VI 021

S-DIAS VARAN Control Module

Instruction Manual

Translation of the Original Instructions

S-DIAS Control Module VARAN   **VI 021**

1x VARAN In
1x 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.

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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.

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 VI 021

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 attention.

2.2 Disclaimer

> **INFORMATION**
>
> 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.

INFORMATION

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.

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!

The module complies with EN 61131-2.

In combination with a facility, the system integrator must comply with EN 60204-1 standards.

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

Le module est conforme à la norme EN 61131-2.

En combinaison avec une équipement, l'intégrateur de système doit respecter la norme EN 60204-1.

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

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 VI 021 conforms to the following European directives:

- **2014/35/EU** Low-voltage Directive

- **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. See Products/Downloads or use the search function and the keyword "EU Declaration of Conformity".

4   Type Plate

	HW: X.XX SW: XX.XX.XXX Safety Version: SXX.XX.XX
	SIGMATEK GMBH & CO KG Sigmatekstrasse 1 A-5112 LAMPRECHTSHAUSEN
Serial No.	
Article Number	Product Name Short Name

Exemplary nameplate (symbol image)

	HW: 1.00 SW: 01.00.000 Safety Version: S01.00.00
	SIGMATEK GMBH & CO KG Sigmatekstrasse 1 A-5112 LAMPRECHTSHAUSEN
12345678	
12-246-133-3	Handbediengerät Wireless HGW 1033-3

HW: Hardware version
SW: Software version

5   Technical Data

5.1   Performance Data

Interfaces	1x VARAN In (Tyco Mini I/O) (maximum length: 100 m) 1x VARAN Out (since FPGA 2.0: optional Ethernet (VtE)) (Tyco Mini I/O) (maximum length: 100 m)

5.2   Electrical Requirements

Supply voltage HW1.x to 2.x	18-30 V DC	
Supply voltage HW6.x	18-27 V DC	
Supply voltage (UL) HW1.x to 2.x	18-30 V DC (Class 2)	
Supply voltage (UL) HW6.x	18-27 V DC (Class 2)	
Current consumption of voltage supply	the current consumption is dependent on the connected loads (max. 2.75 A)	
Voltage supply on the S-DIAS bus	via the VI 021	
Current capacity on the S-DIAS bus (power supply for I/O/P modules)	+5 V	+24 V
	maximum 1.6 A	maximum 1.6 A

INFORMATION

For USA and Canada:

The supply must be limited to:

a) max. 5 A at voltages from 0-20 V DC, or

b) 100 W at voltages from 20-60 V DC

The limiting component (e.g. transformer, power supply or fuse) must be certified by an NRTL (Nationally Recognized Testing Laboratory).

Wiring S-DIAS Safety in S-DIAS System

- each S-DIAS module is an active module (active node)
- Safety CPU is connected to the S-DIAS bus (incl. +5 V supply)
- Safety bus is independent and separated from the S-DIAS bus

a.n. = active node
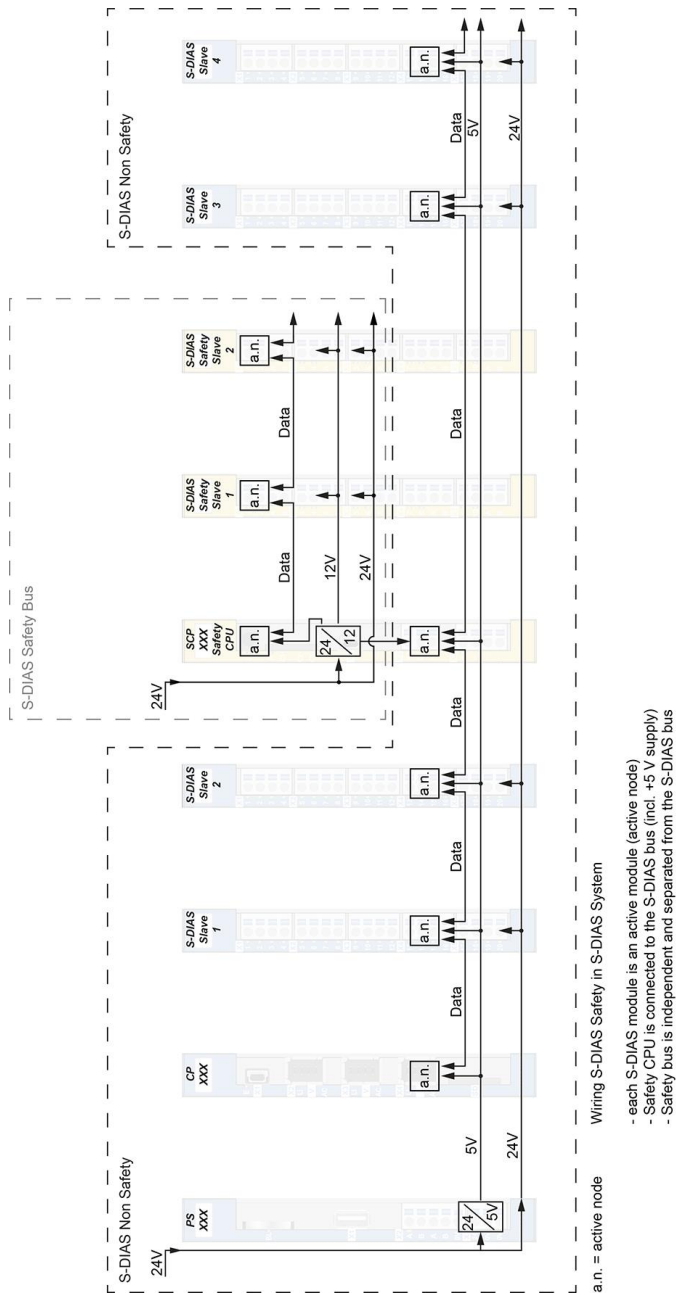
5.3   Miscellaneous

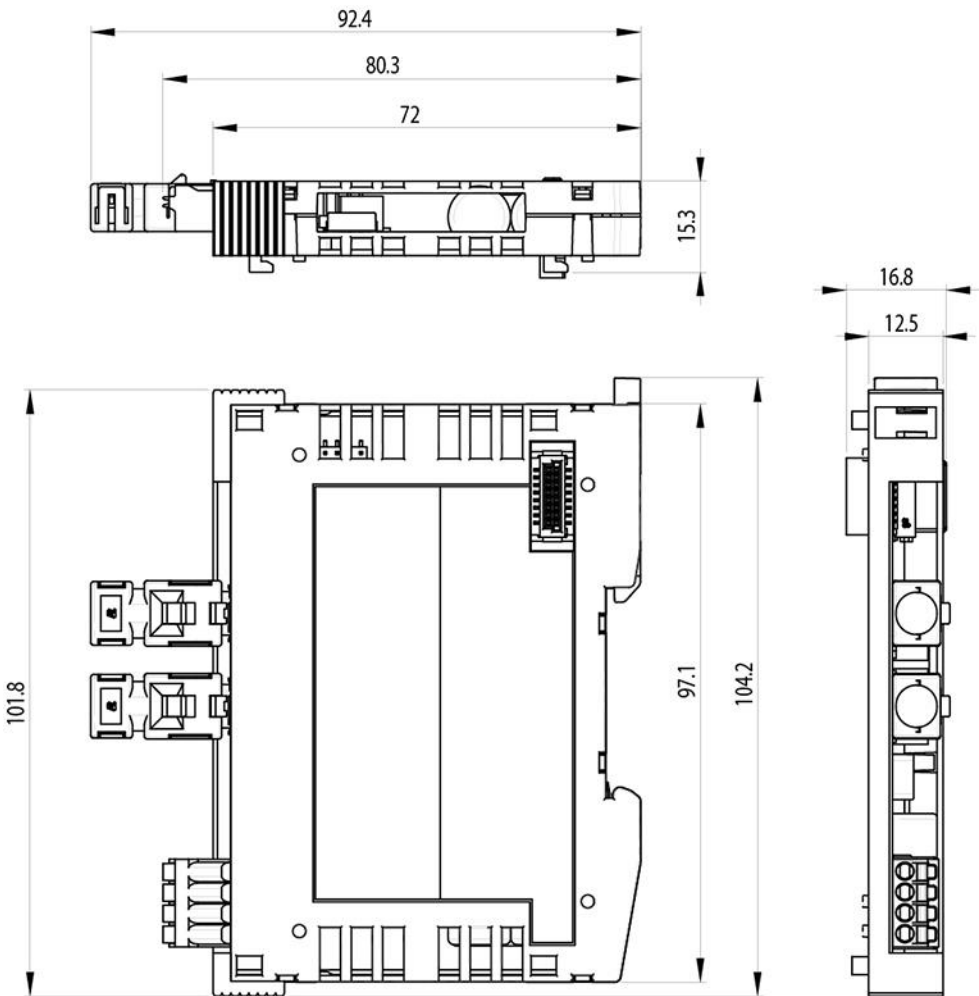| Article number	20-003-021 20-003-021-X (polymer coated printed circuit board)
Standard	UL 508 (E247993)
Approbations	UL, cUL, CE, UKCA

5.4   Environmental Conditions

Storage temperature	-20 ... +85 °C	
Environmental temperature HW1.x to 3.x	0 ... +55 °C	
Environmental temperature HW6.x	0 ... +50 °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

6 Mechanical Dimensions

7   Connector Layout

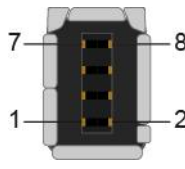|	
Sync (green)	VI 021
Reset (red)	
Link (green)	X1 VARAN In
Active (yellow)	
Link (green)	X2 VARAN Out
Active (yellow)	
DC OK (green)	24 +24 V
	24 +24 V
	0V GND
	0V GND
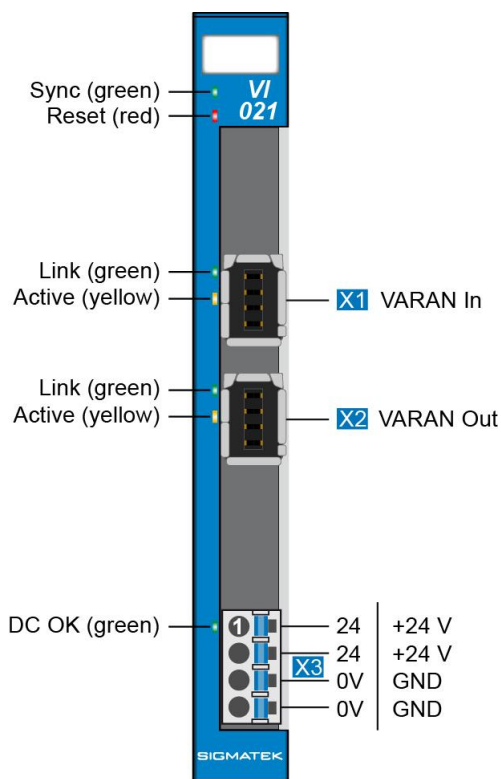
INFORMATION

The connections of the +24 V supply (X4: pin 1 and pin 2) or the GND supply (X4: 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!

7.1   Status LEDs

Sync	green	ON	the module is synchronized with the VARAN manager.
Reset	red	ON	the module is in Reset.
VARAN In Link	green	ON	the connection between the two PHYs is established.
		BLINKS	the VARAN In of the primary client does not have a link.
VARAN In Active	yellow	ON	data is exchanged over the VARAN bus.
VARAN Out Link	green	ON	the connection between the two PHYs is established.
		BLINKS	there is no connection between VARAN In and the primary client.
VARAN Out Active	yellow	ON	data is exchanged over the VARAN bus.
DC OK	green	ON	the module is supplied with +24 V.

7.2   Connectors

X1: VARAN In, X2: VARAN Out (since FPGA 2.0: optional Ethernet (VtE))
(Tyco Mini I/O)

Pin	Function
1	Tx+/Rx+
2	Tx-/Rx-
3	Rx+/Tx+
4-5	n.c.
6	Rx-/Tx-
7-8	n.c.

n.c. = do not use

7.3 Applicable Connector Cables

VARAN

Cable type	Length	Article number
RJ45 on industrial Mini I/O Type 1, drag chain capable	0.5 m	16-911-005
	1 m	16-911-010
	1.5 m	16-911-015
	2 m	16-911-020
	3 m	16-911-030
	5 m	16-911-050
	10 m	16-911-100
	20 m	16-911-200
	50 m	16-911-500
Industrial Mini I/O Type 1 on industrial Mini I/O Type 1, drag chain capable	0.5 m	16-912-005
	1 m	16-912-010
	1.5 m	16-912-015
	2 m	16-912-020
	3 m	16-912-030
	5 m	16-912-050
	10 m	16-912-100
	20 m	16-912-200

7.4   Applicable Connectors

Connectors:
X1, X2: Tyco Mini I/O Plug Type 1 Lock Extend Version (not included in delivery)
X3: Connector with spring terminals (included in delivery)
The spring terminals are suitable connecting ultrasonically compacted (ultrasonically welded) strands.

Connections:

|	
Stripping length/Sleeve length:	10 mm
Plug-in direction:	parallel to conductor axis or to PCB
Conductor cross section, rigid:	0.2-1.5 mm²
Conductor cross section, flexible:	0.2-1.5 mm²
Conductor cross section, ultrasonically compacted:	0.2-1.5 mm²
Conductor cross section AWG/kcmil:	24-16
Conductor cross section flexible, with ferrule without plastic sleeve:	0.25-1.5 mm²
Conductor cross section flexible, with ferrule with plastic sleeve:	0.25-0.75 mm² (ground for reducing d2 of the ferrule)

d2 = max. 2.8 mm

INFORMATION

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

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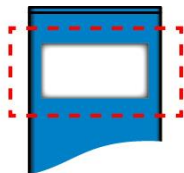
Manufacturer	Weidmüller
Type	MF 10/5 CABUR MC NE WS
Weidmüller article number	1854510000
Compatible printer	Weidmüller
Type	Printjet Advanced 230V
Weidmüller article number	1324380000

8   Strain Relief
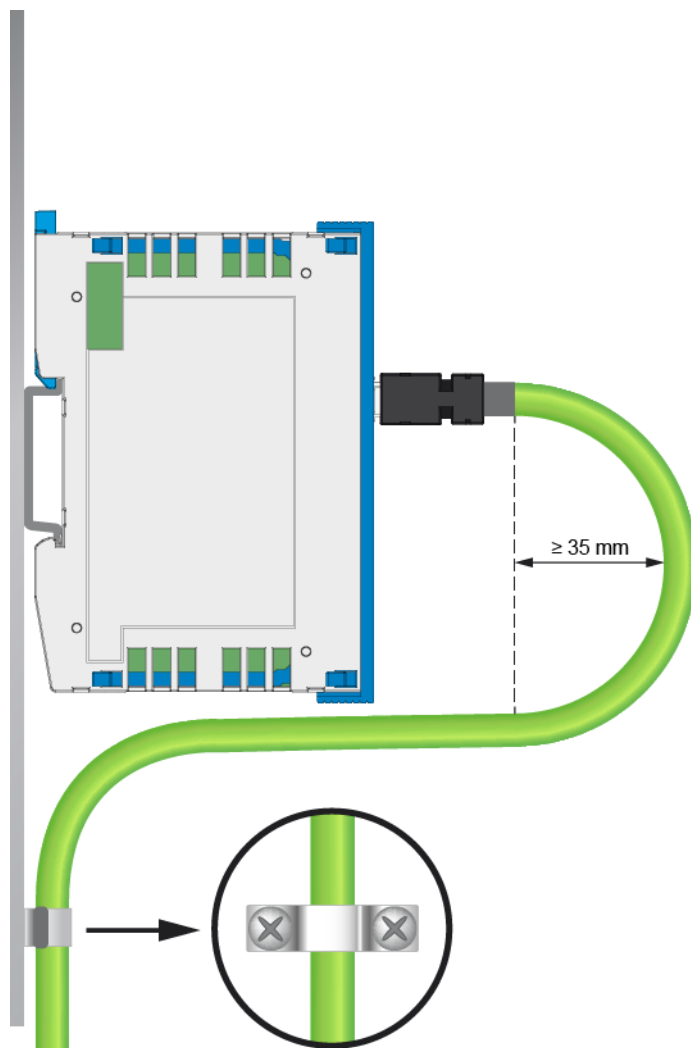
INFORMATION

The VARAN cable must be mounted close to the module (e.g. using a clamp)! No mechanical stress can be applied to the connection!

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 clamp 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, so that proper function up to the maximum operating temperature is ensured.
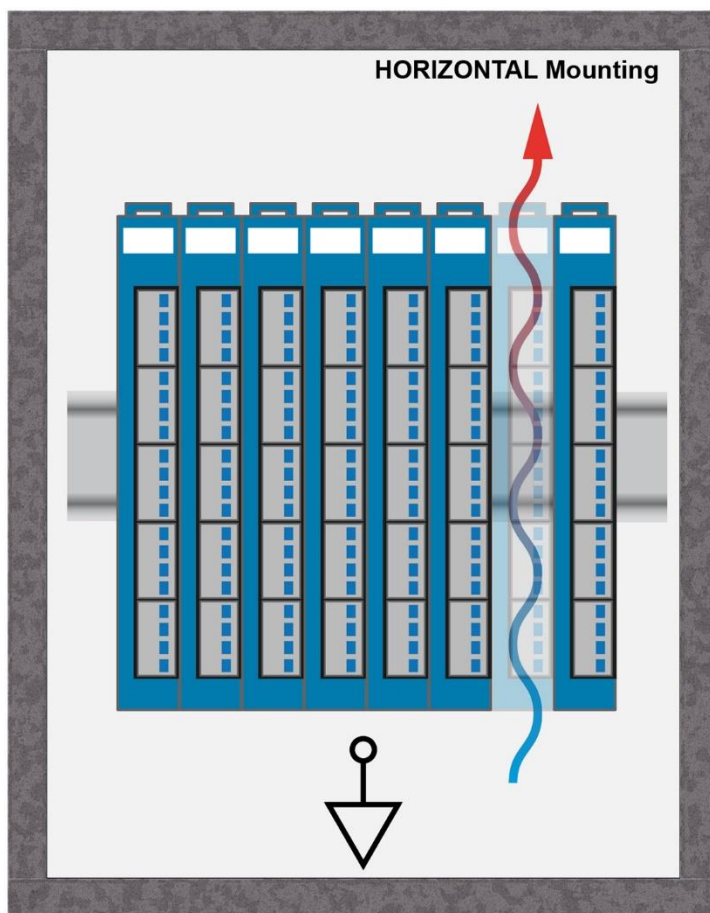
Recommended minimum distances of the S-DIAS modules to the surrounding components or control cabinet wall:
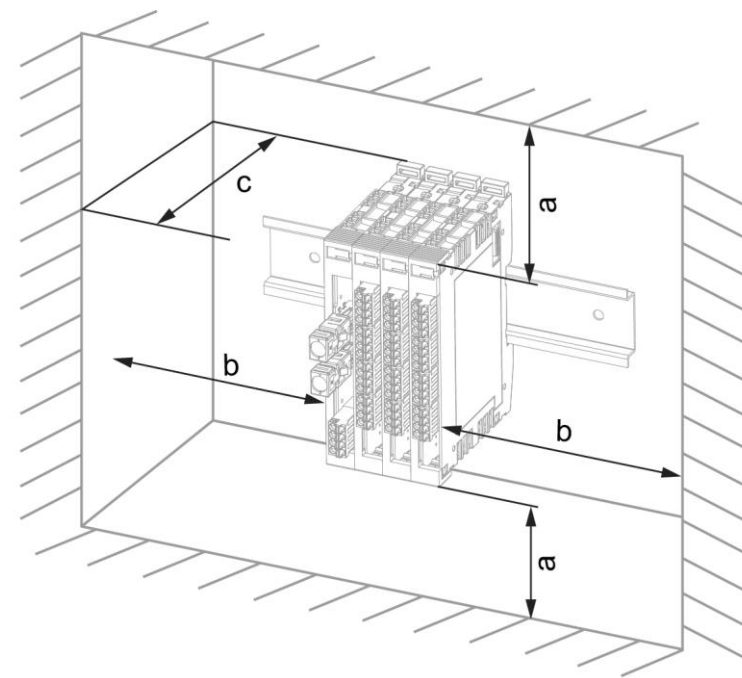
a	b	c
30 mm (1.18˝)	**30 mm** (1.18˝)	**100 mm** (3.94˝)

a, b, c … distances in mm (inches)

10 Recommended Shielding for VARAN

The VARAN real-time Ethernet bus system exhibits a very robust quality in harsh industrial environments. Through the use of IEEE 802.3 standard Ethernet physics, the potentials between an Ethernet line and sending/receiving components are separated. In the event of an error, the VARAN Manager resends messages to a bus participant immediately. The shielding described below is principally recommended.

For applications in which the bus is run outside the control cabinet, the correct shielding is required. This is especially important, if due to physical requirements, the bus cables must be placed next to sources of strong electromagnetic noise. It is recommended to avoid placing VARAN bus lines parallel to power cables whenever possible.

SIGMATEK recommends the use of CAT5e industrial Ethernet bus cables.

For the shielding, an S-FTP cable should be used.

An S-FTP bus is a symmetric, multi-wire cable with unshielded pairs. For the total shielding, a combination of foil and braiding is used. A non-laminated variant is recommended.

INFORMATION

The VARAN cable must be secured at a maximum distance of 20 cm from the connector to protect against vibration!

10.1   Wiring from the Control Cabinet to an External VARAN Component

If the Ethernet lines are connected from a VARAN component to a VARAN node located outside the control cabinet, the shielding should be placed at the entry point to the control cabinet housing. All noise can then be deflected from the electronic components before reaching the module.
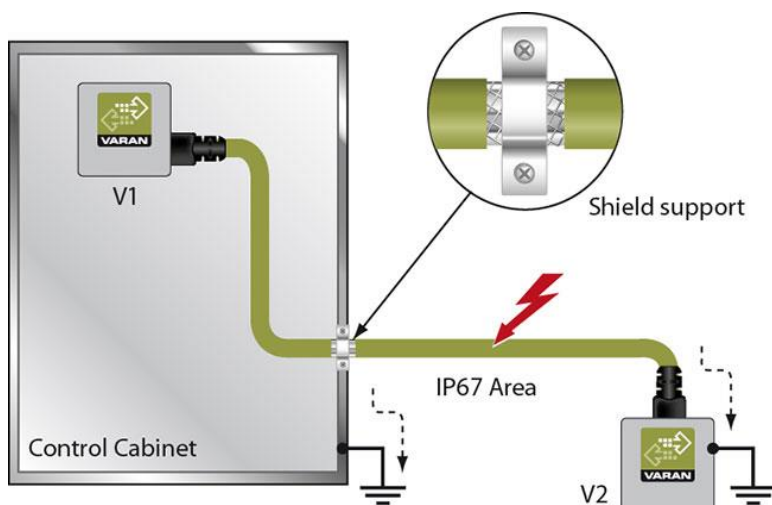
10.2   Wiring Outside of the Control Cabinet

If a VARAN bus line must be connected outside of the control cabinet only, no additional shield support is required. A requirement therefore is, outside the control cabinet, only IP67 modules and connectors are used. These components are very robust and noise resistant. The shielding for all sockets in IP67 modules is electrically connected internally or over the housing, whereby voltage spikes are not deflected through the electronics.
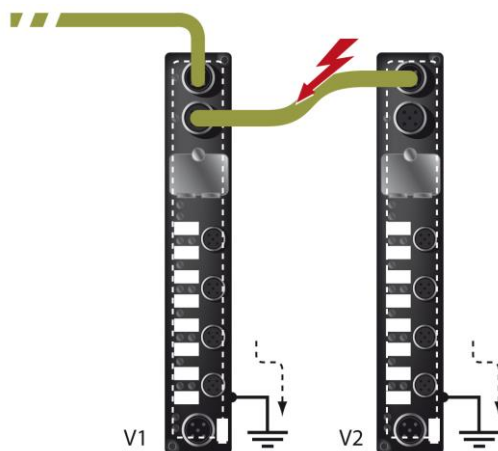
10.3 Shielding for Wiring Within the Control Cabinet

Sources of strong electromagnetic noise located within the control cabinet (drives, Transformers, etc.) can induce interference in a VARAN bus line. Spike voltages are deflected over the metallic housing of a RJ45 connector. Noise is conducted through the control cabinet housing without further action from the electronic components. To eliminate sources of noise during data transfer, it is recommended that the shielding for all electronic components be connected within the control cabinet.
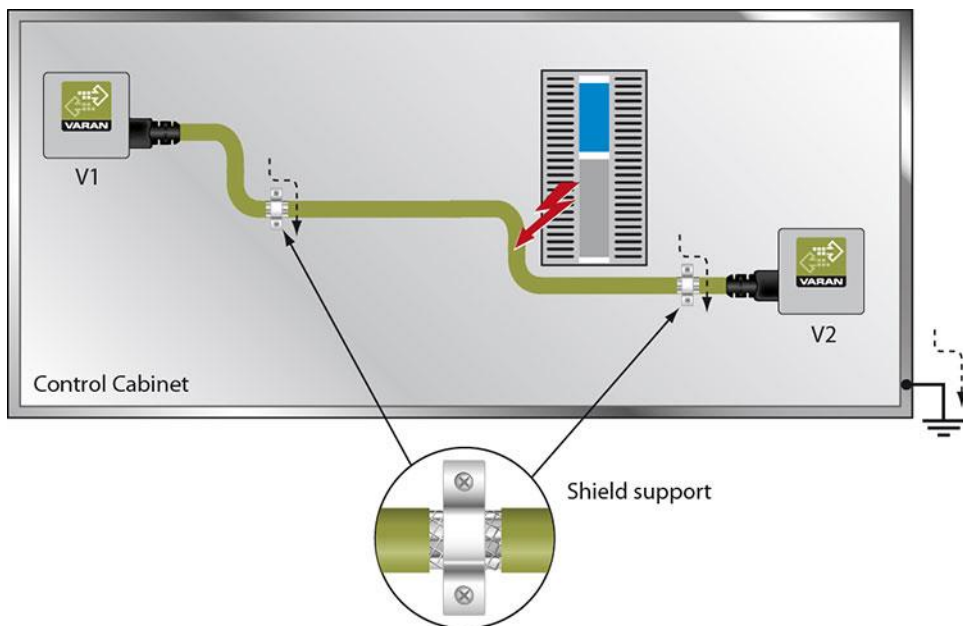
10.4   Connecting Noise-Generating Components

With the connection of power components that generate strong electromagnetic interference, it is also critical to ensure correct shielding. The shielding should be placed before a power element (or group of power elements).

Shield support
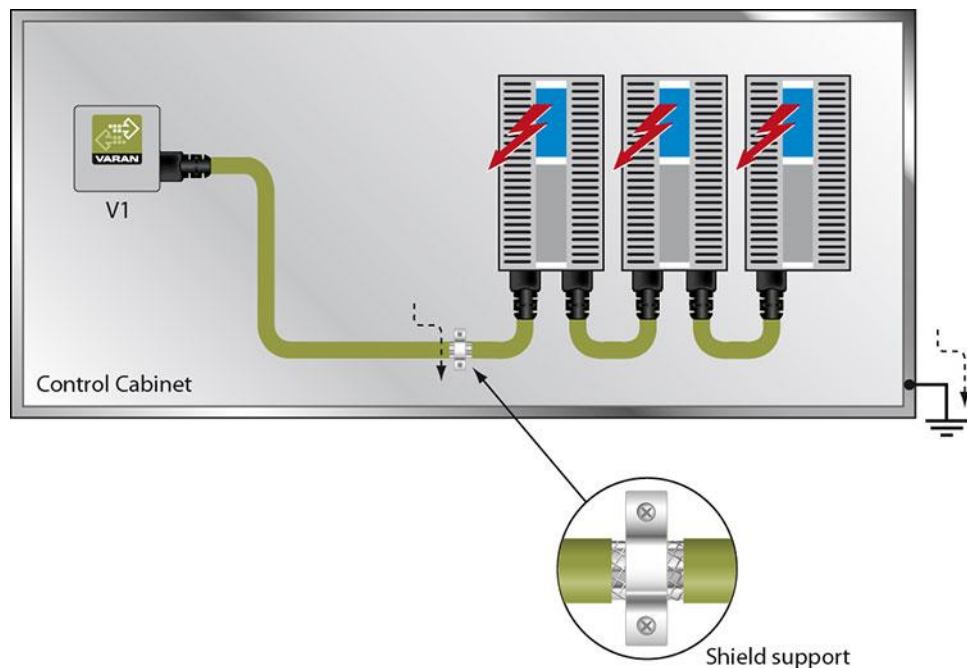
10.5 Shielding Between Two Control Cabinets

If two control cabinets must be connected over a VARAN bus, it is recommended that the shielding be located at the entry points of both cabinets. Noise can be thereby stopped from reaching the electronics within the control cabinet.
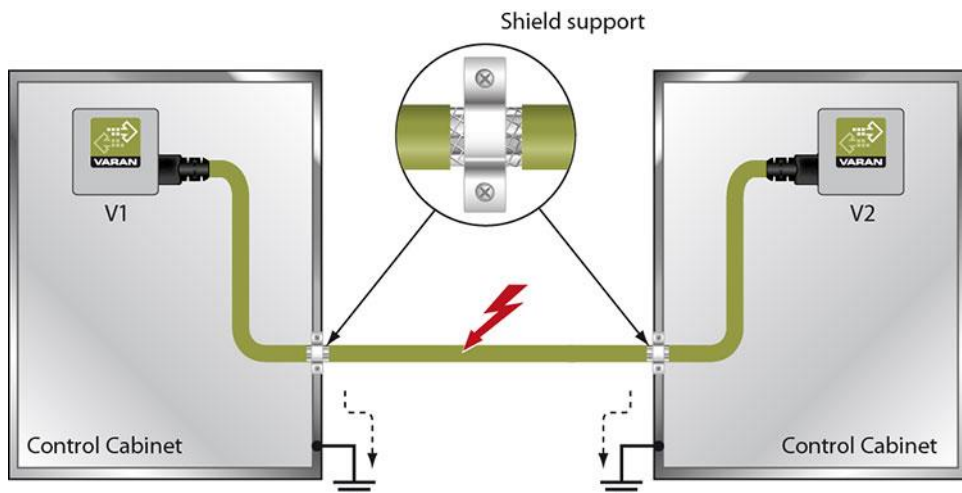
11 Hardware Class VI021

VI021 Hardware Class for the S-DIAS VI021 interface module

```
VARAN:01, VI021 (VIO211)
    S  Online (Online) <-[]->
    S  State (State) <-[]->
    S  Release (Release) <-[]->
    S  Device Address (DeviceAddress) <-[]->
    S  Vendor ID (VendorID) <-[]->
    S  Device ID (DeviceID) <-[]->
    S  Serial Number (SerialNo) <-[]->
    S  Retry Counter (RetryCounter) <-[]->
    S  Validate Serial Number (ValidateSerNo) <-[]->
    S  Sdias Firmware Version (FirmwareVersion) <-[]->
    S  Sdias Manager Protocol Version (ManagerProtocolVersion) <-[]->
    S  Sdias State (SdiasState) <-[]->
    S  Sdias Retry Counter (SdiasRetryCounter) <-[]->
    S  Sdias Iso Wr Task Duration (IsoWrTaskDuration) <-[]->
    S  Sdias Iso Wr Task Duration Max (IsoWrTaskMaxDuration) <-[]->
    S  Sdias Iso Rd Task Duration (IsoRdTaskDuration) <-[]->
    S  Sdias Iso Rd Task Duration Max (IsoRdTaskMaxDuration) <-[]->
    S  Sdias Manager Option Bits (ManagerOptionBits) <-[]->
    ||  ALARM:00, Empty
    ||  SDIAS:00, Empty
    ||  VARAN:01, Empty
```

This hardware class is used for controlling the VI 021 hardware module. More information regarding the hardware can be found in the hardware documentation.

11.1 General

State	State	This server shows the actual status of the hardware class. For a detailed description, see Status of VARAN Hardware Classes.
Online	State	This server is set as soon as the hardware class is processed properly (when the data are valid, drives synchronized,..) The server is reset when an error occurs or when disconnected.
Release	State	The actual FPGA version of the connected hardware module is shown in this server.
Device Address	State	The actual device address of the connected hardware module is shown in this server.
Vendor ID	State	The vendor ID of the hardware module is shown in this server.
Device ID	State	The device ID of the hardware module is shown in this server.
Serial No	State	The serial number of the hardware module is shown in this server.
Retry Counter	State	On this server, all retries of active VARAN data objects that affect this module are displayed. If, for example, packets are repeated on the VARAN bus due to malfunctions, this counter increases. If the system runs without transmission errors on the VARAN bus, this value remains unchanged. When modules are disconnected from the VARAN bus, retries do not necessarily have to occur. This depends on whether communication was active for the respective module (active data objects).
Validate Serial No	State	If serial number validation is enabled (SerNoValidation = 1), the serial number of the connected module is confirmed by writing 1 to this server. The server also shows the status of the serial number validation: <table><tr><td>-2</td><td>Serial number validation not enabled</td></tr><tr><td>-1</td><td>No serial number defined for this position</td></tr><tr><td>0</td><td>Serial number of the connected module does not match the stored number</td></tr><tr><td>1</td><td>Serial number matches the stored number</td></tr></table>
ProtocolVersion		The VARAN protocol version of the hardware module is displayed on this server. Format xx.y.z e.g. 16#0130 means v01.3.0 If this server is 16#0, then reading the VARAN protocol version is not supported by the operating system interface.
Firmware Version	State	The Firmware version of the hardware module is shown in this server.
Required	Property	This client 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 missing, disconnected or return an error. Otherwise, the entire hardware deactivated. If the hardware module is missing, and error is returned. This triggers a S-DIAS error. 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.
User Action	Property	This client is optional and must not be connected. For more information refer to General Documentation to the VARAN Library.

Serial No Validation	Property	This client activates the validation of the serial number of a module
		<table><tr><td>0</td><td>Serial number of the module is not checked</td></tr><tr><td>1</td><td>Serial number of the module must be confirmed (validated)</td></tr></table>
		The serial number is confirmed for a connected module by writing to the "ValidateSerNo" server.
Transparent	Property	With this client, the module can be switched transparently. The transparent mode is described in the chapter "Transparent Mode".
		<table><tr><td>0</td><td>The transparent mode is inactive.</td></tr><tr><td>1</td><td>The transparent mode is active The module is not used in the "VARAN tree".</td></tr></table>

11.2   SDIAS

Sdias Firmware Version	State	This server shows the current firmware version of the connected hardware module.
Sdias Manager Protocol Version	State	This server shows the current Sdias Manager Protocol version of the connected hardware module.
Sdias State	State	This server shows the current status of the S-DIAS Manager.
Sdias Retry Counter	State	Shows occurred retries on the S-DIAS bus.
Sdias Iso Write Task Duration	State	The required time of the last SDIAS write task in μs is displayed on this server.
Sdias Iso Write Task Duration Max	State	The maximum required time of the SDIAS write task in μs is displayed on this server.
Sdias Iso Read Task Duration	State	The required time of the last SDIAS read task in μs is displayed on this server. Depending on the SDIAS-Manager version the measured time shows a higher value than the time calculation. The reason is, that in older versions the measured time includes a pre-processing time. But this is not relevant for the bus load, as the pre-processing can also be executed parallelly to the procedure. The type of the used measuring of the time can be seen on the server manager option bit "Bit 4: Execution time selection supported". If this bit is 1, only the processing time is measured.
Sdias Iso Read Task Duration Max	State	The maximum required time of the SDIAS read task in μs is displayed on this server. Depending on the SDIAS-Manager version the measured time shows a higher value than the time calculation. The reason is, that in older versions the measured time includes a pre-processing time. But this is not relevant for the bus load, as the pre-processing can also be executed parallelly to the procedure. The type of the used measuring of the time can be seen on the server manager option bit "Bit 4: Execution time selection supported". If this bit is 1, only the processing time is measured.

| **Sdias Manager Option Bits**	State	On this server, the options supported by the SDIAS Manager are displayed bitwise.	
		Bit 1	Interrupts supported
		Bit 2	Half duplex (SDIAS S2), bus scan required
		Bit 3	Far Memory access supported
		Bit 4	Status wait supported (to differ TimeSliceError and TimeSliceErrorIRQ)
		Bit 5	Execution time selection supported 1
		Bit 6	Task interruption detection supported
		Bit 7	Execution time selection supported 2

11.3 Communication Interfaces

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

11.4   Transparent Mode

The transparent mode is set so that a project with different stages of the hardware can be maintained with just one software version.

Example: With the full range of functions, a system consists of 10 modules that are connected by the VARAN bus. There is a project, which contains all system functions. If not all modules are required and therefore not integrated into the system, the hardware class objects or the respective modules are switched to transparent in the project. This means the project does not have to be changed with the reduced hardware stage. It is sufficient to switch the respective objects to transparent.

All VARAN hardware classes have a "Transparent" client. Through this client, the read method of the server connected to the client is called. In the read method for example, a configuration file can be read in which whether the transparent mode should be active or inactive is defined. The status is sent as a return value.
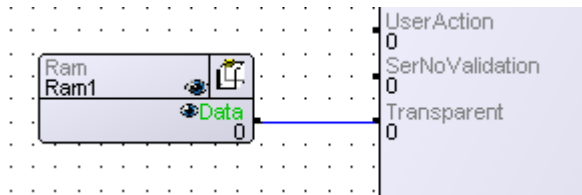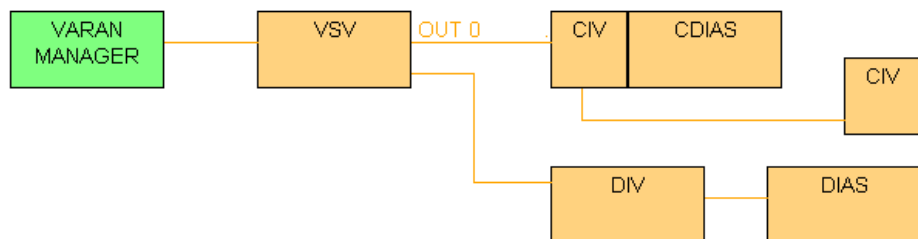
If a hardware class object is set to transparent, The VARAN bus structure moves up and the module is removed from the configuration. A distinction is now made between modules with 1 output and modules with several outputs.

If a module is removed (the corresponding object set to transparent) that has only one output, the following module (if available) must be directly connected to the preceding module (See item CIV Transparent).

If a module (e.g. VSV) with several outputs is removed, only the module at the first output (if available) has to be connected to the preceding module. The other modules at the remaining outputs are removed and the corresponding hardware class objects are set to transparent (See item VSV Transparent).
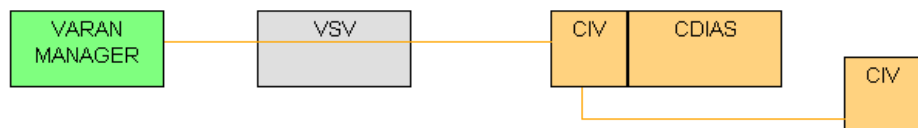
11.4.1   No transparent module

The following image shows the output assignment in which no class is set to transparent. The modules are connected to one another by the VARAN bus.

11.4.2   VSV Transparent

The "Transparent" client of the VSV hardware class object was initialized with 1. This means that the object is set to transparent. The VSV hardware must therefore be removed from the configuration and the VARAN Manager is connected directly to the CIV module through the software. All modules that are not connected to the first output of the VSV are set to transparent and not initialized, since with the VSV, only one thread can be moved.
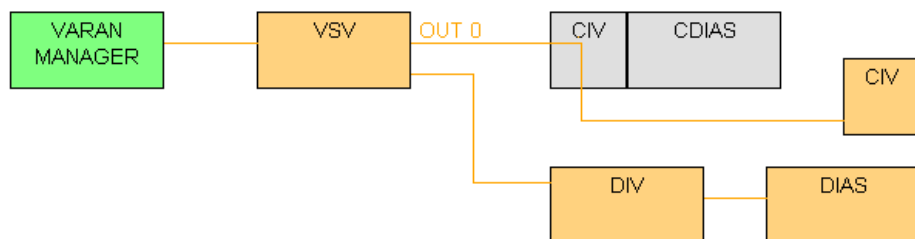
11.4.3   CIV Transparent

The "Transparent" client of the CIV hardware object was initialized with 1. This means that the object is set to transparent. The CIV hardware must therefore be removed from the configuration and the VSV module is connected directly to the following CIV module.

12 Transport/Storage

INFORMATION

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.

13 Storage

INFORMATION

When not in use, store the operating panel according to the storage conditions. See chapter 12.

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

14 Maintenance

INFORMATION

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

14.1 Service

This product was constructed for low-maintenance operation.

14.2 Repair

INFORMATION

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 12 Transport/Storage.

15 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.

Documentation Changes

Change date	Affected page(s)	Chapter	Note
29.07.2013	9	5 Mounting	Chapter Mounting added
23.10.2013	4	1.4 Environmental Cond.	Added Vibration resistance
23.12.2013	7	3 Connector Layout	Changed image
	7	3.2 Applicable Connector Cables	Chapter added
09.01.2014	7, 8	3.1 Applicable Connector Cables	Article description more detail included, Article numbers added
		3.2 Applicable Connectors	Plug description more detail included
11.02.2014	6	3 Connector Layout	Changed image
	8	3.2 Applicable Connectors	Changed plug description French notes added
01.04.2014	3	1.2 Electrical Requirements	Supply voltage (UL) and notice in grey box added
	4	1.3 Miscellaneous	UL added
	10	5 Mounting	Text updated
15.05.2014	10	4 Strain Relief	Chapter revised
18.07.2014	6	3 Connector Layout	Added wiring notice
30.01.2015	8	3.4 Applicable Connectors	Added note concerning connecting the S-DIAS module while voltage is applied
26.03.2015	9	3.4 Applicable Connectors	Added connections
28.04.2016	13	5 Mounting	Graphics distances
17.08.2017	5	1.4 Environmental Conditions	Pollution Degrees
	10	3.4 Applicable Connectors	Sleeve length added Added info regarding ultrasonically welded strands
03.10.2017	9	3.3 Applicable Connector Cables	RJ45 on industrial Mini I/O Type 1, drag chain capable: 50 m cable added
18.10.2017	11	3.5 Label Field	Added chapter
	14	5 Mounting	Graphic replaced

19.04.2018	1			(since FPGA 1.6: optional Ethernet (VtE))
	3	1.1 Performance Data		
	8	3.2 Connectors		
19.06.2018	3	1.2 Electrical Requirements	Note UL conditions
20.09.2018		3 Connector Layout	Note added
14.02.2020	3	1.1 Performance Data	Changed to FPGA 2.0
	5	1.3 Miscellaneous	Hardware version changed
	8	3.2 Connectors	X2 connector changed to FPGA 2.0
08.09.2020	22	7 Hardware Class VI021	Chapter added
04.11.2020	14	5 Mounting	Expansion functional ground connection
04.05.2021	6	1.3 Miscellaneous	Article number -X added
02.02.2022	4	1.2 Electrical Requirements	Supply voltage HW-V 6.x from maximum 30 V to 27 V
	6	1.4 Environmental Conditions	Environmental temperature HW-V 6.x from maximum 55 °C to 50 °C
20.09.2022	6	1.4 Environmental Conditions	Hardware version adjusted
06.12.2022	6	1.3 Miscellaneous	UKCA conformity
26.07.2023		Document	General chapters added, design