2	123	369	221.4	≤ 8	8	3600	6000	≤ 64	0.2-2.68	4.3	14-28
	70	2	100	300	180	≤ 8	8	3600	6000	≤ 64	0.2-2.68	4.3	14-28
	100	2	70	210	126	≤ 8	8	3600	6000	≤ 64	0.2-2.68	4.3	14-28
PEII 120													
	3	1	217	651	390.6	≤ 6	12	3600	4800	≤ 66	1.6-14	11.8	19-38
	4	1	223	669	401.4	≤ 6	12	3600	4800	≤ 66	1.6-14	11.8	19-38
	5	1	220	660	396	≤ 6	12	3600	4800	≤ 66	1.6-14	11.8	19-38
	7	1	198	594	356.4	≤ 6	12	3600	4800	≤ 66	1.6-14	11.8	19-38
	10	1	155	465	279	≤ 6	12	3600	4800	≤ 66	1.6-14	11.8	19-38

Technical Data

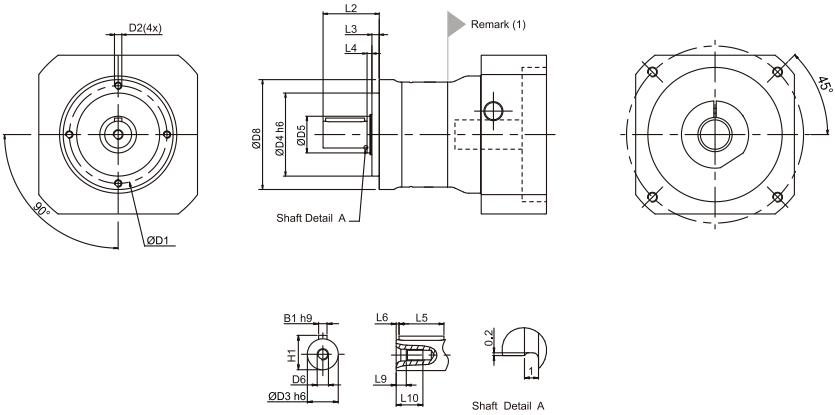
	Gear ratio	Stages	Nominal output torque	Emergency stop torque	Max. acceleration torque	Backlash	Torsional stiffness	Nominal input speed	Max. input speed	Running noise	Moment of inertia	Weight	Input shaft diameter
	i		T_{2N} (Nm)	T_{2NOT} (Nm)	T_{2B} (Nm)	$\Lambda\varphi 2$ (arcmin)	C2 (Nm/arcmin)	n_{1N} (rpm)	n_{1B} (rpm)	LPA (dB)	J (kg.cm^2)	kg	Ø$^{(A)}$ (mm)
	15	2	213	639	383.4	≤ 8	12	3600	4800	≤ 66	1.6-14	13.8	19-38
	16	2	228	684	410.4	≤ 8	12	3600	4800	≤ 66	1.6-14	13.8	19-38
	20	2	230	690	414	≤ 8	12	3600	4800	≤ 66	1.6-14	13.8	19-38
	25	2	228	684	410.4	≤ 8	12	3600	4800	≤ 66	1.6-14	13.8	19-38
	30	2	212	636	381.6	≤ 8	12	3600	4800	≤ 66	1.6-14	13.8	19-38
	35	2	206	618	370.8	≤ 8	12	3600	4800	≤ 66	1.6-14	13.8	19-38
	40	2	232	696	417.6	≤ 8	12	3600	4800	≤ 66	1.6-14	13.8	19-38
	50	2	228	684	410.4	≤ 8	12	3600	4800	≤ 66	1.6-14	13.8	19-38
	70	2	206	618	370.8	≤ 8	12	3600	4800	≤ 66	1.6-14	13.8	19-38
	100	2	162	486	291.6	≤ 8	12	3600	4800	≤ 66	1.6-14	13.8	19-38

PEII 155

	3	1	430	1290	774	≤ 6	16	2500	3600	≤ 68	2.23-24.5	16.5	24-42
	4	1	440	1320	792	≤ 6	16	2500	3600	≤ 68	2.23-24.5	16.5	24-42
	5	1	435	1305	783	≤ 6	16	2500	3600	≤ 68	2.23-24.5	16.5	24-42
	7	1	366	1098	658.8	≤ 6	16	2500	3600	≤ 68	2.23-24.5	16.5	24-42
	10	1	295	885	531	≤ 6	16	2500	3600	≤ 68	2.23-24.5	16.5	24-42
	15	2	424	1272	763.2	≤ 8	16	2500	3600	≤ 68	1.69-14.2	20.1	19-38
	16	2	452	1356	813.6	≤ 8	16	2500	3600	≤ 68	1.69-14.2	20.1	19-38
	20	2	454	1362	817.2	≤ 8	16	2500	3600	≤ 68	1.69-14.2	20.1	19-38
	25	2	450	1350	810	≤ 8	16	2500	3600	≤ 68	1.69-14.2	20.1	19-38
	30	2	422	1266	759.6	≤ 8	16	2500	3600	≤ 68	1.69-14.2	20.1	19-38
	35	2	382	1146	687.6	≤ 8	16	2500	3600	≤ 68	1.69-14.2	20.1	19-38
	40	2	459	1377	826.2	≤ 8	16	2500	3600	≤ 68	1.69-14.2	20.1	19-38
	50	2	450	1350	810	≤ 8	16	2500	3600	≤ 68	1.69-14.2	20.1	19-38
	70	2	382	1146	687.6	≤ 8	16	2500	3600	≤ 68	1.69-14.2	20.1	19-38
	100	2	308	924	554.4	≤ 8	16	2500	3600	≤ 68	1.69-14.2	20.1	19-38

Planetary Gears Series PEII

Mechanical Dimensions



Mechanical Dimensions

Dimension	PEII 050		PEII 070		PEII 090		PEII 120		PEII 155	
	1-stage	2-stage	1-stage	2-stage	1-stage	2-stage	1-stage	2-stage	1-stage	2-stage
D1	44		62		80		108		140	
D2	M4X9		M5X10		M6X12		M8X15		M10X18	
$D3_{h6}$	12		16		22		32		40	
$D4_{h6}$	35		52		68		90		120	
D5	17		22		30		40		55	
D6	M4X0.7P		M5X0.8P		M8X1.25P		M12X1.75P		M16X2P	
D8	50		70		90		120		155	
L2	24.5		36		46		70		97	
L3	4		4.5		6		7		9.5	
L4	2.5		3.5		4		5		5.5	
L5	14		25		32		50		70	
L6	2		2		2		4		6	
L9	4.5		4.8		7.2		10		12	
L10	10		12.5		19		28		36	
$B1_{h9}$	4		5		6		10		12	
H1	13.5		18		24.5		35		43	

Notes

Cable

Sensor Cables

For the power connection, prefabricated shielded motor cables with plugs as well as connectors for the DIAS drive are used; all cables can also be used as drag cables.

The technical data is based on moving applications of the cable with a life span of 5 million bend cycles.

Sensor Cables DC, SDD

Shielded, assembled on both sides, drag chain suitable, highly flexible (5 million bend cycles), with round connector on the motor and device connector
Temperature range: moving: -10 ... +60 °C/stationary: -50 ... +80 °C
Minimum bend radius: permanent wiring: 7.5 x D/flexible use: 1.5-4.0 mm^2: 10 x D; from 4.0 mm^2: 12 x D

Article Number	Feedback systems used by the motor	Length	Outside Diameter
F-R0-061-015-0-00	Resolver	1.5 meters	approx. 6.4 mm
F-R0-061-015-3-00	Resolver	1.5 meters	approx. 6.4 mm
F-R0-061-030-0-00	Resolver	3 meters	approx. 6.4 mm
F-R0-061-030-3-00	Resolver	3 meters	approx. 6.4 mm
F-R0-061-050-0-00	Resolver	5 meters	approx. 6.4 mm
F-R0-061-050-3-00	Resolver	5 meters	approx. 6.4 mm
F-R0-061-100-0-00	Resolver	10 meters	approx. 6.4 mm
F-R0-061-100-3-00	Resolver	10 meters	approx. 6.4 mm

	F-R0-300-010-0-00	Resolver	1 meter	approx. 6.4 mm
	F-R0-300-020-0-00	Resolver	2 meters	approx. 6.4 mm
	F-R0-300-030-0-00	Resolver	3 meters	approx. 6.4 mm
	F-R0-300-040-0-00	Resolver	4 meters	approx. 6.4 mm
	F-R0-300-050-0-00	Resolver	5 meters	approx. 6.4 mm
	F-R0-300-100-0-00	Resolver	10 meters	approx. 6.4 mm
	F-R0-300-150-0-00	Resolver	15 meters	approx. 6.4 mm
	F-R0-300-200-0-00	Resolver	20 meters	approx. 6.4 mm
	F-EE-300-010-0-00	EnDat sensor	1 meter	approx. 7.8 mm
	F-EE-300-020-0-00	EnDat sensor	2 meters	approx. 7.8 mm
	F-EE-300-030-0-00	EnDat sensor	3 meters	approx. 7.8 mm
	F-EE-300-040-0-00	EnDat sensor	4 meters	approx. 7.8 mm
	F-EE-300-050-0-00	EnDat sensor	5 meters	approx. 7.8 mm
	F-EE-300-100-0-00	EnDat sensor	10 meters	approx. 7.8 mm
	F-EE-300-150-0-00	EnDat sensor	15 meters	approx. 7.8 mm
	F-EE-300-200-0-00	EnDat sensor	20 meters	approx. 7.8 mm
	F-EH-300-010-0-00	Hiperface sensor	1 meter	approx. 7.8 mm
	F-EH-300-020-0-00	Hiperface sensor	2 meters	approx. 7.8 mm
	F-EH-300-030-0-00	Hiperface sensor	3 meters	approx. 7.8 mm
	F-EH-300-040-0-00	Hiperface sensor	4 meters	approx. 7.8 mm
	F-EH-300-050-0-00	Hiperface sensor	5 meters	approx. 7.8 mm
	F-EH-300-100-0-00	Hiperface sensor	10 meters	approx. 7.8 mm
	F-EH-300-150-0-00	Hiperface sensor	15 meters	approx. 7.8 mm
	F-EH-300-200-0-00	Hiperface sensor	20 meters	approx. 7.8 mm

Sensor Cables MDD 2000

Shielded, assembled on both sides, drag chain suitable, highly flexible (10 million bend cycles), with round connector on the motor and device connector
TTemperature range: moving: -20 ... +60 °C/stationary: -50 ... +80 °C
Minimum bend radius: permanent wiring: 4 x D/flexible use: 8 x D

Article Number	Feedback systems used by the motor	Length	Outside Diameters
F-R0-200-010-0-00	Resolver	1 meters	approx. 6.4 mm
F-R0-200-020-0-00	Resolver	2 meters	approx. 6.4 mm
F-R0-200-030-0-00	Resolver	3 meters	approx. 6.4 mm
F-R0-200-040-0-00	Resolver	4 meters	approx. 6.4 mm
F-R0-200-050-0-00	Resolver	5 meters	approx. 6.4 mm
F-R0-200-100-0-00	Resolver	10 meters	approx. 6.4 mm
F-R0-200-150-0-00	Resolver	15 meters	approx. 6.4 mm
F-R0-200-200-0-00	Resolver	20 meters	approx. 6.4 mm
F-R0-200-300-0-00	Resolver	30 meters	approx. 6.4 mm
F-EE-200-010-0-00	EnDat Geber	1 meters	approx. 7.8 mm
F-EE-200-020-0-00	EnDat Geber	2 meters	approx. 7.8 mm
F-EE-200-030-0-00	EnDat Geber	3 meters	approx. 7.8 mm
F-EE-200-040-0-00	EnDat Geber	4 meters	approx. 7.8 mm
F-EE-200-050-0-00	EnDat Geber	5 meters	approx. 7.8 mm
F-EE-200-100-0-00	EnDat Geber	10 meters	approx. 7.8 mm
F-EE-200-150-0-00	EnDat Geber	15 meters	approx. 7.8 mm
F-EE-200-200-0-00	EnDat Geber	20 meters	approx. 7.8 mm
F-EE-200-300-0-00	EnDat Geber	30 meters	approx. 7.8 mm
F-EH-200-010-0-00	Hiperface	1 meters	approx. 7.8 mm
F-EH-200-020-0-00	Hiperface	2 meters	approx. 7.8 mm
F-EH-200-030-0-00	Hiperface	3 meters	approx. 7.8 mm
F-EH-200-040-0-00	Hiperface	4 meters	approx. 7.8 mm
F-EH-200-050-0-00	Hiperface	5 meters	approx. 7.8 mm
F-EH-200-100-0-00	Hiperface	10 meters	approx. 7.8 mm
F-EH-200-150-0-00	Hiperface	15 meters	approx. 7.8 mm
F-EH-200-200-0-00	Hiperface	20 meters	approx. 7.8 mm
F-EH-200-300-0-00	Hiperface	30 meters	approx. 7.8 mm

F-R0-200-050-0-00

Encoder cable

Feedback unit used with motor:

R0	Resolver
EE	EnDat feedback for types: DA, DB, LA, LB see motor type code
EH	Hiperface feedback for types: GA, GB, GD see motor type code
IG	Incremental encoder

For the DSL one cable solution (W, Y) no encoder cable is needed.
The encoder cable is integrated in the motor cable.

Drive:

200	MDP/MDD 2000
300	SDD 310 SDD 315 SDD 215 SDD 120 MDD 1x1 MDD 1x1-1
061	DC 061
062	DC 062

Version:

00	Standard
xx	Special

Connection type: (motor side)

0	Standard (M23 round plug)
1	y-tec plug
2	Tyco plug
3	Molex plug
x	Special

Cable length:

010	1 m
015	1.5 m
020	2 m
030	3 m
040	4 m
050	5 m
100	10 m
150	15 m
200	20 m
300	30 m

Example of article number composition:
Encoder cable for motor with resolver as feedback, standard configuration, cable length 5 m

Cable

Motor Cable MDD 2000

For the power connection, prefabricated shielded motor cables with plugs as well as connectors for the DIAS drive are used; all cables can also be used as drag cables.

The technical data is based on moving applications of the cable with a life span of 5 million bend cycles.

Motor Cable without Hiperface DSL

For motors **with/without holding brakes,** shielded, double-side assembled, drag chain suitable, highly flexible (5 million bend cycles), with round plug on the motor side and module connector
Temperature range: moving: -40 ... +90 °C (UL: +80 °C)/stationary: -50 ... +90 °C (UL: +80 °C)
Minimum bend radius: permanent wiring: 4 x D/flexible use: ≤ 16 mm²: from 7.5 x D

Article Number	Brake	Length	Cable Diameter	Outside Diameter
M200B-15-1-010-0-00	X	1 meters	4x1.5 mm² + 2x0.5 mm²	12 mm
M200B-15-1-020-0-00	X	2 meters	4x1.5 mm² + 2x0.5 mm²	12 mm
M200B-15-1-030-0-00	X	3 meters	4x1.5 mm² + 2x0.5 mm²	12 mm
M200B-15-1-040-0-00	X	4 meters	4x1.5 mm² + 2x0.5 mm²	12 mm
M200B-15-1-050-0-00	X	5 meters	4x1.5 mm² + 2x0.5 mm²	12 mm
M200B-15-1-100-0-00	X	10 meters	4x1.5 mm² + 2x0.5 mm²	12 mm
M200B-15-1-150-0-00	X	15 meters	4x1.5 mm² + 2x0.5 mm²	12 mm
M200B-15-1-200-0-00	X	20 meters	4x1.5 mm² + 2x0.5 mm²	12 mm
M200B-15-1-300-0-00	X	30 meters	4x1.5 mm² + 2x0.5 mm²	12 mm

Motor Cable with Hiperface DSL

For motors **with/without holding brakes,** shielded, double-side assembled, drag chain suitable, highly flexible (5 million bend cycles), with round plug on the motor side and module connector
Temperature range: moving: -40 ... +90 °C (UL: +80 °C)/stationary: -50 ... +90 °C (UL: +80 °C)
Minimum bend radius: permanent wiring: 5 x D/flexible use: 7.5 x D

Article Number	Brake	Length	Cable Diameter	Outside Diameter
M200B-15-0-010-0-02		1 meters	4x1.5 mm² + 2x22 AWG	11.2 mm
M200B-15-0-020-0-02		2 meters	4x1.5 mm² + 2x22 AWG	11.2 mm
M200B-15-0-030-0-02		3 meters	4x1.5 mm² + 2x22 AWG	11.2 mm
M200B-15-0-040-0-02		4 meters	4x1.5 mm² + 2x22 AWG	11.2 mm
M200B-15-0-050-0-02		5 meters	4x1.5 mm² + 2x22 AWG	11.2 mm
M200B-15-0-100-0-02		10 meters	4x1.5 mm² + 2x22 AWG	11.2 mm
M200B-15-0-150-0-02		15 meters	4x1.5 mm² + 2x22 AWG	11.2 mm
M200B-15-0-200-0-02		20 meters	4x1.5 mm² + 2x22 AWG	11.2 mm
M200B-15-0-300-0-02		30 meters	4x1.5 mm² + 2x22 AWG	11.2 mm
M200B-15-1-010-0-02	X	1 meters	4x1.5 mm² + 2x1.0 mm² + 2x22 AWG	13.2 mm
M200B-15-1-020-0-02	X	2 meters	4x1.5 mm² + 2x1.0 mm² + 2x22 AWG	13.2 mm
M200B-15-1-030-0-02	X	3 meters	4x1.5 mm² + 2x1.0 mm² + 2x22 AWG	13.2 mm
M200B-15-1-040-0-02	X	4 meters	4x1.5 mm² + 2x1.0 mm² + 2x22 AWG	13.2 mm
M200B-15-1-050-0-02	X	5 meters	4x1.5 mm² + 2x1.0 mm² + 2x22 AWG	13.2 mm
M200B-15-1-100-0-02	X	10 meters	4x1.5 mm² + 2x1.0 mm² + 2x22 AWG	13.2 mm
M200B-15-1-150-0-02	X	15 meters	4x1.5 mm² + 2x1.0 mm² + 2x22 AWG	13.2 mm
M200B-15-1-200-0-02	X	20 meters	4x1.5 mm² + 2x1.0 mm² + 2x22 AWG	13.2 mm
M200B-15-1-300-0-02	X	30 meters	4x1.5 mm² + 2x1.0 mm² + 2x22 AWG	13.2 mm

M 200 B-15-0-050-0-00

Motor cable

Drive:

200	MDP/MDD 2000
310	SDD 310
	SDD 315
	SDD 215
	SDD 120
100	MDD 111
	MDD121
101	MDD 111-1
	MDD 121-1
061	DC 061-1
062	DC 062

Assembly:

B	both sides
*E	one-sided

*with y-tec only one side is possible

Cable cross section:

*10	1.0 mm²
15	1.5 mm²
25	2.5 mm²
40	4.0 mm²

*with DC and MDD 10X, only 10 possible

Version:

00	Standard
01	drive type 310 only without shield plate
*02	Hiperface DSL (only Drive type 200)
03	Motor thermostat (only Drive type 200)
x	Special

*for encoder types W and Y

Conncetion type: (motor side)

0	Standard (M23 round plug)
1	y-tec plug
2	Tyco plug
3	Molex plug
4	M40 Round connectors
x	Special

Cable length:

*010	1 m
**015	1.5 m
*020	2 m
* **030	3 m
*040	4 m
050	5 m
100	10 m
150	15 m
200	20 m
300	30 m

*possible for MDD only
**possible for DC only

Brake:*

0	no brake
1	brake (+2x0.5 mm²)

*only MDD with brake

Example of article number composition:
Motor cable for MDD type 2000, assembled on both sides, wire cross section 1.5 mm², withou brake, cable length 5 m, Standard configuration

Notes

Cable

Motor Cable MDD 100 and DC 061-1/062

For the power connection, prefabricated shielded motor cables with plugs as well as connectors for the DIAS drive are used; all cables can also be used as drag cables.

The technical data is based on moving applications of the cable with a life span of 5 million bend cycles.

Motor Cable MDD 100

For motors **with/without holding brakes**, shielded, double-side assembled, drag chain suitable, highly flexible (5 million bend cycles), with round plug on the motor side and module connector
Temperature range: moving: -10 ... +60 °C/stationary: -50 ... +80 °C
Minimum bend radius: permanent wiring: 7.5 x D/flexible use: 1.0-4.0 mm^2: 10 x D; from 4.0 mm^2: 12 x D

Article Number	Length	Cable Diameter	Outside Diameter
M101B-10-1-010-0-00	1 meter	4x1 mm^2 + 2x0.5 mm^2	10 mm
M101B-10-1-020-0-00	2 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M101B-10-1-030-0-00	3 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M101B-10-1-040-0-00	4 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M101B-10-1-050-0-00	5 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M101B-10-1-100-0-00	10 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M101B-10-1-150-0-00	15 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M101B-10-1-200-0-00	20 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M101B-10-1-250-0-00	25 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm

Motor Cable DC 061-1/062

For motors **with/without holding brakes**, shielded, double-side assembled, drag chain suitable, highly flexible (5 million bend cycles), with round plug on the motor side and module connector
Temperature range: moving: -10 ... +60 °C/stationary: -50 ... +80 °C
Minimum bend radius: permanent wiring: 7.5 x D/flexible use: 1.5 mm²-4.0 mm²: 10 x D from 4.0 mm²: 12 x D

Article Number	Brake	Length	Cable Diameter	Outside Diameter
M061E-10-0-015-0-0		1.5 meters	4x1 mm² + 2x0.5 mm²	10 mm
M061E-10-0-015-3-0		1.5 meters	4x1 mm² + 2x0.5 mm²	10 mm
M061E-10-0-030-0-0		3 meters	4x1 mm² + 2x0.5 mm²	10 mm
M061E-10-0-030-3-0		3 meters	4x1 mm² + 2x0.5 mm²	10 mm
M061E-10-0-050-0-0		5 meters	4x1 mm² + 2x0.5 mm²	10 mm
M061E-10-0-050-3-0		5 meters	4x1 mm² + 2x0.5 mm²	10 mm
M061E-10-0-100-0-0		10 meters	4x1 mm² + 2x0.5 mm²	10 mm
M061E-10-0-100-3-0		10 meters	4x1 mm² + 2x0.5 mm²	10 mm
M061E-10-1-015-0-0	X	1.5 meters	4x1 mm² + 2x0.5 mm²	10 mm
M061E-10-1-015-3-0	X	1.5 meters	4x1 mm² + 2x0.5 mm²	10 mm
M061E-10-1-030-0-0	X	3 meters	4x1 mm² + 2x0.5 mm²	10 mm
M061E-10-1-030-3-0	X	3 meters	4x1 mm² + 2x0.5 mm²	10 mm
M061E-10-1-050-0-0	X	5 meters	4x1 mm² + 2x0.5 mm²	10 mm
M061E-10-1-050-3-0	X	5 meters	4x1 mm² + 2x0.5 mm²	10 mm
M061E-10-1-100-0-0	X	10 meters	4x1 mm² + 2x0.5 mm²	10 mm
M061E-10-1-100-3-0	X	10 meters	4x1 mm² + 2x0.5 mm²	10 mm

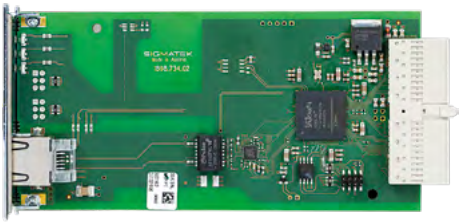
M 200 B-15-0-050-0-00

- **Motor cable**
- **Drive:** 200 MDP/MDD 2000; 310 SDD 310, SDD 315, SDD 215, SDD 120; 100 MDD 111, MDD121; 101 MDD 111-1, MDD 121-1; 061 DC 061-1; 062 DC 062
- **Assembly:** B both sides; *E one-sided — *with y-tec only one side is possible
- **Cable cross section:** *10 1.0 mm²; 15 1.5 mm²; 25 2.5 mm²; 40 4.0 mm² — *with DC and MDD 10X, only 10 possible
- **Version:** 00 Standard; 01 drive type 310 only without shield plate; *02 Hiperface DSL (only Drive type 200); 03 Motor thermostat (only Drive type 200); x Special — *for encoder types W and Y
- **Conncetion type: (motor side)** 0 Standard (M23 round plug); 1 y-tec plug; 2 Tyco plug; 3 Molex plug; 4 M40 Round connectors; x Special
- **Cable length:** *010 1 m; **015 1.5 m; *020 2 m; * **030 3 m; *040 4 m; 050 5 m; 100 10 m; 150 15 m; 200 20 m; 300 30 m — *possible for MDD only; **possible for DC only
- **Brake:*** 0 no brake; 1 brake (+2x0.5 mm²) — *only MDD with brake

Example of article number composition:
Motor cable for MDD type 2000, assembled on both sides, wire cross section 1.5 mm², withou brake, cable length 5 m, Standard configuration

VARAN Baumüller Interface
VBI 021

This interface card serves as the communication between a Baumueller server amplifier (b maXX - 4000 series) and control over the VARAN bus.



Performance Data

Internal memory	serial Flash ((W25Q80))	
Interfaces	1x VARAN bus 1x „BACI" bus	
LEDs	1x PLL sync. (green) 1x DCOK (green) 1x Error (red)	

Electrical Requirements

Supply voltage „BACI"	typically +5 V DC (provided by the converter)	
Current consumption of voltage supply	typically 170 mA	maximum 400 mA

Article Number and Miscellaneous

Article number	16-071-021
Hardware version	3.x

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	150 m/s²
	Protection type	EN 60529	IP00

FDD 3000 VARAN-Interface
SI-VARAN

Interface module for FDD 3000 AC Drives for integration into a VARAN network with

1x VARAN-IN
1x VARAN-OUT

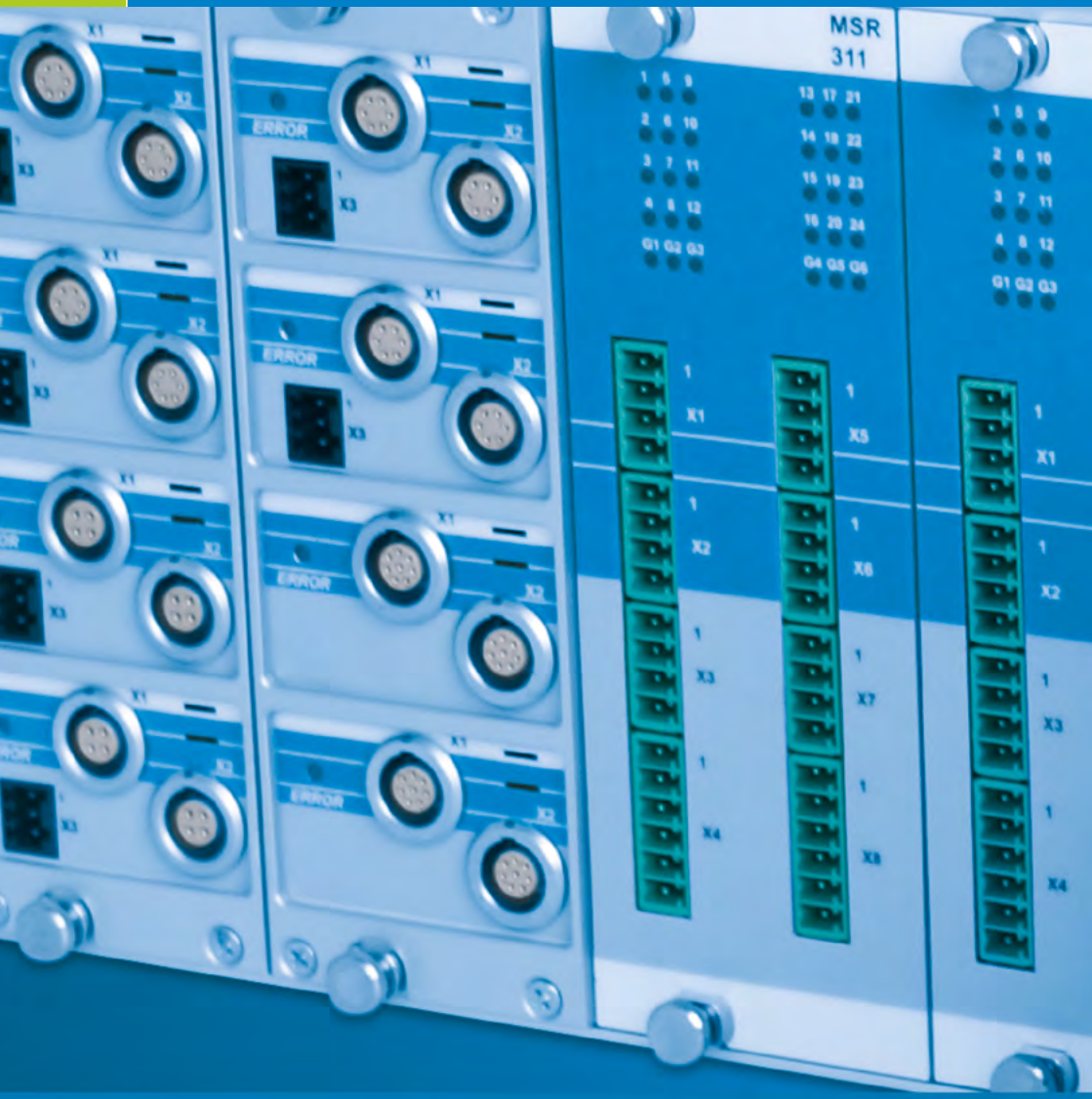
General

	Interfaces	1x VARAN IN 1x VARAN OUT

Article Number and Miscellaneous

	Article number	09-920-003

Notes


MSR
311
ERROR
X1
X2
X3
X4
X5
X6
X7
X8

MSR System

MSR System

Through its modularity, the innovative MSR system from SIGMATEK is optimally suited for the most varied tasks in measuring and regulation technology. The measured values can be collected decentrally close to the sensors and transmitted over the VARAN Ethernet bus system with the highest data security.

The module carrier in 19" format with 3 RU can have up to 8 base modules mounted, each of which can be equipped with 24 digital channels or 8 analog channels. A flexible configuration is therefore produced, with up to 192 digital or 64 analog I/Os. The conversion time is 25 µs per channel (40 kHz). As the CPU, a Compact-IPC can be used.

All measurement values in the entire system can be recorded and processed with the highest synchronously and possible data security using VARAN. The isochronous cycle time of the system is 200 µs.


VARAN

MSR System

Module Carrier
MSR 111

The measuring system is used to record analog and digital measurement values. The connection to the C-IPC is made over the VARAN bus directly to the module carrier. The module carrier connects the eight modules with an LVDS bus (one LVDS connection per module). Up to eight modules can be operated per module carrier. To connect the VARAN and power plugs on the same plane as the Lemo-plug, an interface module is available. On the front side of the module carrier is a diagnostic connector for each module socket, which tests the function of the module. To dissipate the waste heat generated, the MSR 131 fan module can be integrated. This fan module is mounted on a circuit board and can therefore be exchanged.

Performance Data

	Interfaces	8x LVDS bus (with distributor function) 1x interface module (for VARAN In, VARAN Out and supply) 1x fan module

Electrical Requirements

	Supply voltage	18-30 V DC
	Current consumption of voltage supply	the current consumption is dependent on the connected loads maximum 9 A

Article Number and Miscellaneous

	Article number	18-001-111
	Hardware version	1.x

Environmental Conditions

	Storage temperature	-30 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
	Shock resistance	EN 60068-2-27	150 m/s²
	Protection type	EN 60529	IP20

Interface Module
MSR 121

With this module, the VARAN bus and the power plug are connected to the front panel. In addition, the interface module has an inrush current limiter. To avoid misplugging, a DIN connector (connection to the module carrier) is offset from I/O base or fan module.

The VARAN Out port allows the construction of the VARAN bus in a line structure.

Performance Data

	Interfaces	1x VARAN In (RJ45) 1x VARAN Out (RJ45)

Electrical Requirements

	Supply voltage	18-30 V DC
	Current consumption of voltage supply	the current consumption is dependent on the connected loads. **CAUTION: the maximum current is 9 A!**

Article Number and Miscellaneous

	Article number	18-001-121
	Hardware version	1.x

Environmental Conditions

	Storage temperature	-30 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
	Shock resistance	EN 60068-2-27	150 m/s²
	Protection type	EN 60529	IP20

Fan Module
MSR 131

The fan module is an exchangeable unit. Here, a radial fan is mounted on a circuit board. The side intake air is distributed through an air duct in the 19" housing. The fan is activated over the module carrier. To avoid misplugging, a DIN connector (connection to the module carrier) is offset from I/O base or interface module.

Performance Data

Type	side intake DC radial fan
Nominal voltage	24 V
Rotation speed	4400 min^{-1}
Speed signal	yes
Volume flow	28 m^3/h
Lifespan at 40 °C	60.000 h
Lifespan at 70 °C	30.000 h

Consumables

Filter mat	65 mm x 65 mm type P12-150B (1.6 m^2, RS order number 229-251)

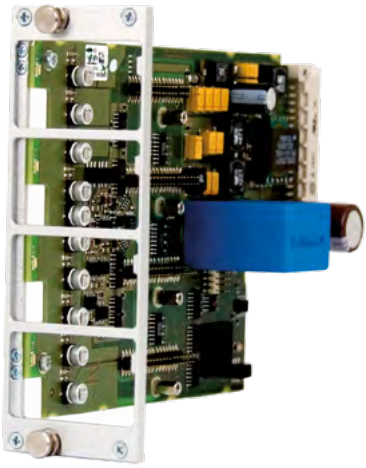
Article Number and Miscellaneous

Article number	18-001-131
Hardware version	1.x

Environmental Conditions

	Storage temperature	-30 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
	Shock resistance	EN 60068-2-27	150 m/s²
	Protection type	EN 60529	IP20

Base Module
MSR 211



The base module serves as the interface for the insert modules. The base module serves as the interface for the insertable modules; it is addressed over the LVDS bus. In the base module, galvanic isolation is implemented for the analog modules.
There is no galvanic isolation between the analog channels of a base (the 8B module is an exception).
The base module has space for a maximum of 4 insertable modules The ±5 V analog input signals are converted with the 18-bit converter in the base module.
The base module provides a short-circuit proof, galvanically isolated 24 V supply voltage for the AI, AO and 8B modules. This voltage can be shut off and has a 100 mA load capacity per channel.

Article Number and Miscellaneous

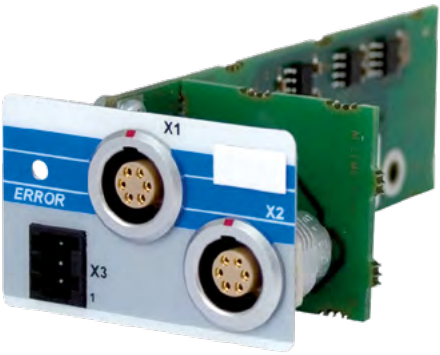
Article number	18-001-211	
Hardware version	1.x	

Environmental Conditions

Storage temperature	-30 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
Shock resistance	EN 60068-2-27	150 m/s²
Protection type	EN 60529	IP00

Notes

AI Insertable Module
MSR 221



This analog input module is used to record voltages in the range of ±10 V. The module has two channels, each with a short-circuit proof reference voltage of 10 V. In addition, each channel has a 24 V supply voltage.

On the diagnostic connector, the processed input signals can be measured. The signal in the diagnostic connectors can only be used for diagnostic purposes and cannot be calibrated.

Analog Channel Specifications

Number of channels	2
Measurement range [Volt]	±10 V
Measurement range [Digit]	-100.000 ... +100.000 in 0.1 mV increments an open input returns 999.999 (sensor break detection)
Resolution [Volt]	333.3 µV/LSB
Resolution [bits]	16
Sensor break detection	10 MΩ between AI- and −15 V 10 MΩ between AI+ and +15 V
Conversion time per channel	≤ 25 µs
Common mode range	±12 V
Input resistance	> 1 MΩ
Analog channel accuracy from end value 0 °C ... 60 °C	typically ±0.0205 %
Status display	ERROR (red) (located on the base)
Converter	18-bit serial SAR
Galvanic isolation	500 V DC

Analog Channel Accuracy

	Integral non-linearity error	typically ±0.006 %	maximum ±0.01 %
	Noise voltage	typically ±0.01 % ≙300 µV rms	maximum ±0.015 % ≙450 µV rms
	Temperature drift 0 ... +60 °C	typically ±0.002 %	maximum ±0.01 %
	Cross talk from previous channel −10 ... +10 V	typically ±0.0025 %	maximum ±0.0035 %
	Total error	typically ±0.0205 %	maximum ±0.0385 %
	Long-term drift 1000 h	typically ±0.006 %	

Reference Output

	Rated voltage 25 °C	+10,000 V	
	Initial accuracy 25 °C	typically ±0.01 %	maximum ±0.05 %
	Temperature drift 0 ... +60 °C	typically ±0.01 %	maximum ±0.03 %
	Total error 0 ... +60 °C	typically ±0.02 %	maximum ±0.08 %
	Additional error with load 0 ... 1 mA 0 ... 10 mA	typically ±0.001 % typically ±0.015 %	
	Long-term drift 1000 h	typically ±0.005 %	
	Maximum load (per channel)	10 mA short-circuit proof	

Supply Voltage 0 ... +60 °C

	Output voltage	+23.343 V ... 24.330 V ... 25.127 V
	Output current/channel	maximum 100 mA short-circuit proof
	Total current/base module	maximum 800 mA
	Galvanic isolation	500 V DC

Diagnostic Connector

	Voltage range	±5 V
	Load capacity	10 mA
	Short-circuit proof	yes

Article Number and Miscellaneous

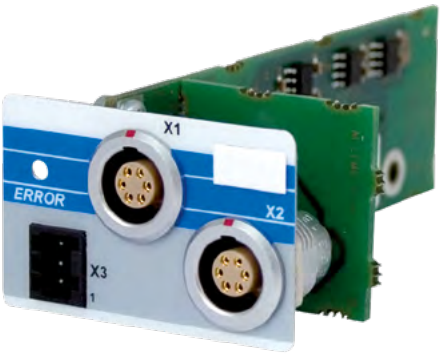
	Article number	18-001-221
	Hardware version	2.x

Environmental Conditions

	Storage temperature	-30 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
	Shock resistance	EN 60068-2-27	150 m/s²
	Protection type	EN 60529	IP00

Notes

AI Insertable Module
MSR 222



This analog insert module is used to detect currents from 0 to 20 mA. The module has two channels, each with a short-circuit proof reference voltage of 10 V. In addition, each chan-nel has a 24 V supply voltage.

On the diagnostic connector, the processed input signals are measured (0...20 mA ≙0...5 V). The signals on the diagnostic connector are for diagnostic purposes only and cannot be calibrated.

Analog Channel Specifications

Number of channels	2
Measurement range [mA]	0 ... 20 mA
Measurement range [Digit]	0...200,000 in 0.1 µA increments
Resolution [Ampere]	666.7 nA/LSB
Resolution [Bit]	16
Sensor break detection	using a measurement of 4 ... 20 mA
Conversion time per channel	≤ 25 µs
Common mode range	±12 V
Shunt resistor	typically 50 Ω
Analog channel accuracy from end value 0 ... 60 °C	typically ±0.027 %
Status display	ERROR (red) (located on the base)
Converter	18-bit serial SAR
Galvanic isolation	500 V DC

Analog Channel Accuracy

Integral non-linearity error	typically ±0.006 %	maximum ±0.01 %
Noise	typically ±0.01 %	maximum ±0.015 %
Temperature input 0 ... 40 °C 0 ... 60 °C	 typically ±0.004 % typically ±0.01 %	 maximum ±0.02 % maximum ±0.03 %
Cross talk from previous channel 0 ... 20 mA	typically ±0.001 %	maximum ±0.002 %
Total error 0 ... 40 °C 0 ... 60 °C	 typically ±0.021 % typically ±0.027 %	 maximum ±0.047 % maximum ±0.057 %
Long-term drift 1000 h	typically ±0.006 %	

Reference Output

Rated voltage 25 °C	+10,000 V	
Accuracy 25 °C	typically ±0.01 %	maximum ±0.05 %
Temperature input 0 ... +60 °C	typically ±0.01 %	maximum ±0.03 %
Total error 0 ... +60 °C	typically ±0.02 %	maximum ±0.08 %
Additional error with load 0 ... 1 mA 0 ... 10 mA	 typically ±0.001 % typically ±0.015 %	
Long-term drift 1000 h	typically ±0.005 %	
Maximum load (per channel)	10 mA short-circuit proof	

Supply Voltage 0 ... +60 °C

Output voltage	+23.343 V ... 24.330 V ... 25.127 V
Output current/channel	maximum 100 mA short-circuit proof
Total current/base module	maximum 800 mA
Galvanic isolation	500 V DC

Diagnostic Connector

Voltage range	0...5 V (≙0...20 mA)
Load capacity	10 mA
Short-circuit proof	yes

Article Number and Miscellaneous

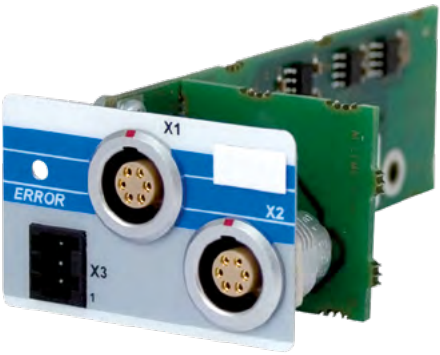
Article number	18-001-222
Hardware version	2.x

Environmental Conditions

	Storage temperature	-30 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
	Shock resistance	EN 60068-2-27	150 m/s²
	Protection type	EN 60529	IP00

Notes

AI-Einsteckmodul
MSR 223



This analog insert module is used to detect temperatures in the range of -200 ... +250 °C (-328 ... +482 °F). A Pt100 resistance thermometer is used as the temperature sen-sor in a 2 or 4-wire configuration. The module has two channels. Additionally, each channel has a switchable 24 V supply voltage.

On the diagnostic connector, the processed input signals can be measured. The signals on the diagnostic connector are for diagnostic purposes only and cannot be calibrated.

Analog Channel Specifications

Number of channels	2
Measurement range	-200 ... +250 °C An open input returns 9999.99 °C
Resolution	0,01 K
Resolution [Bit]	16
Sensor break detection	yes
Conversion time per channel	≤ 25 µs
Sensor current Sensor voltage	typically 0.34 mA maximum 10 V
Analog channel accuracy from end value 0 ... 60 °C	typically 0.3 K
Status display	ERROR (red) (located on the base)
Converter	18-bit Serial SAR
Galvanic isolation	500 V DC

Analog Channel Accuracy

	Accuracy	typically ±0.095 K	maximum ±0.15 K
	Noise	typically ±0.1 K	maximum ±0.14 K
	Temperature input 0 ... 40 °C 0 ... 60 °C	 typically ±0.05 K typically ±0.1 K	 maximum ±0.1 K maximum ±0.2 K
	Cross talk from previous channel. -200 ... +250 °C	typically ±0.005 K	maximum ±0.01 K
	Total error 0 ... 40 °C 0 ... 60 °C	 typically ±0.25 K typically ±0.3 K	 maximum ±0.4 K maximum ±0.5 K
	Long-term drift 1000 h	typically ±0.03 K	

Supply Voltage 0 ... +60 °C

	Output voltage	+23,343 V ... 24,330 V ... 25,127 V
	Output current/channel	100 mA maximum, short-circuit proof
	Total current/base module	maximum 800 mA
	Galvanic isolation	500 V DC

Diagnostic Connector

	Voltage range with cable break	circa 0.5 V to 5 V, 0 V or circa 7 V
	Load capacity	10 mA
	Short-circuit proof	yes

Article Number and Miscellaneous

	Article number	18-001-223
	Hardware version	1.x

Environmental Conditions

	Storage temperature	-30 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
	Shock resistance	EN 60068-2-27	150 m/s²
	Protection type	EN 60529	IP00

8B Insertable Module
MSR 231

This module is used as a carrier for two 8B modules. In addition, each channel has a 24 V supply voltage.

Over the diagnostic connector, the processed input signals can be measured.

Analog Channel Specifications

Number of channels	2
Measurement range [Volt]	according to 8B module specification
Measurement range [Digit]	±30000
Resolution [Volt]	166.6 µV/bits output signal of the 8B modules (±5 V)
Resolution [bits]	16
Sensor break detection	according to 8B module specification
Conversion time per channel	≤ 25 µs
Input filter	according to 8B module specification
Common mode range	according to 8B module specification
Input resistance	according to 8B module specification
Measurement precision (based on the measurement range)	according to 8B module specification typically ± 0.0205 %
Status display	ERROR (red) (located on the base)
Converter	18-bit serial SAR

List of Maximum Current Consumption of 8B Modules

8B module used	Current consumption	Note
Voltage input	25 mA	
PT100	25 mA	
Potentiometer	25 mA	
Thermocouple	30 mA	
Frequency input	45 mA	
Current output	100 mA	
Voltage output	120 mA	(no load: 55 mA)
Current transmitter	125 mA	
Strain gauge input	150 mA	(without bridge supply: 110 mA)

Supply Voltage 0 ... +60 °C

Output voltage	+23.343 V ... 24.330 V ... 25.127 V
Output current/channel	maximum 100 mA short-circuit proof
Total current/base module	maximum 800 mA
Galvanic isolation	500 V DC

Diagnostic Connector

Voltage range	±5 V
Load capacity	10 mA
Short-circuit proof	yes

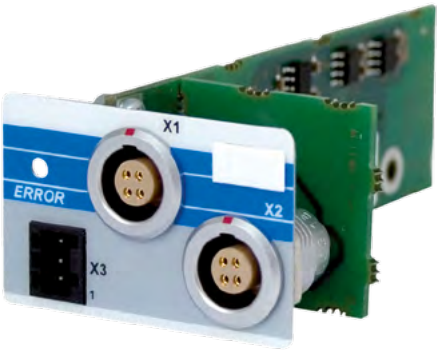
Article Number and Miscellaneous

Article number	18-001-231
Hardware version	1.x

Environmental Conditions

Storage temperature	-30 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
Shock resistance	EN 60068-2-27	150 m/s²
Protection type	EN 60529	IP00

AO Insertable Module
MSR 241



This analog module is used to output voltages in the range of ±10 V. The module has 2 channels, each with a short-circuit proof reference voltage of -10 ... +10 V. In addition, each channel has a 24 V supply voltage.

On the diagnostic connector, the output signals can be measured.

Analog Channel Specifications

	Number of channels	2	
	Measurement range [Volt]	±10 V DC	
	Measurement range [Digit]	-100.000 ... +100.000 in 0.1 mV increments	
	Resolution [bits]	16	
	Resolution [Volt]	333.3 µV/LSB	
	Output voltage capacity	maximum 10 mA	
	Capacitive load of the output voltage	< 100 nF	
	Short-circuit proof	yes	
	Settling time -10 V ... +10 V	typically 150 µs (with a load of 10 kW || 100 nF)	
	Ambient temperature Analog channel accuracy of final value	0 ... +40 °C typically ±0.008 %	0 ... +60 °C typically ±0.023 %
	Status display	ERROR (red) (located on the base)	
	Galvanic isolation	500 V DC	

Settling Time

Hardware settling time -10 ... +10 V/+10 ... -10 V	typically 150 µs (with a load of 10 kW || 100 nF)	

Analog Channel Accuracy

Integral non-linearity error	typically ±0.003 %	maximum ±0.005 %
Temperature drift 0 ... +40 °C 0 ... +60 °C	 typically ±0.005 % typically ±0.02 %	 maximum ±0.02 % maximum ±0.04 %
Cross talk between both channels	typically 0	maximum ±0.0015 %
total error 0 ... +40 °C 0 ... +60 °C	 typically ±0.008 % typically ±0.023 %	 maximum ±0.0265 % maximum ±0.0465 %
Additional error under load 0 ... 1 mA	typically ±0.001 %	
Additional error under load 0 ... 10 mA	typically ±0.015 %	
Long-term drift 1000 h	typically ±0.0065 %	

Supply Voltage 0 ... +60 °C

Output voltage	+23.343 V ... 24.330 V ... 25.127 V
Output current/channel	maximum 100 mA
Total current/base module	maximum 800 mA
Galvanic isolation	500 V DC

Diagnostic Connector

Voltage range	±10 V
Load capacity	10 mA
Short-circuit proof	yes

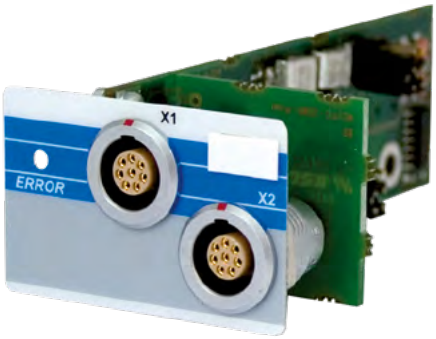
Article Number and Miscellaneous

Article number	18-001-241
Hardware version	1.x

Environmental Conditions

Storage temperature	-30 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
Shock resistance	EN 60068-2-27	150 m/s²
Protection type	EN 60529	IP00

FC Insertable Module
MSR 251



This module has two counter or SSI (Serial Synchronous Interface) inputs. The counters are 32 bits wide and can be used as a counter or frequency meter. The two channels can be configured through the software as counters or an SSI interface. The SSI interface is designed to function as an SSI sensor. Uncoded and Gray encoded sensors are supported.

Analog Channel Specifications

Number of channels	2 counter inputs (or SSI)	
Counter width	32-bit	
Counter frequency	50 MHz internal 5 MHz external	
Time base accuracy	quartz frequency stability: ±100 ppm, aging: ±5 ppm p.a.	
Signal level (can be selected for each channel using a jumper)	RS422 inputs: 150 Ohm bus termination, per 1.2-Ohm resistor to 5 volts spread and mass	+5 V/+24 V (GND-based) switching threshold: typically 2 V input filter: 50 µs counter frequency: max. 10 kHz
Prescaler	16-bit, software configurable	
Pulse suppression	16-bit counter with 1 MHz, software configurable (0-65.53 ms in 1 µs steps)	
Configuration	Up/Down ENABLE LOAD Flank Counter source	per software per software per software per software per software
Inputs	2 inputs, which can be optionally used as counters or SSI data inputs.	
Reference counter	internal counter with programmable prescaler. If the counter of the respective channel is raised, the reference counter is saved.	

SSI Encoder Specifications

Number of channels	2 SSI (or 2 counter inputs)	
SSI signal level	RS422 inputs: 150 Ohm bus termination, per 1.2-Ohm resistor to 5 volts spread and mass outputs: without spreading or bus termination	
Shift register frequency	125 kHz-1 MHz	
Shift register length	maximum 32 bits	
Signal evaluation	Gray code or binary	

Output Voltage

Output voltage	+5 V/short-circuit protected 4.5 V-5.5 V/0.1 A 4.0 V-5.5 V/0.2 A	
Total current 5 V per module	400 mA	
Total current 5 V per base	1.6 A	
Total current 5 V per system	3 A	

Article Number and Miscellaneous

Article number	18-001-251	
Hardware version	1.x	

Environmental Conditions

Storage temperature	-30 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
Shock resistance	EN 60068-2-27	150 m/s²
Protection type	EN 60529	IP00

NC Insertable Module
MSR 261

This input module has two independent counter stages for incremental encoder with a RS422 signal. The module provides a 16-bit counter resolution with a maximum input frequency of 125 kHz.

Incremental Encoder Connection

Number of channels	2
Input signals	incremental encoder signals (A, /A, B, /B, R, /R) RS422 signal with a 150 Ω termination
Input frequency	maximum 125 kHz
Counter frequency	maximum 500 kHz
Signal evaluation	4X
Counter resolution	16-bit

Output Voltage

Output voltage	+5 V/short-circuit protected 4.5 V-5.5 V/0.1 A 4.0 V-5.5 V/0.2 A
Total current 5 V per module	400 mA
Total current 5 V per base	1.6 A
Total current 5 V per system	3 A

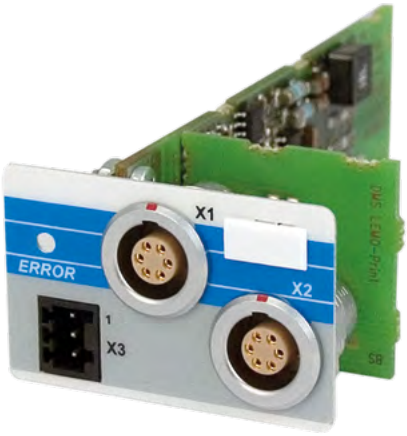
Article Number and Miscellaneous

Article number	18-001-261	
Hardware version	1.x	

Environmental Conditions

Storage temperature	-30 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
Shock resistance	EN 60068-2-27	150 m/s²
Protection type	EN 60529	IP00

DMS Insert Module
MSR 281



This input module is used to measure the expanding or compression of strain gauges with a Wheatstone bridge. The module has two channels, each with a short-circuit proof excitation voltage of 3.333 V. The measurement range of the Wheatstone bridge is 3 mV/V. Other measuring ranges starting from 1.5 mV/V are available on request. The strain gauges can be connected with 4 or 6-wire technology. Drift correction (zeroing) is Possipble.

The processed input signals can be measured over the diagnostic connector. The signals on the diagnostic connector are for diagnostic purposes only and cannot be calibrated.

Analog Channel Specifications

Number of channels	2
Excitation voltage	3.333 V
Measurement range	3 mV/V
Bridge resistance	100-5000 Ω
Measurement range [Digit]	±100.000
Resolution [Bit]	16
Sensor break detection	yes
Input filter	8 kHz (-3 dB) -60 dB/decade
Conversion time per channel	≤ 25 µs
Common mode range	1-2.3 V
Analog channel accuracy from end value, 25 °C	typisch ±0.0565 %
Status display	ERROR (red) (located on the base)
Converter	18-bit Serial SAR
Galvanic isolation	500 V DC

Analog Channel Accuracy

	Integral non-linearity	typically ±0.008 %	maximum ±0.02 %
	Noise voltage	typically ±0.046 % ≙ 1.4 µV rms	maximum ±0.056 % ≙ 1.7 µV rms
	Cross talk from previous channel -10 mV ... +10 mV	typically ±0.0025 %	maximum ±0.0035 %
	Temperature drift 0 ... +40 °C 0 ... +60 °C	typically ±0.065 % typically ±0.15 %	maximum ±0.2 % maximum ±0.45 %
	Total error +25 °C 0 ... +40 °C 0 ... +60 °C	typically ±0.0565 % typically ±0.1215 % typically ±0.2065 %	maximum ±0.0795 % maximum ±0.2795 % maximum ±0.5295 %
	Effects of the supply line resistance. ΔR = ±1 % from the bridge resistance 4-wire measurement 6-wire measurement	typically ±1 % typically ±1 ppm	maximum ±1 % maximum ±3 ppm
	Long-term drift 1000 h	typically ±0.007 %	

Drift Correction

	Turn-on time	typically 80 ms	maximum 120 ms
	Turn-off time	typically 105 ms	maximum 160 ms

Excitation Voltage

	Rated voltage +25 °C	+3.333 V	
	Initial accuracy +25 ° C	typically ±0.05 %	maximum ±0.3 %
	Temperature drift 0 °C ... +40 °C 0 °C ... +60 °C	typically ±0.01 % typically ±0.025 %	maximum ±0.03 % maximum ±0.05 %
	Total error 0 °C ... +40 °C 0 °C ... +60 °C	typically ±0.06 % typically ±0.075 %	maximum ±0.33 % maximum ±0.35 %
	Additional error under load R_{Bridge} = 5 kΩ R_{Bridge} = 100 Ω	typically 0.0003 % typically 0.03 %	maximum 0.0015 % maximum 0.06 %
	Long-term drift 1000 h	typically ±0.007 %	
	Maximum load (per channel)	35 mA	
	Short-circuit proof	yes	

Diagnostic Connector

	Voltage range with cable break	-5 V ... +5 V (≙ -10 mV ... +10 mV) ca. +14 V
	Load capacity	10 mA
	Short-circuit proof	yes

Article Number and Miscellaneous

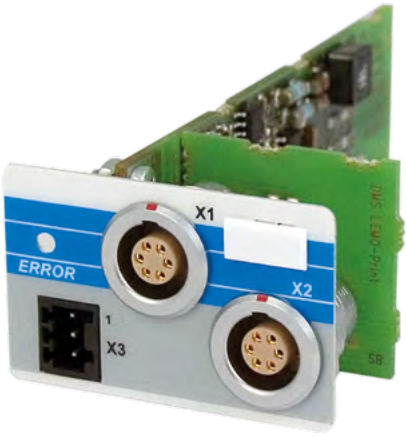
Article number	18-001-281	
Hardware version	1.x	

Environmental Conditions

Storage temperature	-30 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
Shock resistance	EN 60068-2-27	150 m/s²
Protection type	EN 60529	IP00

Notes

DMS Insert Module
MSR 282



This input module is used to measure the expanding or compression of strain gauges with a Wheatstone bridge. The module has two channels, each with a short-circuit proof excitation voltage of 3.333 V. The measurement range of the Wheatstone bridge is 10 mV/V. Other measuring ranges starting from 1.5 mV/V are available on request. The strain gauges can be connected with 4 or 6-wire technology. Drift correction (zeroing) is possible.

The processed input signals can be measured over the diagnostic connector. The signals on the diagnostic connector are for diagnostic purposes only and cannot be calibrated.

Analog Channel Specifications

Number of channels	2
Excitation voltage	3.333 V
Measurement range	10 mV/V
Bridge resistance	100-5000 Ω
Measurement range [Digit]	±100.000
Resolution [Bit]	16
Sensor break detection	yes
Input filter	8 kHz (-3 dB) -60 dB/decade
Conversion time per channel	≤ 25 µs
Common mode range	1-2.3 V
Analog channel accuracy from end value, 25 °C	typisch ±0.0565 %
Status display	ERROR (red) (located on the base)
Converter	18-bit Serial SAR
Galvanic isolation	500 V DC

Analog Channel Accuracy

	Integral non-linearity	typically ±0.008 %	maximum ±0.02 %
	Noise voltage	typically ±0.046 % ≙ 1.4 µV rms	maximum ±0.056 % ≙ 1.7 µV rms
	Cross talk from previous channel -10 mV ... +10 mV	typically ±0.0025 %	maximum ±0.0035 %
	Temperature drift 0 ... +40 °C 0 ... +60 °C	typically ±0.065 % typically ±0.15 %	maximum ±0.2 % maximum ±0.45 %
	Total error +25 °C 0 ... +40 °C 0 ... +60 °C	typically ±0.0565 % typically ±0.1215 % typically ±0.2065 %	maximum ±0.0795 % maximum ±0.2795 % maximum ±0.5295 %
	Effects of the supply line resistance. ΔR = ±1 % from the bridge resistance 4-wire measurement 6-wire measurement	typically ±1 % typically ±1 ppm	maximum ±1 % maximum ±3 ppm
	Long-term drift 1000 h	typically ±0.007 %	

Drift Correction

	Turn-on time	typically 80 ms	maximum 120 ms
	Turn-off time	typically 105 ms	maximum 160 ms

Excitation Voltage

	Rated voltage +25 °C	+3.333 V	
	Initial accuracy +25 ° C	typically ±0.05 %	maximum ±0.3 %
	Temperature drift 0 °C ... +40 °C 0 °C ... +60 °C	typically ±0.01 % typically ±0.025 %	maximum ±0.03 % maximum ±0.05 %
	Total error 0 °C ... +40 °C 0 °C ... +60 °C	typically ±0.06 % typically ±0.075 %	maximum ±0.33 % maximum ±0.35 %
	Additional error under load R_{Bridge} = 5 kΩ R_{Bridge} = 100 Ω	typically 0.0003 % typically 0.03 %	maximum 0.0015 % maximum 0.06 %
	Long-term drift 1000 h	typically ±0.007 %	
	Maximum load (per channel)	35 mA	
	Short-circuit proof	yes	

Diagnostic Connector

	Voltage range with cable break	-5 V ... +5 V (≙ -33,.3 mV ... +33.33 mV) ca. +14 V
	Load capacity	10 mA
	Short-circuit proof	yes

Article Number and Miscellaneous

Article number	18-001-281	
Hardware version	1.x	

Environmental Conditions

Storage temperature	-30 ... +85 °C	
Environmental temperature	0 ... +60 °C	
Humidity	0-95 %, non-condensing	
EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
Shock resistance	EN 60068-2-27	150 m/s²
Protection type	EN 60529	IP00

Notes

I/O Modules

MSR 311

This module has 24 short-circuit proof +24 V/2 A (positive switching) digital outputs, which are back-readable and therefore can also be used as inputs with a +24 V level for reading the signal conditions 0 and 1.

The power supply for each channel group is monitored for over voltage.

Digital Outputs

Number of outputs	24 (back-readable)
Short-circuit proof	yes
Maximum continuous current load allowed per channel	2 A
Maximum total current 4 outputs	6 A (100 % of on time)
Maximum total current (complete module)	36 A (100 % of on time)
Voltage drop over power supply (output active)	≤ 1 V
Residual current (output inactive)	≤ 12 mA
Turn-on delay	typically 100 µs
Turn-off delay	typically 100 µs
Status display	LEDs: outputs yellow, voltage monitor red

Status of the Back-Readable Outputs

	Number	24	
	Input voltage	typically +24 V	maximum +30 V
	Signal level	low: < +4.5 V	high: > +12 V
	Switching threshold	typically +8 V	
	Input current	typically 5 mA at +24 V	
	Input delay	typically 5 ms	

Electrical Requirements

	Supply voltage for Outputs +24 V /1-6	18-30 V DC
	Current consumption of supply voltage for the outputs +24 V /1-6	corresponds to the load on the digital outputs (maximum of 6 A per group of 4)

Voltage Monitor

	Supply voltage +24 V /1-6	power supply < 18 V (error LED lights red)

Article Number and Miscellaneous

	Article number	18-001-311
	Hardware version	1.x

Environmental Conditions

	Storage temperature	-30 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	EMC stability	in accordance with EN 61000-6-2:2001 (industrial area)	
	Shock resistance	EN 60068-2-27	150 m/s²
	Protection type	EN 60529	IP20

Accessories


54
128 MB
Industrial Grade

Accessories General

Accessories

Batteries

Available Products

	Description	Article number
	Battery CR 1/2 AA	01-690-004
	Battery for Build-in terminals	01-690-014
	Battery CR2450N	01-690-027
	Battery CR2032	01-690-028

Notes

Accessories

CAN Bus

Available Products

	Description	Article number
	CAN bus termination plug SG004	01-019-004
	CAN bus termination plug SG005	01-019-005
	CAN bus cable 2-pin shielded	01-690-013
	CAN bus protection plug SG 001	01-019-001

Available Products

	Description	Article number
	CAN bus protection plug SG002	01-019-002
	CAN bus interface BU105	01-016-105
	C-DIAS CAN bus adapter cable	01-016-041

Accessories

S-DVI Interface Cable

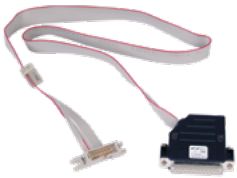
This cable is used for connections between the C-IPC and TAE terminals.

Available Cables

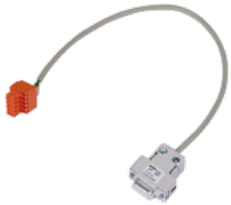
	Length	Article number
	0.3 meters	05-950-003
	2 meters	05-950-020
	3 meters	05-950-030
	3.5 meters	05-950-035
	5 meters	05-950-050
	7 meters	05-950-070
	10 meters	05-950-100
	15 meters	05-950-150

Accessories
Cable

Available Products

	Description	Article number
	Connection cable CT032-25 2.5 meters	01-900-070
	IPC-DIAS cable (2 connectors) 0.7 meters	01-359-007
	Online cable COL09	01-900-001
	USB 1.1 cable A/m-B/m 3 meters 5 meters	05-970-030 05-970-050

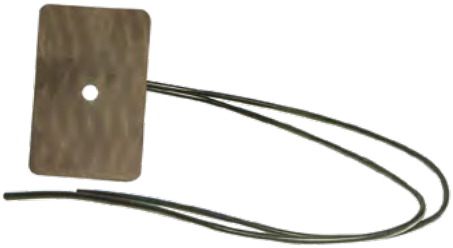
Available Products

	Description	Article number
	Connection cable IPC – DIAS 0.7 meters 2 meters 10 meters	 01-358-007 01-358-020 01-358-100
	Interface cable 0.3 meters 2 meters 5 meters 10 meters 15 meters	 05-960-003 05-960-020 05-960-050 05-960-100 05-960-150

Notes

Regen Resistor

DC 06X-Z1



Power resistance in thick-film technologies on steel substrate

- pulse strong

- low inductive

- easy mounting

Specification

Resistance value	15 Ω
Tolerance	±10 %
Temperature coefficient	150 ppm/°C
Operating voltage	1000 V DC
Withstand voltage of the isolation	2.5 KV DC, 60 s at 50 Hz
Stability (maximuml ΔR/R)	±20 %
Higher inductivity	< 6 µH
Temperature range (operation/storage)	-50 ... +200 °C/-40 ... +105 °C
Tightening torque (Mounting screws)	6 Nm
Cover	glass
Protection type	IP00
Connection type	400 mm strand
Nominal power	100 W (heat sink necessary)
Mounting	M5
Weight	20 g

Article Number and Miscellaneous

	Article number	20-014-061-Z1
	Dimensions	61 x 41 x 1 mm (Length x Width x Thickness)

Regen Resistor assembled
DC 061-Z3

Power resistance in thick-film technologies on steel substrate

- pulse strong
- low inductive
- easy mounting
- Fabricated connector MOLEX 042816-0212

Specification

Resistance value	15 Ω
Tolerance	±10 %
Temperature coefficient	150 ppm/°C
Operating voltage	1000 V DC
Withstand voltage of the isolation	2.5 KV DC, 60 s at 50 Hz
Stability (maximuml ΔR/R)	±20 %
Higher inductivity	< 6 µH
Temperature range (operation/storage)	-50 ... +200 °C/-40 ... +105 °C
Tightening torque (Mounting screws)	6 Nm
Cover	glass
Protection type	IP00
Connection type	connector plug Molex 042816-0212 cable length 250 mm
Nominal power	100 W (heat sink necessary)
Mounting	M5
Weight	20 g (resistor)

Article Number and Miscellaneous

	Article number	20-014-061-Z3
	Dimensions	61 x 41 x 1 mm (Length x Width x Thickness)

RFID-Reader

RFID 131

with 1 USB device 2.0
1 CAN bus

The RFID reader is an installable device for reading and writing to RFID card. Communication with other bus participants is established over the CAN bus or USB interface. The reader is supplied with +24 V.

The RFID reader is installed in a cutaway of the control cabinet.

Performance Data

Protocol	ISO 15693, ISO 14443A, ISO 14443B
Supported cards	Mifare Ultralight/Ultralight C Mifare Classic Mini/1K/4K Mifare Desfire EV1 2K, 4K 8K Mifare Pro, Plus ISO15693 NXP ICOD SLI, TI TagIT, standard cards
RF power	100 mW EIRP
Operating frequency	13.56 MHz
Reading distance	up to 5 cm (depending on the tag, antenna and ambient conditions)
Write distance	approximately 70 % of the read distance
Interfaces	1x USB device 2.0, (Type Mini-B) 1x CAN bus
Status LEDs	yes, blinks in 1 s frequency and indicates the readiness of the device

Electrical Requirements

	Supply voltage	typically +24 V DC	
		minimum +18 V DC	maximum +30 V DC
	Current consumption Power supply +24 V	minimum 45 mA	maximum 60 mA
	Inrush current	2 A for 2 ms	

RFID Reader

	Material	front: acrylic glass back: chromated sheet steel
	Weight	110 g

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +55 °C	
	Humidity	0-95 %, non-condensing	
	EMC resistance	according to EN 61000-6-2 (industrial area)	
	EMC noise generation	according to EN 61000-6-4 (industrial area)	
	Radio Communication Conformity Europe	according to ETSI EN 300 330 (2014/53/EU, RED Directive)	
	Radio Communication Conformity USA	FCC CFR 47 Part 15	
	Product safety	EN 60950-1:2006	
	Vibration resistance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 h (10 m/s2)
	Shock resistance	EN 60068-2-27	duration 11 ms, 18 Shocks 15 g (150 m/s2)
	Protection type	EN 60529 protected through the housing	front: IP65 cover: IP20

Article Number and Miscellaneous

	Article number	01-691-131
	Dimensions	90 x 57 x 30.8 mm (W x H x D)

Remote Access Router
RAR 24XX

with 5 Ethernet ports
1 USB 2.0

The RAR 24XX is the standard and most supported hardware for SIGMATEK´s Remote Access Platform (RAP). The RAR 24XX makes it convenient to remotely connect to your equipment, while the built-in firewall keeps your equipment safe from outside threats. Configuration is as easy as inserting a USB flash drive, which contains your configura-tion file, into the RAR 24XX´s USB port.

Technical Data

Power supply (recommended)	12-24 VDC ±20 % LPS 2 A
Power consumption	10 W max, about 2.5-5 W* idle
Operating temperature	-20 ... +65 °C
Relative humidity	10-95 % non-condensing
Operating altitude	up to maximum 2000 m
Storage temperature	-20 ... +65 °C
Storage humidity	10-95 % non-condensing
Storage altitude	up to maximum 3000 m
Ethernet ports	five 1 Gbps (4x LAN, 1x WAN)
USB	USB 2.0
Processor	MIPS 800 MHz
Digital Input	yes
Degree of protection	IP20
Mounting	DIN rail
Size	95 x 116 x 28 mm (excl. DIN rail clip)
Weight	270-310 g

Certifications	CE, FCC Verification, RoHS, REACH
Class	5 bands GPRS/EDGE Class 12
Speed	HSPA+ - Max.14.4 Mbps (DL)/Max.5.76 Mbps (UL) UMTS - Max.384 Kbps (DL)/Max.384 Kbps (UL) EDGE - Max.236.8 Kbps (DL)/Max.236.8 Kbps (UL) GPRS - Max.85.6 Kbps (DL)/Max.85.6 Kbps (UL) CSD - 14.4 Kbps
SIM size	Standard SIM card (size 2FF)
FCC ID LTE additional specifications: 4G-G protocols and frequencies (Gobal)	XMR201903EG25G FDD-LTE - B1, B3, B5, B7, B8, B20 WCDMA - B1, B5, B8 GSM/GPRS/EDGE - 850, 900, 1800, 1900 MHz
Speed	LTE-FDD - Max.100 Mbps (DL)/Max.50 Mbps (UL) LTE-TDD - Max.61 Mbps (DL)/Max.18 Mbps (UL) DC-HSPA+ - Max.42 Mbps (DL)/Max.5.76 Mbps (UL) TD-SCDMA - Max.4.2 Mbps (DL)/Max.2.2 Mbps (UL) WCDMA - Max.384 Kbps (DL)/Max.384 Kbps (UL) EDGE - Max.236.8 Kbps (DL)/Max.236.8 Kbps (UL) GPRS - Max.85.6 Kbps (DL)/Max.85.6 Kbps (UL) CSD - 14.4 Kbps
SIM size	Standard SIM card (size 2FF)
Wi-Fi additional specifications: WI-FI IEEE 802.11 version	b/g/n
WI-FI modes	Station (Client) Mode and Access Point
Speed	72 Mbps
FCC ID	XPYLILYW1

Electrical Requirements

Power supply	12-24 VDC ±20 % LPS 2 A
Internal voltage protection	maximum 29 V
Input protection	protected against polarity inversion
Isolation	1.5 kV

Digital Input

Type	Optocoupler
Voltage range	0-29 VDC
Voltage range (OFF state)	0-3 VDC
Voltage range (ON state)	7-29 VDC
Current voltage (ON state)	2-5 mA (typically)

Article Number and Miscellaneous

The RAR 24XX contains different FCC certified modules, depending on the variant.

Type	Enclosed Module	Article Number
RAR 2400	-	01-692-2400
RAR 2405	4G Global	01-692-2405
RAR 2410	Wi-Fi	01-692-2410
RAR 2415	Wi-Fi + Global	01-692-2415
Dimensions	28 x 116 x 95 mm (W x H x D)	

Notes

WiFi Adapter
WIFI 011

- WiFi 802,11 b/g/n

- 1x1 MIMO technology improves effective throughput and range over existing 802.11 b/g/n products

- up to 150 Mbps data transfer rate

- BPSK, QPSK, 16-QAM, DBPSK, DQPSK and CCK modulation schemes

- WEP, TKIP, AES, WPA and WPA2 hardware encryption schemes

Performance Data	
Wireless standard	802.11 b/g/n
Module type	Host Controller Interface (HCI)
Tested operating systems	Salamander, Gecko OS1)
Security	WEP 64 bit, WEP 128 bit, TKIP, AES, WPA, WPA2
Network architecture	Ad hoc mode (peer-to-peer) and infrastructure mode

Hardware	
Chipset	Realtek
Antenna	Onboard chip antenna
Interfaces	USB 2.0
LED	Power

RF Characteristics

Tx output power	(±2 dBm): 13 dBm @ 11 n, 17 dBm @ 11 b, 15 dBm @ 11 g
Rx sensitivity	11 Mbps -80 dBm @ 8 % 54 Mbps -70 dBm @ 10 % 150 Mbps -64 dBm @ 10 %
Range (in open space)	indoor: up to 100 m outdoor: up to 180 m
Current consumption	transmit: average 125 mA receive: average 68 mA transmit and receive: average 104 mA
Data transfer rate	1, 2, 5,5, 6, 11, 12, 18, 22, 24, 30, 36, 48, 54, 60, 90, 120 Mbps to a maximum of 150 Mbps
Frequency	2.4 GHz ISM band
Modulation scheme	BPSK/QPSK/16-QAM/DBPSK/DQPSK/CCK
Spreizspektrum	IEEE 802.11b: DSSS (Direct Sequence Spread Spectrum) IEEE 802.11g/n: OFDM (Orthogonal Frequency Division Multiplexing)

Environmental Conditions

Storage temperature	-20 ... +70 °C
Environmental temperature	-10 ... +60 °C
Humidity	5-90 %, non-condensing

Article Number and Miscellaneous

Article number	12-640-011
Mechanical dimensions	17.00 x 15.00 x 8.00 mm (L x W x H)
Weight	1.80 g ±0.25 g tolerance 25.36 g in retail pack
Approvals	ROHS, REACH, WEEE (in EU, Brazil, Canada, Japan and USA)

Accessories

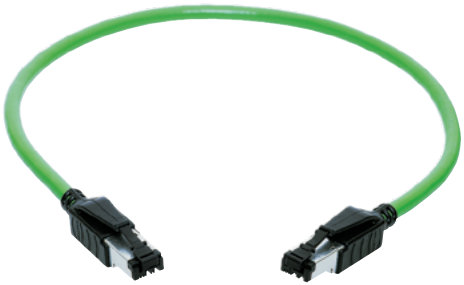
Memory Cards and Miscellaneous

Available Products

	Description	Article number
	CF-Memory card 128-Mbyte CF-Memory card 1-Gbyte CF-Memory card 2-Gbyte CF-Memory card 8-Gbyte CF-Memory card 16-Gbyte	12-610-011 12-610-101 12-610-201 12-610-801 12-610-1601
	USB Stick 2-Gbyte	12-620-203
	microSD card for EDGE2 1-Gbyte	12-630-105
	Screwdriver angled	01-690-012

Notes

VARAN Bus Connection Technology
Prefabricated Connector Cable



VARAN bus connection cable for
DRAG CHAIN wiring

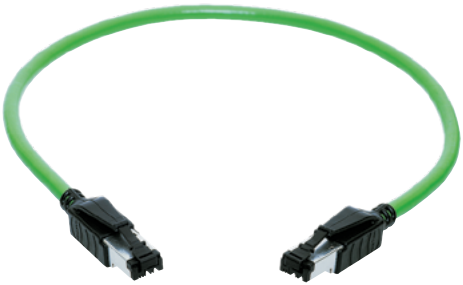
Prefabricated 4-pin, flexible system cable for the drag chain (IP20 area), tested for its industrial suitability. The connector cable is recommended for the IP20 area by the VNO (VARAN BUS USER ORGANIZATION), since real-time Ethernet in industrial automation requires higher quality and robustness for cables and connectors than office Ethernet.

VARAN bus connection cable **for drag chain application**
2x RJ45 industrial, 4-pin, overmolded housings, prefabricated

Connector	2x HARTING RJ Industrial IP20 Data with overmoulded housings
Cable type	drag chain system cable 4-pin, 2x2xAWG22/7, double shielding
Protection type	IP20 (when mated)
Sheath	PUR green
Mating interface	2x RJ45 in accordance with IEC 60603-7

Length	Article number
1.5 meters	16-910-015
3 meters	16-910-030
5 meters	16-910-050
10 meters	16-910-100
20 meters	16-910-200
50 meters	16-910-500

VARAN Bus Connection Technology
Prefabricated Connector Cable



VARAN bus connection cable **for flexible application**
2x RJ45 industrial, 4-pin, overmolded housings, prefabricated

Connector	2x HARTING RJ Industrial IP20 Data with overmoulded housings
Cable type	flexible system cable 4-pin, 2x2xAWG26/7, double shielding
Protection type	IP20 (when mated)
Sheath	PVC green
Mating interface	2x RJ45 in accordance with IEC 60603-7

Length	Article number
1.5 meters	16-900-015
3 meters	16-900-030
5 meters	16-900-050
10 meters	16-900-100
20 meters	16-900-200
50 meters	16-900-500

VARAN Bus Connection Technology

Prefabricated Connector Cable

VARAN bus connection cable for
DRAG CHAIN wiring

Prefabricated 4-pin, flexible system cable for the drag chain (IP20 area), tested for its industrial suitability. The connector cable is recommended for the IP20 area by the VNO (VARAN BUS USER ORGANIZATION), since real-time Ethernet in industrial automation requires higher quality and robustness for cables and connectors than office Ethernet.

VARAN bus connection cable **for drag chain application**
1x RJ45 industrial to 1x Mini I/O, 4-pin, prefabricated

Connector	1x HARTING RJ Industrial IP20 Data 1x Industrial Mini I/O Type 1 plug IP20 Data
Cable type	drag chain system cable 4-pin, 2x2xAWG22/7, double shielding
Protection type	IP20 (when mated)
Sheath	PUR green
Mating interface	1x RJ45 in accordance with IEC 60603-7, 1x Mini I/O Type 1

Length	Article number
0.5 meters	16-911-005
1 meters	16-911-010
1.5 meters	16-911-015
2 meters	16-911-020
3 meters	16-911-030
5 meters	16-911-050
10 meters	16-911-100
20 meters	16-911-200
50 meters	16-911-500

VARAN Bus Connection Technology
Prefabricated Connector Cable

VARAN bus connection cable for
FLEXIBLE wiring

Prefabricated 4-pin, flexible system cable for the IP20 area, tested for its industrial suitability. The connector cable is recommended for the IP20 area by the VNO (VARAN BUS USER ORGANIZATION), since real-time Ethernet in industrial automation requires higher quality and robustness for cables and connectors than office Ethernet.

VARAN bus connection cable **for flexible application**
1x RJ45 industrial to 1x Mini I/O, 4-pin, prefabricated

Connector	1x HARTING RJ Industrial IP20 Data 1x Industrial Mini I/O Type 1 plug IP20 Data
Cable type	flexible system cable 4-pin, 2x2xAWG26/7, double shielding
Protection type	IP20 (when mated)
Sheath	PVC green
Mating interface	1x RJ45 in accordance with IEC 60603-7, 1x Mini I/O Type 1

Length	Article number
0.2 meters	16-901-002
0.5 meters	16-901-005
1 meters	16-901-010
1.5 meters	16-901-015
2 meters	16-901-020
3 meters	16-901-030
5 meters	16-901-050
10 meters	16-901-100
20 meters	16-901-200

VARAN Bus Connection Technology

Prefabricated Connector Cable

VARAN bus connection cable for
DRAG CHAIN wiring

Prefabricated 4-pin, flexible system cable for the drag chain (IP20 area), tested for its industrial suitability. The connector cable is recommended for the IP20 area by the VNO (VARAN BUS USER ORGANIZATION), since real-time Ethernet in industrial automation requires higher quality and robustness for cables and connectors than office Ethernet.

VARAN bus connection cable **for drag chain application**
2x Mini I/O, 4-pin, prefabricated

Connector	2x Industrial Mini I/O Type 1 plug IP20 Data
Cable type	drag chain system cable 4-pin, 2x2xAWG22/7, double shielding
Protection type	IP20 (when mated)
Sheath	PUR green
Mating interface	2x Mini I/O Type 1

Length	Article number
0.5 meters	16-912-005
1 meters	16-912-010
1.5 meters	16-912-015
2 meters	16-912-020
3 meters	16-912-030
5 meters	16-912-050

VARAN Bus Connection Technology
Prefabricated Connector Cable

VARAN bus connection cable for
FLEXIBLE wiring

Prefabricated 4-pin, flexible system cable for the IP20 area, tested for its industrial suitability. The connector cable is recommended for the IP20 area by the VNO (VARAN BUS USER ORGANIZATION), since real-time Ethernet in industrial automation requires higher quality and robustness for cables and connectors than office Ethernet.

VARAN bus connection cable **for flexible application**
2x Mini I/O, 4-pin, prefabricated

Connector	2x Industrial Mini I/O Type 1 plug IP20 Data
Cable type	flexible system cable 4-pin, 2x2xAWG26/7, double shielding
Protection type	IP20 (when mated)
Sheath	PVC green
Mating interface	2x Mini I/O Type 1

Length	Article number
0.5 meters	16-902-005
1 meters	16-902-010
1.5 meters	16-902-015
2 meters	16-902-020
3 meters	16-902-030
5 meters	16-902-050

VARAN Bus Connection Technology

Connector Cable CAT5

VARAN bus connector cable CAT5 for DRAG CHAIN wiring

The CAT5 connector cable is used with the RJ45 connector set for constructing specific on-site cable systems.

Industrial Ethernet Cable

Cable type	drag chain capable connector cable 4-pin , 2x2xAWG22/7, double shielded
Sheath	PUR green

Article number	Description	Length	Cable
16-915-002	industrial Ethernet connection for drag chain wiring, 4-pin CAT5, PUR insulation green	100 meter ring	2x2xAWG22/7

VARAN Bus Connection Technology
Connector Cable CAT5

VARAN bus connector cable CAT5 for FLEXIBLE wiring

The CAT5 connector cable is used with the RJ45 or Mini I/O connector set for constructing specific on-site cable systems.

Industrial Ethernet Cable for RJ45 Connector Set

Cable type	flexible connection cable 4-pin, 2x2xAWG26/7, double shielding
Sheath	PVC green

Article number	Description	Length	Cable
16-915-001	industrial Ethernet cable for flexible wiring, 4-pin CAT5, PVC insulation green	100 meter ring	2x2xAWG26/7

Industrial Ethernet Cable for Mini I/O Connector Set

Cable type	flexible connection cable 4-pin, 1x4xAWG26/7, double shielding
Sheath	PVC green

Article number	Description	Length	Cable
16-915-001-1	industrial Ethernet cable for flexible wiring, 4-pin CAT5, PVC insulation green	100 meter ring	1x4xAWG26/7

VARAN Bus Connection Technology

RJ45 Connector Set CAT5

IP20 data connector

The RJ45 connector set is used with the CAT5 connector cable for constructing specific cable on-site systems.

RJ45 Industrial Connector

Housing material	plastic version
Protection type	IP20
Mating interface	RJ45 in accordance with IEC 60603-7

Article number	Description
16-915-011	RJ45 industrial plug 4-pin cable assembly without tools CAT5

VARAN Bus Connection Technology
Mini I/O Connector Set CAT5

IP20 data connector

The Mini I/O connector set is used with the CAT5 connector cable for constructing specific cable on-site systems.

RJ45 Industrial Connector

Housing material	plastic version
Protection type	IP20
Mating interface	RJ45 in accordance with IEC 60603-7

Article number	Description
16-915-011	Mini I/O industrial plug 4-pin cable assembly CAT5

VARAN Bus Connection Technology
Stripping Tool

Stripping tool to remove the insulation

Stripping Tool		
	Article number	16-915-012

Notes


VARAN

VARAN Boards/Analyzer

Manager Board

Client Boards

Demo Boards

Analyzer

VARAN Manager Board
VEB 031

The VARAN Manager board is used to equip all peripheral devices with the VARAN bus as simply as possible. By using the VEB 031 and with minimal external wiring, the peripheral device is expanded over the PCI bus with 2 VARAN Manager interfaces.

Performance Data

	Internal memory	serial 16-Mbit Flash	
	Interfaces	2x VARAN (Manager)	
		PCI bus (32-bit, 33 MHz)	Vendor ID: 5112 Device ID: 0C00
	Connection to periphery device	over two 50-pin board-to-board connector slots with 0.8 mm contact spacing (type: ERNI Microstac, order number. 114713)	

Electrical Requirements

	Internal power supply (VDD)	typically +3.3 V DC (±4 %) (provided by the peripheral device over the 50-pin connector slot)	
	Current consumption of voltage supply	typically 400 mA	maximum 450 mA

Article Number and Miscellaneous

	Article number	16-081-031
	Hardware version	1.x

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0-70 °C (according to component specifications) the operating temperature for the entire unit must be specifically defined for each application, as the operating conditions (mounting position, housing, heat sources in the vicinity of the VEB) are unknown. the environmental temperature of the VEB must not exceed +70 °C.	
	Humidity	0-95 %, non-condensing	
	EMC stability	the EMC stability has to be tested separately in the complete system for each application.	
	Shock resistance	EN 60068-2-27	150 m/s²

VARAN Client Board
VEB 011

The VEB 011 VARAN client board serves to easily expand all possible peripheral devices with the VARAN bus. Operating temperature 0-70 °C (commercial grade).

Performance Data

Internal memory	serial 4-Mbit Flash
Interfaces	1x VARAN (client) 1x periphery interface
Connection to periphery device	via 50-pin board-to-board plug connector, 0.8 mm spacing (type ERNI Microstac, order Nr. 114713)

Electrical Requirements

Internal power supply (VDD)	typically +3.3 V DC (±4 %) (provided by the peripheral device via 50-pin plug connector)
Current consumption of voltage supply	minimum 250 mA (depending on the external circuit)

Article Number and Miscellaneous

Article number	16-081-011
Hardware version	1.x

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0-70 °C (according to component specifications) the operating temperature for the entire unit must be specifically defined for each application, as the operating conditions (mounting position, housing, heat sources in the vicinity of the VEB) are unknown. The environmental temperature of the VEB must not exceed +70 °C.	
	Humidity	0-95 %, non-condensing	
	EMC stability	the EMC stability has to be tested separately in the complete system for each application.	
	Shock resistance	EN 60068-2-27	150 m/s²

VARAN Client Board
VEB 011C

The VEB 011C VARAN client board serves to easily expand all possible peripheral devices with the VARAN bus.

Data exchange can be done via CANopen® or DPRAM. Operating temperature 0-83 °C (industrial grade).

Performance Data

Internal memory	serial 4-Mbit Flash
Interfaces	1x VARAN (client) 1x periphery interface
Connection to periphery device	via 50-pin board-to-board plug connector, 0.8 mm spacing (type ERNI Microstac, order Nr. 114713)

Electrical Requirements

Internal power supply (VDD)	typically +3.3 V DC (±4 %) (provided by the peripheral device via 50-pin plug connector)
Current consumption of voltage supply	minimum 250 mA (depending on the external circuit)

Article Number and Miscellaneous

Article number	16-081-011C
Hardware version	1.x

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0-85 °C (according to component specifications) the operating temperature for the entire unit must be specifically defined for each application, as the operating conditions (mounting position, housing, heat sources in the vicinity of the VEB) are unknown.	
	Humidity	0-95 %, non-condensing	
	EMC stability	the EMC stability has to be tested separately in the complete system for each application.	
	Shock resistance	EN 60068-2-27	150 m/s²

VARAN Client Board
VEB 011-SPI

This client board is used to easily equip any periphery device with the VARAN bus. Data can be exchanged over tan alternating buffer and DPRAM.

Performance Data

Internal memory	serial 4-Mbit Flash
Interfaces	1x VARAN (client) 1x periphery interface
Connection to periphery device	via 50-pin board-to-board plug connector, 0.8 mm spacing (type ERNI Microstac, order Nr. 114713)

Electrical Requirements

Internal power supply (VDD)	typically +3.3 V DC (±4 %) (provided by the peripheral device via 50-pin plug connector)
Current consumption of voltage supply	minimum 250 mA (depending on the external circuit)

Article Number and Miscellaneous

Article number	16-081-011-SPI
Hardware version	1.x

Environmental Conditions

	Storage temperature	-20 ... +85 °C
	Environmental temperature	0-70 °C (according to component specifications)
	Humidity	0-95 %, non-condensing
	EMC stability	the EMC stability has to be tested separately in the complete system for each application.
	Shock resistance	150 m/s²

VARAN Client Board
VEB 012

The VEB 012 VARAN client board serves to easily expand all possible peripheral devices with the VARAN bus.
Operating temperature 0-85 °C (industrial grade).

Performance Data

Internal memory	serial 4-Mbit Flash
Interfaces	1x VARAN (client) 1x periphery interface
Connection to periphery device	via 50-pin board-to-board plug connector, 0.8 mm spacing (type ERNI Microstac, order Nr. 114713)

Electrical Requirements

Internal power supply (VDD)	typically +3.3 V DC (±4 %) (provided by the peripheral device via 50-pin plug connector)
Current consumption of voltage supply	minimum 250 mA (depending on the external circuit)

Article Number and Miscellaneous

Article number	16-081-012
Hardware version	1.x

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0-85 °C (according to component specifications) the operating temperature for the entire unit must be specifically defined for each application, as the operating conditions (mounting position, housing, heat sources in the vicinity of the VEB) are unknown.	
	Humidity	0-95 %, non-condensing	
	EMC stability	the EMC stability has to be tested separately in the complete system for each application.	
	Shock resistance	EN 60068-2-27	150 m/s²

VARAN Client Board
VEB 013

The VEB 013 VARAN client board serves to simply expand all possible peripheral devices with the VARAN bus.

With help from the integrated splitter function, the devices are provided with two VARAN ports (VARAN In and VARAN Out). Operating temperature 0-70 °C (commercial grade).

Performance Data

Internal memory	serial 4-Mbit Flash
Interfaces	2x VARAN (Client In/Out) 1x periphery interface
Connection to periphery device	50-pin board-to-board plug connector (type ERNI Microstac, order Nr. 114713) 12-pin Board-to-Board plug connector (type ERNI Microstac, order Nr. 114712)

Electrical Requirements

Internal power supply (VDD)	typically +3.3 V DC (±4 %) (provided by the peripheral device)
Current consumption of voltage supply	minimum 200 mA (depending on the external circuit)

Article Number and Miscellaneous

Article number	16-081-013
Hardware version	1.x

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0-70 °C (according to component specifications) the operating temperature for the entire unit must be specifically defined for each application, as the operating conditions (mounting position, housing, heat sources in the vicinity of the VEB) are unknown.	
	Humidity	0-95 %, non-condensing	
	EMC stability	the EMC stability has to be tested separately in the complete system for each application.	
	Shock resistance	EN 60068-2-27	150 m/s²

VARAN Client Board
VEB 013-SPI

This client board is used to easily equip any periphery device with the VARAN bus.

Data can be exchanged over alternating buffer and DPRAM.

Performance Data

Internal memory	serial 4-Mbit Flash
Interfaces	1x VARAN In 1x VARAN Out 1x Periphery interface
Connection to periphery device	50-pin board-to-board plug connector (type ERNI Microstac, order Nr. 114713) 12-pin Board-to-Board plug connector (type ERNI Microstac, order Nr. 114712)

Electrical Requirements

Internal power supply (VDD)	typically +3.3 V DC (±4 %) (Provided from the periphery module over a 50-pin connector)
Current consumption of voltage supply	minimum 250 mA (depending on the external circuit)

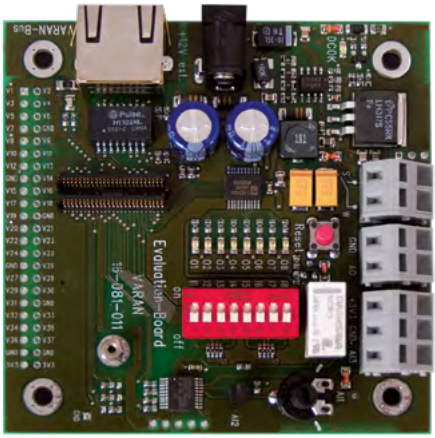
Article Number and Miscellaneous

Article number	16-081-013-SPI
Hardware version	1.x

Environmental Conditions

Storage temperature	-20 ... +85 °C
Environmental temperature	0-70 °C (according to component specifications)
Humidity	0-95 %, non-condensing
EMC stability	the EMC stability has to be tested separately in the complete system for each application.
Shock resistance	150 m/s²

VARAN Demo Board
VEB 021



The VARAN VEB 021 demo board provides VARAN users and sensor/actuator manufactures with simple hardware so that they can implement this bus system in their products quickly and easily.

The VEB 011 or VEB 012 client board is simply connected to the demo board and the VARAN bus to the RJ45 socket.

Digital Outputs

Number of outputs	8
Output to connect	yellow LED per output
Supply voltage LEDs	+3V3
Output current	typically 3 mA per output

Relay Output (for signal switch)

Number	1
Relay type	1x converter
Relays	NA-5W-K
Power supply	+5 V/typically 30 mA
Minimum switch current	10 mA
Switching time	maximum 10 ms
Switching range	4 V-6 V
Switching power	0.5 A/30 V DC

Digital Inputs

Number	8
Input type	switched via DIP switch
Input voltage	typically + 3V3
Input current	typically 1 mA
Status Displays	no

Controller for Analog I/Os

Controller	PSoC CY8C24223A
Clock speed	24 MHz
Storage (On-Board)	4-kbyte Flash 256 bytes SRAM
Communication	via I²C–interface
Software requirements	the analog I/Os are read/written via the I²C bus

Number of Inputs

Number	3
Resolution	12-bit
Measurement range	0 ... +3.3 V
Reference voltage for AI3	+3.3 V
Sensor type at AI2	KTY10-6
Analog measurement precision	±0.2 %

Analog Output

Number	1
Output voltage	0 ... +3.3 V
Resolution	6-bit
Analog channel accuracy	±1 %
Maximum output current	20 mA

Electrical Requirements

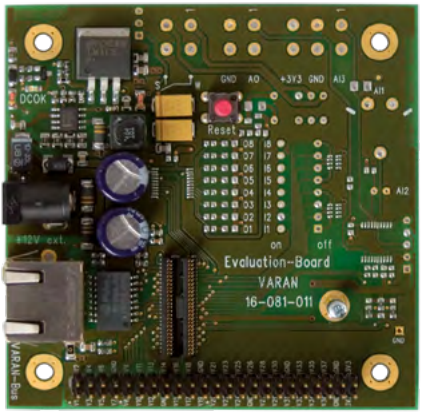
Supply voltage	10-30 V DC	
Supply of external power supply	+12 V for internal supply (optional)	
Voltage supply from C-DIAS bus	+24 V for internal supplies	
Data Exchange on the VARAN Bus (+24 V power supply)	typically 70 mA	maximum 100 mA
Current consumption of the external supply (+12 V supply)	typically 140 mA	maximum 200 mA
Status display	Power LED	

Article Number and Miscellaneous

	Article number	16-081-021
	Hardware version	1.x

Notes

VARAN Demo Board
VEB 022



The VARAN VEB 022 demo board provides VARAN users and sensor/actuator manufactures with simple hardware so that they can implement this bus system in their products quickly and easily.

The respective VEB 011 or VEB 022 client board is simply connected to the demo board and the VARAN bus to the RJ45 socket.

Unlike the VEB 021, the VEB 022 is a less populated demo board. The DPRAM mode is defined for this board by default. External hardware can be connected over the connector strip.

Electrical Requirements

	Supply voltage	10-30 V DC	
	Voltage from external supply	+12 V for internal supply (optional)	
	Voltage supply from C-DIAS bus	+24 V for internal supplies	
	Current consumption of VARAN bus (+24 V supply)	typically 90 mA	maximum 110 mA
	If the +24 V supply is not set over the VARAN bus, an external +12 V power supply must be connected to plug X2!		
	Current consumption of the external supply (+12 V supply)	typically 150 mA	maximum 200 mA
	Status display	LED	
	+3V3 for external applications (connectable by a strip)	maximum 50 mA	

Article Number and Miscellaneous

	Article number	16-081-022
	Applicable power supply 12 V DC	16-081-022-Z1
	Hardware version	1.x
	Preset mode (Mode pins)	010 DPRAM mode
	LASAL class	veb022

Mechanical Dimensions

	Circuit board	85.0 x 85.0 mm
	Mounting hole clearance	69.00 mm horizontal and vertical
	Diameter of mounting holes	3.5 mm

VARAN Valve Interface
VVO 323

with 32 short-circuit proof digital outputs for valve terminal with EX250 flange connection

The VVO 323 module has 32 short-circuit digital outputs proof (+24 V/50 mA/short-circuit proof). The supply voltage is divided into two groups. Both groups are monitored for under and over voltage.

Digital Output Specifications

	Number	32
	Short-circuit proof	yes
	Maximum continuous current load allowed per channel	50 mA
	Maximum total current (entire module)	1.6 A (100% of on-time)
	Residual current (off)	≤ 10 µA
	Turn-on delay	< 100 µs
	Turn-off delay	< 100 µs

Electrical Requirements

	Force supply +24 V DC	+18-30 V DC
	Current consumption of +24 V supply voltage	corresponds to the load on the digital outputs

Voltage Monitor

	Power supply +24 V	supply voltage > 18 V (corresponding DC OK-LED lights green) supply voltage < 30 V (corresponding DC OK-LED lights green)

Article Number and Miscellaneous

	Article number	16-050-323
	Hardware version	1.x
	Standard	UL 61010-1 UL 61010-2-201 CAN/CSA-C22.2 No. 61010-1-12 CAN/CSA-IEC 61010-2-201:14
	Dimensions Standard	89 x 79.8 x 167 mm (W x H x D)
	Approvals	UKCA

Environmental Conditions

	Storage temperature	-20 ... +85 °C	
	Environmental temperature	0 ... +60 °C	
	Humidity	0-95 %, non-condensing	
	EMC resistance	in accordance with EN 61000-6-2 (industrial area)	
	EMC-noise generation	in accordance with EN 61000-6-4 (industrial area)	
	Vibration resistance	EN 60068-2-6	3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz
	Shock resistance	EN 60068-2-27	15 g
	Protection type	EN 60529	IP67

VARAN Analyzer
ETVA 0501

with 5.7" VGA TFT color display

With the ETVA 0501 VARAN Analyzer, the communication for a real-time Ethernet VARAN bus network can be analyzed. The connection is made over a free VARAN port. If no port is available, an existing VARAN bus connection can simply be removed and the VARAN Analyzer inserted.

The ETV 0501-SK is operated through the menus on touch screen. On the 5.7" VGA TFT color display, diagnostic data are clearly shown. The VARAN Analyzer has a USB socket for connecting external storage devices.

Performance Data

Processor	ELAN SC520
Cache	16-kbyte write-back cache
BIOS	yes
Internal main memory (SDRAM) 133 MHZ	64-Mbyte
Battery buffered internal expanded memory (SRAM)	256-kbyte
Internal program memory	10-Mbyte
Internal data memory	40-Mbyte
Internal storage device (IDE)	64-Mbyte CompactFlash
Interfaces	1x VARAN In (RJ45) 1x VARAN Out or Ethernet 10/100 Mbits (RJ45) 1x USB V1.1 type A
Internal interface connections and devices	1x TFT LCD color display 1x Touch
Control panel	touch screen (analog resistive)

	Display	5.7" TFT color display 640 x 480 pixels
	Data buffer	lithium battery
	Signal generator	no
	Real-time clock	yes
	Cooling	passive (fanless)

Electrical Requirements

	Supply voltage	typically +24 V DC	
		minimum +18 V DC	maximum +30 V DC
	Current consumption of voltage supply	typically 350 mA (at +24 V)	maximum 500 mA
	Current load on the VARAN bus (I/O module power supply)	typically 530 mA (at +24 V)	
	Inrush current	maximum 2.4 A for 7 ms	

Terminal

	Dimensions	203.5 x 170.1 x 47.5 mm (W x H x D)
	Material	aluminium, anodized
	Weight	circa 1kg

Control Unit

	Touch pad	integrated into display (TOP ITO Film: Anti-Glare Hard Coating & Anti-Newton RingSheet resistance : 450±50 Ω BOTTOM GLASS: sheet resistance : 500±50 Ω)
	Resolution	12-bit (4096 x 4096)

Display

	Type	5.7" TFT color display
	Resolution	VGA, 640 x 480 pixels
	Color depth	16-bit (65 536 colors)
	Pixel size	0.1815 mm x 0.1815 mm
	Active surface	116.16 mm x 87.12 mm
	Backlight	LED
	Contrast	300 : 1
	Brightness	typically 220 cd/m^2
	Angle CR > 10	left and right 100°, above and below 100°

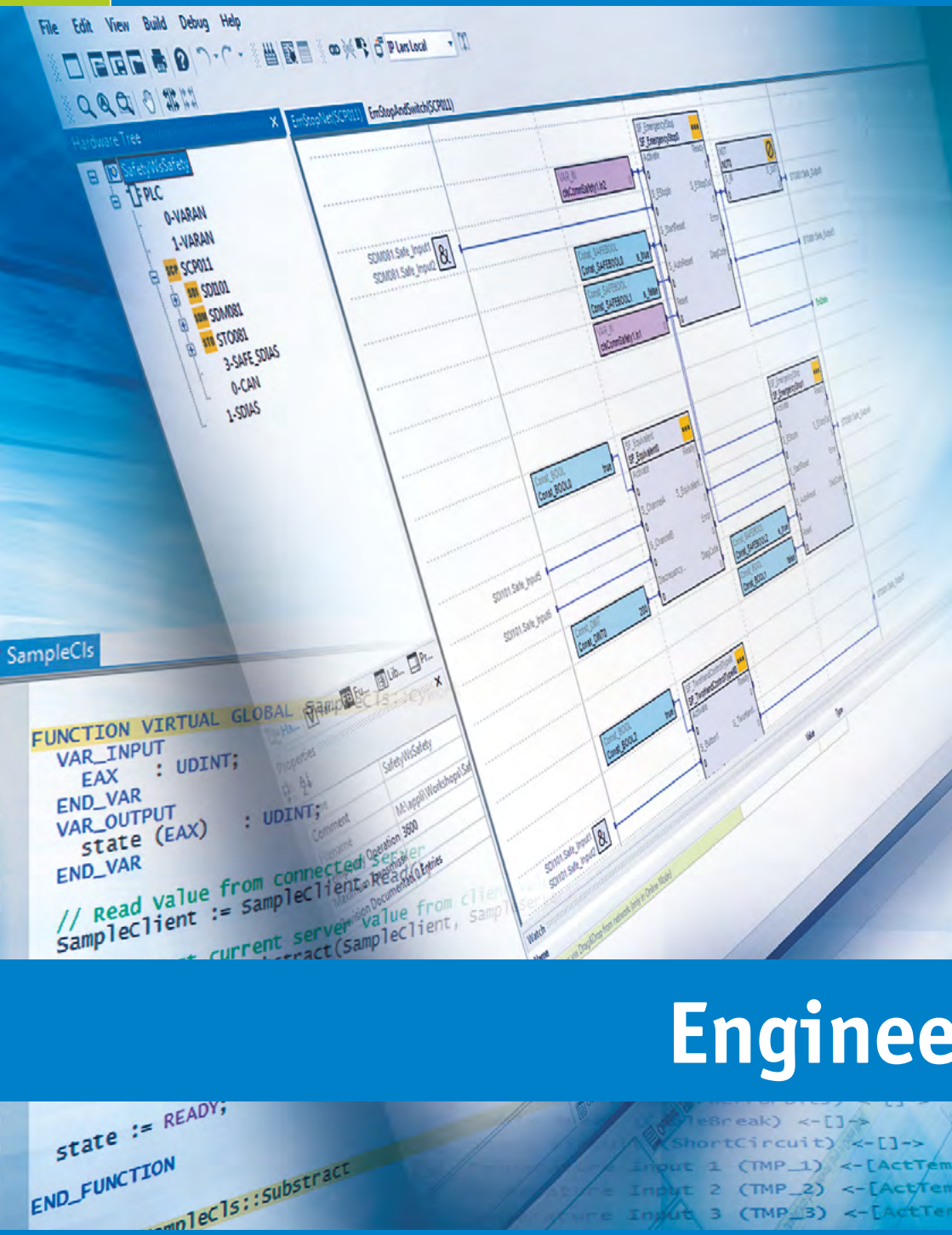
Article Number and Miscellaneous

Article number	12-230-0501-VA	
Hardware version	1.x	

Environmental Conditions

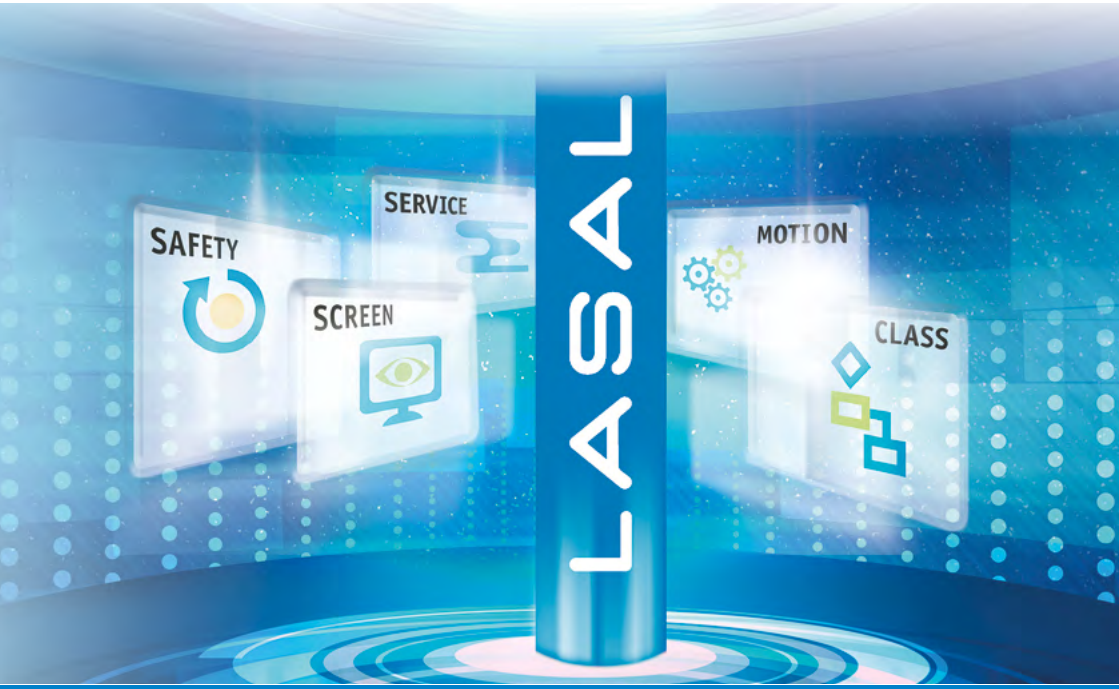
Storage temperature	-20 ... +60 °C	
Environmental temperature	0 ... +50 °C	
Humidity	10-95 %, non-condensing	
EMC tolerance	EN 61000-6-2: noise resistance EN 61000-6-4: noise emission	
Vibration tolerance	EN 60068-2-6	2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²)
Shock resistance	EN 60068-2-27	15 g (150 m/s²), duration 11 ms, 18 shocks
Protection type	EN 60529: protected through the housing	cover: IP20

Notes


File Edit View Build Debug Help
HardwareTree
PLC
0-VARAN
1-VARAN
SCP011
SDI101
SDM081
STO081
3-SAFE_SDIAS
0-CAN
1-SDIAS
SampleCls
FUNCTION VIRTUAL GLOBAL
VAR_INPUT
EAX : UDINT;
END_VAR
VAR_OUTPUT
state (EAX) : UDINT;
END_VAR
// Read Value from connected Server
SampleClient := SampleClient.Read();
state := READY;
END_FUNCTION
SampleCls::Substract

Enginee

ering Tool LASAL


SAFETY
SERVICE
SCREEN
LASAL
MOTION
CLASS

Engineering Tool LASAL

LASAL CLASS

LASAL SCREEN

LASAL MOTION

LASAL SAFETYDesigner

LASAL SERVICE

Integrated and Object Oriented: Engineering Tool LASAL

The all-in-one engineering tool LASAL offers all the advantages of a modern and integrated engineering environment: Innovative programming techniques allow the simple and fast implementation of machine applications. With LASAL, engineering times and time-to-market cycles are significantly reduced - achieving a higher software quality.

LASAL CLASS

Object-oriented programming with graphic representation

LASAL SCREEN

Visualization fast and simple

LASAL MOTION

For regulation and control tasks in drive technology

LASAL SAFETY

Safety programming and configuration

LASAL SERVICE

Tools for remote maintenance, simulation, software updates, data exchange

"All-in-one": One Tool for all Aspects of Automation

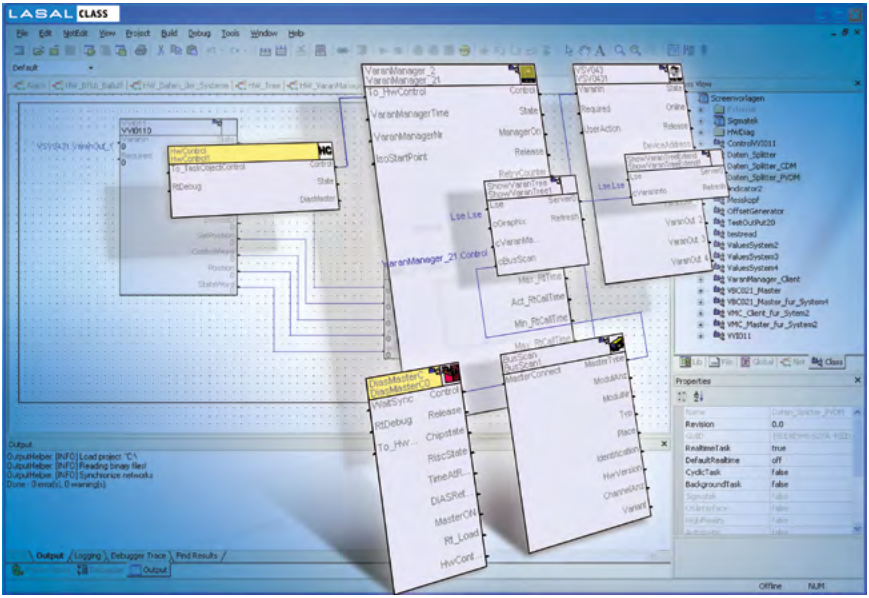
LASAL provides all necessary functions for solving automation tasks in one tool: PLC programming, visualization, motion control, Safety diagnosis and remote maintenance. The individual software modules can be combined like a modular toolbox system. The integrated development environment reduces the engineering times and costs significantly.

Object Oriented Programming

Object oriented programming ensures the highest possible flexibility for the machine builder, since the object oriented construction of the software allows a quick reaction to customer-specific needs.

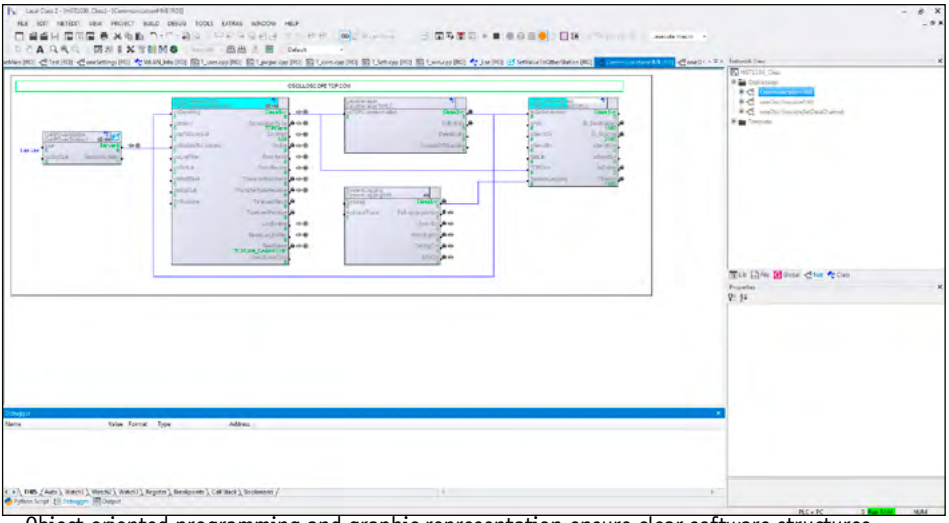
In 2000, SIGMATEK was the first to integrate object oriented programming with graphic representation and client/server communication into automation technology. With object orientation, LASAL sets a new standard for modularity and reusability. Through the inheritance of class properties, a structure of program components in hierarchical levels is possible.

Through the modular structure, previously created application sections can be changed or reused easily.



Clear Organization with Graphic Representation

Through the graphic representation of program components, the complexity of the program is encapsulated. This means that the program code is not visible at the first glance. The relationships between the program sections as well as the most important program data are shown. The interconnections of the individual modules are thereby clarified.



Object oriented programming and graphic representation ensure clear software structures.

Comprehensive and Future-Proof

LASAL can be used on all platforms. The entire SIGMATEK product palette such as CPUs, terminals and industrial PCs are supported. In addition, the hardware platform can be changed without having to adapt the software. The automation system can therefore be easily expanded at any time; the user has a future-proof system.

LASAL highlights at a Glance

Comprehensive engineering

With LASAL, all automation tasks are comfortably implemented: PLC, visualization, motion control, Safety, diagnostics. An integrated and simple to operate tool for all phases of the engineering process is thereby provided: from project development to programming to initial start-up and service of the machine in the field. The programming is significantly reduced and the engineering and maintenance times are drastically shortened.

Efficient and clear

Object oriented programming with graphic representation enables the highest modularity, reusability and clear structuring of the software.

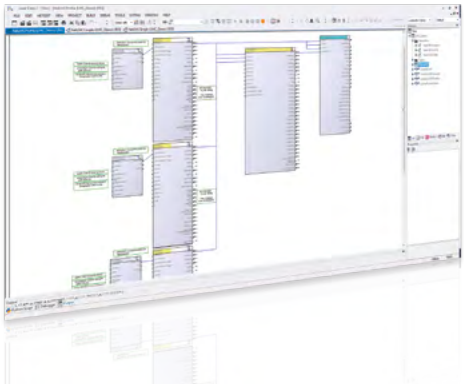
Comfortable: everal integrated tools

The fast development and comprehensive analysis of programs are supported by an extensive collection of tools such as

- Online debugger with all the functions one expects from an integrated development environment
- Real-time oscilloscope and trend recording
- Time response analysis of the real-time multitasking operating system (PlcTraceView)
- Project comparison

LASAL
reflects your machine

Project Development According to IEC 61131-3 Standard
LASAL CLASS



LASAL CLASS (Control Logic Application Software) is THE engineering tool to solve your automation tasks. With an integrated operating concept and clearly organized surface, LASAL CLASS offers a comfortable design environment for object oriented programming - from the simplest machine to complex applications.

Object Oriented Programming

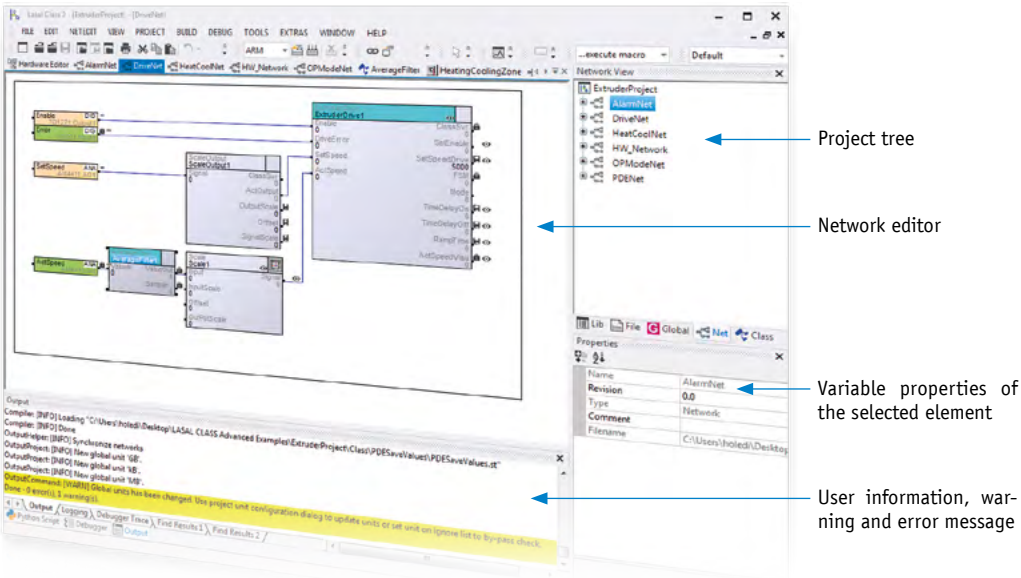
LASAL expands the IEC 61131-3 standard with object oriented programming and ensures the simple and clear creation of applications. Thanks to the modularity, the reusability of the classes and the encapsulation of user programs, the application is more efficient and easier to test. The development time and engineering costs are therefore reduced significantly.

With object oriented programming, the various components of a machine or system are represented in the form of objects. Behind each object, there is a class containing the program code and the corresponding data elements. The usual separation of data and program code with procedural programming languages is eliminated.

Each class can therefore assume a specific task, such as measuring and evaluating temperatures, a filter function, motor control, etc. The various classes are managed in a clearly organized library.

Through importation, the classes are integrated into the project tree. For the exchange of information, defined interfaces (connections) are available, which can send and receive data.

A class can be placed in the network by Drag & Drop from the project tree and thereby creating an instanced, real object. The objects must only be connected to one another and a application is generated. The objects need only be connected to one another and an application is created.



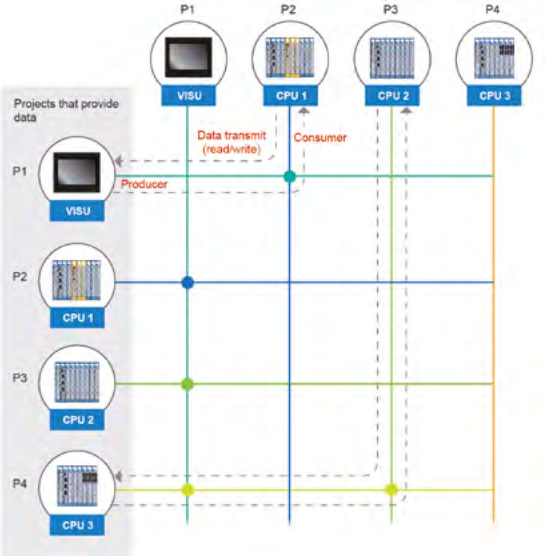
Article Number		
	LASAL CLASS	02-010-041

LASAL Machine Manager

With „smart factories“ and „Industry 4.0“ in sight, SIGMATEK focuses on modular, decentral automation solutions. Machine or plant functions are organized in logical, mechatronic units – equipped with decentral compact CPUs.

The system configuration can therewith be assembled from a toolkit specifically to a customer's needs and later expanded with optional function units, such as a handling robot.

To perfectly reproduce this intelligent modularity in the software, the „Machine Manager“ was developed.



It enables the organized display of individual software projects in a machine or system and regulates the communication of distributed intelligences - who can exchange which data with whom.

Data exchange with external equipment components and the connection to higher-level systems can also be implemented with the help of the machine manager. This reduces the work for initial start-up and handling, and simplifies the implementation of adaptive production strategies.

OPC UA

OPC UA – the new protocol generation in M2M communication – enables manufacturer and platform-independent data exchange in one future-oriented intelligent control network of machines and plants.

LASAL supports the OPC UA communications protocol. The LASAL OPC UA server runs directly in the control or HMI. The OPC UA clients from MES and ERP systems can log in to exchange process data over the OPC UA server or for example, manage production orders. Via the settings in the project, it is possible to specify which process data can be read or written.

C-Code Models

In Matlab Simulink, existing C-code models can be directly inserted into LASAL. This reduces the development times considerably.

During import to LASAL, the C-code is packed into the class automatically. Input and return values are defined by the user; LASAL generates the code automatically.

The C-code model can be thereby easily used. Possible changes to the model can be made in Matlab Simulink and reimported into the LASAL project with the push of a button.

Convincing Visualization Comfortably Applied
LASAL SCREEN

LASAL SCREEN is an HMI tool for visualization on all graphic display units from SIGMATEK. The system is Unicode-based and can therefore be used with any language in the world. An online language and unit converter is already integrated.

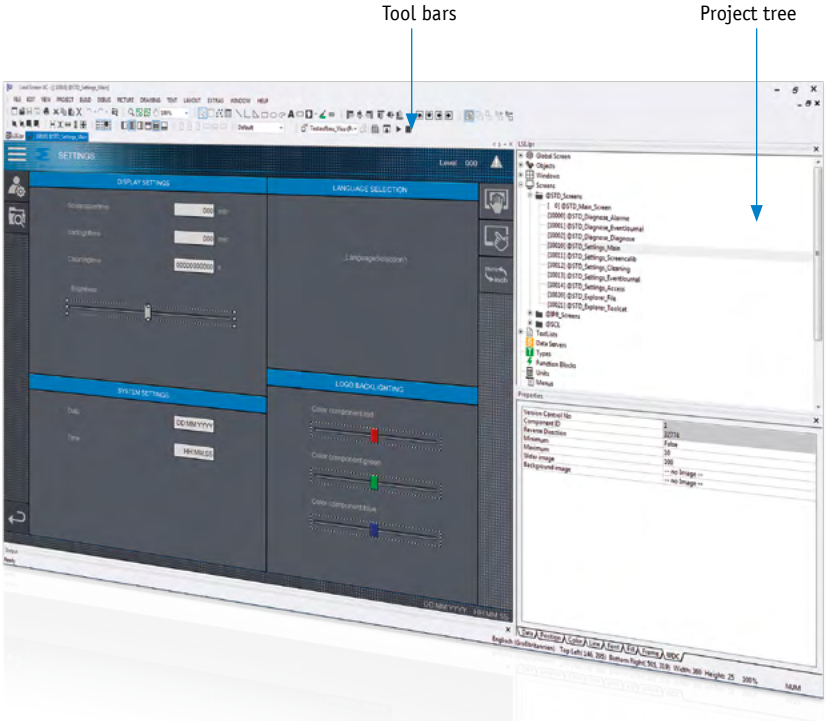
Programming knowledge is not required for creating the visualization. LASAL CLASS defines the variables available for the visualization.

Flexible Screen Construction

With LASAL SCREEN, graphics can be easily created in the corporate design of the company. For project development, integrated designs and a large graphic pool (library) is available. In addition, user-defined graphics in standard formats can also be imported (BMP, JPG).

With the definition of a global screen and the individual screens derived there from, the project development time can be significantly reduced. LASAL SCREEN supports all resolutions of the various SIGMATEK displays.

Additionally, LASAL SCREEN offers the user such functions as alarm and event management (logbook), trend display, bar diagrams, recipe management, etc.



Editor for creating screens

Article Number		
	LASAL SCREEN	02-010-051

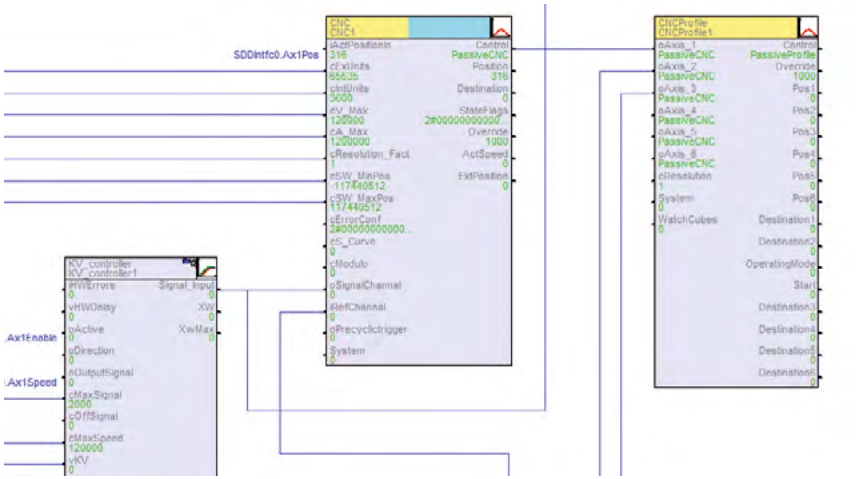
High Performance Tool for Drive Technology
LASAL MOTION

LASAL MOTION simplifies all drive technology tasks and is fully integrated in LASAL CLASS. The modular construction enables the efficient implementation of the drive concept. The project development and start-up software for the SIGMATEK drives is also integrated. In addition, a large drive library is available.

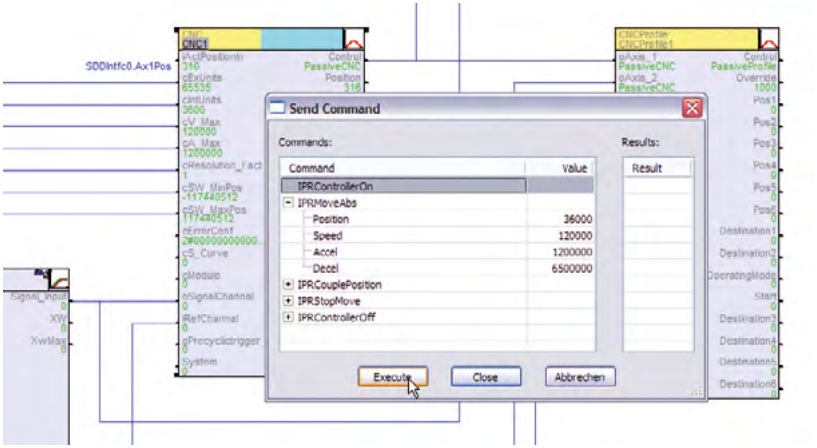
Numerous Motion Control Components

In the library provided, a large selection of standard motion functions is available such as absolute, relative and endless positioning as well as CNC functions, coordinated movements such as linear interpolation with up to 6 axes, circular interpolation, curved disks, gear functions, flying saws, electrical waves and tracked movements. Furthermore, numerous types of referencing and NC applications are available in addition to standard functions.

Existing motion control components can be tailored to customer-specific requirements with little effort. For the most common drive systems from various manufacturers and the bus systems used (VARAN bus CAN bus, Profibus, etch), LASAL MOTION offers standard components for simple control.



Axial movements can be executed using simple data inputs or instructions without any programming.



Article Number		
	LASAL MOTION	02-010-081

Safety Seamlessly Integrated with the LASAL SAFETYDesigner

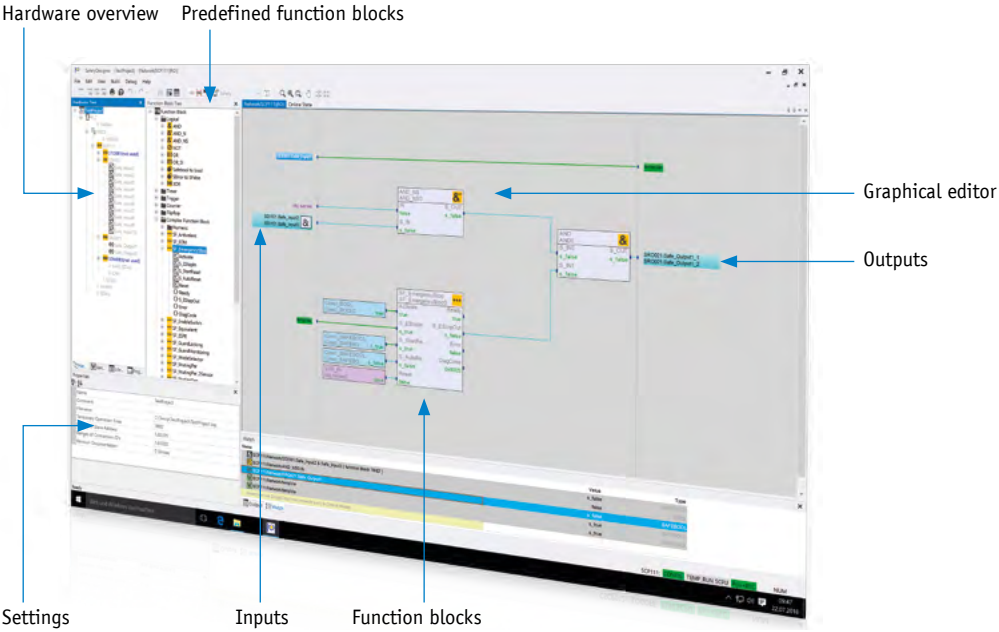
For Safety programming and configuration, a comfortable tool is provided with the LASAL SAFETYDesigner.

Safety Made Easy

The LASAL SAFETYDesigner simplifies the programming and configuration of the Safety controller. Logic connections and I/O configurations can be created comfortably.

Based on a functions library, which in addition to standard function blocks, also provides functions based on the PLCopen standard such as Emergency Stop, 2 Hand Control or Guard Locking. Logic connections to the safety-related processes can thereby be easily created. In the integrated graphic editor, function blocks and I/Os can be easily placed through Drag & Drop and connected to the non-safe variables of the PLC.

Downloading, online monitoring and debugging are done over LASAL's online interface. Several Safety controllers can be used per project, whereby the program in each Safety controller can be distributed over any number of networks. The simple operation and clearly organized display reduce the time and effort for programming, maintenance, diagnosis and especially for the validation.



Article Number		
	LASAL SAFETYDesigner	02-010-141

Simple Diagnosis, Service and Remote Maintenance with LASAL SERVICE

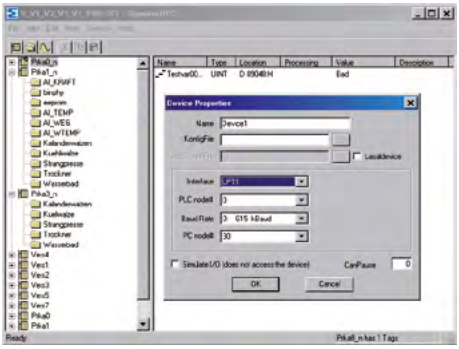
The all-in-one engineering tool is equipped with numerous service tools. Remote maintenance, software updates and data exchange are comfortably realized with LASAL SERVICE tools and additional SIGMATEK add-ons.

Webserver

The web server in the control provides information on the Hypertext Transfer Protocol (HTTP). The websites created by the user must be written in HTML and located in a user-defined directory in the control. Using a browser (e.g. Internet Explorer), the website can be viewed. For remote maintenance, data in the PLC can also be accessed regardless of where the active visualization is located. Naturally, access can be protected by a password.

OPC UA Client & Server

The OPC Unified Architecture communications protocol enables manufacturer and platform-independent data exchange, which makes a good choice for implementing Industry 4.0 concepts. OPC UA functions according to the client-server principle and is supported by LASAL. In LASAL CLASS the user can define which process data can be read or written.

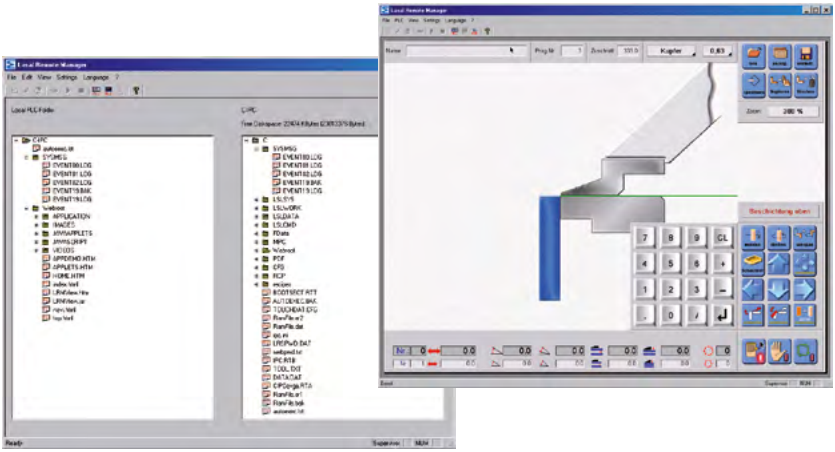


LRS API

With the LRS API (Application Programming Interface), any type of remote maintenance or visualization tool can access the world of SIGMATEK controls online. The API is part of a Windows DLL. All communication interfaces such as RS232, CAN bus, Ethernet and Modem are supported.

LASAL Remote Manager

The LASAL Remote Manager (LRM) is used for remote maintenance of machines. In addition to a tabular overview of user-defined machines (controls), this tool offers a remote view of the visualization. For data transfer between the PC and control, a control explorer is provided. Additional features: Application start and stop, CPU reboot, software updates (application and operating system), setting and reading application data, etc. The connection between the PC (LASAL Remote Manager) and the control can be established over RS232, CAN bus Ethernet and Modem.



LRMView

LRMView is an add-on software for the control. It offers the possibility to display or control an on-site visualization through a standard web browser, (e.g. internet explorer) without having to install special software on the PC. Naturally, the system is protected with user names and passwords for secure access. LRMView is a modern Java applet with so-called PUSH technology, which can be used in connection with the web server in the control.

FTP-Client and FTP-Server

The operating LASAL OS operating system provides a standard F(ile)T(ransfer)P(rotocol), with which files can be loaded to an FTP protocol-based server. The CPU can also be used as an FTP server.

Functions:

- Create/terminate connections
- Send, receive, attach, rename, delete or move files
- Create, delete, rename or move directories
- List files and directories

SIGMATEK System Manager

The SIGMATEK System Manager (SSM) supports the user with maintaining, securing and restoring SIGMATEK systems. The SSM is installed using a USB stick and provides a simple and comfortable user guide. All necessary functions such as data backup, hard drive formatting and driver installation are covered.

LARS

LARS, a Windows-based simulation of control programs and visualizations, serves the development of visualization projects on the Windows PC. In Addition, LARS can be used for demo applications for presentations and offers remote maintenance support.

LASAL SERVICE & Article Number

Description	Article number
LASAL SERVICE (LRM, LRMView, LRS API)	02-010-091
OPC Server	02-010-031
Web Server	02-010-101
FTP Client and FTP Server	02-010-111
SIGMATEK System Manager	02-010-131
LARS	02-010-121
PDF License	02-010-071

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