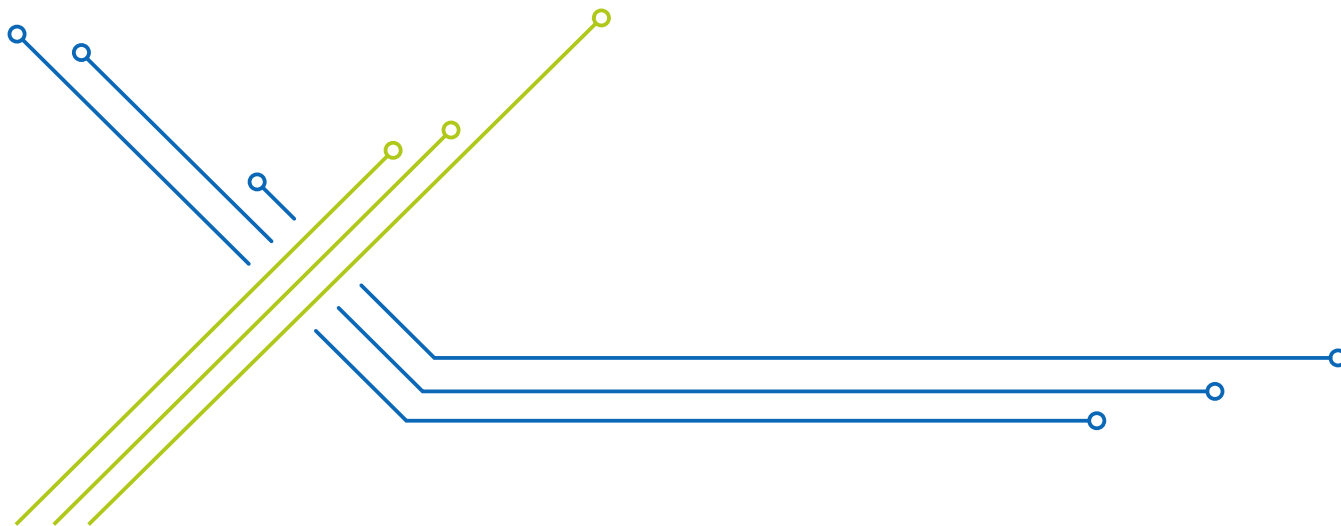


# IIO 041

S-DIAS Interface SDCI Master

## INSTRUCTION MANUAL

|                   |              |
|-------------------|--------------|
| Article number:   | 20-104-041-E |
| Date of creation: | 07.02.2017   |
| Version date:     | 06.08.2026   |



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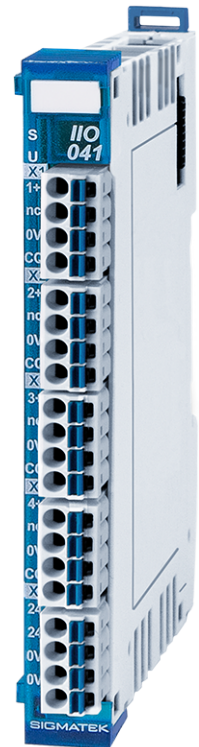
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**S-DIAS Interface SDCI Master****IIO 041****4 SDCI ports****4 digital inputs**

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 IEC 61131-9. 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.

The SDCI devices are configured with the SDCI configuration tool integrated into LASAL. Using the tool, an SDCI configuration file (IODD) can be loaded for each device and their parameters defined.



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# 1 Introduction

## 1.1 Target Group/Purpose of this Operating Manual

This operating manual contains all information required for the operation of the product.

This operating manual is intended for:

- Project planners
- Technicians
- Commissioning engineers
- Machine operators
- Maintenance/test technicians

General knowledge of automation technology is required.

Further help and training information, as well as the appropriate accessories can be found on our website [www.sigmatek-automation.com](http://www.sigmatek-automation.com).

Our support team is happily available to answer your questions or assist you in case of any issues. Please see our website for our hotline number and business hours.

## 1.2 Important Reference Documentation

This and additional documents can be downloaded from our website or obtained through support.

## 1.3 Contents of Delivery

1x IIO 041

## 2 Basic Safety Directives

### 2.1 Symbols Used

The following symbols are used in the operator documentation for warning and danger messages, as well as informational notes.

#### DANGER



**Danger** indicates that death or serious injury **will occur**, if the specified measures are not taken.

→ To avoid death or serious injuries, observe all guidelines.

**Danger** indique une situation dangereuse qui, faute de prendre les mesures adéquates, **entraînera** des blessures graves, voire mortelles.

→ Respectez toutes les consignes pour éviter des blessures graves, voire mortelles.

#### WARNING



**Warning** indicates that death or serious injury **can** occur, if the specified measures are not taken.

→ To avoid death or serious injuries, observe all guidelines.

**Avertissement** d'une situation dangereuse qui, faute de prendre les mesures adéquates, **entraînera** des blessures graves, voire mortelles.

→ Respectez toutes les consignes pour éviter des blessures graves, voire mortelles.

#### CAUTION



**Caution** indicates that moderate to slight injury **can** occur, if the specified measures are not taken.

→ To avoid moderate to slight injuries, observe all guidelines.

**Attention** indique une situation dangereuse qui, faute de prendre les mesures adéquates, **peut** entraîner des blessures assez graves ou légères.

→ Respectez toutes les consignes pour éviter des blessures graves, voire mortelles.

#### INFORMATION



#### INFORMATION

→ Provides important information on the product, handling or relevant sections of the documentation, which require particular attention.

## 2.2 Disclaimer

The contents of this operating manual were prepared with the greatest care. However, deviations cannot be ruled out. This operating manual is regularly checked and required corrections are included in the subsequent versions. The machine manufacturer is responsible for the proper assembly, as well as device configuration. The machine operator is responsible for safe handling, as well as proper operation.

The current operating manual can be found on our website. If necessary, contact our support.

Subject to technical changes, which improve the performance of the devices. The following operating manual is purely a product description. It does not guarantee properties under the warranty.

Please thoroughly read the corresponding documents and this operating manual before handling a product.

**SIGMATEK GmbH & Co KG is not liable for damages caused through, non-compliance with these instructions or applicable regulations.**

## 2.3 General Safety Directives

The Safety Directives in the other sections of this operating manual must be observed. These instructions are visually emphasized by symbols.

According to EU Directives, the operating manual is a component of a product. This operating manual must therefore be accessible in the vicinity of the machine since it contains important instructions. This operating manual should be included in the sale, rental or transfer of the product, or its online availability indicated.

Regarding the requirements for Safety and health connected to the use of machines, the manufacturer must perform a risk assessment in accordance with machine directives 2006/42/EG before introducing a machine to the market.

### INFORMATION



Operate the unit with devices and accessories approved by SIGMATEK only.



**CAUTION**

Handle the device with care and do not drop or let fall.  
Prevent foreign bodies and fluids from entering the device.  
The device must not be opened!

Manipulez l'appareil avec précaution et ne le laissez pas tomber.  
Empêchez les corps étrangers et les liquides de pénétrer dans l'appareil.  
L'appareil ne doit pas être ouvert!

If the device does not function as intended or has damage that could pose a danger, it must be replaced!

En cas de fonctionnement non conforme ou de dommages pouvant entraîner des risques, l'appareil doit être remplacé !

For your own safety and that of others, compliance with the environmental conditions is essential.

Pour votre propre sécurité et celle des autres, le respect des conditions environnementales est essentiel.

## 2.4 Software/Training

The application is created with the software LASAL CLASS 2 and LASAL SCREEN Editor.

Training for the LASAL development environment, with which the product can be configured, is provided. Information on our training schedule can be found on our website.

## 3 Standards and Directives

### 3.1 Directives

The product was constructed in compliance with the following European Union directives and tested for conformity.

#### 3.1.1 EU Declaration of Conformity



---

#### EU Declaration of Conformity

The product IIO 041 conforms to the following European directives:

- 2014/30/EU Electromagnetic Compatibility (EMC Directive)
- 2011/65/EU “Restricted use of certain hazardous substances in electrical and electronic equipment” (RoHS Directive)

The EU Conformity Declarations are provided on the SIGMATEK website. They can be found in the download area of the respective product.

---

# 4 Type Plate

The type plate provides information about the product's features. The type plate shown here is only an example.

| Approbations                                                                                                                                                       |                                                                                                                                     | Standards                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>QR-Code</div> <div></div> <div>BJ: XXXX/XX</div> <div>S/N<br/>XXXXXXXX</div> | <div>Short Name</div> <div>Specifications</div> <div>FS: XXX.XX.XX</div> <div>FW: XXX</div> <div>LD: XX.X</div> <div>HW: X.XX</div> | <div>Electrical Ratings</div> <div> SIGMATEK</div> <div>Sigmathekstraße 1</div> <div>A-5112 Lamprechtshausen</div> <div>www.sigmatek-automation.com</div> |
| Article Number                                                                                                                                                     |                                                                                                                                     | Product Name                                                                                                                                                                                                                               |

- HW: Hardware version
- FS: Safety version number
- FW: Firmware version
- LD: Logic device version
- QR-Code: Serial number

## 5 Technical Data

### 5.1 SDCI Interface Specifications

|                        |                                               |
|------------------------|-----------------------------------------------|
| Number of interfaces   | 4                                             |
| Specification version  | SDCI V1.1                                     |
| Data transfer rate     | 4.8 Kbits/s, 38.4 Kbits/s, 230.4 Kbits/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 $\Omega$                            |
| wire capacity          | maximum 3 nF                                  |
| Status LEDs            | yes                                           |

### 5.2 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) | maximum 1 Joule/channel |
| Residual current output (off)                      | $\leq 10 \mu\text{A}$   |
| Turn-on delay                                      | $< 10 \mu\text{s}$      |
| Turn-off delay                                     | $< 10 \mu\text{s}$      |

### 5.3 SDCI Interface as a Digital Input

|                             |                  |               |
|-----------------------------|------------------|---------------|
| Input voltage <sup>1)</sup> | 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 |               |

### 5.4 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 |               |

### 5.5 Electrical Requirements

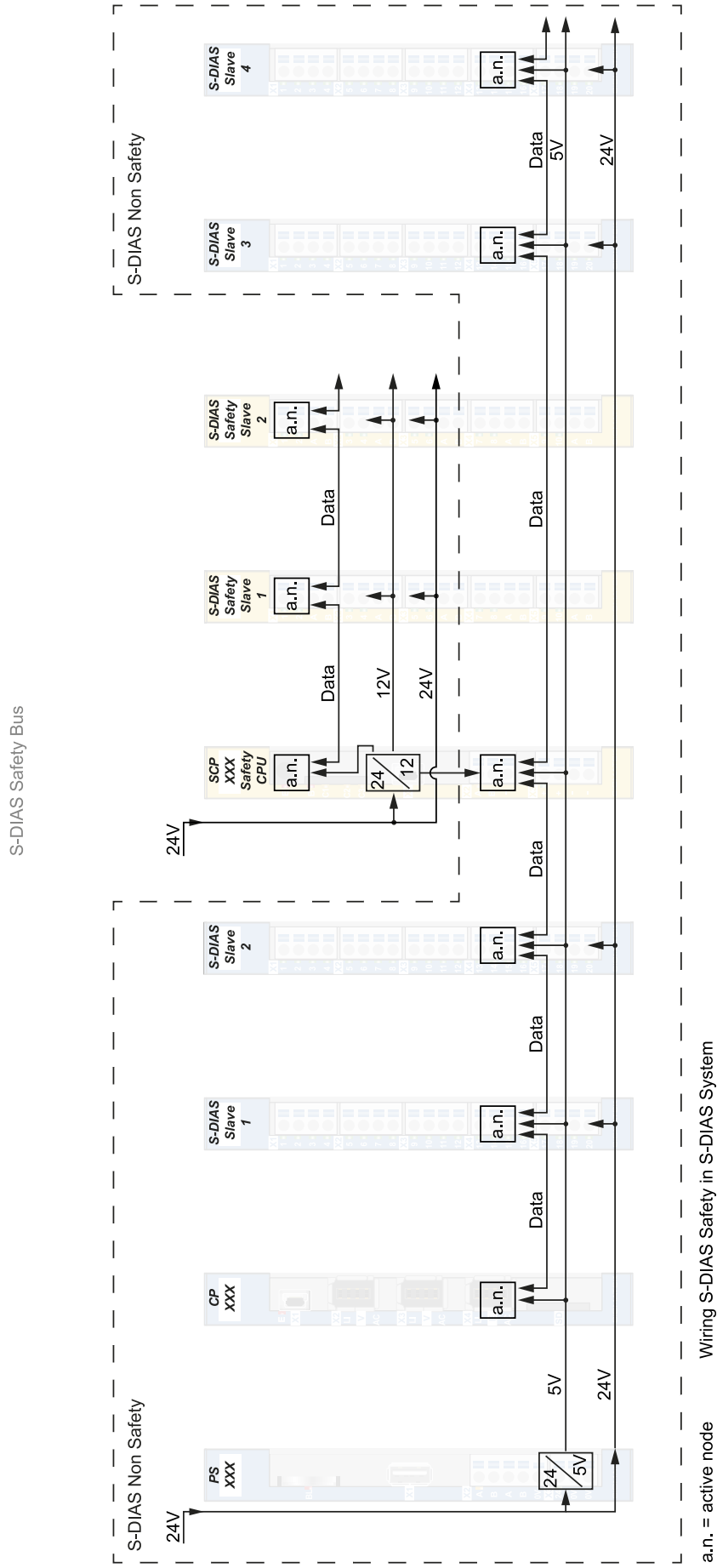
|                                                                        |                                                                                                                                                                                               |                                                                            |
|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Supply voltage +24 V (external)                                        | +18-30 V DC<br>UL: NEC Class 2                                                                                                                                                                |                                                                            |
| Current consumption external +24 V supply without actuators or sensors | typically 20 mA at +18 V<br>typically 23 mA at +24 V<br>typically 26 mA at +30 V                                                                                                              | maximum 25 mA at +18 V<br>maximum 29 mA at +24 V<br>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) |                                                                            |
| Supply from S-DIAS bus                                                 | +24 V                                                                                                                                                                                         |                                                                            |
| Current consumption on the S-DIAS bus (+24 V supply)                   | typically 33 mA at +18 V<br>typically 27 mA at +24 V<br>typically 23 mA at +30 V                                                                                                              | maximum 41 mA at +18 V<br>maximum 34 mA at +24 V<br>maximum 29 mA at +30 V |

#### INFORMATION



If this S-DIAS module is connected to an S-DIAS supply module with several S-DIAS modules, the total current of the modules used must be determined and checked.  
The total current of the +24 V S-DIAS supply cannot exceed 1.6 A!  
The total current of the +5 V S-DIAS supply cannot exceed 1.6 A!  
The specification for the current can be found in the module-specific documentation under "Electrical Requirements".

<sup>1)</sup> The input voltage cannot exceed the +24 V SDCI supply voltage.



## 5.6 Voltage Monitoring

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

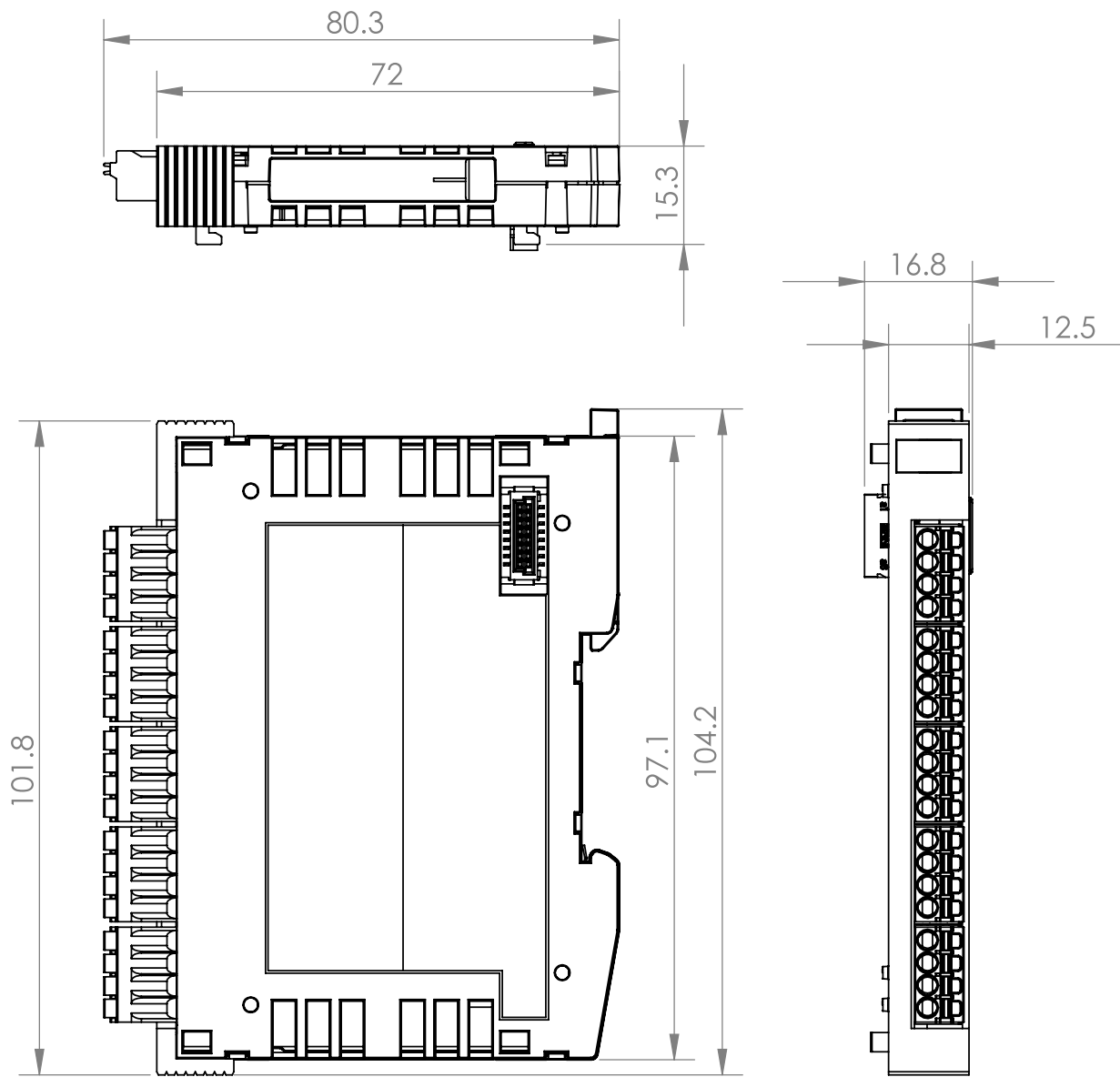
## 5.7 Miscellaneous

|                               |                   |                          |
|-------------------------------|-------------------|--------------------------|
| Article number                | 20-104-041        |                          |
| Printed circuit board coating | no                |                          |
| Approvals                     | CE                | yes                      |
|                               | UL                | designed according to UL |
|                               | Functional Safety | no                       |
|                               | UKCA              | no                       |

## 5.8 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                                                                                            |                                             |
| Noise emission                        | ≤ 70 dB                                                                                                       |                                             |
| EMC resistance                        | 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<br>1 g from 8.4-150 Hz |
| Shock resistance                      | EN 60068-2-27                                                                                                 | 15 g (147.15 m/s²)                          |
| Protection type                       | EN 60529                                                                                                      | IP20                                        |

## 6 Mechanical Dimensions

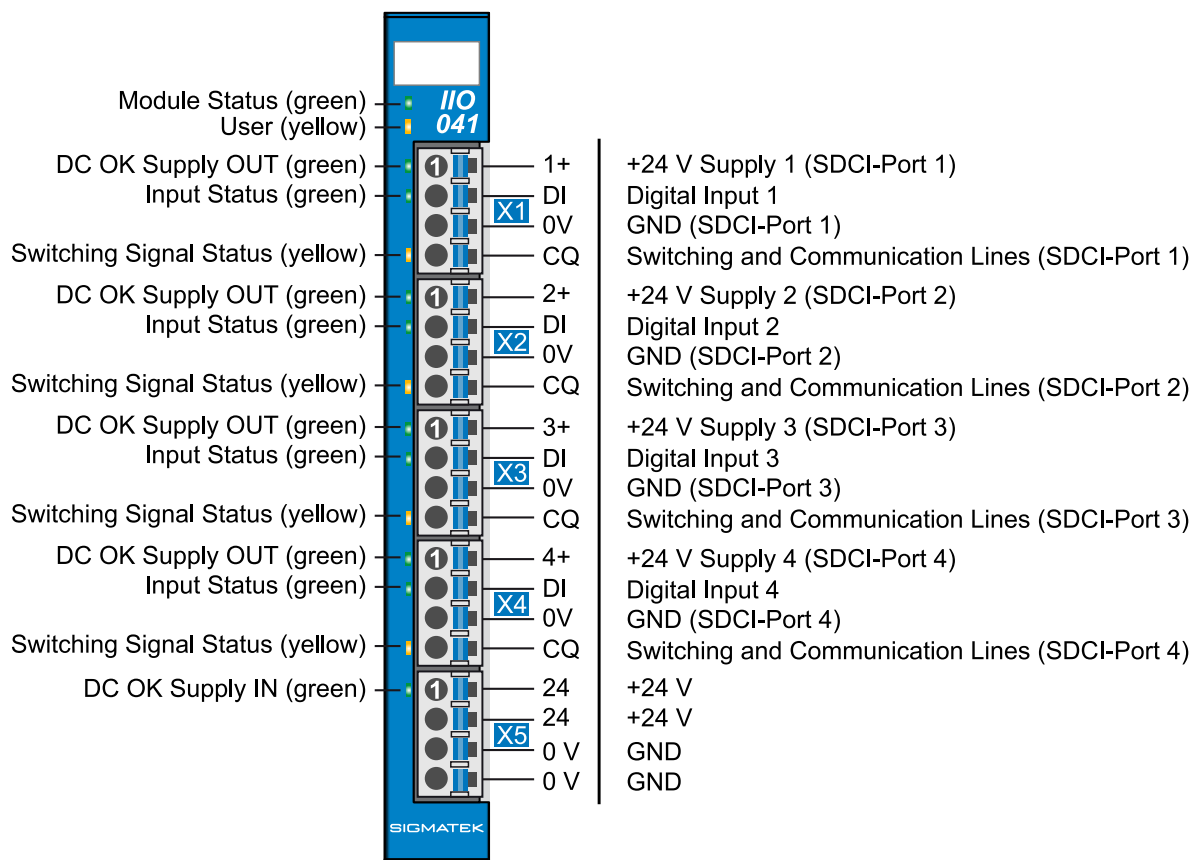


Measurements

12.5 x 104 x 72 mm (W x H x D)



## 7 Connector Layout



### INFORMATION



The connections of the +24 V supply (X5: pin 1 and pin 2) or the GND supply (X5: pin 3 and pin 4) are internally bridged. To supply the module, only one connection to a +24 V pin (pin 1 or pin 2) and a GND pin (pin 3 or pin 4) is required. The bridged connections may be used for further looping of the +24 V supply and the GND supply. However, it must be taken into account that a total current of 6 A per connection is not exceeded by the forward looping!

In addition, the GND connections from X1 (pin 3) through X4 (pin 3) may be loaded with a maximum of 2 A per connection, taking into account a maximum total current of 6 A at the GND connection on the power connector X5 (pins 3 and 4).

## 7.1 Status LEDs

|                         |        |                 |                                                                                                                                                               |
|-------------------------|--------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module status           | green  | ON              | module active                                                                                                                                                 |
|                         |        | OFF             | no supply available                                                                                                                                           |
|                         |        | BLINKING (5 Hz) | no communication                                                                                                                                              |
| User                    | yellow | ON              | adjustable by application<br>(e.g. the module LED can be set to blinking through the visualization so that the module is easily found in the control cabinet) |
|                         |        | OFF             |                                                                                                                                                               |
|                         |        | BLINKING (2 Hz) |                                                                                                                                                               |
|                         |        | BLINKING (4 Hz) |                                                                                                                                                               |
| DC OK supply OUT        | green  | ON              | +24 V supply SDCI port ON                                                                                                                                     |
|                         |        | OFF             | +24 V supply SDCI port OFF or shorted                                                                                                                         |
| Input status            | green  | ON              | input on                                                                                                                                                      |
|                         |        | OFF             | input OFF                                                                                                                                                     |
| Switching signal status | yellow | ON              | SDCI switching signal / in/output HIGH                                                                                                                        |
|                         |        | OFF             | SDCI switching signal / in/output LOW                                                                                                                         |
| DC OK supply IN         | green  | ON              | +24 V supply available                                                                                                                                        |
|                         |        | OFF             | +24 V supply missing                                                                                                                                          |

## 7.2 Applicable Connectors

**X1-X5:** Connectors with spring terminals (included in delivery)

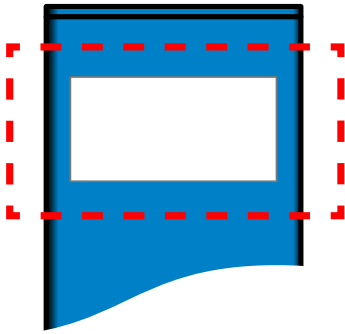
The spring terminals are suited for the connection of ultrasonically compacted (ultrasonically welded) stranded wire.

### Connection capacity:

|                                                                      |                                                                   |
|----------------------------------------------------------------------|-------------------------------------------------------------------|
| Stripping length/sleeve length                                       | 10 mm                                                             |
| Mating direction                                                     | parallel to conductor axis or to circuit board                    |
| Conductor cross section rigid                                        | 0.2-1.5 mm <sup>2</sup>                                           |
| Conductor cross section flexible                                     | 0.2-1.5 mm <sup>2</sup>                                           |
| Conductor cross section, ultrasonically compacted                    | 0.2-1.5 mm <sup>2</sup>                                           |
| Conductor cross section AWG/kcmil                                    | 24-16                                                             |
| Conductor cross section flexible with ferrule without plastic sleeve | 0.25-1.5 mm <sup>2</sup>                                          |
| Conductor cross section flexible with ferrule with plastic sleeve    | 0.25-0.75 mm <sup>2</sup> (reason for reducing d2 of the ferrule) |



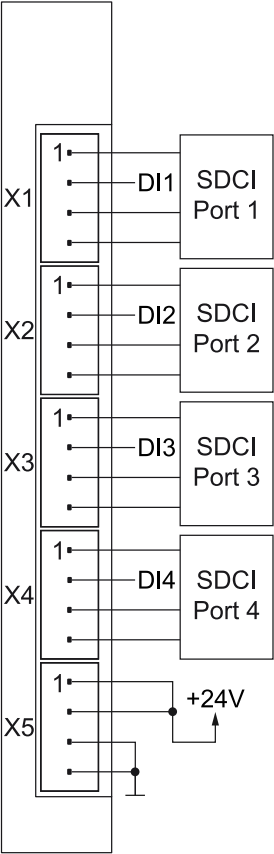
### 7.3 Label Field



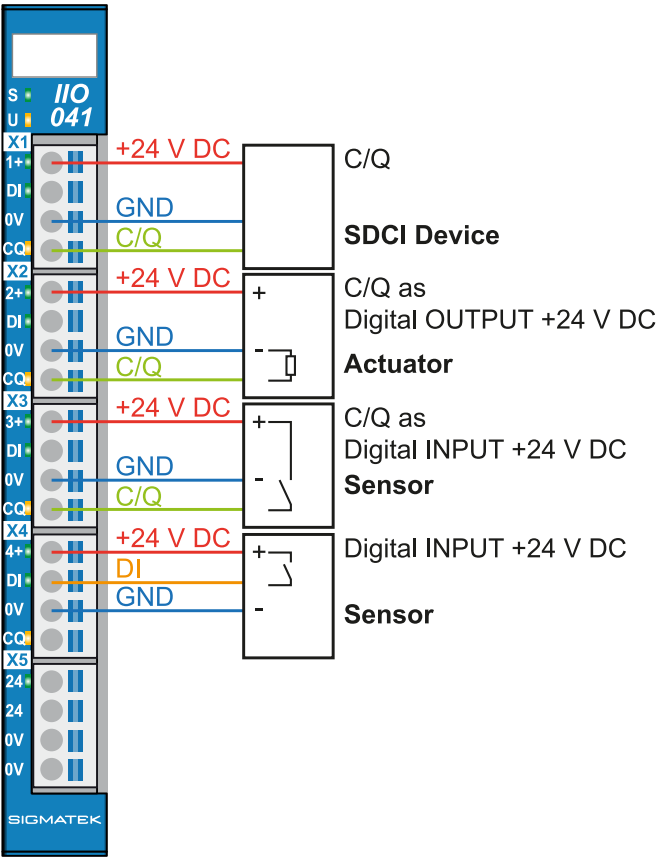
The labeling field is printed directly on the module.

# 8 Wiring

## 8.1 Wiring Example



8.2 Connection Variants



## 9 Assembly/Installation

### 9.1 Check Contents of Delivery

Ensure that the contents of the delivery are complete and intact. See chapter 1.3 Contents of Delivery.

#### INFORMATION

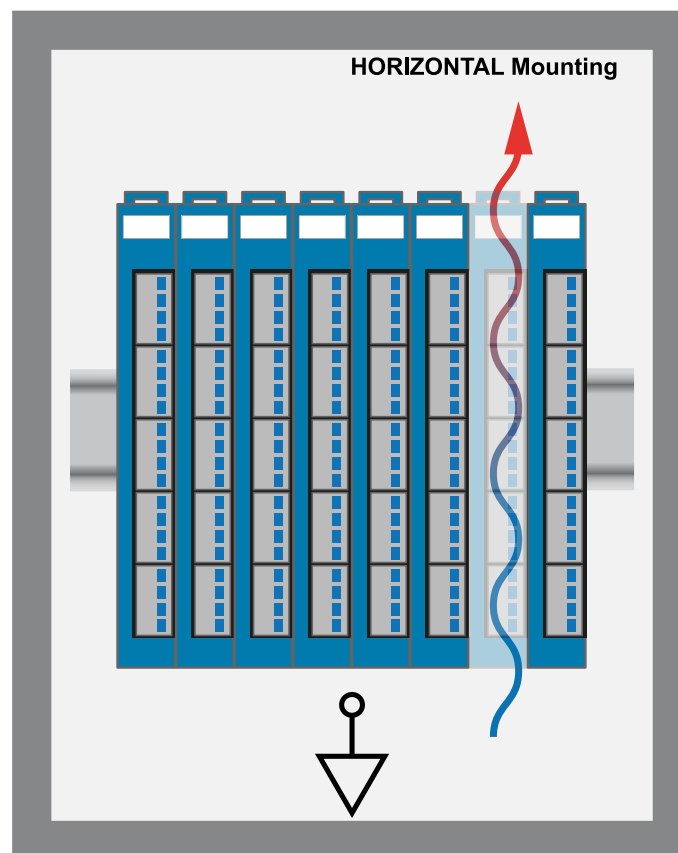


On receipt and before initial use, check the device for damage. If the device is damaged, contact our customer service and do not install the device in your system.

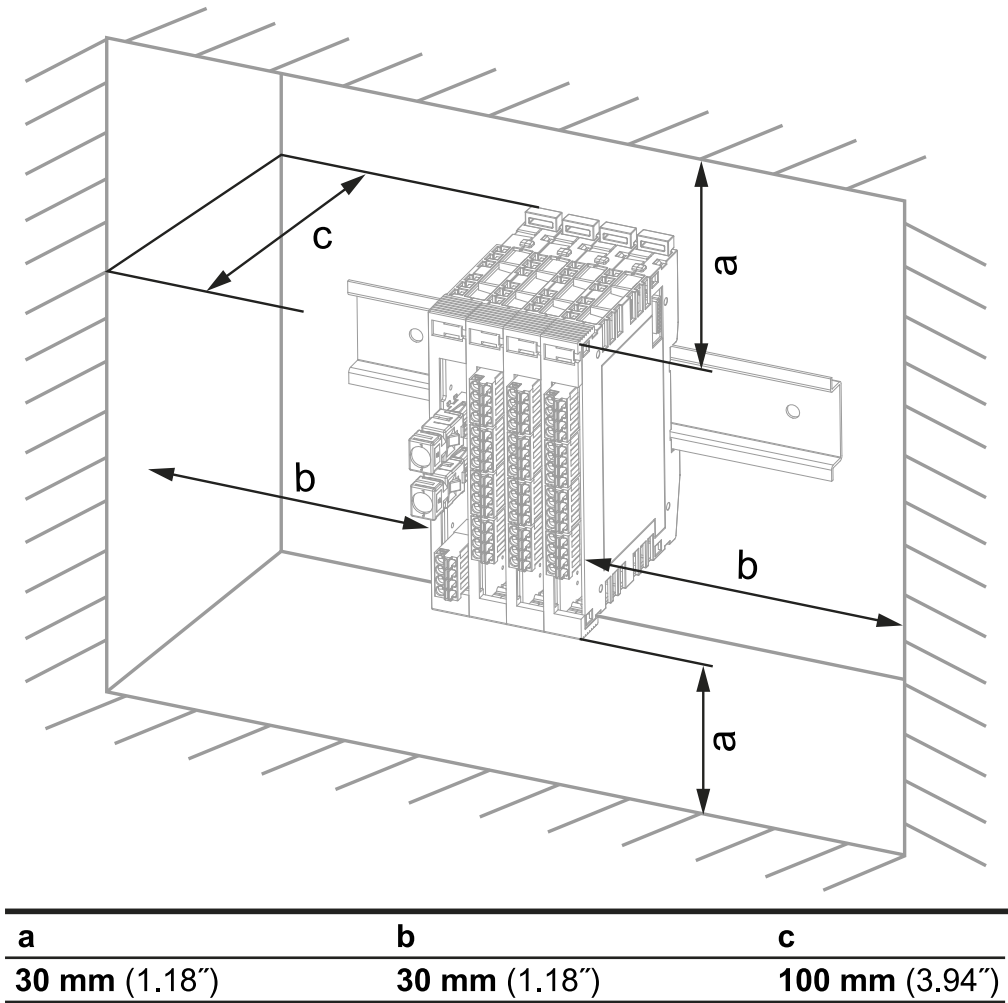
Damaged components can disrupt or damage the system.

### 9.2 Mounting

The S-DIAS modules are designed for installation into the control cabinet. To mount the modules, a DIN-rail is required. The DIN rail must establish a conductive connection with the back wall of the control cabinet. The individual S-DIAS modules are mounted on the DIN rail as a block and secured with latches. The functional ground connection from the module to the DIN rail is made via the grounding lug on the back of the S-DIAS modules. The modules must be mounted horizontally (module label up) with sufficient clearance between the ventilation slots of the S-DIAS module blocks and nearby components and/or the control cabinet wall. This is necessary for optimal cooling and air circulation to ensure proper function up to the maximum operating temperature.



Recommended minimum distances between the S-DIAS modules and the surrounding components or control cabinet wall:



a, b, c ... distances in mm (inches)

## 10 Transport/Storage

This device contains sensitive electronics. During transport and storage, high mechanical stress must therefore be avoided.

For storage and transport, the same values for humidity and vibration as for operation must be maintained!

Temperature and humidity fluctuations may occur during transport. Ensure that no moisture condenses in or on the device, by allowing the device to acclimate to the room temperature while turned off.

When sent, the device should be transported in the original packaging if possible. Otherwise, packaging should be selected that sufficiently protects the product from external mechanical influences. Such as cardboard filled with air cushioning.



## 11 Storage

When not in use, store the device according to the storage conditions. See chapter 10 Transport/Storage.

### INFORMATION



During storage, ensure that all protective covers (if available) are placed correctly, so that no contamination, foreign bodies or fluids enter the device.

## 12 Maintenance

During maintenance as well as servicing, observe the safety instructions from chapter 2 Basic Safety Directives.

### 12.1 Service

This product was constructed for low-maintenance operation.

### 12.2 Repair

In the event of a defect/repair, send the device with a detailed error description to the address listed at the beginning of this document.

For transport conditions, see chapter 10 Transport/Storage.

## 13 Disposal



### INFORMATION

Should you need to dispose of the device, the national regulations for disposal must be followed.

The device appliance must not be disposed of as household waste.



## Changes Chart

| Change date | Affected page(s) | Chapter                      | Note                                               |
|-------------|------------------|------------------------------|----------------------------------------------------|
| 01.03.2017  | 19               | 8.2 Connection Variants      | Added                                              |
| 17.08.2017  | 13               | 5.8 Environmental Conditions | Pollution degree                                   |
|             | 16               | 7.2 Applicable Connectors    | Added info regarding ultrasonically welded strands |
| 18.10.2017  | 17               | 7.3 Label Field              | Added chapter                                      |
|             | 20               | 9 Assembly/Installation      | Graphic replaced                                   |
| 20.09.2018  | 15               | 7 Connector Layout           | Note added                                         |
| 14.11.2019  | 17               | 6 Supported Cycle Times      | Chapter added                                      |
| 28.02.2020  | 17               | 6 Supported Cycle Times      | Text adapted                                       |
| 28.05.2020  | 17               | 6 Supported Cycle Times      | Chapter removed                                    |
| 08.09.2020  |                  | 9 Hardware Class IIO 041     | Chapter added                                      |
| 04.11.2020  | 20               | 9 Assembly/Installation      | Expansion functional ground connection             |
| 26.07.2023  |                  | Document                     | General chapters added, design                     |
| 06.08.2026  | 15               | 7 Connector Layout           | GND note added                                     |

## 14 Hardware Class

The HW classes are used to configure the module under LASAL CLASS and this document is available in the LASAL CLASS help.

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## IIO041

Hardware class IIO041 for the 4-port S-DIAS master module IIO41

```

SDIAS:31, IIO041 (IIO0411)
... S Class State (ClassState) <-[]->
... S Device ID (DeviceID) <-[]->
... S FPGA Version (FPGAVersion) <-[]->
... S Hardware Version (HwVersion) <-[]->
... S Serial Number (SerialNo) <-[]->
... S Retry Counter (RetryCounter) <-[]->
... O LED Control (LEDControl) <-[]->
... S Firmware Version (FirmwareVersion) <-[]->
... S Cycle Time in  $\mu$ s (CycleTime) <-[]->
... S Power Supply (PowerSupply) <-[]->
... S Number Of Available Master Events (NbrOfEventsAvailable) <-[]->
... I ALARM:00, Empty
... I SDCI:00, Empty
... I SDCI:01, Empty
... I SDCI:02, Empty
... I SDCI:03, Empty

```

| Properties                                                                                                                                                         |                        |                                                        | X |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------|---|
|   |                        |                                                        |   |
|                                                                                                                                                                    | Object of class IIO041 | IIO0411                                                |   |
|                                                                                                                                                                    | Place                  | 0                                                      |   |
|                                                                                                                                                                    | Required               | Module is not required                                 |   |
|                                                                                                                                                                    | Start In Init          | Initialization of SDCI devices in initialization phase |   |
|                                                                                                                                                                    | Max Buffer Size        | 1024                                                   |   |
|                                                                                                                                                                    | Wait Time Reconnect    | 500                                                    |   |
| <input checked="" type="checkbox"/>                                                                                                                                | Settings for 'IIO0411' |                                                        |   |
|                                                                                                                                                                    | Visualized             | true                                                   |   |
|                                                                                                                                                                    | World                  | true                                                   |   |
|                                                                                                                                                                    | OPC-UA Instance        |                                                        |   |
|                                                                                                                                                                    | Comment                |                                                        |   |
| <input checked="" type="checkbox"/>                                                                                                                                | Voltage 5000 [mV]      |                                                        |   |
|                                                                                                                                                                    | Supply                 | 0 [mA]                                                 |   |
|                                                                                                                                                                    | Drain                  | 0 [mA]                                                 |   |
|                                                                                                                                                                    | UseParentBus           | false                                                  |   |
| <input checked="" type="checkbox"/>                                                                                                                                | Voltage 24000 [mV]     |                                                        |   |
|                                                                                                                                                                    | Supply                 | 0 [mA]                                                 |   |
|                                                                                                                                                                    | Drain                  | 30 [mA]                                                |   |
|                                                                                                                                                                    | UseParentBus           | false                                                  |   |

This hardware class is used to control the the IIO 041 hardware module with 4 ports, which can be used as either a connection for SDCI devices (Single Drop Communication Interface), 24 V digital inputs or 24 V digital outputs. More information on the hardware can be found in the module documentation.



# 1 Interfaces

## General

|                       |                                            |                                                                                                                                                                                                                                                                                                                                |       |                   |       |                   |       |                   |       |                   |       |                                            |
|-----------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------|-------|-------------------|-------|-------------------|-------|-------------------|-------|--------------------------------------------|
| Class State           | State                                      | Shows the actual status of the hardware class                                                                                                                                                                                                                                                                                  |       |                   |       |                   |       |                   |       |                   |       |                                            |
| Device ID             | State                                      | Shows the Device ID of the hardware module                                                                                                                                                                                                                                                                                     |       |                   |       |                   |       |                   |       |                   |       |                                            |
| FPGA Version          | State                                      | FPGA version of the module in 16#XY (e.g. 16#10 = version 1.0)                                                                                                                                                                                                                                                                 |       |                   |       |                   |       |                   |       |                   |       |                                            |
| Hardware Version      | State                                      | Hardware version of the module in format 16#XXYY (e.g. 16#0120 = version 1.20)                                                                                                                                                                                                                                                 |       |                   |       |                   |       |                   |       |                   |       |                                            |
| Serial Number         | State                                      | Shows the serial number of the hardware module                                                                                                                                                                                                                                                                                 |       |                   |       |                   |       |                   |       |                   |       |                                            |
| Retry Counter         | State                                      | This server increments when a transfer fails                                                                                                                                                                                                                                                                                   |       |                   |       |                   |       |                   |       |                   |       |                                            |
| LED Control           | State                                      | <div>With this output, the application LED of the S-DIAS module can be activated to find the module in the network more quickly.<table><tr><td>0</td><td>LED off</td></tr><tr><td>1</td><td>LED on</td></tr><tr><td>2</td><td>blinks slowly</td></tr><tr><td>3</td><td>blinks rapidly</td></tr></table></div>                  | 0     | LED off           | 1     | LED on            | 2     | blinks slowly     | 3     | blinks rapidly    |       |                                            |
| 0                     | LED off                                    |                                                                                                                                                                                                                                                                                                                                |       |                   |       |                   |       |                   |       |                   |       |                                            |
| 1                     | LED on                                     |                                                                                                                                                                                                                                                                                                                                |       |                   |       |                   |       |                   |       |                   |       |                                            |
| 2                     | blinks slowly                              |                                                                                                                                                                                                                                                                                                                                |       |                   |       |                   |       |                   |       |                   |       |                                            |
| 3                     | blinks rapidly                             |                                                                                                                                                                                                                                                                                                                                |       |                   |       |                   |       |                   |       |                   |       |                                            |
| Firmware Version      | State                                      | The firmware version of the hardware module is shown in this server                                                                                                                                                                                                                                                            |       |                   |       |                   |       |                   |       |                   |       |                                            |
| Cycle Time in $\mu$ s | State                                      | <div>Calculated cyclic time (in <math>\mu</math>s) of the SDCI system based on the SDIAS cyclic time.<br/>The cyclic time corresponds to the SDIAS cyclic time, when it is 1 ms or greater.<br/>If the SDIAS cycle time is less than 1 ms the SDIAS cycle time is set to 1 ms.</div>                                           |       |                   |       |                   |       |                   |       |                   |       |                                            |
| Power Supply          | State                                      | <div>Voltage supply status.<table><tr><td>Bit 0</td><td>Port 1 Voltage OK</td></tr><tr><td>Bit 1</td><td>Port 2 Voltage OK</td></tr><tr><td>Bit 2</td><td>Port 3 Voltage OK</td></tr><tr><td>Bit 3</td><td>Port 4 Voltage OK</td></tr><tr><td>Bit 4</td><td>External voltage OK (24 V at connector X5)</td></tr></table></div> | Bit 0 | Port 1 Voltage OK | Bit 1 | Port 2 Voltage OK | Bit 2 | Port 3 Voltage OK | Bit 3 | Port 4 Voltage OK | Bit 4 | External voltage OK (24 V at connector X5) |
| Bit 0                 | Port 1 Voltage OK                          |                                                                                                                                                                                                                                                                                                                                |       |                   |       |                   |       |                   |       |                   |       |                                            |
| Bit 1                 | Port 2 Voltage OK                          |                                                                                                                                                                                                                                                                                                                                |       |                   |       |                   |       |                   |       |                   |       |                                            |
| Bit 2                 | Port 3 Voltage OK                          |                                                                                                                                                                                                                                                                                                                                |       |                   |       |                   |       |                   |       |                   |       |                                            |
| Bit 3                 | Port 4 Voltage OK                          |                                                                                                                                                                                                                                                                                                                                |       |                   |       |                   |       |                   |       |                   |       |                                            |
| Bit 4                 | External voltage OK (24 V at connector X5) |                                                                                                                                                                                                                                                                                                                                |       |                   |       |                   |       |                   |       |                   |       |                                            |
| Number Of Available   | State                                      | <div>The number of master events available<br/>The events can (starting with the oldest) be retrieved with the GetEvent method</div>                                                                                                                                                                                           |       |                   |       |                   |       |                   |       |                   |       |                                            |

| Master Events |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Required      |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|               | Property | This property is active by default, which means that the S-DIAS hardware module at this position is mandatory for the system and can under no circumstances be disconnected or return an error. Otherwise, the entire hardware deactivated. If the hardware module is missing or removed, an S-DIAS error is triggered. If his client is initialized with 0, the hardware module located in this position is not mandatory. This means that it doesn't have to be available or error-free. However, which components identified as "not required" should be selected with regard to the safety of the system. |

|                     |          |                                                                                                                                                                                                                                                                          |
|---------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| StartInInit         | Property | 0 Initialization of the connected sensors/actuators in Cylic task                                                                                                                                                                                                        |
|                     |          | 1 Initialization of the connected sensors/actuators during initialization phase                                                                                                                                                                                          |
| MaxBufferSize       | Property | Size of the FIFO buffer for the asynchronous commands in bytes. The individual entries in the buffer have variable sizes.<br>One entry consists of 24 byte header + 0-232 bytes data.                                                                                    |
| Wait Time Reconnect | Property | "Wait Time Reconnect" specifies the time in [ms], in which a new SDCI Device Portscan is executed.<br>This setting is only used, if the "Auto Connect" setting is active on a SDCI device.<br>Default value: 500 ms<br>Value range: 0-1000 ms<br>as initialization value |

Communication Interfaces

|       |          |                                                                                         |
|-------|----------|-----------------------------------------------------------------------------------------|
| ALARM | Downlink | With this downlink the corresponding alarm class can be placed via the hardware editor. |
|-------|----------|-----------------------------------------------------------------------------------------|

## 2 Global Methods

### 2.1 GetEvent

If the EventsAvailable server shows that master events are available, these can be retrieved via the GetEvent method.

| Return parameters    | Type                               | Description                                                                                                                                                                                  |
|----------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OldestEventAvailable | <a href="#">t_SDCIEventDetails</a> | This structure variable contains the details of the event that occurred. If no event is available, all bytes of the variable are 0<br>See description according to <a href="#">the table</a> |

# 3 Data Structures

## 3.1 t\_SDCEventDetails

|                                                                                                                      |                                                                                 |              |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|--------------|
| EventInfo :<br>t_EventInfo                                                                                           | BINT, by which each of the 4 bits are combined into one of the values described |              |
|                                                                                                                      | Instance                                                                        |              |
|                                                                                                                      | 0                                                                               | Unknown      |
|                                                                                                                      | 4                                                                               | Application  |
|                                                                                                                      | Mode                                                                            |              |
| EventCode :<br>t_EventCode                                                                                           | 1                                                                               | Single shot  |
|                                                                                                                      | 2                                                                               | Disappeared  |
|                                                                                                                      | 3                                                                               | Appeared     |
|                                                                                                                      | Type                                                                            |              |
|                                                                                                                      | 1                                                                               | Notification |
|                                                                                                                      | 2                                                                               | Warning      |
|                                                                                                                      | 3                                                                               | Error        |
|                                                                                                                      | Origin                                                                          |              |
|                                                                                                                      | 0                                                                               | Remote       |
|                                                                                                                      | 1                                                                               | Local        |
| UINT enumeration, which contains the default error codes (each manufacturer can additionally define their own codes) |                                                                                 |              |
| E_EVENT_NO_MALFUNCTION (0)                                                                                           |                                                                                 |              |
| E_EVENT_GENERAL_MALFUNCTION (4096)                                                                                   |                                                                                 |              |
| E_EVENT_EXCESS_AMBIENT_TEMPERATURE (16656)                                                                           |                                                                                 |              |
| E_EVENT_TOO_LOW_AMBIENT_TEMPERATURE (16672)                                                                          |                                                                                 |              |
| E_EVENT_EXCESS_DEVICE_TEMPERATURE (16912)                                                                            |                                                                                 |              |
| E_EVENT_TOO_LOW_DEVICE_TEMPERATURE (16928)                                                                           |                                                                                 |              |
| E_EVENT_EXCESS_PERIPHERY_TEMPERATURE (17168)                                                                         |                                                                                 |              |
| E_EVENT_TOO_LOW_PERIPHERY_TEMPERATURE (17184)                                                                        |                                                                                 |              |
| E_EVENT_HW_COMPONENT_MALFUNCTION (20496)                                                                             |                                                                                 |              |
| E_EVENT_LOW_SUPPLY_VOLTAGE_15V (20753)                                                                               |                                                                                 |              |
| E_EVENT_LOW_SUPPLY_VOLTAGE_24V (20754)                                                                               |                                                                                 |              |
| E_EVENT_LOW_SUPPLY_VOLTAGE_5V (20755)                                                                                |                                                                                 |              |

E\_EVENT\_SHORT\_CIRCUIT (20817)  
E\_EVENT\_OUTPUT\_STAGE (21520)  
E\_EVENT\_FUSE\_S1 (21585)  
E\_EVENT\_FUSE\_S2 (21586)  
E\_EVENT\_FUSE\_S3 (21587)  
E\_EVENT\_SW\_RESET\_WATCHDOG (24592)  
E\_EVENT\_LOSS\_OF\_PARAMETER (25360)  
E\_EVENT\_PARAMETER\_ERROR (25376)  
E\_EVENT\_PARAMETER\_NOT\_INITIALIZED (25392)  
E\_EVENT\_PARAMETER\_NON\_SPECIFIC (25408)  
E\_EVENT\_PARAMETER\_CHANGED (25424)  
E\_EVENT\_PROCESS\_DATA\_MONITORING (33040)  
E\_EVENT\_EXCESS\_PROCESS\_VARIABLE\_RANGE (35856)  
E\_EVENT\_EXCESS\_MEASUREMENT\_RANGE (35872)  
E\_EVENT\_TOO\_LOW\_PROCESS\_VARIABLE\_RANGE (35888)  
E\_EVENT\_ADVANCE\_WARNING (35904)  
E\_EVENT\_EXTERNAL\_MALFUNCTION (36864)  
E\_EVENT\_UV33UNDERVOLTAGE (49409)  
E\_EVENT\_OVERTEMPERATURE (49410)  
E\_EVENT\_UV24UNDERVOLTAGE (49411)  
E\_EVENT\_CQSHORTCUT (49412)  
E\_EVENT\_DSACCESSERROR (49665)  
E\_EVENT\_NEW\_SLAVE (65313)  
E\_EVENT\_DEV\_COM\_LOST (65314)  
E\_EVENT\_DS\_IDENT\_MISMATCH (65315)  
E\_EVENT\_DS\_BUFFER\_OVERFLOW (65316)  
E\_EVENT\_DS\_ACCESS\_DENIED (65317)  
E\_EVENT\_DS\_INCORRECT\_EVENT (65329)  
E\_EVENT\_DS\_UPLOAD\_REQ (65425)

## 4 Internal Properties

### Behavior Asynchronous Communication (SDOs)

The asynchronous communication of the SDCIDevices (e.g. SDCIDevice\_AsyncPara) is managed by the SDCI master class (e.g. IIO041). It has only one asynchronous channel to the module and can therefore only process the asynchronous accesses in sequence. This means, for example, if the SDCI device communicates asynchronously on port 1, it is blocked on the other ports for this period.

### Behavior SDCI Device at Project Start

After the project is uploaded, the enable is set in all ports that should be started in SDCI mode. For this reason, the objects are not immediately ready.

During the process, `_NotInitialized` is displayed in the ClassState server and in ActualMode, `_Inactive` is shown.

If the process is completed successfully, the ClassState server displays `_ClassOk` and in ActualMode `_SDCI` is shown.

### Auto Connect Function of the SDCI Devices

The function of the Auto Connect of SDCI devices is described in the SDCIDevice help.

The Auto Connect function is supported starting with SDCIDevice 1.5 and IIO041 1.12.

### Compatibility Mode

If the device ID of the detected SDCI device differs from the device ID configured at this point when establishing a connection (during initialization or at runtime by triggering a reconnect), but the manufacturer ID matches, an attempt is made to address the device with the configured device ID and thus set it to compatibility mode.