HIMax®

System Bus Module
Manual

SAFETY
NONSTOP

HIMA

X-SB 01

8

Contact

HIMA Address

HIMA Paul Hildebrandt GmbH + Co KG

P.O. Box 1261

68777 Brühl, Germany

Phone: +49 6202 709-0

Fax: +49 6202 709-107

E-mail: info@hima.com

Revision index	Revisions	Type of Change	
		technical	editorial
4.00	New edition for SILworX V4	X	X

Table of Contents

1 Introduction

The present manual describes the technical characteristics of the module and its use. It provides information on how to install, start up and configure the module in SILworX.

1.1 Structure and Use of this Manual

The content of this manual is part of the hardware description of the HIMax programmable electronic system.

This manual is organized in the following main chapters:

- Introduction
- Safety
- Product Description
- Start-up
- Operation
- Maintenance
- Decommissioning
- Transport
- Disposal

Additionally, the following documents must be taken into account:

Name	Content	Document no.
HIMax System manual	Hardware description of the HIMax system	HI 801 001 E
HIMax Safety manual	Safety functions of the HIMax system	HI 801 003 E
HIMax Communication manual	Description of communication and protocols	HI 801 101 E
SILworX Online Help (OLH)	Instructions on how to use SILworX	-
First Steps	Introduction to SILworX	HI 801 103 E

Table 1: Additional Relevant Manuals

The latest manuals can be downloaded from the HIMA website at www.hima.com. The revision index on the footer can be used to compare the current version of existing manuals with the Internet edition.

1.2 Target Audience

This document addresses system planners, configuration engineers, programmers of automation devices and personnel authorized to implement, operate and maintain the devices and systems. Specialized knowledge of safety-related automation systems is required.

1.3 Formatting Conventions

To ensure improved readability and comprehensibility, the following fonts are used in this document:

Bold:	To highlight important parts Names of buttons, menu functions and tabs that can be clicked and used in SILworX.
Italics:	System parameter and variables
`Courier`	Literal user inputs
RUN	Operating state are designated by capitals
Chapter 1.2.3	Cross references are hyperlinks even though they are not particularly marked. When the cursor hovers over a hyperlink, it changes its shape. Click the hyperlink to jump to the corresponding position.

Safety notes and operating tips are particularly marked.

1.3.1 Safety Notes

The safety notes are represented as described below.
These notes must absolutely be observed to reduce the risk to a minimum. The content is structured as follows:

- Signal word: danger, warning, caution, notice
- Type and source of danger
- Consequences arising from the danger
- Danger prevention

⚠ SIGNAL WORD

Type and source of danger!
Consequences arising from the danger
Danger prevention

The signal words have the following meanings:

- Danger indicates hazardous situation which, if not avoided, will result in death or serious injury.
- Warning indicates hazardous situation which, if not avoided, could result in death or serious injury.
- Warning indicates hazardous situation which, if not avoided, could result in minor or modest injury.
- Notice indicates a hazardous situation which, if not avoided, could result in property damage.

NOTICE

Type and source of damage!
Damage prevention

1.3.2 Operating Tips

Additional information is structured as presented in the following example:

i	The text corresponding to the additional information is located here.

Useful tips and tricks appear as follows:

TIP	The tip text is located here.

2 Safety

All safety information, notes and instructions specified in this manual must be strictly observed. The product may only be used if all guidelines and safety instructions are adhered to.

This product is operated in accordance with SELV or PELV. No imminent danger results from the module itself. The use in Ex-Zone is permitted if additional measures are taken.

2.1 Intended Use

HIMax components are designed for assembling safety-related controller systems.

When using the components in the HIMax system, comply with the following general requirements

2.1.1 Environmental Requirements

Requirement type	Range of values
Protection class	Protection class III in accordance with IEC/EN 61131-2
Ambient temperature	0...+60 °C
Storage temperature	-40...+85 °C
Pollution	Pollution degree II in accordance with IEC/EN 61131-2
Altitude	< 2000 m
Housing	Standard: IP20
Supply voltage	24 VDC

Table 2: Environmental Requirements

Exposing the HIMax system to environmental conditions other than those specified in this manual can cause the HIMax system to malfunction.

2.1.2 ESD Protective Measures

Only personnel with knowledge of ESD protective measures may modify or extend the system or replace modules.

NOTE

Device damage due to electrostatic discharge!

- **When performing the work, make sure that the working area is free of static and wear an ESD wrist strap.**
- **If not used, ensure that the device is protected from electrostatic discharge, e.g., by storing it in its packaging.**

2.2 Residual Risk

No imminent danger results from a HIMax module itself.

Residual risk may result from:

- Faults in the engineering
- Faults in the user program
- Faults in the wiring

2.3 Safety Precautions

Observe all local safety requirements and use the protective equipment required on site.

2.4 Emergency Information

A HIMax controller is a part of the safety equipment of a system. If the controller fails, the system adopts the safe state.

In case of emergency, no action that may prevent the HIMax systems from operating safely is permitted.

3 Product Description

The X-SB 01 system bus module is intended for use in the programmable electronic systems (PES) HIMax. The module can only be inserted into base plate's slots 1 and 2.

If the base plate only contains one module, the HIMax system operates with only one system bus (mono operation). If the base plate contains two modules, the HIMax system operates with two redundant system busses (redundant operation).

HIMA recommends using redundant operation (default) to exploit the HIMax system availability.

The module has the following functions:

- To establish connections between the modules.
- To establish connections to other base plates.
- Manage the rack ID and SRS of the modules.

Further, the module provides an interface to the programming and debugging tool (PADT).

The module has been certified by the TÜV for safety-related applications up to SIL 3 (IEC 61508, IEC 61511 and IEC 62061), Cat. 4 (EN 954-1) and PL e (EN ISO 13849-1).

Refer to the HIMax Safety Manual (HI 801 003 E) for more information on the standards used to test and certify the module and the HIMax system.

3.1 Safety Function

The module transfer the data via a safety-related protocol.

3.1.1 Reaction in the Event of a Fault

If a failure occurs on a system bus, the bus connection is ensured via the redundant system bus, provided that both system busses have been previously configured.

3.2 Scope of Delivery

The module must be installed on a suitable connector board to be able to operate. The connector boards for the system bus module are integrated into the base plate and are contained within the scope of delivery, see Chapter 3.6.

3.3 Type Label

The type label specifies the following important details:

- Product name
- Mark of conformity
- Bar code (2D or 1D code)
- Part number (Part-No.)
- Hardware revision index (HW Rev.)
- Software revision index (SW Rev.)
- Operating voltage (Power)
- Ex specifications (if applicable)
- Production year (Prod-Year:)

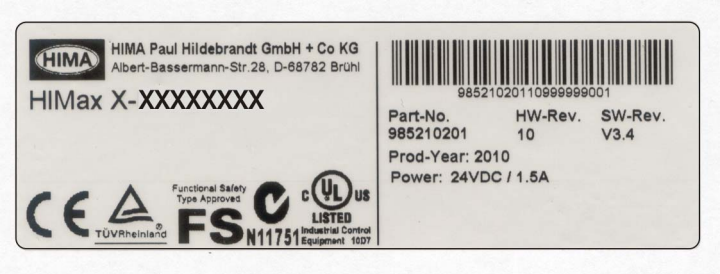


Figure 1: Sample Type Label

3.4 Structure

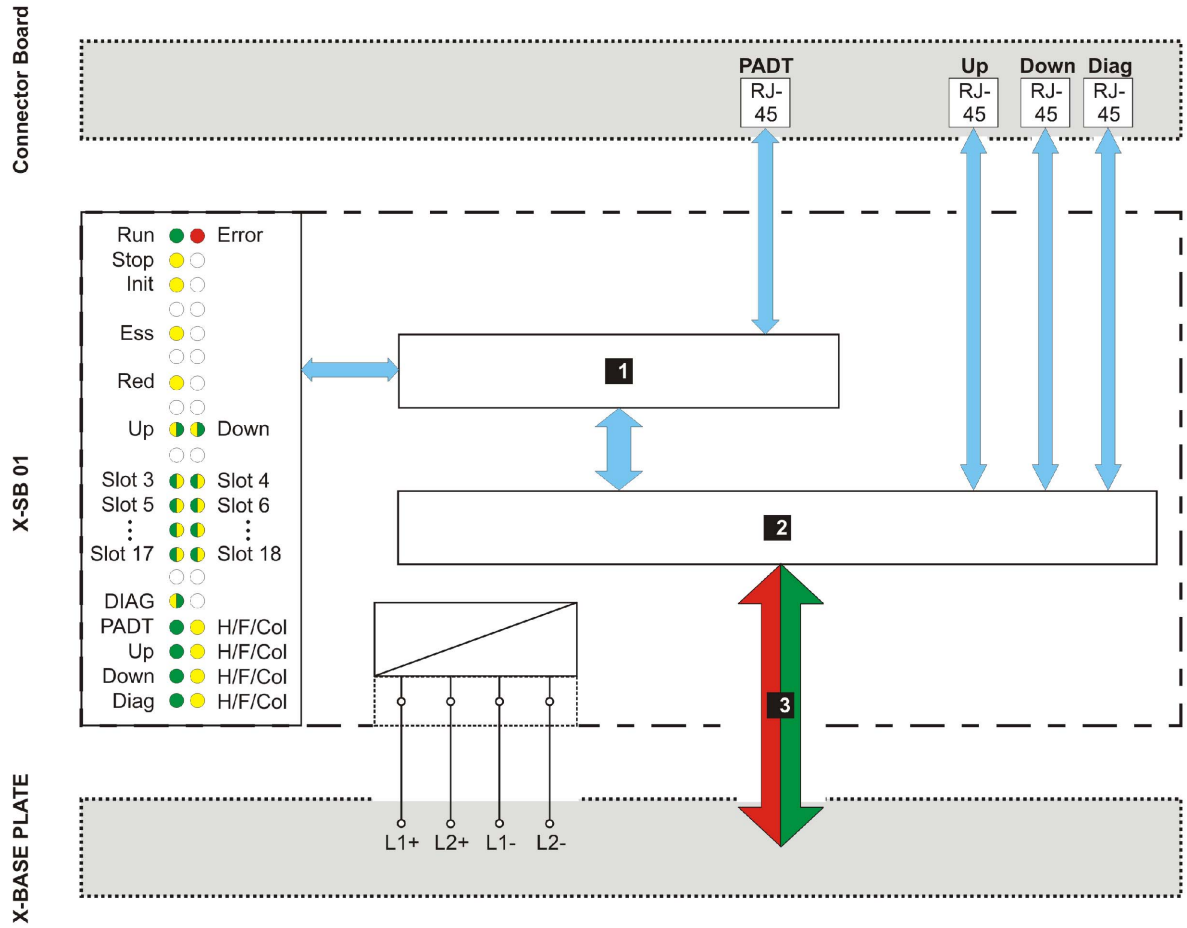
The module consists of:

- Safety-related processor system
- Service and system bus interfaces

The module is equipped with LEDs to indicate the status, see Chapter 3.4.4.

3.4.1 Block Diagram

The following block diagram illustrates the structure of the module.



1 Safety-Related Processor System
2 System Bus Controller
3 System Bus A or System Bus B

Figure 2: Block Diagram

3.4.2 Safety-Related Processor System

The safety-related 1oo2 processor system controls and monitors one system bus of the HIMax system. The X-SB 01 module in slot 1 controls and monitors the system bus A and the module in slot 2 controls and monitors the system bus B.

Operating system and error code history are stored in a non-volatile memory which can be read in SILworX via the diagnosis.

3.4.3 Interfaces

The connector board associated with the module is equipped with the following interfaces:

- One service interface (PADT)
- Two system bus interfaces (UP, DOWN)
- One diagnostic interface (DIAG), for future applications

Service Interface PADT

The service interface allows the user to connect to the PADT. The service interface can be used to load both the user program into the processor module and the operating system into the individual modules.

Service interface PADT	
Number	1
Transfer standard	10/100 Base-T, half and full duplex
Auto Negotiation	Yes
Auto Crossover	No
Connection socket	RJ-45
IP Address	Freely configurable
Subnet Mask	Freely configurable

Table 3: Specifications for the Service Interface

i The service interface does not support auto crossover. A crossover cable must be used for point-to-point connections.

System Bus Interface UP, DOWN

The system bus interfaces are used to connect to additional base plates in the HIMax system and are configured with the SILworX programming tool. To connect the interfaces, use cables complying with Ethernet megabit standard (at least CAT 5e cable).

System bus interfaces	
Number	2
Auto crossover	Yes
Connection socket	RJ-45
Labeling	Up, Down

Table 4: Specifications for the System Bus Interface

Diagnostic Interface DIAG

Diagnostic interface reserved for further applications

3.4.4 Indicators

The following figure shows the LED indicators for the module.

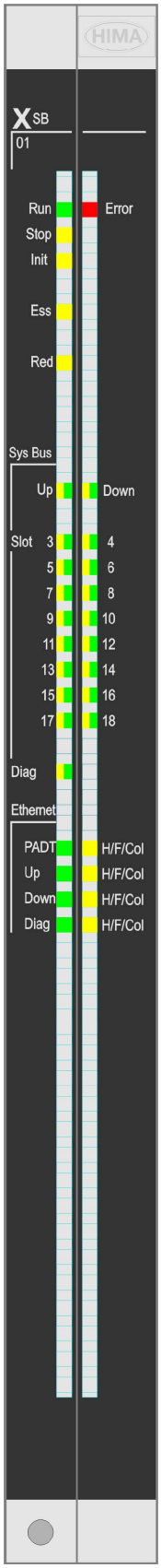


Figure 3: Indicators

The LEDs indicate the operating state of the module.

The LEDs on the module are divided into six groups:

- Module status indicators (Run, Error, Stop, Init)
- Redundancy indicators (Ess, Red)
- Rack connection indicators (Up, Down)
- Slot indicators (Slot 3…18)
- Diagnostic indicators (Diag)
- Communication indicators (Ethernet)

When the supply voltage is switched on, a LED test is performed and all LEDs briefly flash simultaneously.

Definition of Blinking Frequencies

The following table defines the blinking frequencies of the LEDs:

Name	Blinking Frequencies
Blinking1	Long (approx. 600 ms) on, long (approx. 600 ms) off
Blinking2	Short (approx. 200 ms) on, short (approx. 200 ms) off, short (approx. 200 ms) on, long (approx. 600 ms) off
Blinking-x	Ethernet communication: Flashing in sync with data transfer

Table 5: Blinking Frequencies of LEDs

3.4.5 Module Status Indicators

These LEDs are located on the front plate, on the upper part of the module.

LED	Color	Status	Description
Run	Green	On	Module in RUN, normal operation
		Blinking1	Module state: STOP/OS_DOWNLOAD or OPERATE (only with processor modules)
		Off	Module not in RUN, observe the other status LEDs
Error	Red	On/Blinking1	Internal module faults detected by self-tests, e.g., hardware, software or voltage supply. Fault while loading the operating system
		Off	Normal operation
Stop	Yellow	On	Module state: STOP / VALID CONFIGURATION
		Blinking1	Module state: STOP / INVALID CONFIGURATION or STOP / OS_DOWNLOAD
		Off	Module not in STOP, observe the other status LEDs
Init	Yellow	On	Module state: INIT, observe the other status LEDs
		Blinking1	Module state: LOCKED, observe to the other status LEDs
		Off	Module state: neither INIT nor LOCKED, observe the other status LEDs

Table 6: Module Status Indicators

3.4.6 Redundancy Indicators

The LEDs are located below the module status indicators.

LED	Color	Status	Description
Ess	Yellow	On	**Caution: Removing an operating system bus module cause the system to fail!** The SB module is ▪ running in mono operation (only 1 system bus active) ▪ configured in SILworX The module is absolutely required for operating the HIMax system!
		Blinking1	**Caution: Removing an operating system bus module cause the system to fail!** The SB module is inserted and configured for redundant operation, but the redundant module is not available. The module is absolutely required for operating the HIMax system!
		Off	The system bus module is not absolutely required for operation! Observe the **Red** LED!
Red	Yellow	On	Redundant operation, the SB module is operating redundantly. The redundant SB module periodically allocates identical system/rack IDs (the adjustment of the system/rack IDs was successful).
		Blinking1	Redundancy setting
		Off	No redundant operation!

Table 7: Redundancy Indicators

3.4.7 Rack Connection Indicators

The rack connection and slot LEDs are labeled *Sys Bus.*

LED	Color	Status	Description
Up	Green	On	Physical and logical connection to the system bus module in another base plate.
		Blinking1	Transient disturbances on the system bus
	Yellow	On	The modules recognizes additional system bus modules on the system bus
		Blinking1	Only a physical connection to the system bus module in another base plate.
	Off	Off	No connection to another system bus module.
Down	Green	On	Physical and logical connection to the system bus module in another base plate.
		Blinking1	Transient disturbances on the system bus
	Yellow	On	The modules recognizes additional system bus modules on the system bus
		Blinking1	Only a physical connection to the system bus module in another base plate.
	Off	Off	No connection to another system bus module.

Table 8: Rack Connection Indicators

3.4.8 Slot Indicators

The slot indicator LEDs are located after the *Slot* label.

LED	Color	Status	Description
3...18	Green	On	Module inserted in slot X, logical connection established.
	Yellow	Blinking1	Module inserted in slot X, logical connection not established.
	Off	Off	Slot X not used

Table 9: Slot Indicators

3.4.9 Diagnostic Indicators

Diagnostic indicators reserved for future applications!

3.4.10 Ethernet Indicators

The communication LEDs are labeled *Ethernet*.

LED	Color	Status	Description
PADT	Green	Blinking-x	Communication detected on interface.
		Blinking1	IP address conflict detected. LEDs adjacent to one another, PADT and H/F/Col blinking
		Off	PADT not connected.
H/F/Col (PADT)	Yellow	On	Speed = 100 Mbit/s
		Blinking-x	not defined!
		Blinking1	IP address conflict detected. LEDs adjacent to one another, *PADT* and *H/F/Col* blinking
		Off	Speed = 10 Mbit/s or no connection.
Up	Green	On	System bus module connected, physical connection established.
		Off	No system bus module connected.
Down	Green	On	System bus module connected, physical connection established.
		Off	No system bus module connected.
Diag	Green	On	Diagnostic device connected, physical connection established
		Off	No diagnostic device connected.
H/F/Col (Up, Down, Diag)	Yellow	On	Full duplex operation on the *F* line
		Blinking-x	Collision detected on the *Col* line
		Off	Half duplex operation on *H* line

Table 10: Communication Indicators

3.5 Product Data

General	
Supply voltage	24 VDC, -15 %...+20 %, $r_P \leq 5$ %, SELV, PELV
Current input	max. 0.65 A
Operating temperature	0…+60 °C
Storage temperature	-40…+85 °C
Humidity	max. 95 % relative humidity, non-condensing
Type of protection	IP20
Dimensions (H x W x D)	310 x 29.2 x 230 mm
Weight	approx. 1.2 kg

Table 11: Product Data

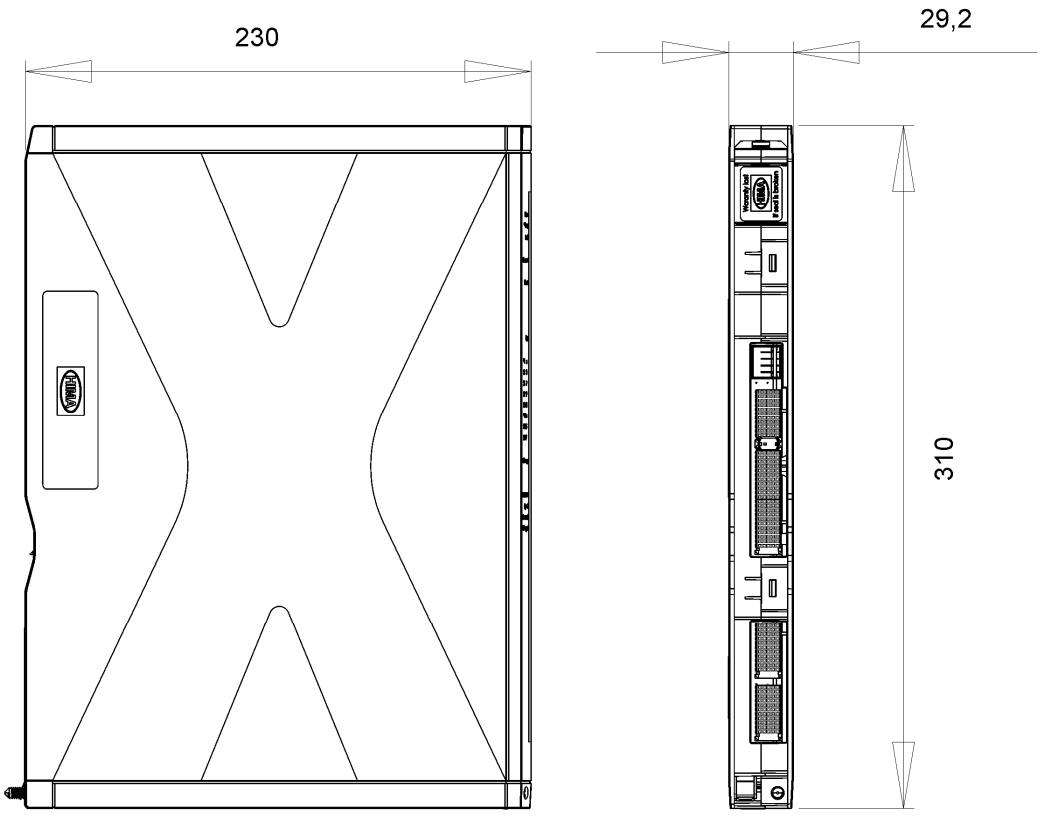


Figure 4: Views

3.6 Connector Boards

The connector boards connect the system modules to the Ethernet interfaces. Two connector boards are secured to the base plate: one left connector board (L) for slot 1 and one right connector board (R) for slot 2. The connector boards contain information on the number of modules (10, 15 or 18) that can be inserted into the base plate and the corresponding slot IDs.

Slot	Left/Right	Slot ID
1	Left (L)	62
2	Right (R)	63

Table 12: Connector Boards

3.6.1 Pin Assignment

The interface name is printed on the connector boards.

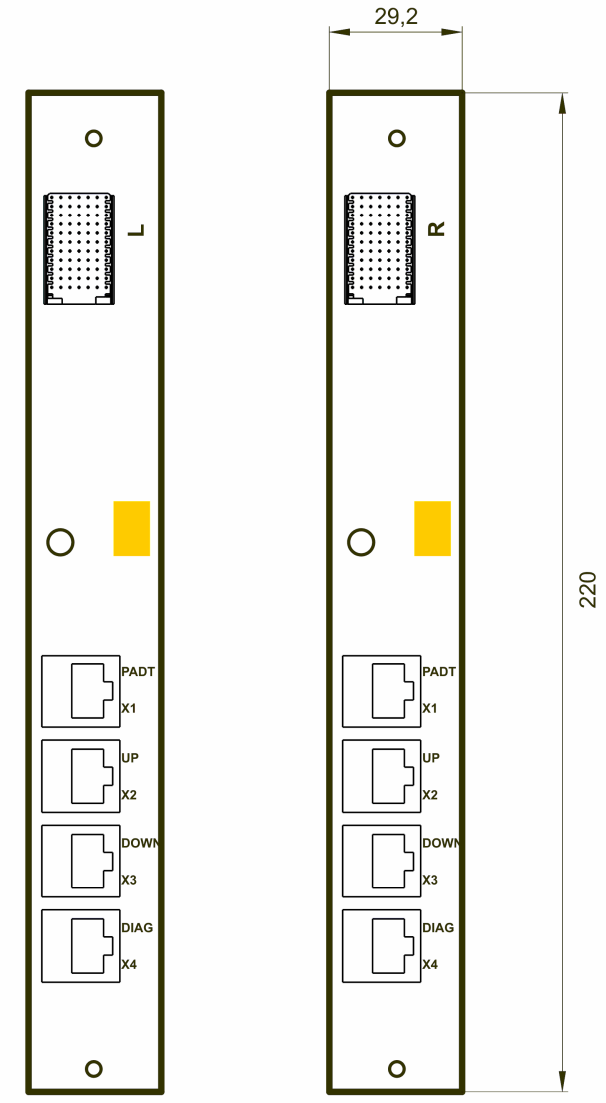


Figure 5: Connector Boards

Designation	Description
External interface	
PADT (X1)	Connection for the PADT
External system bus interfaces	
UP (X2)	Connection for additional HIMax base plates
DOWN (X3)	Connection for additional HIMax base plates
External diagnostic interface	
DIAG (X4)	Connection reserved for future applications

Table 13: Description of the Connector Boards

4 Start-up

This chapter describes how to install and configure the module. For more information, refer to the Safety Manual (HI 801 003 E).

4.1 Mounting

Observe the following points when mounting the module:

- Only operate the module with the appropriate fan components. For more information, see the System Manual (HI 801 001 E).
- Operation is only allowed with connector boards secured to the base plate, see Chapter 3.6.
- Use crossover cables to connect to the PADT, see Chapter 3.4.3.
- Use only the patch cables approved by HIMA to connect to additional base plates.

4.2 Mounting and Removing the Module

When replacing an existing module or mounting a new one, follow the instructions given in this chapter.

When removing the module, the connector board remains in the HIMax base plate. This saves additional wiring effort since all field terminals are connected via the connector board of the module.

4.2.1 Mounting and Removing the Module

This chapter describes how to mount and remove the HIMax module. A module can be mounted and removed while the HIMax system is operating.

NOTICE

Damage to bus and power sockets due to module jamming!

Failure to observe this can damage the controller.

Always take care when inserting the module in the base plate.

Tools and utilities

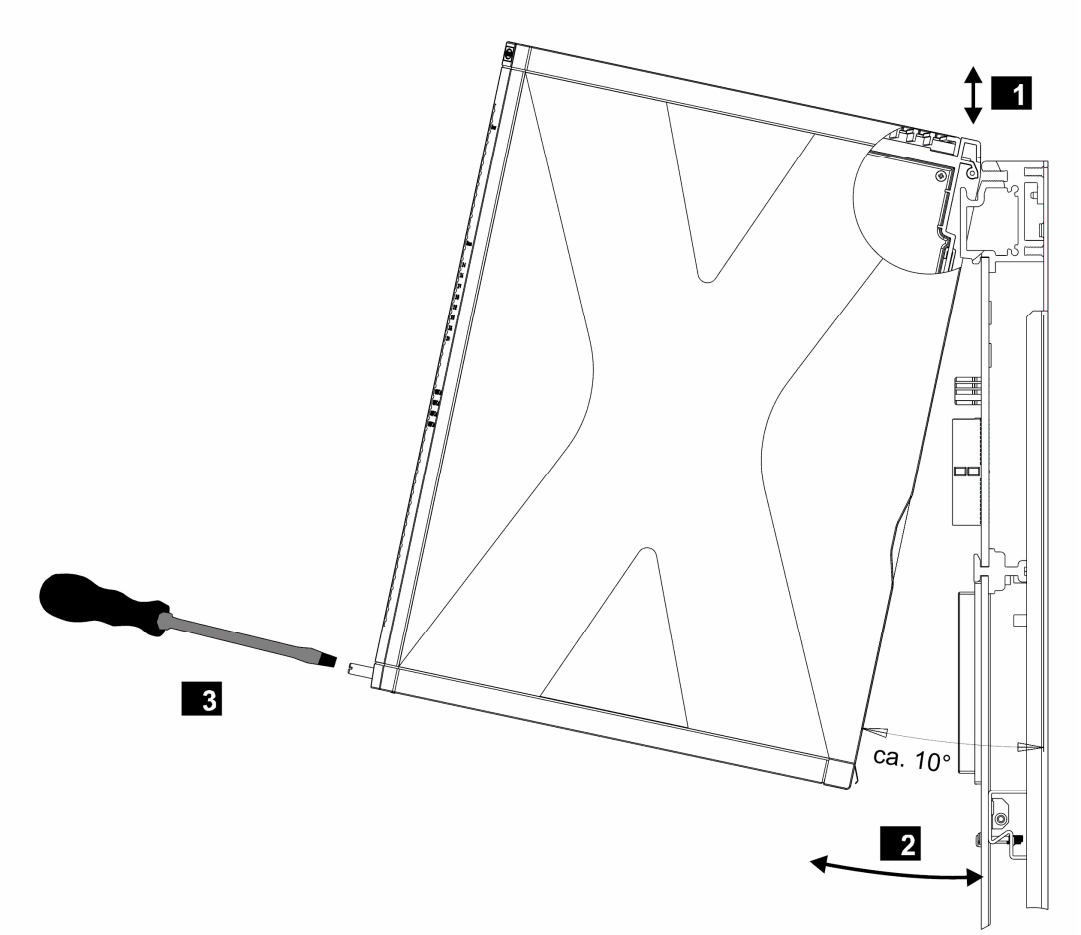
- Screwdriver, slotted 0.8 x 4.0 mm
- Screwdriver, slotted 1.2 x 8.0 mm

Installation

1. Open the cover plate on the fan rack:
   ☑ Move the locks to the *open* position.
   ☑ Lift the cover plate and insert into the fan rack
2. Insert the top of the module into the hook-in rail, see 1.
3. Swivel the lower edge of the module towards the base plate and apply light pressure to snap it into place, see 2.
4. Tighten the screws, see 3.
5. Pull the cover plate out of the fan rack and close it.
6. Lock the cover plate.

Removal

1. Open the cover plate on the fan rack:
   ☑ Move the locks to the *open* position.
   ☑ Lift the cover plate and insert into the fan rack
2. Release the screw 3.
3. Swivel the lower edge of the module away from the base plate. Lift and apply light pressure to remove the module from the hook-in rail, see 2 and 1.
4. Pull the cover plate out of the fan rack and close it.
5. Lock the cover plate.



1 Inserting and Removing a Module
2 Swiveling a Module in and out
3 Securing and Releasing a Module

Figure 6: Mounting and Removing a Module

i If the HIMax system is operating, do not open the cover plate of the fan rack for more than a few minutes (< 10 min) since this affects the forced cooling.

4.3 Configuring the Module in SILworX

The module is configured in the Hardware Editor of the SILworX programming tool.

The following tables present the statuses and parameters for the module in the same order given in the SILworX Hardware Editor.

4.3.1 Tab: Module

The **Module** tab contains the statuses and parameters for the module.

System parameter	Description
Name	Module name
IP Address	IP address of the Ethernet interface.
Subnet Mask	Subnet mask of the Ethernet interface
Speed Mode	Transfer rate: ▪ 10 Mbit/s ▪ 100 Mbit/s ▪ Autoneg HIMA recommends to maintain the *Autoneg* default setting.
Flow Control Mode	Operational mode of the flow control: ▪ Half Duplex ▪ Full Duplex ▪ Autoneg HIMA recommends to maintain the *Autoneg* default setting.
Standard Interface	Activated: the interface is used as standard interface for the system login. Deactivated: the interface is not used as standard interface for the system login. Default setting: Deactivated
Default Gateway	IP address of the default gateway.
ARP Aging Time [s]	A system bus module stores the MAC addresses of the communication partners in a MAC/IP address assignment table (ARP cache). If in a period of 1x....2x *ARP Aging Time* ... ▪ ... messages of the communication are received, the MAC address remains stored in the ARP cache. ▪ ... no messages of the communication partner are received, the MAC address is erased from the ARP cache. The typical value for the *ARP Aging Time* in a local network ranges from 5...300 s. The user cannot read the contents of the ARP cache. Range of values: 1...3600 s Default value: 60 s **Note:** If routers or gateways are used, the user must adjust (increase) the *ARP Aging Time* due to the additional time required for two-way transmission. If the *ARP Aging Time* is too low, the MAC address of the communication partner is erased from the ARP cache, the communication is delayed or interrupted. For an efficient performance, the ARP aging time value must be less than the receive timeout set for the protocols in use.

Designation	Description
MAC Learning	MAC Learning and *ARP Aging Time* are used to set how quick the Ethernet switch should learn the MAC address. The following settings are possible: ▪ Conservative (recommended): If the ARP cache already contains MAC addresses of communication partners, these are locked and cannot be replaced by other MAC addresses for at least one *ARP Aging Time* and a maximum of two *ARP Aging Time* periods. This ensures that data packets cannot be intentionally or unintentionally forwarded to external network participants (ARP spoofing). ▪ Tolerant: When a message is received, the IP address contained in the message is compared to the data in the ARP cache and the MAC address stored in the ARP cache is immediately overwritten with the MAC address from the message. Use the Tolerant setting if the availability of communication is more important than the authorized access to the controller. Default setting: Conservative
IP Forwarding	Allow a system bus module to operate as router and to forward data packets to other network nodes. Default setting: Deactivated
ICMP Mode	The Internet Control Message Protocol (ICMP) allows the higher protocol layers to detect error states on the network layer and optimize the transmission of data packets. Message types of Internet Control Message Protocol (ICMP) supported by the system bus module: ▪ No ICMP Responses All the ICMP commands are deactivated. This ensures a high degree of safety against potential sabotage that might occur over the network. ▪ Echo Response If Echo Response is activated, the node responds to a ping command. It is thus possible to determine if a node can be reached. Safety is still high. ▪ Host Unreachable Not important for the user. Only used for testing at the manufacturer's facility. ▪ All Implemented ICMP Responses All ICMP commands are activated. This allows a more detailed diagnosis of network malfunctions. Default setting: Echo Response

Table 14: Parameters in the Module Tab

4.3.2 Tab: Routings

The **Routings** tab contains the routing table. This table is empty if the module is new. A maximum of 8 routing entries are possible.

Element	Description
Name	Denomination of the routing settings
IP Address	Target IP address of the communication partner (with direct host routing) or network address (with subnet routing). Range of values: 0.0.0.0...255.255.255.255 Default value: 0.0.0.0
Subnet Mask	Define the target address range for a routing entry. 255.255.255.255 (with direct host routing) or subnet mask of the addressed subnet. Range of values: 0.0.0.0...255.255.255.255 Default value: 255.255.255.255
Gateway	IP address of the gateway to the addressed network. Range of values: 0.0.0.0...255.255.255.255 Default value: 0.0.0.1

Table 15: Parameters in the Routing Table

4.4 Managing the Modules

The system bus module manages all the modules inserted in the base plate.

5 Operation

The module runs within a HIMax base plate and does not require any specific monitoring.

5.1 Handling

Direct handling of the module is not foreseen.

The module is operated from within the PADT. For more details, refer to the SILworX documentation.

5.2 Diagnosis

LEDs on the front side of the module indicate the module state, see Chapter 3.4.4.

The diagnostic history of the module can also be read using SILworX.

i If a module is plugged in to a base plate, it generates diagnostic messages during its initialization phase indicating faults such as incorrect voltage values.
These messages only indicate a module fault if they occur after the system starts operation.

6 Maintenance

Defective modules must be replaced with a faultless module of the same type or with an approved replacement model.

Only the manufacturer is authorized to repair the module.

When replacing modules, observe the instructions specified in the System Manual (HI 801 001 E) and Safety Manual (HI 801 003 E).

6.1 Maintenance Measures

6.1.1 Loading the Operating System

HIMA is continuously improving the operating system of the module. HIMA recommends to use system downtimes to load the current version of the operating system into the module.

For detailed instructions on how to load the operating system, see the system manual and the online help. The module must be in STOP to be able to load an operating system.

i The current version of the module in use is displayed in the SILworX Control Panel! The type label specifies the version when the module is delivered, see Chapter 3.3.

6.1.2 Proof Test

HIMax modules must be subjected to a proof test in intervals of 10 years. For more information, refer to the Safety Manual HI 801 003 E.

7 Decommissioning

To decommission the module, remove it from the base plate. For more information, see *Mounting and Removing the Module*.

8 Transport

To avoid mechanical damage, HIMax components must be transported in packaging.

Always store HIMax components in their original product packaging. This packaging also provides protection against electrostatic discharge. Note that the product packaging alone is not suitable for transport.

9 Disposal

Industrial customers are responsible for correctly disposing of decommissioned HIMax hardware. Upon request, a disposal agreement can be arranged with HIMA.

All materials must be disposed of in an ecologically sound manner.

Appendix

Glossary

Term	Description
ARP	Address Resolution Protocol: Network protocol for assigning the network addresses to hardware addresses
AI	Analog Input
Connector Board	Connector board for the HIMax module
COM	Communication module
CRC	Cyclic Redundancy Check
DI	Digital Input
DO	Digital Output
EMC	Electromagnetic Compatibility
EN	European Norm
ESD	ElectroStatic Discharge
FB	Fieldbus
FBD	Function Block Diagram
FTT	Fault Tolerance Time
ICMP	Internet Control Message Protocol: Network protocol for status or error messages
IEC	International Electrotechnical Commission
MAC address	Hardware address of one network connection (Media Access Control)
PADT	Programming And Debugging Tool (in accordance with IEC 61131-3), PC with SILworX
PE	Protective Earth
PELV	Protective Extra Low Voltage
PES	Programmable Electronic System
PFD	Probability of Failure on Demand, probability of failure on demand of a safety function
PFH	Probability of Failure per Hour, probability of a dangerous failure per hour
R	Read
Rack ID	Base plate identification (number)
Non-reactive	Supposing that two input circuits are connected to the same source (e.g., a transmitter). An input circuit is termed "non-reactive" if it does not distort the signals of the other input circuit.
R/W	Read/Write
SB	System Bus (Module)
SELV	Safety Extra Low Voltage
SFF	Safe Failure Fraction, portion of safely manageable faults
SIL	Safety Integrity Level (in accordance with IEC 61508)
SILworX	Programming tool for HIMax
SNTP	Simple Network Time Protocol (RFC 1769)
SRS	System.Rack.Slot addressing of a module
SW	Software
TMO	TiMeOut
TMR	Triple Module Redundancy
W	Write
r_P	Peak value of a total AC component
Watchdog (WD)	Time monitoring for modules or programs. If the watchdog time is exceeded, the module or program enters the ERROR STOP state.
WDT	WatchDog Time

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HI 801 007 E

Albert-Bassermann-Str. 28
68782 Brühl, Germany
Phone +49 6202 709-0
Fax +49 6202 709-107
HIMax-info@hima.com
www.hima.com

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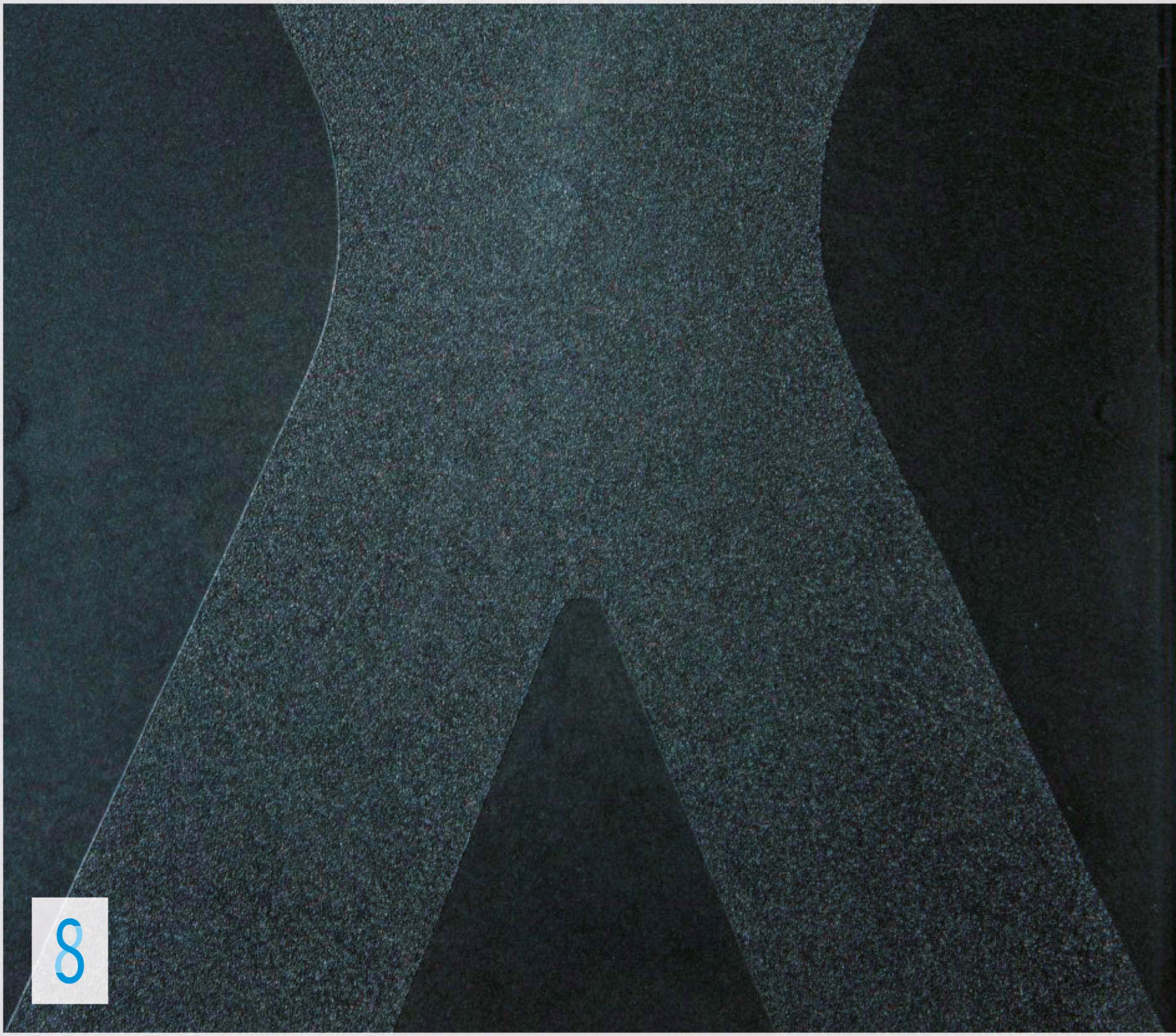

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