



# HIMax<sup>®</sup>

Base Plates for X-CPU 01  
Manual

SAFETY  
NONSTOP



# X-BASE PLATE



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# 1 Introduction

This manual describes the technical characteristics of the different base plates (X-BASE PLATE XX 01) for X-CPU 01 processor modules and their use. It provides information on how to install and equip the base plate.

## 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	-
SILworX First Steps Manual	Introduction to SILworX	HI 801 103 E

Table 1: Additional Valid Manuals

The latest manuals can be downloaded from the HIMA website at [www.hima.com](http://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:

<b>Bold</b>	To highlight important parts. Names of buttons, menu functions and tabs that can be clicked and used in SILworX.
<i>Italics</i>	System parameter and variables.
<code>Courier</code>	Literal user inputs.
<b>RUN</b>	Operating states are designated by capitals.
Chapter 1.2.3	Cross-references are hyperlinks even if 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 notices and operating tips are particularly marked.

#### 1.3.1 Safety Notices

The safety notices are represented as described below.

These notices must absolutely be observed to reduce the risk to a minimum. The content is structured as follows:

- Signal word: warning, caution, notice
- Type and source of risk
- Consequences arising from non-observance
- Risk prevention

#### **SIGNAL WORD**



**Type and source of risk!**

**Consequences arising from non-observance.**

**Risk prevention.**

The signal words have the following meanings:

- Warning indicates hazardous situation which, if not avoided, could result in death or serious injury.
- Caution 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, notices and instructions specified in this document must be strictly observed. The product may only be used if all guidelines and safety instructions are adhered to.

The product is operated with SELV or PELV. No imminent risk results from the base plate 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.

### NOTICE



#### Device damage due to electrostatic discharge!

- When performing the work, make sure that the workspace 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 risk results from the base plate itself.

Residual risk may result from:

- Faults related to engineering
- Faults related to 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 plant. If the controller fails, the system enters 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-BASE PLATE XX 01 is a component part of the HIMax programmable electronic system (PES) and is approved for operating HIMax modules (SIL 3, SIL 1 and NonSIL) without interruptions. The base plates specified in Table 3 are designed to be equipped with X-CPU 01 processor modules.

The following table specifies the various base plates:

Base plates	Number of modules	Type of mounting
X-BASE PLATE 10 01	10	Backplane
X-BASE PLATE 15 01	15	Backplane
X-BASE PLATE 15 02 <sup>1)</sup>	15	19-inch frame
X-BASE PLATE 18 01	18	Backplane
<sup>1)</sup> Composed of X-BASE PLATE 15 01 and X-FRONT COVER 15 02		

Table 3: Base Plate

The base plates differ in the number of slots and type of mounting.

Base plates X-BASE PLATE 10 01, 15 01 and 18 01 are secured to a backplane (e.g., mounting plate). Base plate X-BASE PLATE 15 02 is secured to the 19-inch frame (e.g., control cabinet).

Each slot is designed for being used by a functional unit consisting of a module and a connector board. Slot 1 and slot 2 are reserved for the system bus modules and equipped with the connector boards for system bus A and system bus B. The redundant system busses, system bus A and system bus B, ensure continuous operation within a base plate, even if a system bus fails, see Chapter 3.4.4.

The assignment of the remaining slots depends on whether the base plate is configured as basic base plate or extension base plate. Slots not in use must be equipped with appropriate blank modules to ensure optimal ventilation of all the modules.

For more details on which modules can be mounted in the basic and extension racks, refer to Chapter *Permissible Slot Assignments* of the system manual (HI 801 001 E).

The power supply is set up redundantly. The modules can be either supplied with power supply connected to L1+/L1- (Rail 1) or L2+/L2- (Rail 2), or in parallel via both power supply units. Using redundant power supply increases the HIMax system availability, see Chapter 3.4.6.

#### 3.1 Safety Function

No safety function is performed by the base plate.

#### 3.2 Scope of Delivery

The scope of delivery includes the base plate with two integrated connector boards for the system bus modules and the filters.

Chapter 3.6 describes the available accessories.

### 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:)



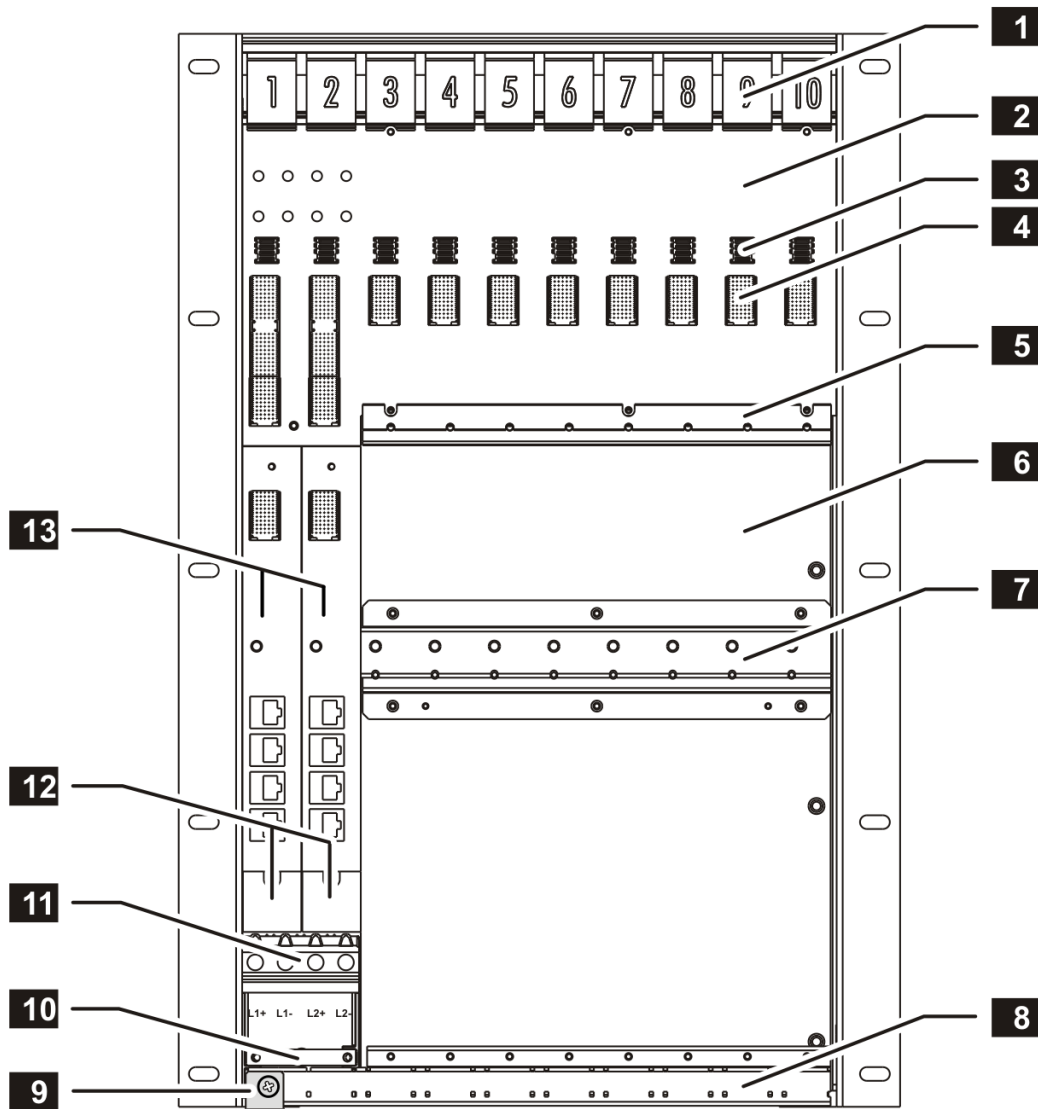
Figure 1: Sample Type Label

### 3.4 Structure

The chapter describes the structure of the base plates.

X-BASE PLATE 15 02 is composed of X-BASE PLATE 15 01 and X-FRONT COVER 15 02.  
See Chapter 3.6.2.3 for more details on how to assemble the base plate and the front cover.

#### 3.4.1 Base Plate Structure



- |  |   |
|--|---|
| <b>1</b> Hook-in Rail with Slot Numbers                          | <b>8</b> Cable Shield Rail                        |
| <b>2</b> Backplane Bus   | <b>9</b> Shield Connection Angle                  |
| <b>3</b> 24 VDC Supply Voltage for the Modules                   | <b>10</b> Strain Relief for Supply                |
| <b>4</b> System Bus Connection                                   | <b>11</b> Clamp Terminal Block                    |
| <b>5</b> Guiding Rail for Connector Boards                       | <b>12</b> Filters for High Voltage Transients     |
| <b>6</b> Backplane with Wall Flanges or 19-Inch Mounting Flanges | <b>13</b> Connector Boards for System Bus Modules |
| <b>7</b> Mounting Rail   |   |

Figure 2: Base Plate Structure

3.4.2 Side View of X-BASE PLATE 10 01, 15 01, 18 01

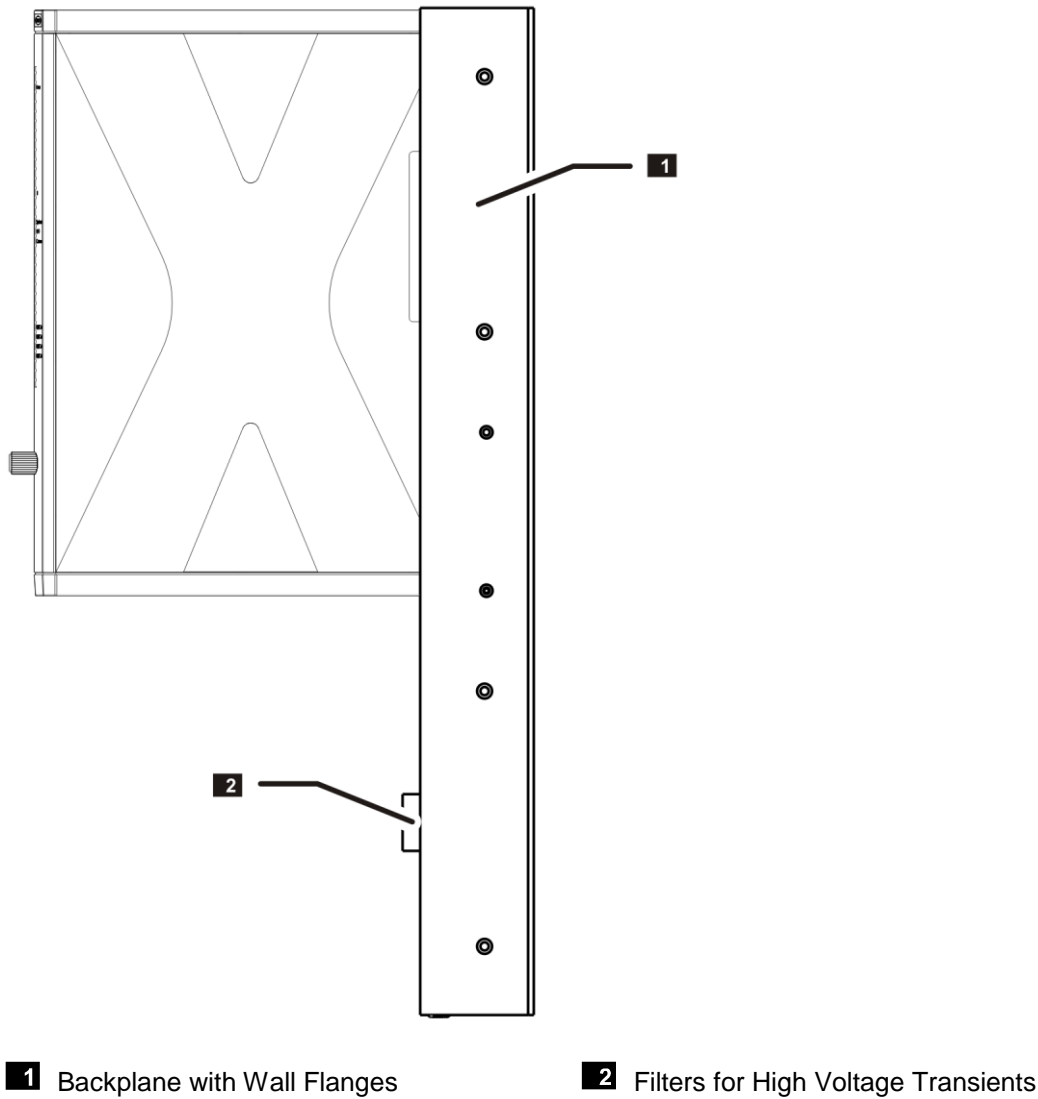


Figure 3: Side View with Module

## 3.4.3 Perspective View of X-BASE PLATE 15 02

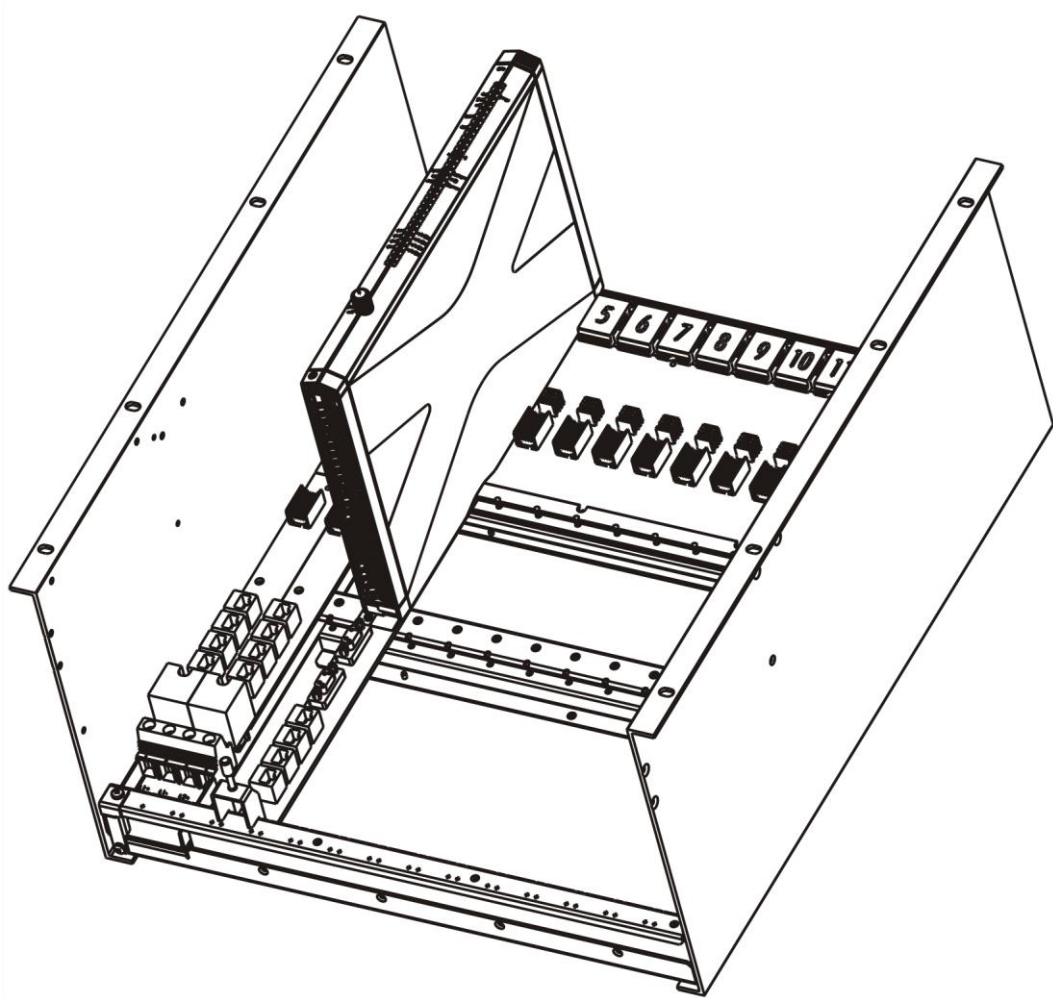


Figure 4: Perspective View with Module and Shield Connection Terminal Block



### 3.4.4 System Bus Connection

System bus A and system bus B interconnect the modules via the system bus modules. The system bus provides a physical connection between a system bus module and another module. If one module fails, only the individual connection fails, all other connections remain intact.

A system bus module is required to manage a system bus. The system bus module in slot 1 operates system bus A and the system bus module in slot 2 operates system bus B.

---

#### i

If only one system bus module is used, only one system bus is available!

---

If both system bus modules are used to operate the HIMax system, communication runs on both system busses simultaneously. The redundancy of system bus A and system bus B can be monitored in SILworX using system variables.

If the HIMax system is composed of various base plates, the system busses are interconnected using the interfaces UP and DOWN.

The system bus can be organized in two different structures:

- Line structure (default)  
Using this structure, the base plates are arranged in line.
- Network structure  
This structure enables the construction of a network, in which the base plates can be shut down and replaced during operation without interrupting the connection to other base plates.

For more details on the line and network structure, refer to HIMax system manual (HI 801 001 E).

### 3.4.5 Connector Boards for System Bus Modules

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.

Both connector boards are fixed components of the base plate. Each connector board is equipped with four Ethernet interfaces.

- PADT, Ethernet connection for PADT (PC).
- UP, system bus connection for additional base plates.
- DOWN, system bus connection for additional base plates.
- DIAG, system bus connection for additional base plates (network structure) or diagnostic device (for future applications).

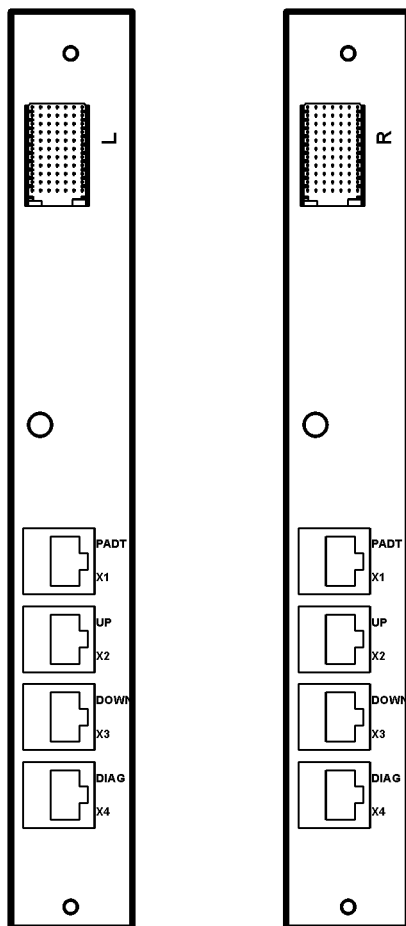


Figure 5: Connector Boards for System Bus Modules

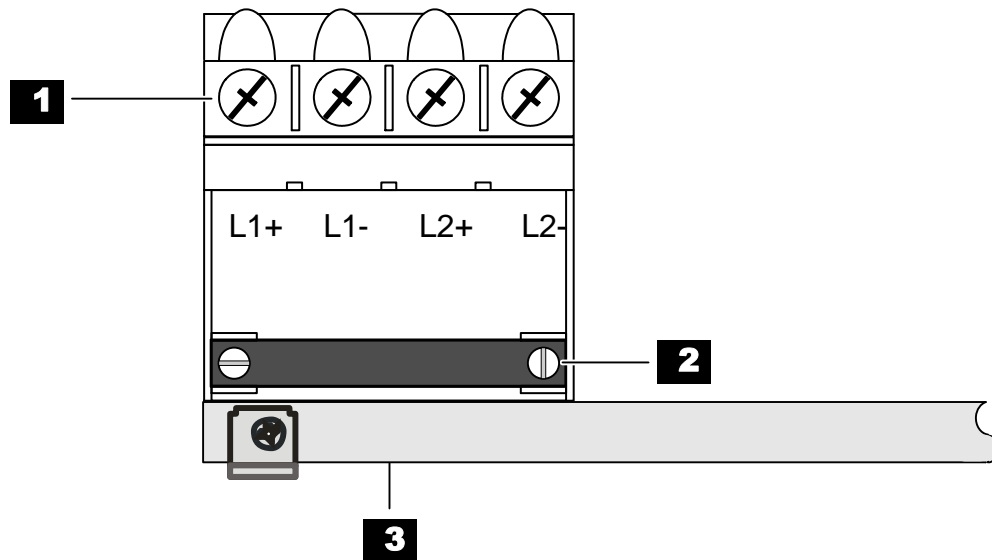
**⚠ WARNING**

The connector boards are coded for the corresponding base plate. Using an improperly coded connector board may result in a system failure or malfunction.

### 3.4.6 Power Supply

Only connect the base plate to 24 V power supply units that meet SELV or PELV requirements.

The power supply is set up redundantly and is connected via the clamp terminal block. The first power supply is connected to terminal L1+/L1- and the redundant power supply is connected to terminal L2+/L2-, see Figure 6 and Figure 7. Each power supply can be composed of various power supply units.



**1** Clamp Terminal Block

**2** Strain Relief

**3** Cable Shield Rail

Figure 6: Clamp Terminal Block with Strain Relief

The redundant power supply ensures that the HIMax system can continue to operate if one of the two power supply units fails.

The following points must be observed when configuring the power supply redundantly:

- Connect the separated voltage supplies to L1 and L2.
- Each power supply must be able to supply the total current  $I_{L1} + I_{L2}$  on its own. Thus, the controller functionality is ensured even if one power supply fails.
- The total current resulting from  $I_{L1}$  and  $I_{L2}$  must not exceed the value of 63 A.
- Depending on the power consumption, each power supply must be equipped with external fuses with a fuse rating of 63 A.

### ⚠ CAUTION



**Controller damage!**

**Exceeding the maximum current value (63 A) can damage the base plate!**

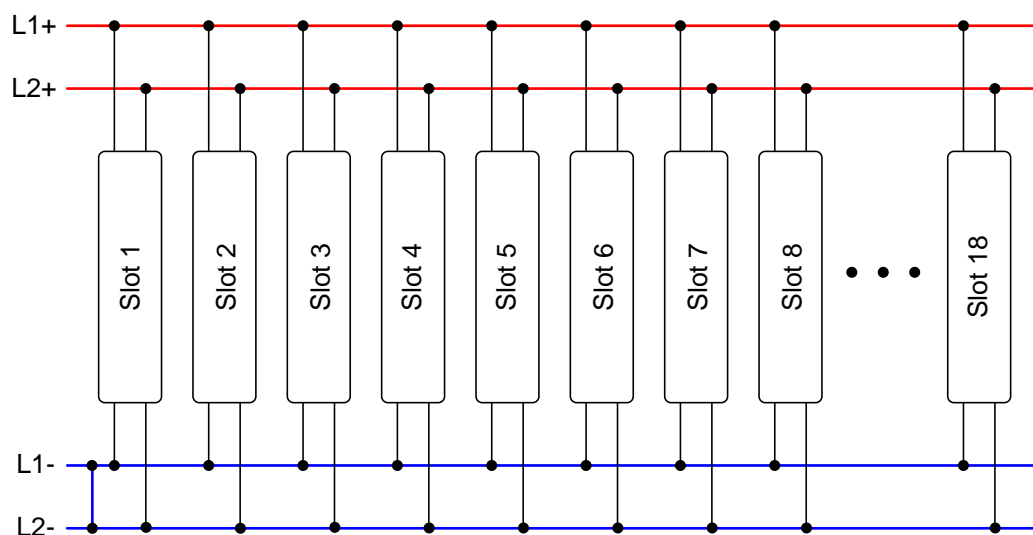


Figure 7: Power Supply via Backplane

#### 3.4.6.1 X-FILTER 01

Pluggable filters for transient voltage peaks are located above the clamp terminal block, see Figure 2. The filters are included within the scope of delivery of the base plate.

HIMA recommends replacing the filters every 10 years.

### 3.5 Product Data

X-BASE PLATE	
Number of slots	10, 15 or 18
Backplane material	Stainless steel
Material of the mech. attaching parts	Aluminum
Supply voltage	24 VDC, L1+/L1- and L2+/L2-, -15...+20 %, $r_P \leq 5$ %, Observe polarity!
Connection to the power supply	Redundant L1+, L2+
Total current	max. 63 A
Fuse (external)	max. 63 A (device protection fuse)
Operating temperature	0...+60 °C
Storage temperature	-40...+85 °C
Connectors	4, each connector board
External service connection, PADT, Ethernet	1 10BASE-T/100BASE-Tx (100 Mbit/s) in accordance with IEEE 802.3 Connection via RJ-45 connector
External system bus connection UP, DOWN, DIAG	3 1000 BASE-T Connection via RJ-45 connector
Humidity	max. 95 % relative humidity, non-condensing
Type of protection	IP20
Dimensions (H x W x D)	
X-BASE PLATE 10 01	533 x 358 x 60 mm (without modules) 533 x 358 x 276 mm (with modules)
X-BASE PLATE 15 01	533 x 505.5 x 60 mm (without modules) 533 x 505.5 x 276 mm (with modules)
X-BASE PLATE 15 02	533 x 483 x 260 mm (without modules) 533 x 483 x 276 mm (with modules)
X-BASE PLATE 18 01	533 x 594 x 60 mm (without modules) 533 x 594 x 276 mm (with modules)
Weight (without modules)	
X-BASE PLATE 10 01	approx. 6.1 kg
X-BASE PLATE 15 01	approx. 8.4 kg
X-BASE PLATE 15 02	approx. 11.1 kg
X-BASE PLATE 18 01	approx. 9.7 kg

Table 4: Product Data

### 3.6 Accessories

The following accessories are available for the base plate:

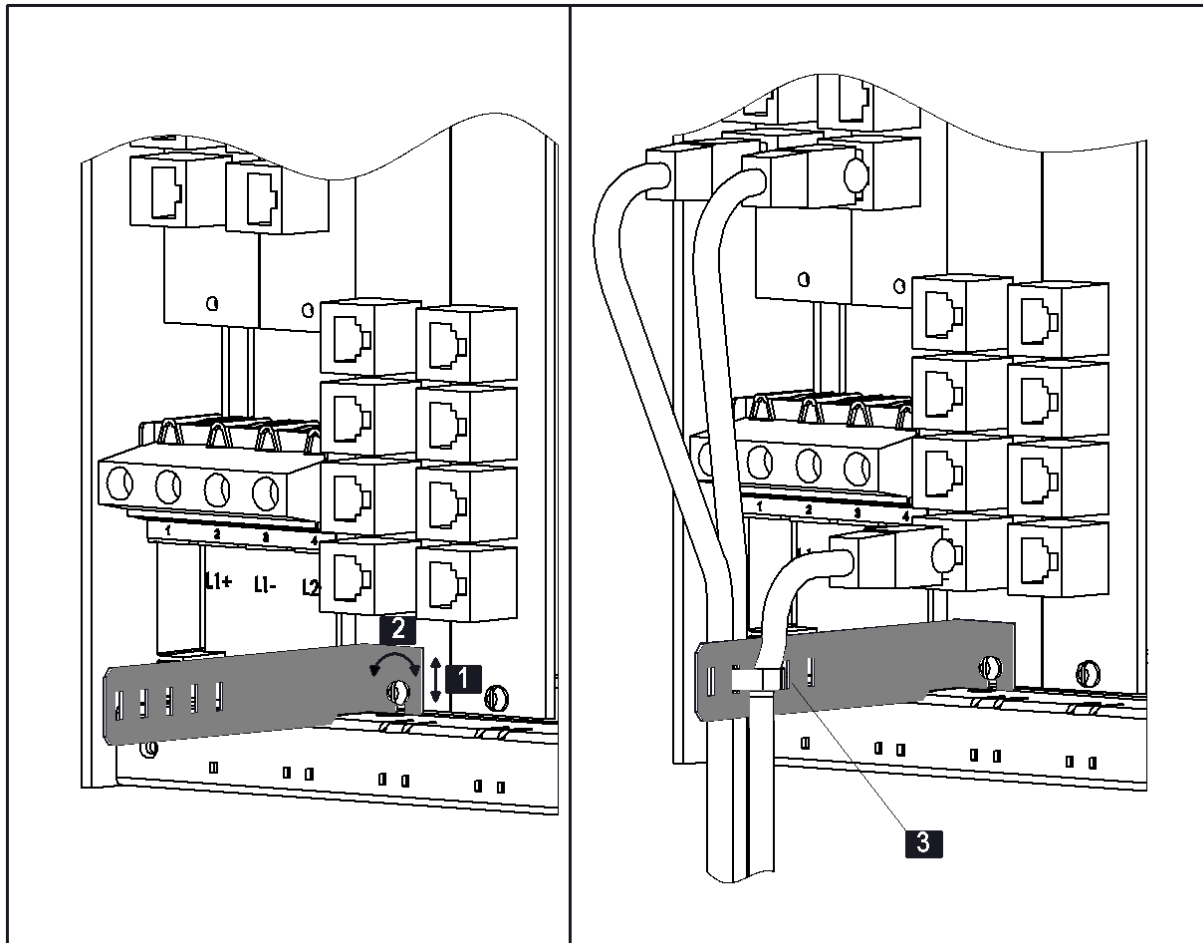
Designation	Description
X-SR CB 01	Strain relief for connector boards
X-FRONT COVER 10 01	Front cover for X-BASE PLATE 10 01
X-FRONT COVER 15 01	Front cover for X-BASE PLATE 15 01
X-FRONT COVER 15 02	Front cover for X-BASE PLATE 15 02
X-FRONT COVER 18 01	Front cover for X-BASE PLATE 18 01
X-BLK 01	Blank module for I/O slots
X-BLK 02	Blank module for X-CPU 01/X-COM slots
X-BLK 03	Blank module for X-CPU 31/X-SB slots
X-CB 002 01	Connector board for system bus module (10 slots, left)
X-CB 002 02	Connector board for system bus module (10 slots, right)
X-CB 002 03	Connector board for system bus module (15 slots, left)
X-CB 002 04	Connector board for system bus module (15 slots, right)
X-CB 002 05	Connector board for system bus module (18 slots, left)
X-CB 002 06	Connector board for system bus module (18 slots, right)
X-CB 002 07	Connector board for X-BASE PLATE 10 31 (10 slots)
X-CB 002 08	Connector board for X-BASE PLATE 15 31 (15 slots)
X-CB 002 09	Connector board for X-BASE PLATE 18 31 (18 slots)
X-CB 003 01	Connector board for blank module
X-FILTER 01	Pluggable filter, see 3.4.6.1
SK 20	Shield connection terminal block

Table 5: Available Accessories



### 3.6.1 Strain Relief X-SR CB 01

The X-SR CB 01 strain relief ensures that the RJ-45 connectors and cable plugs can be better fixed.



- 1** Inserting and Removing a Module
- 2** Securing and Releasing a Module

- 3** Fastening and Releasing Cables Using Cable Ties

Figure 8: Mounting the Strain Relief

## i

### Fixing patch cables and cable plugs

Observe the following points when fixing patch cables and cable plugs:

- Observe the cable bending radius.
- Do not apply tensile stress to the patch cable plugs.

### 3.6.2 X-FRONT COVER

The front cover (X-FRONT COVER) is used as a mechanical protection of the connector panel and as an optical cover.

X-FRONT COVER is specified as a component of the 19-inch base plate (X-BASE PLATE 15 02) and is optional for the following base plates (X-BASE PLATE 10 01, 15 01 and 18 01).

---

#### i

If the front cover is used, an angled PROFIBUS plug must be used at the FB1 fieldbus interface of the communication module. Note that the FB2 fieldbus interface is covered. The construction depth of the PROFIBUS plugs and the bending radius of the PROFIBUS cables must be observed.

The front cover cannot be used if both fieldbus interfaces, FB1 and FB2, are required as PROFIBUS interfaces. The straight PROFIBUS plug plus the bending radius of the cable does not fit under the front cover.

---

X-FRONT COVER must be secured prior to mounting the base plate, afterwards only the cover must be opened and closed.

The kits X-FRONT COVER 10 01, 15 01 and 18 01 contain the following parts, see Figure 9:

- Cover **1**.
- Left side frame with guiding rail.
- Right side frame **3** with guiding rail.
- 2 label rails **4**.
- 4 x M6x25x10 Phillips collar screws.
- 4 x M5x8 Phillips pan head screws.
- 8 x M4x10 Phillips countersunk screws.

The X-FRONT COVER 15 02 kit contains the following parts, see Figure 11:

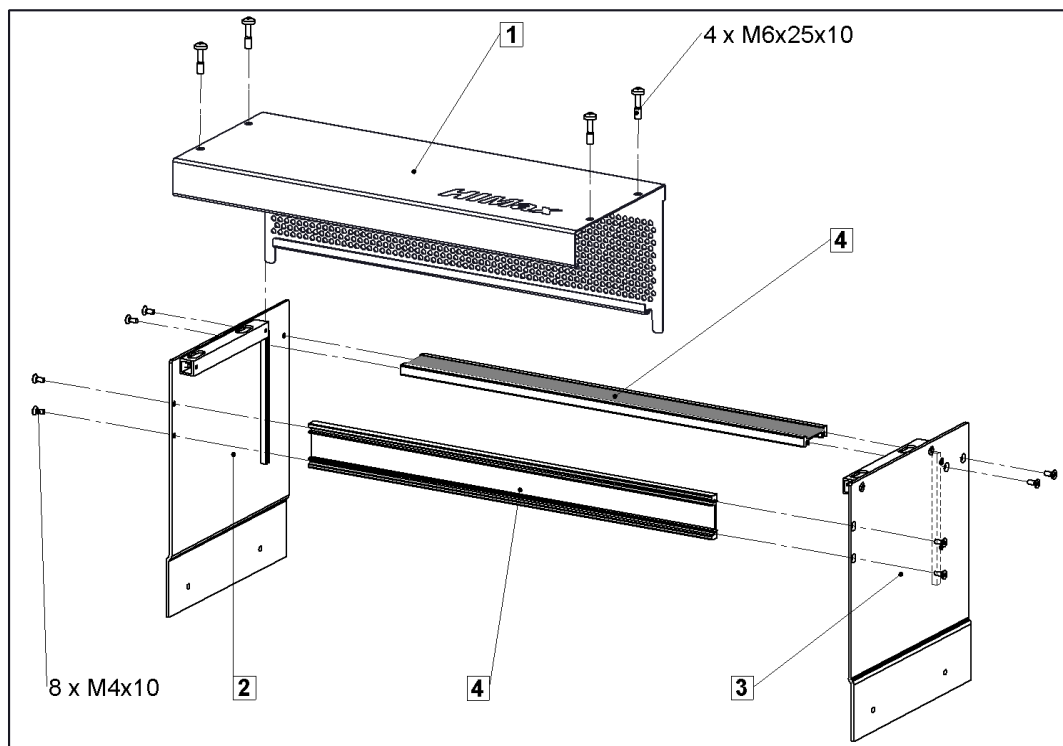
- Cover **1**.
- Left-side 19-inch mounting flange with guiding rail.
- Right-side 19-inch mounting flange **3** with guiding rail.
- 2 label rails **4**.
- 4 x M6x25x10 Phillips collar screws.
- 10 x M5x8 Phillips countersunk screws.
- 8 x M4x10 Phillips countersunk screws.
- 1 x M3x8 Phillips countersunk screws.

## 3.6.2.1 Assembling X-FRONT COVER 10 01, 15 01 and 18 01

Tools, components and utilities

- Screwdriver
  - Cross PH 2 (M4)
  - Cross PH 3 (M6)
- Single components of X-FRONT COVER

1. Prepare the cover **1**: Screw the M6x25x10 collar screws in the cover.
2. Use the M4x10 countersunk screws to bolt the label rails **4**, the left and the **2** right side parts **3** together. Use the labeled part of the rails to verify their correct mounting position. This part is gray-colored in the figure.
3. Insert the cover **1** in the guiding rail and secure it with the M6x25x10 collar screws.



- |                         |                          |
|-------------------------|--------------------------|
| <b>1</b> Cover          | <b>3</b> Right Side Part |
| <b>2</b> Left Side Part | <b>4</b> Label Rails (2) |

Figure 9: Front Cover Assembly

## 3.6.2.2 Mounting on X-BASE PLATE 10 01, 15 01 and 18 01

Tools, components and utilities

- Screwdriver, cross PH 2
- X-FRONT COVER

1. Put the X-FRONT COVER assembly on the base plate, see Figure 10.
2. Use the M5x8 pan head screws to secure the front cover to the base plate.
3. After the X-FRONT COVER mounting is completed, just open and close the cover to perform works to the connection space.
4. Unscrew the 4 collar screws (M6x25x10) and pull the cover to remove it from the X-FRONT COVER.
5. After completing the works to the connection space, reinsert the cover into the X-FRONT COVER and secure the collar screws.

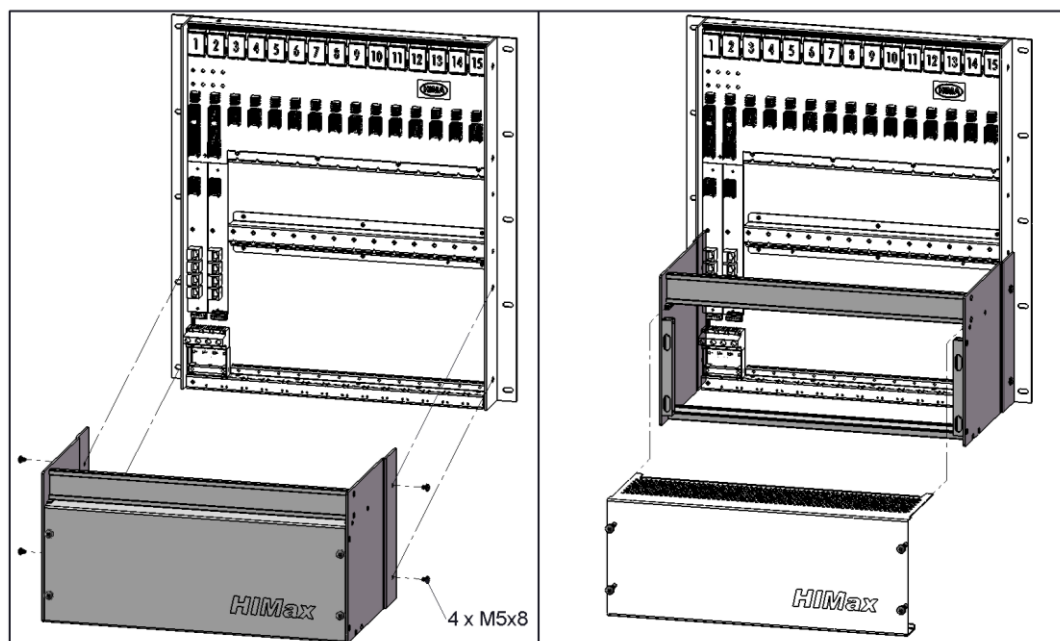


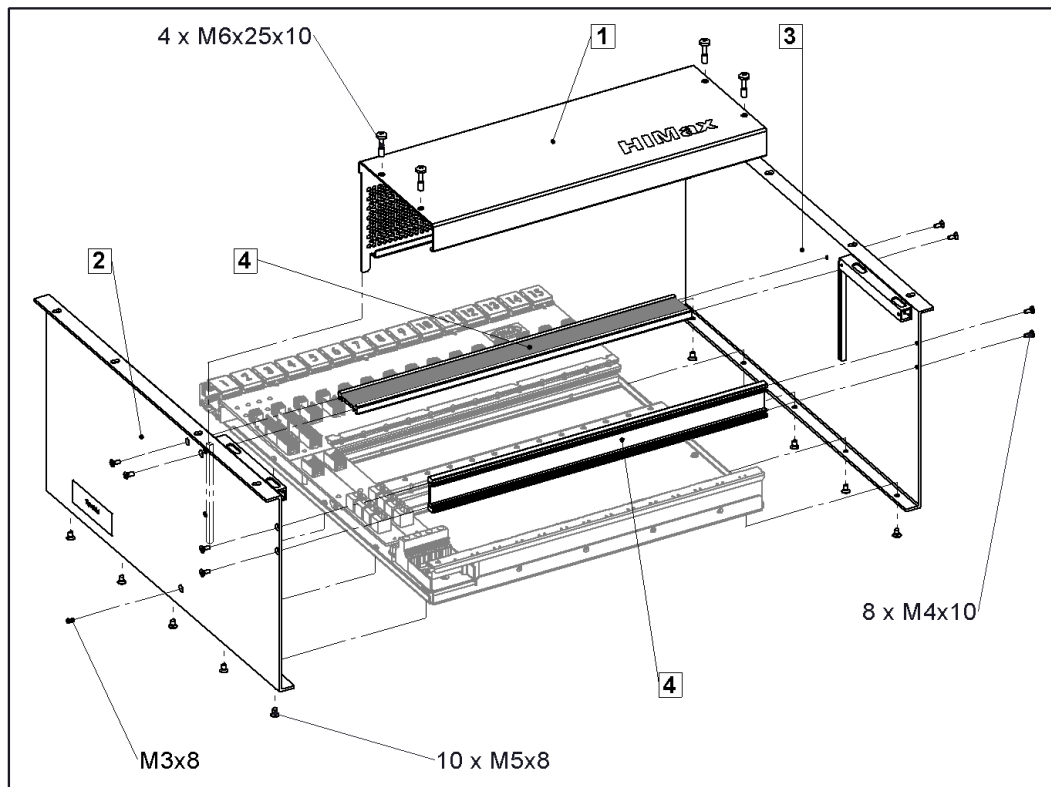
Figure 10: Mounting the X-FRONT COVER on the Base Plate

## 3.6.2.3 Assembling X-FRONT COVER 15 02

Tools, components and utilities

- Screwdriver
  - Cross PH 1 (M3)
  - Cross PH 2 (M4, M5)
  - Cross PH 3 (M6)
- X-BASE PLATE 15 01
- Single components of X-FRONT COVER 15 02

1. Replace the flanges of X-BASE PLATE 15 01 with the left and the right 19-inch mounting flange **2** and use the M5x8 countersunk screws to secure them.
2. Prepare the cover **1**: Screw the M6x25x10 collar screws in the cover.
3. Use the M4x10 countersunk screws to screw the label rails **4**, the left **2** and the right **3** 19-inch mounting flange together. Use the labeled part of the rails to verify their correct mounting position. This part is gray-colored in the figure.
4. Insert the cover **1** in the guiding rails of the 19-inch mounting flange and secure it with the M6x25x10 collar screws.
5. Screw the M3x8 recessed raised cheese head screw into the left part. This establishes a connection between the left 19-inch mounting flange and the mounting rail of X-BASE PLATE 15 01.
6. For more information on how to mount the 19-inch base plate, see Chapter 4.1.2.



- |                                       |  |
|---------------------------------------|--|
| <b>1</b> Cover                        | <b>3</b> Right 19-Inch Mounting Flange |
| <b>2</b> Left 19-Inch Mounting Flange | <b>4</b> Label Rails (2)               |

Figure 11: Assembling X-FRONT COVER 15 02

## 4 Start-Up

This chapter describes how to install the base plates and the connector boards. For more information, refer to HIMax system manual (HI 801 001 E).

### 4.1 Mounting

Observe the following points when mounting the module:

- The base plates can be secured to mounting chassis (25 mm breadboard). To this end, the wall flanges are provided with suitable oblong holes.
- To ensure faultless operation, choose a suitable mounting location for the base plate in accordance with the operating requirements.
- The base plate and its connected components must be mounted to provide protection of at least IP20 in accordance with EN 60529:1991 + A1:2000.

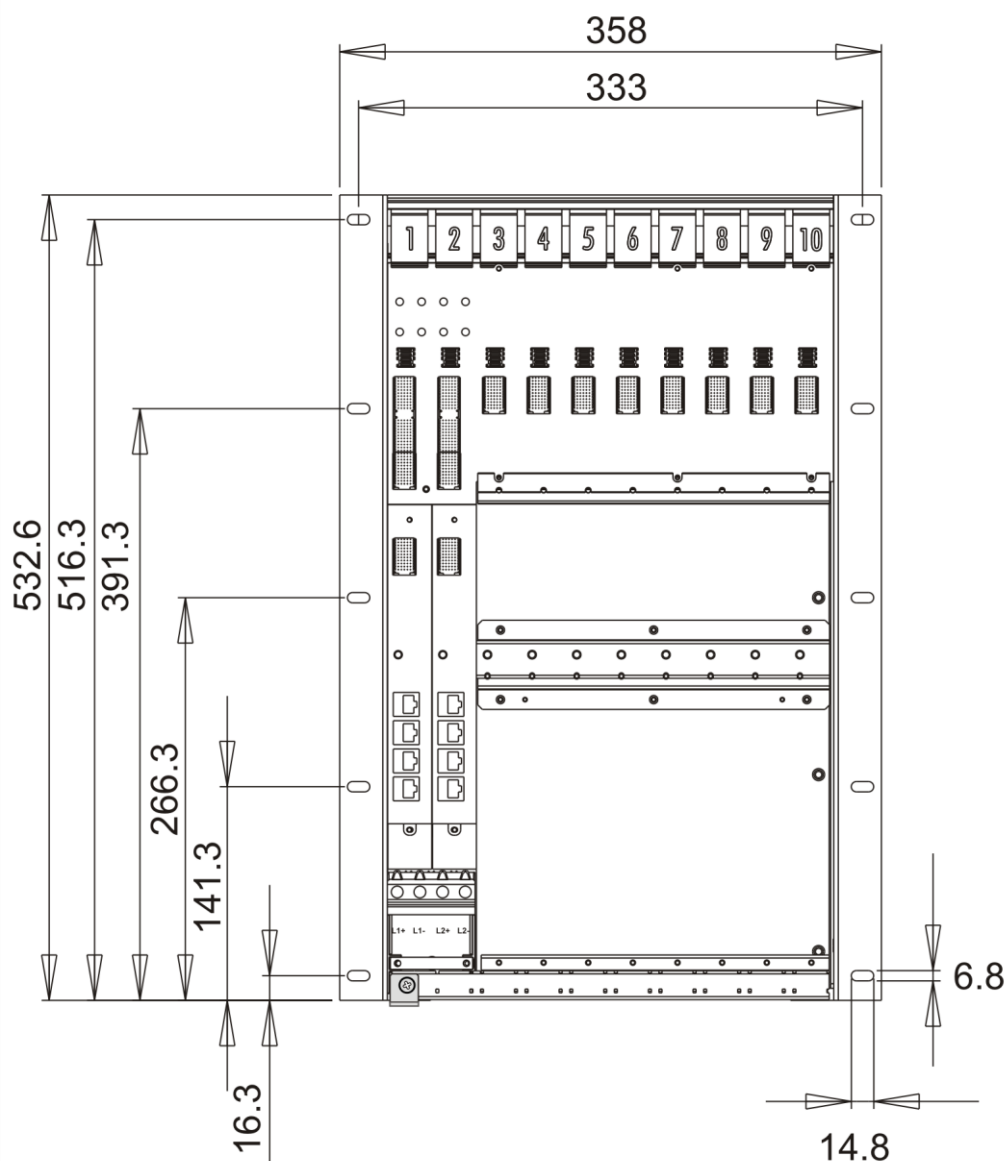


Figure 12: Dimension Drawing of X-BASE PLATE 10 01



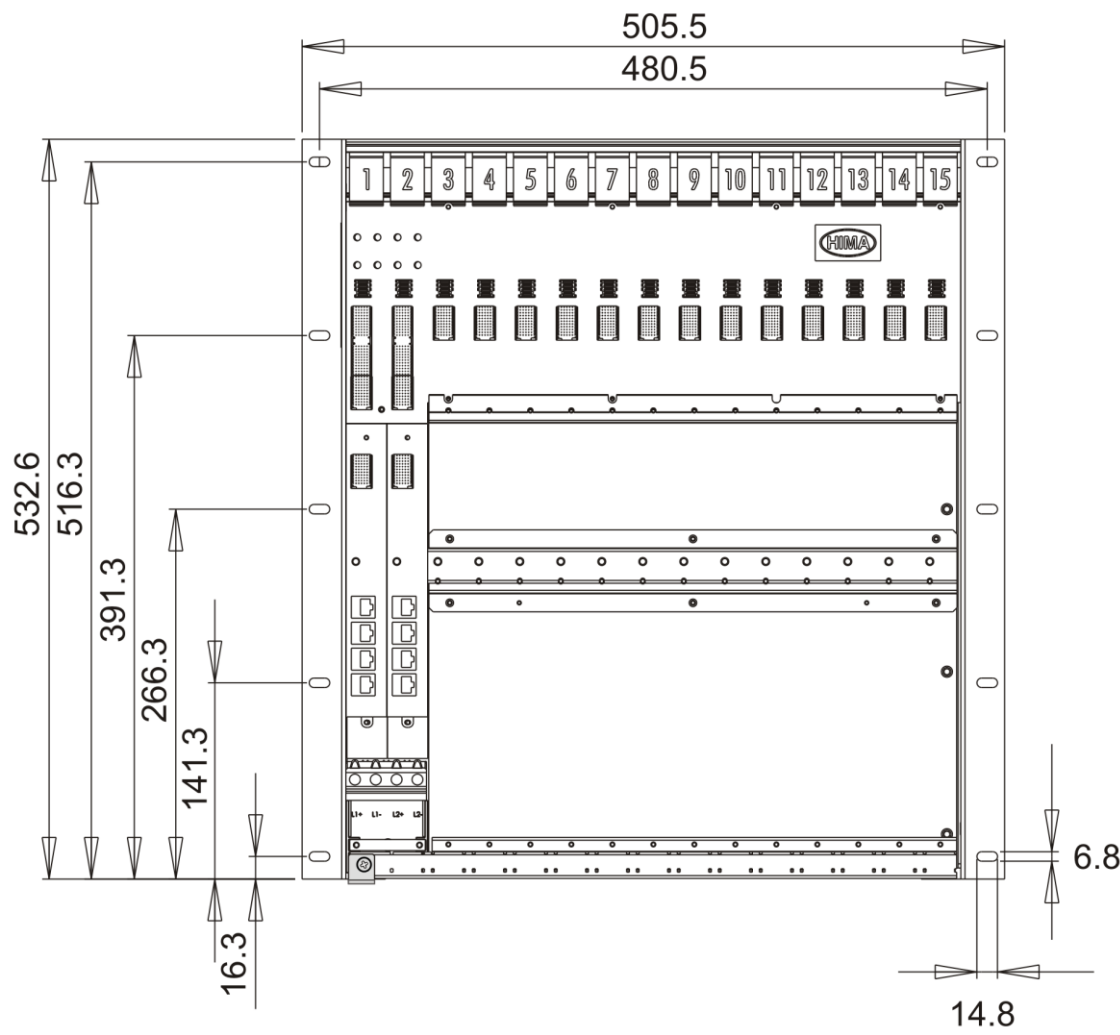


Figure 13: Dimension Drawing of X-BASE PLATE 15 01

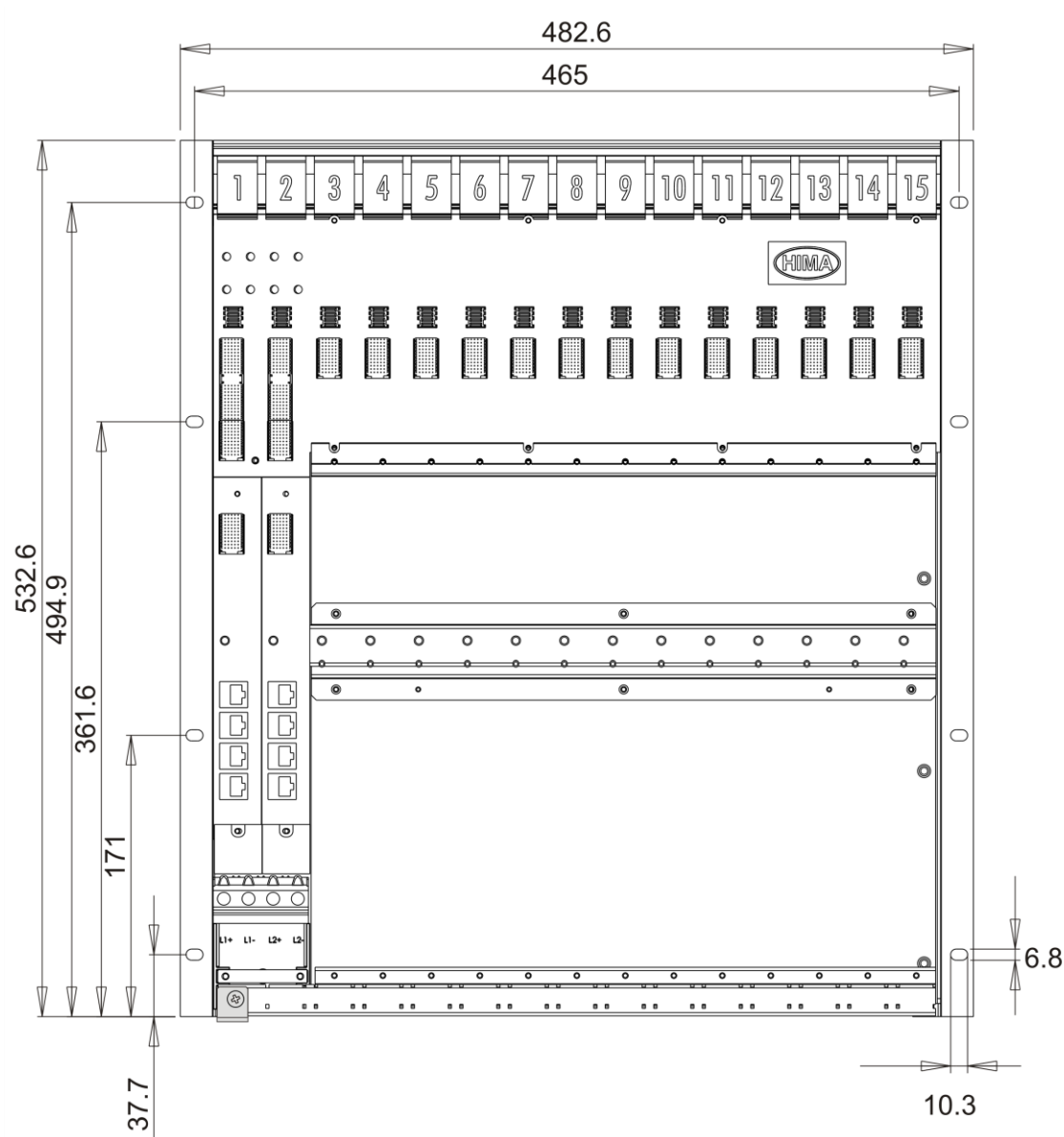


Figure 14: Dimension Drawing of X-BASE PLATE 15 02

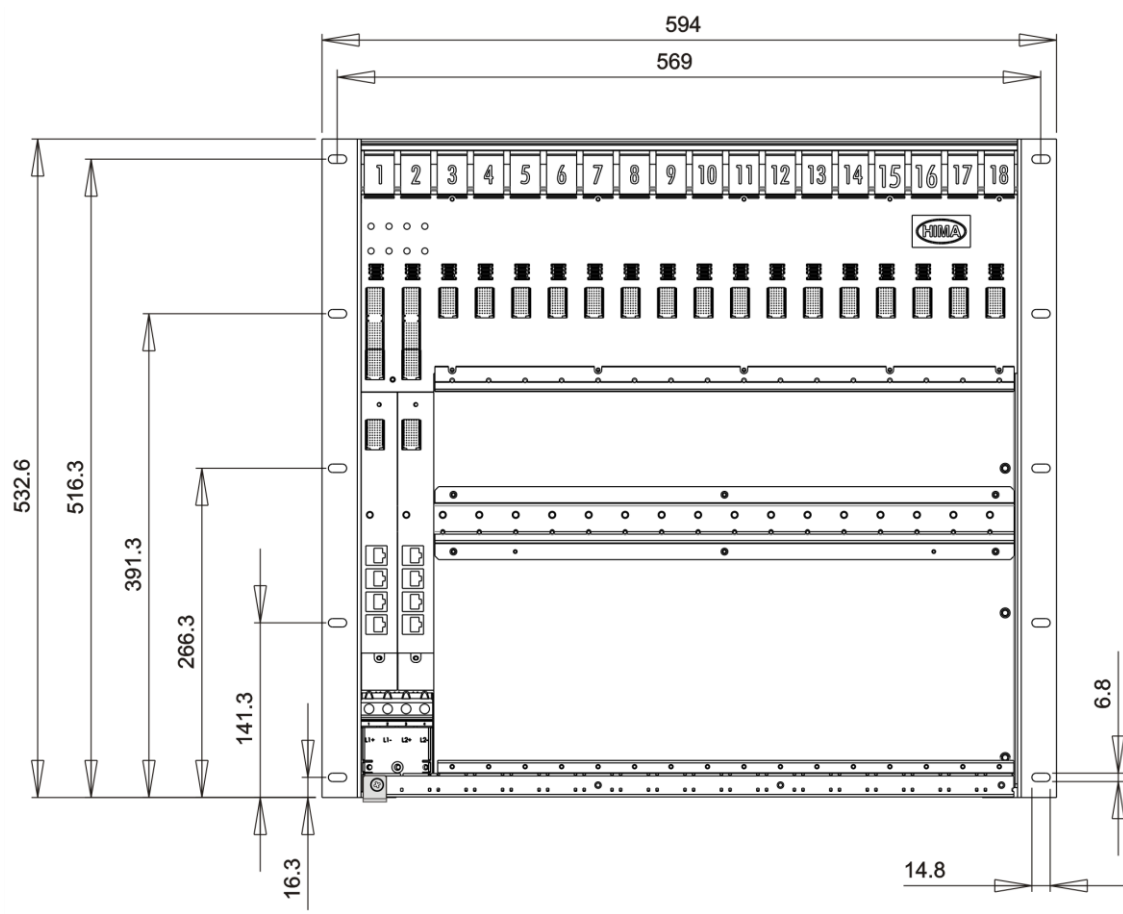


Figure 15: Dimension Drawing of X-BASE PLATE 18 01

#### 4.1.1 Mounting X-BASE PLATE 10 01, 15 01 and 18 01

The base plate has a right and left-side mounting flange for securing to a flat base. Each of the mounting flanges is equipped with 5 oblong holes for mounting.

Observe the following points when securing the base plate:

1. Secure the base plate to a flat surface and leave sufficient space above the fan rack.
2. Adapt the type of mounting and the materials used to the weight of the base plate.
3. Use mounting bolts that not exceed 6 mm in diameter and washers, see figure below.
4. The base plate must have a conductive connection to the earthing of the flat surface.
5. Verify that the base plate has been mounted securely.
6. Remove the cover hood (transport protection) over the power supply's plugs and the system bus connection.

---

**i**

The base plate is mounted with no modules and terminals. However, the connector boards can be installed prior to mounting the base plate.

---

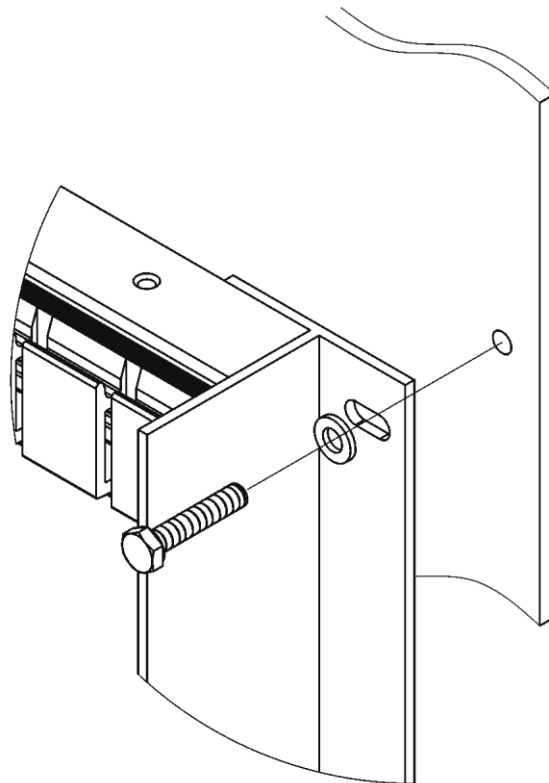


Figure 16: Securing X-BASE PLATE 10 01, 15 01 and 18 01

#### 4.1.2 Mounting X-BASE PLATE 15 02

X-BASE PLATE **15 02** consists in a X-BASE PLATE **15 01** and X-FRONT COVER **15 02**. See Chapter 3.6.2 for more information on how to assemble this two components together.

To allow mounting in a 19-inch control cabinet or 19-inch frame, each 19-inch mounting flange of X-FRONT COVER 15 02 is equipped with four oblong holes spaced from one another in accordance with IEC 60297-3.

Observe the following points when securing the base plate:

1. Secure the base plate to the 19-inch control cabinet or 19-inch frame and leave sufficient space above the fan rack.
2. Adapt the type of mounting and the materials used to the weight of the base plate.
3. Use mounting bolts that not exceed 6 mm in diameter and washers, see figure below.
- 4 The base plate must have a conductive connection to the earthing of the 19-inch control cabinet or 19-inch frame.
5. Verify that the base plate has been mounted securely.
6. Remove the cover hood (transport protection) over the power supply's plugs and the system bus connection.

---

**i**

The base plate is mounted with no modules and terminals. However, the connector boards can be installed prior to mounting the base plate.

---

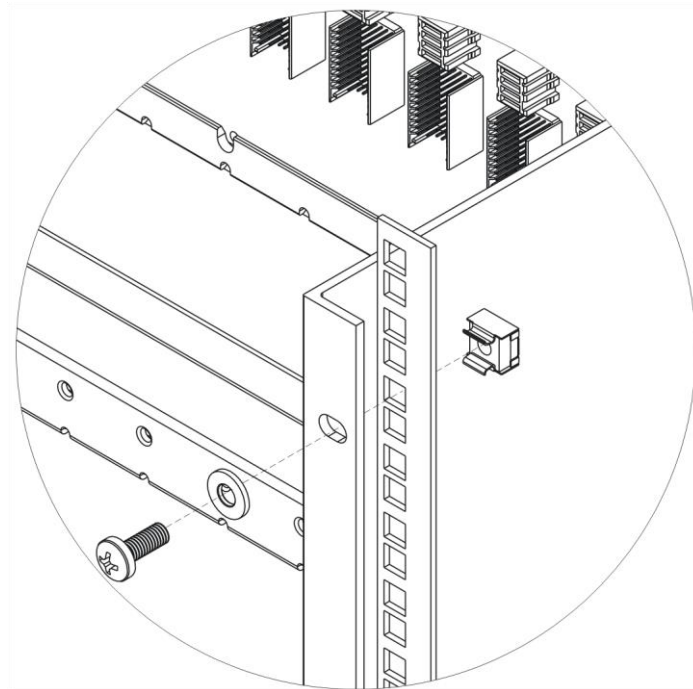


Figure 17: Securing X-BASE PLATE 15 02

### 4.1.3 Mounting the X-CB 002 0X Connector Boards

Two connector boards are integrated in the base plate. The connector boards can be replaced by suitable connector boards to retrofit a X-BASE PLATE XX 01 into a X-BASE PLATE XX 31. Note that the connector board contains information on the number of modules (10, 15 or 18) that can be inserted into the base plate and the corresponding slot IDs.

The available connector boards are listed in Table 5.

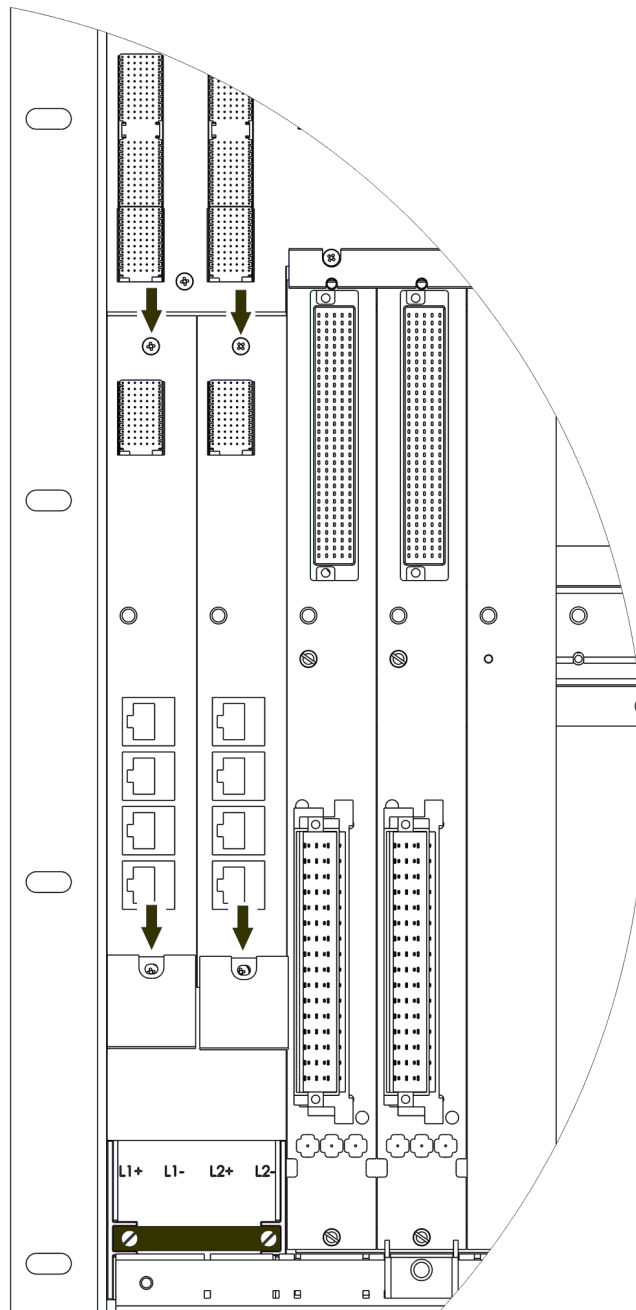


Figure 18: Securing the Connector Boards with Captive Screws



Tools and utilities:

- Screwdriver, cross PH 1
- Matching connector board

**To remove the connector board**

1. Release the lower screws from the base plate.
2. Remove the filters.
3. Release the upper screws from the base plate.
4. Remove the connector board.

Proceed in reversed order to mount the connector board.

#### 4.1.4 Mounting a Connector Board

Tools and utilities:

- Screwdriver, cross PH 1 or slotted 0.8 x 4.0 mm
- Matching connector board

**To install the connector board**

1. Insert the connector board into the guiding rail with the groove facing upwards (see following drawing). Fit the groove into the guiding rail pin.
2. Place the connector board on the cable shield rail.
3. Secure the captive screws to the base plate. First screw in the lower screws than the upper ones.

**To remove the connector board**

1. Release the captive screws from the base plate.
2. Carefully lift the lower section of the connector board from the cable shield rail.
3. Remove the connector board from the guiding rail.

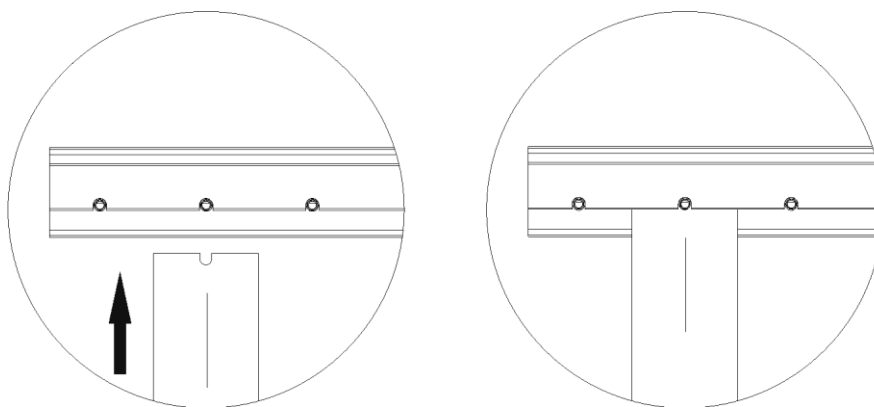


Figure 19: Example of how to Insert the Mono Connector Board

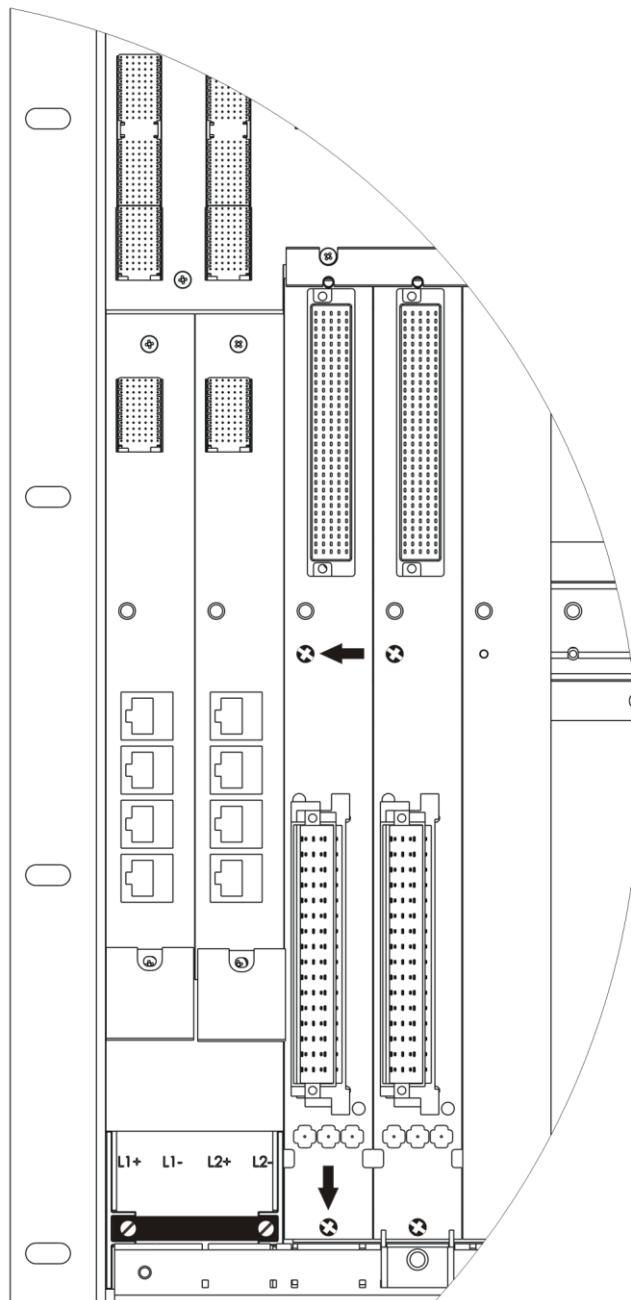


Figure 20: Example of how to Secure the Mono Connector Board with Captive Screws

**i**

These instructions also apply for redundant connector boards. The number of used slots varies in accordance with the connector board type. The number of captive screws depends on the connector board type.

### 4.1.5 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 insert the module in the base plate carefully.**

Tools and utilities

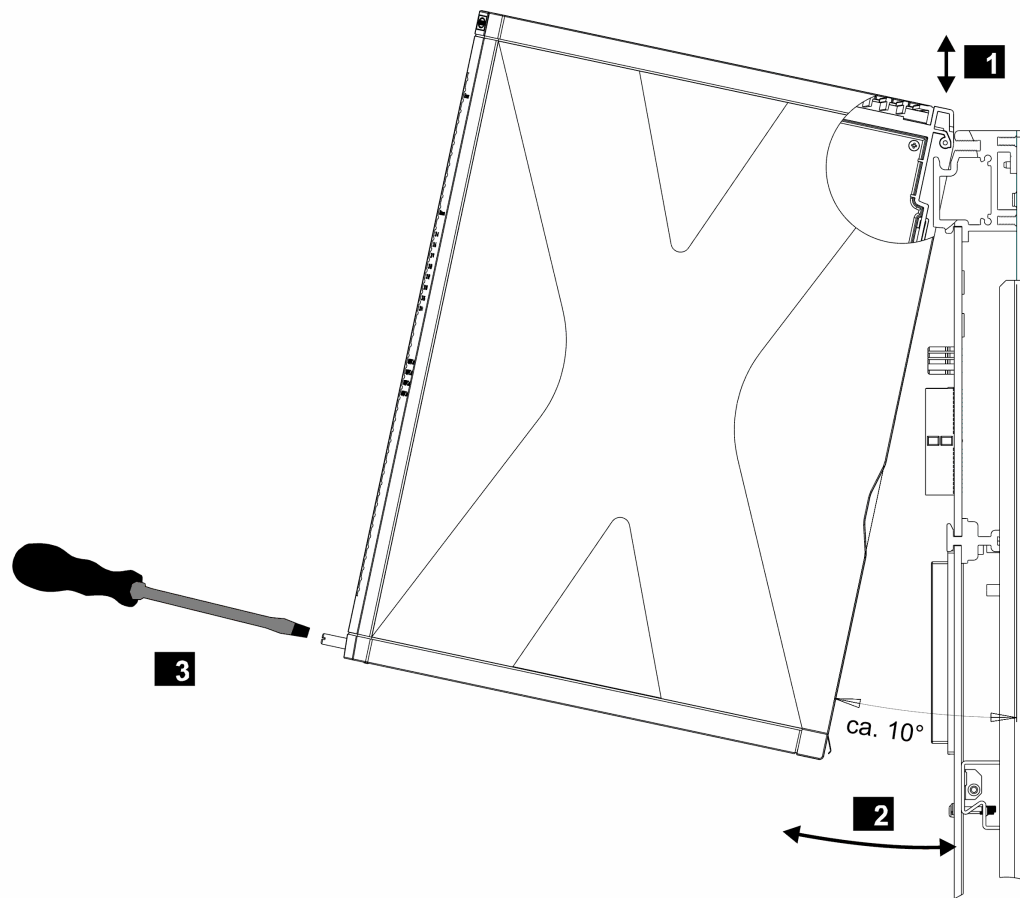
- Screwdriver, slotted 0.8 x 4.0 mm
- Screwdriver, slotted 1.2 x 8.0 mm

#### 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 the Module In and Out

**3** Securing and Releasing a Module

Figure 21: 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.

#### 4.1.6 Connecting the Power Supply

The connection to the clamp terminal block can be established with the following wires:

Wire	Cross-section	Tightening torque
Single-wire	1.5...16 mm <sup>2</sup>	2.4...4 Nm
Multiple-wire	6...25 mm <sup>2</sup>	2.4...4 Nm
Finely stranded	1.5...25 mm <sup>2</sup>	2.4...4 Nm
Finely stranded with wire end ferrule	1.5...16 mm <sup>2</sup>	2.4...4 Nm

Table 6: Terminal Cross-Sections

Tools, components and utilities

- Screwdriver, slotted 1.0 x 5.5 mm
- Wire stripper

##### To connect the power supply

1. Strip the insulation from the ends of the connector cables to a length of 16 mm.
2. Insert the stripped ends of the connector cables into the terminals of the clamp terminal block.
3. Use the screwdriver to tighten the terminals.

#### WARNING



**Controller damage due to reversed polarity!**

**Ensure proper polarity when connecting the power supply unite.**

#### 4.1.7 Earthing the Base Plate

The base plate must have a conductive connection to the earthing of the flate surface, the 19-inch control cabinet or 19-inch frame.

Observe the requirements specified in the low voltage directives SELV (Safety Extra Low Voltage) or PELV (Protective Extra Low Voltage).

### 4.2 Field Cable Shielding

Use a shield connection terminal block to secure the field cables to a cable shield rail. The cable shield rail and the base plate are electrically connected via the shield connection angle. If the shielding concept includes separate equipotential bonding (EB) and separate protective earth (PE), the shield connection angle on the base plate must be removed.

### 4.3 Configuring the Base Plate in SILworX

The parameters can be set in the hardware detail view located in the SILworX Hardware Editor.

The **Rack** tab contains the following system parameters:

Name	Description
These statuses and parameters are entered directly in the Hardware Editor.	
Name	Rack name
Rack ID	Unique identification number, automatically assigned. The identification number can be manually changed. Range of values: 0...15
Power Supply over	Power supply over: <ul style="list-style-type: none"><li>▪ Rail 1</li><li>▪ Rail 2</li><li>▪ Rail 1+2</li></ul> Default setting: Rail 1+2
Temperature Monitoring	Warnings if the temperature thresholds are exceeded: <ul style="list-style-type: none"><li>▪ Warning at temperature thresholds 1 and 2</li><li>▪ Warning at temperature threshold 2 only</li><li>▪ Warning at temperature threshold 1 only</li><li>▪ No warning at temperature thresholds</li></ul> Default setting: Warning at temperature thresholds 1 and 2.

Table 7: Base Plate Parameters

The parameters in the **System** tab are described in the system manual.

## **5 Operation**

The base plate is intended for being used with HIMax modules and operate them. The base plate does not require any specific monitoring.

### **5.1 Handling**

Handling of the base plate or mounted modules during operation is not required.

The base plate is maintenance free, all system components are designed for continuous operation.

## 6 Maintenance

No maintenance measures are required.

### 6.1 Faults

If faults occur, the defective system components must be replaced with components of the same type or with approved replacement models. Only HIMA may replace defective parts. Send defective system components back to HIMA.

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

#### CAUTION



**Electrostatic discharge can damage the electronic components within the systems!**

- Touch a grounded object to discharge any static in your body.
- Make sure that the workspace is free of static.
- 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.



## **7 Decommissioning**

Remove the power supply to decommission the base plate.

## 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.

The system bus connection and the power supply include a cover hood for each slot. These cover hoods are used as transport protection and must be removed prior to inserting the modules.

## 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
AO	Analog output
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 diagrams
ICMP	Internet control message protocol: Network protocol for status or error messages
IEC	International electrotechnical commission
MAC address	Media access control address: Hardware address of one network connection
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
R	READ
Rack ID	Base plate identification (number)
Interference-free	Supposing that two input circuits are connected to the same source (e.g., a transmitter). An input circuit is termed "interference-free" 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 faults that can be safely controlled
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
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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