

AM 821

S-DIAS Analog Mixed Module

Instruction Manual

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Translation of the Original Instructions

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S-DIAS Analog Mixed Module

AM 821**8 analog inputs****2 analog outputs**

The S-DIAS analog mixing module AM 821 has 8 analog inputs with 0-10 V/0-20 mA and 16-bit resolution, which can be switched via software. It also has 2 analog outputs with 0-10 V/0-20 mA and 12-bit resolution, which can also be switched via software.

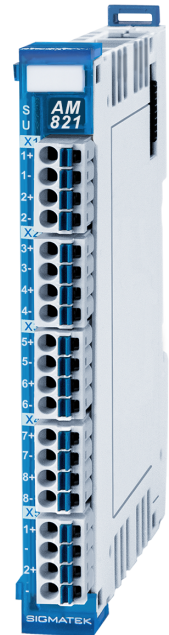


Table of Contents

- 1 Introduction 4**
 - 1.1 Target Group/Purpose of this Operating Manual 4
 - 1.2 Important Reference Documentation 4
 - 1.3 Contents of Delivery 4
- 2 Basic Safety Directives 5**
 - 2.1 Symbols Used 5
 - 2.2 Disclaimer 6
 - 2.3 General Safety Directives 7
 - 2.4 Software/Training 8
- 3 Standards and Directives 9**
 - 3.1 Directives 9
 - 3.1.1 EU Conformity Declaration 9
- 4 Type Plate 10**
- 5 Technical Data 11**
 - 5.1 Specification analog inputs 11
 - 5.2 Specification analog outputs 12
 - 5.3 Electrical Requirements 13
 - 5.4 Miscellaneous 15
 - 5.5 Environmental Conditions 15
- 6 Mechanical Dimensions 16**
- 7 Connector Layout 17**
 - 7.1 Status LEDs 18
 - 7.2 Applicable Connectors 19
 - 7.3 Label Field 20
- 8 Wiring 21**
 - 8.1 Wiring Example 21

8.2 Note	22
9 Assembly/Installation	23
9.1 Check Contents of Delivery	23
9.2 Mounting	24
10 Transport/Storage	26
11 Storage	27
12 Maintenance	28
12.1 Service	28
12.2 Repair	28
13 Disposal	29
14 Supported Cycle Times	30
14.1 Cycle Times below 1 ms (in μ s)	30
14.2 Cycle Times equal to or higher than 1 ms (in ms)	30

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.

Our support team is happily available to answer your questions.
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 AM 821

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 Conformity Declaration



EU Declaration of Conformity

The product AM 821 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
QR-Code  BJ: XXXX/XX S/N XXXXXXXX	Short Name Specifications FS: XXX.XX.XX FW: XXX LD: XX.X HW: X.XX	Electrical Ratings  SIGMATEK Sigmatekstraße 1 A-5112 Lamprechtshausen www.sigmatek-automation.com
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 Specification analog inputs

Number of channels	8		
Measurement range	0-10 V	0-20 mA	4-20 mA
Measurement value	0-10,000 0-30,000 (at full range) When the input is open/short-circuited, the hardware class -2147483632 is supplied.	0-20,000 0-30,000 (at full range)	4.000-20.000 6,000-30,000 (at full range) When the input is open/short-circuited, the hardware class -2147483632 is supplied.
Input type	differential input		
Resolution current	16 bits (ca. 0.15 mV/LSB)	16 bits (ca. 0.3 µA/LSB)	
Conversion time for all channels	1 ms		
Common mode range	±12 V	±8 V	
Input resistance	> 1 MΩ	-	
Load	-	typically 50 Ω	
Input filter hardware	typically 1 kHz, 3 rd order low pass		
Input filter software	configurable		
Maximum permissible input current	-	continuous 30 mA single pulse 1 s 0.12 A single pulse 40 ms 0.25 A single pulse 200 µs 0.75 A	
Cable break monitoring	yes	no	yes
Short-circuit monitoring	no	no	yes
Accuracy	±0.50 % of the maximum output value		

5.2 Specification analog outputs

Number of channels	2		
Output range	0-10 V	0-20 mA	4-20 mA
Output value	0-10,000	0-20,000	4,000-20,000
Resolution	12 bits (ca. 2.5 mV/LSB)	12 bits (ca. 5 μA/LSB)	
Refresh time of all channels	≥ 500 μs (corresponds to the S-DIAS cycle time)		
Load capacity of the output voltage	> 5 kΩ	-	
Load	-	maximum 500 Ω	
Permissible capacitive load	maximum 100 nF	-	
Permissible output inductance	-	maximum 0.5 mH at 50 Ω maximum 5 mH at 500 Ω	
Settling time	< 250 μs (99% of final value)		
Short-circuit monitoring	yes		
Cable break monitoring	no	yes	
Output accuracy	±0.5 % of the maximum output value		

5.3 Electrical Requirements

Power supply from the S-DIAS bus	+24 V	
Current consumption on the S-DIAS bus without load on the current outputs	typically 78 mA	maximum 93 mA
Current consumption on the S-DIAS bus with maximum load on the current outputs	typically 85 mA	maximum 101 mA

INFORMATION

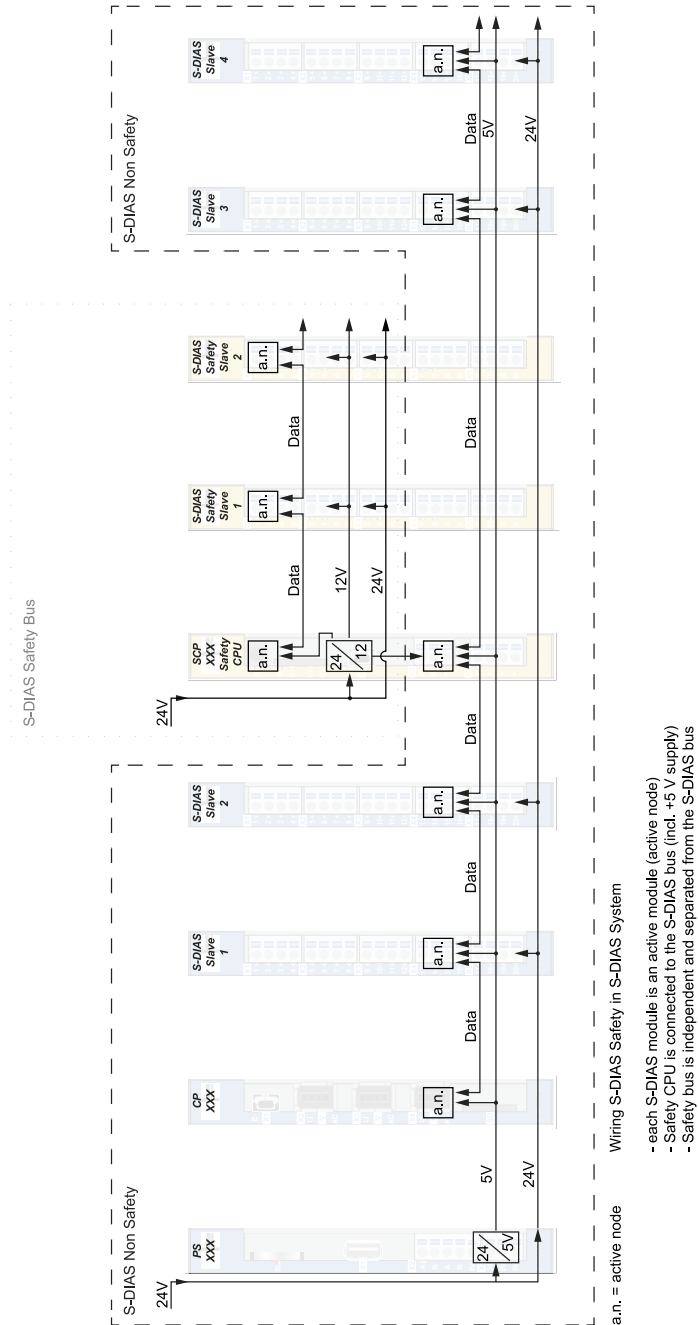


If this S-DIAS module is used on an S-DIAS supply module with several S-DIAS modules, the total currents of the S-DIAS modules used must be determined and checked.

The total current of the +24 V supply must not exceed 1.6 A!

The total current of the +5 V supply must not exceed 1.6 A!

The power consumption information can be found in the module-specific technical documentation under "Electrical Requirements".



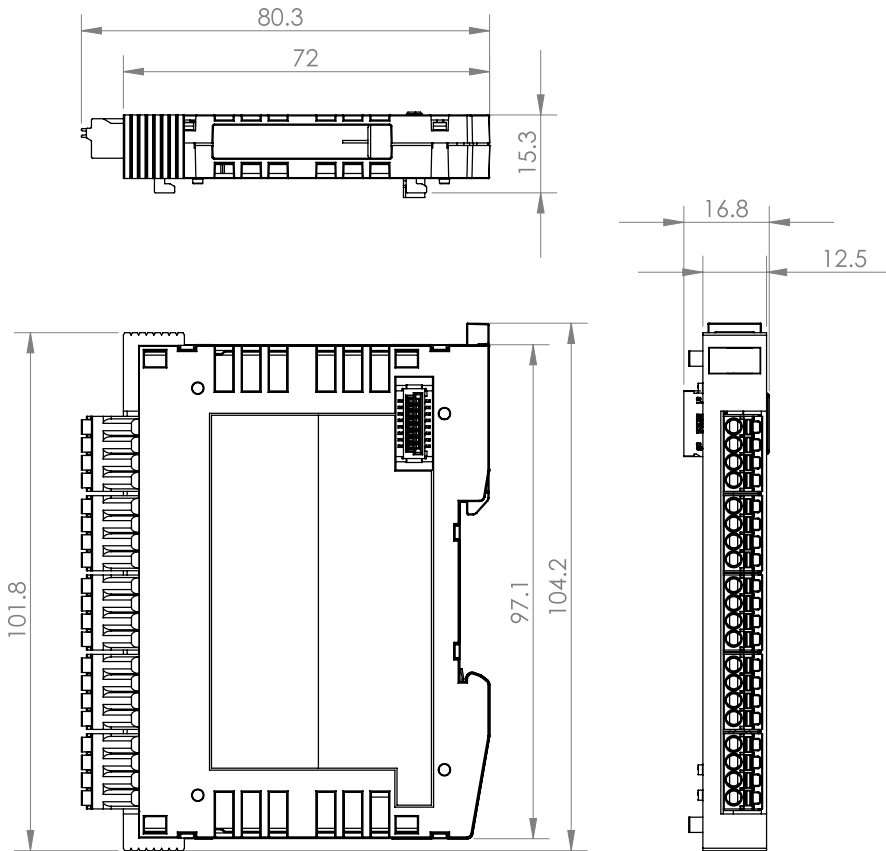
5.4 Miscellaneous

Article number	20-017-821	
Printed circuit board coating	no	
Approvals	CE	yes
	UL	designed according to UL
	Functional Safety	no
	UKCA	no

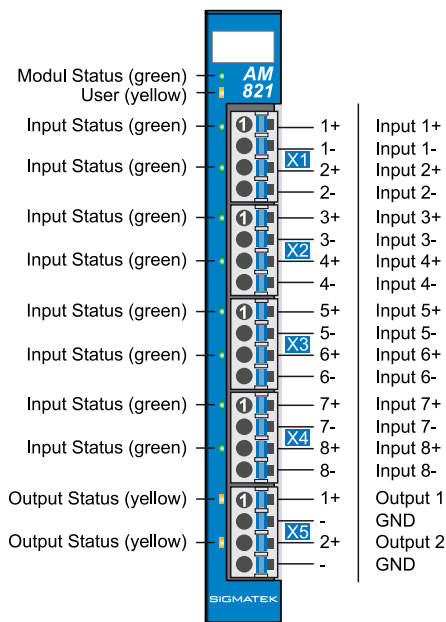
5.5 Environmental Conditions

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 von 5-8.4 Hz 1 g von 8.4-150 Hz
Shock resistance	EN 60068-2-27	15 g (147.15 m/s²)
Protection type	EN 60529/NEMA 250	IP20/Type1

6 Mechanical Dimensions



7 Connector Layout



7.1 Status LEDs

Module Status	green	ON	module active
		OFF	no supply available
		BLINKING (5 Hz)	no communication
User	yellow	ON	can be set from the application
		OFF	(e.g. the module LED can be set to blinking through the visualization so that the module is easily found in the control cabinet)
		BLINKING (2 Hz)	
		BLINKING (4 Hz)	
Input 1-8	green	ON	Input x activated
		OFF	Input x deactivated
		BLINKING (4 Hz)	Cable break or overload
Output 1-2	yellow	ON	Output x activated
		OFF	Output x deactivated
		BLINKING (4 Hz)	Overload

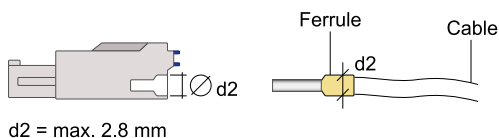
7.2 Applicable Connectors

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

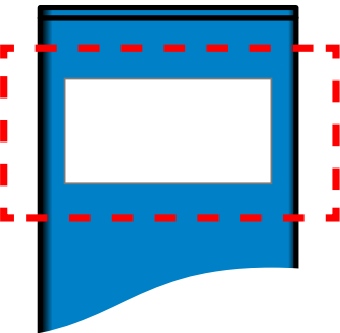
The spring terminals are suited for the connection of ultrasonically compacted (ultrasonically welded) stranded wire.

Connection capacity:

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



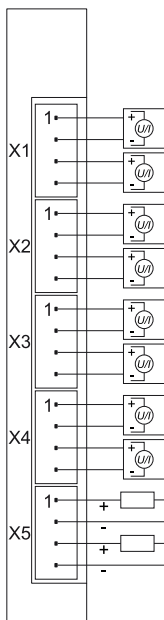
7.3 Label Field



Manufacturer	Weidmüller
Type	MF 10/5 CABUR MC NE WS
Article number Weidmüller	1854510000
Compatible printer	Weidmüller
Type	Printjet Advanced 230V
Article number Weidmüller	1324380000

8 Wiring

8.1 Wiring Example



8.2 Note

The signals recorded by the analog modules are very small, as compared to the digital signals. To ensure error-free operation, a careful wiring method must be followed.

The following installation guidelines should be observed:

- Avoid parallel connections between input lines and load-bearing circuits.
- Protective circuits for all relays (RC networks or free-wheeling diodes)
- The DIN rail must have an adequate mass connection.
- The lines connected to the source of the analog components must be as short as possible and parallel wiring to digital signal lines must be avoided.
- The signal lines must be shielded.
- The shielding must be connected to a shielding bus.

INFORMATION



The ground bus should be connected to the control cabinet when possible!

The S-DIAS module CANNOT be connected/disconnected while voltage is applied!

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

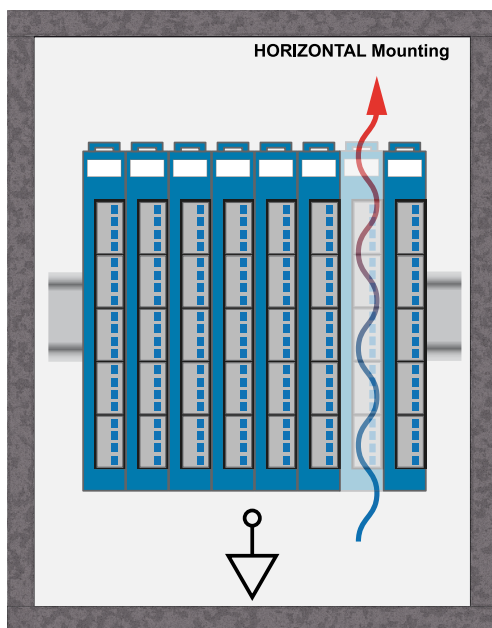


On receipt and before initial use, check the device for damage. If the device is damaged, contact our customer service and do not install the device in your system.

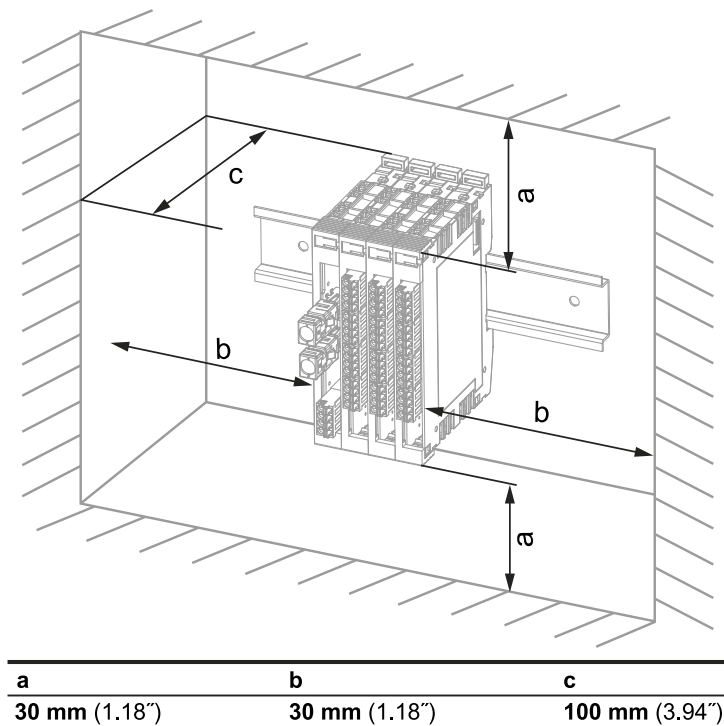
Damaged components can disrupt or damage the system.

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.



14 Supported Cycle Times

14.1 Cycle Times below 1 ms (in μs)

The analog mixing module can be accessed via the S-DIAS bus with different bus cycle times.

50	100	125	200	250	500
					x

x = supported

14.2 Cycle Times equal to or higher than 1 ms (in ms)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

x = supported

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

x = supported

Changes Chart

Change date	Affected page(s)	Chapter	Note
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