

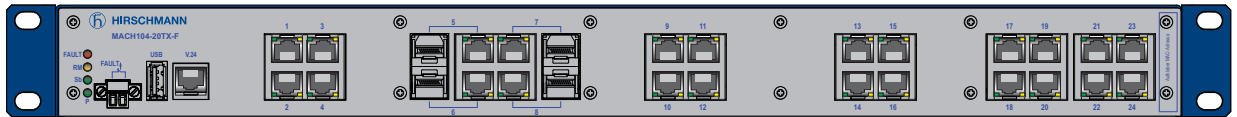


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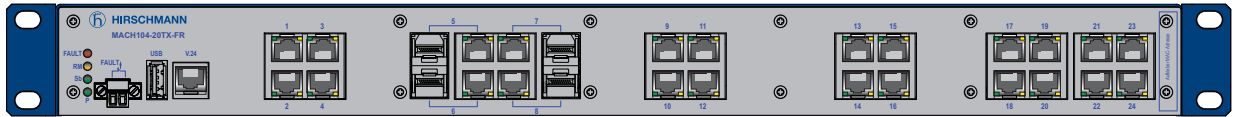
A **BELDEN** BRAND

Mounting Instruction

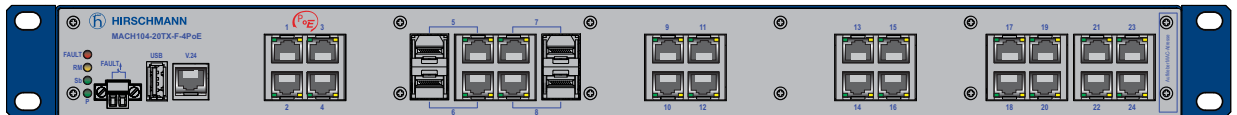
Industrial Ethernet Workgroup Switch MACH104 Full Gigabit Family



MACH104-20TX-F...



MACH104-20TX-FR...



MACH104-20TX-F-4PoE...



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You can get the latest version of this manual on the Internet at the Hirschmann product site (www.hirschmann.com).

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Safety instructions

■ General safety instructions

You operate this device with electricity. The proper and safe operation of this device depends on proper handling during transportation, proper storage and assembly, and conscientious operation and maintenance procedures. Improper use of this device is associated with the risk of personal injury or property damage.

- Read this documentation as well as the safety instructions and warnings before connecting any cables.
- Never start operation with damaged components.
- The device does not contain any service components. If the device is not functioning correctly, or if it is damaged, switch off the voltage supply and return the device to Hirschmann for inspection.

WARNING

UNCONTROLLED MACHINE ACTIONS

To avoid uncontrolled machine actions caused by data loss, configure all the data transmission devices individually.

Before you start any machine which is controlled via data transmission, be sure to complete the configuration of all data transmission devices.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

■ Qualification requirements for personnel

- Only allow qualified personnel to work on the device.

Qualified personnel have the following characteristics:

- ▶ Qualified personnel are properly trained. Training as well as practical knowledge and experience make up their qualifications. This is the prerequisite for grounding and labeling circuits, devices, and systems in accordance with current standards in safety technology.
- ▶ Qualified personnel are aware of the dangers that exist in their work.
- ▶ Qualified personnel are familiar with appropriate measures against these hazards in order to reduce the risk for themselves and others.
- ▶ Qualified personnel receive training on a regular basis.

■ Certified usage

Use the device solely for the application cases described in the Hirschmann product information, including this manual.

Operate the device solely according to the technical specifications.

See [“Technical data” on page 16](#).

■ **National and international safety regulations**

- Verify that the electrical installation meets local or nationally applicable safety regulations.

■ **Grounding the device**

The device is grounded via the operating voltage connections.

■ **Working voltage**

The operating voltage is electrically isolated from the housing.

- Connect solely an working voltage that corresponds to the type plate of your device.
- Internal fuses are triggered solely in the case of a detected error in the device. In case of damage or malfunction of the device, turn off the working voltage and return the device to the plant for inspection.
- Only switch on the device when the housing is closed.
- Only use connection cables that are permitted for the specified temperature range.
- Relevant for North America:
Only use copper wire/conductors of class 1, 60/75°C or 75°C.
- Make sure that the disconnecting device is easily accessible so that the MACH104 device can be disconnected from the mains voltage.
If you disconnect the device from the mains voltage using
 - the plug in the socket
 - an on/off switchit must be easily accessible.
- This applies to the following device variants only:
 - ▶ MACH104-20TX-FR...Pull **both** non-heating plugs to disconnect the device from mains voltage.

■ **Housing**

Only technicians authorized by the manufacturer are permitted to open the housing.

- Never insert sharp objects (small screwdrivers, wires, etc.) into the inside of the device.
- Keep the ventilation slits free to ensure good air circulation.
- Make sure there is at least 3.94 inches (10 cm) of space in front of the ventilation slits of the housing.
- Mount the device horizontally or vertically as a desktop unit, in the control cabinets.

■ **CE marking**

The labeled devices comply with the regulations contained in the following European directive(s):

2011/65/EU (RoHS)

Directive of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

2004/108/EC (EMC)

Directive of the European Parliament and the council for standardizing the regulations of member states with regard to electromagnetic compatibility.

2006/95/EC

Directive of the European Parliament and the council for standardizing the regulations of member states with regard to electrical equipment to be used within specific voltage ranges.

In accordance with the above-named EU directive(s), the EU conformity declaration will be at the disposal of the relevant authorities at the following address:

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The product can be used in the industrial sector.

- ▶ Interference immunity: EN 61000-6-2
- ▶ Emitted interference: EN 55022

Warning! This is a class A device. This device can cause interference in living areas, and in this case the operator may be required to take appropriate measures.

Note: The assembly guidelines provided in these instructions must be strictly adhered to in order to observe the EMC threshold values.

■ **LED or laser components**

LED or LASER components according to IEC 60825-1 (2007):
CLASS 1 LASER PRODUCT
CLASS 1 LED PRODUCT

■ **FCC note**

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference; (2) this device must accept any interference received, including interference that may cause undesired operation.

Appropriate testing has established that this device fulfills the requirements of a class A digital device in line with part 15 of the FCC regulations.

These requirements are designed to provide sufficient protection against interference when the device is being used in a business environment. The device creates and uses high frequencies and can also radiate high frequencies, and if it is not installed and used in accordance with this operating manual, it can cause radio transmission interference. The use of this device in a living area can also cause interference, and in this case the user is obliged to cover the costs of removing the interference.

■ **Relevant for rack mounted installations according to UL 60950-1**

- ▶ Elevated Operating Ambient – If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature of the device.
- ▶ Reduced Air Flow – Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- ▶ Mechanical Loading – Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- ▶ Circuit Overloading – Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- ▶ Reliable Earthing – Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips)

■ **Recycling note**

After usage, this device must be disposed of properly as electronic waste, in accordance with the current disposal regulations of your county, state, and country.

About this manual

The “Mounting Instructions” document contains safety instructions and information that you require to mount the device.

The following manuals are available as PDF files on the CD/DVD supplied:

▶ Installation user manual with additional information on the device:

- Device description
- Interfaces
- Configuration
- EMC and immunity
- Accessories

▶ Basic Configuration user manual

▶ Redundancy Configuration user manual

▶ Graphical User Interface reference manual

▶ Command Line Interface reference manual

Legend

The symbols used in this manual have the following meanings:

▶ Listing

□ Work step

■ Subheading

1 Description

1.1 Display elements

After the working voltage is set up, the software starts and initializes itself. Afterwards, the device performs a self-test. During this process, various LEDs light up.

The process takes around 15 seconds.

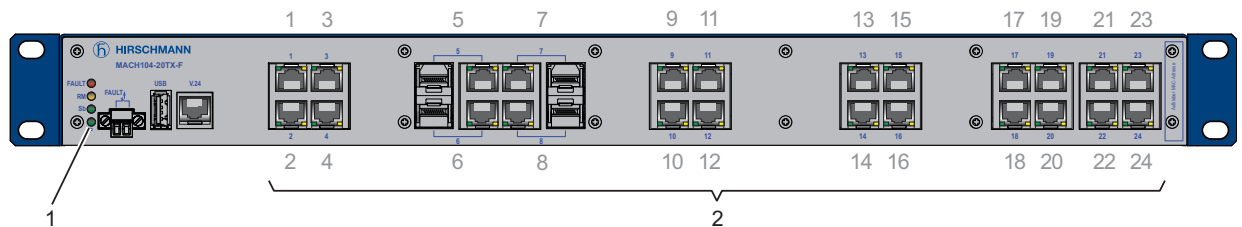
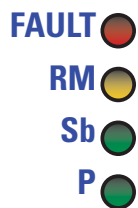


Figure 1: MACH104 Display elements
 1 - Device status display elements
 2 - Port status display elements

1.1.1 Device state



These LEDs provide information about conditions which affect the operation of the whole device.

The following table applies to the stated device variants only:

► MACH104-20TX-FR...

| LED | Display | Color | Activity | Meaning |
|-----|-----------------|--------|-----------|---|
| P | Working voltage | Green | Lights up | The working voltages 1 and 2 are on. |
| | | Yellow | Lights up | The working voltages 1 or 2 are on. |
| | | None | | The supply voltages 1 and 2 are too low. |

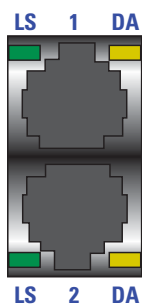
The following table applies to the stated device variants only:

► MACH104-20TX-F...

► MACH104-20TX-F-4PoE...

| LED | Display | Color | Activity | Meaning |
|-----|-----------------|-------|-----------|------------------------------|
| P | Working voltage | Green | Lights up | Operating voltage is on |
| | | | None | Operating voltage is too low |

1.1.2 Port state



These LEDs display port-related information.

| LED | Display | Color | Activity | Meaning |
|-----|--------------|--------|--------------------------|--|
| LS | Link status | | None | Device detects an invalid or missing link |
| | | Green | Lights up | Device detects a valid link |
| | | | Flashes 1 time a period | Port is switched to stand-by |
| | | | Flashes 3 times a period | Port is switched off |
| DA | Data traffic | Yellow | Flashing | Device is transmitting and/or receiving data |

1.2 Management interfaces

1.2.1 USB interface

The USB socket provides an interface for the local connection of an Auto-Configuration Adapter. It is used for saving/loading the configuration and for loading the software.

2 Installation

Note: Read the safety guidelines under [“Safety instructions”](#) on page 4.

2.1 Wiring and assembling the signal contact

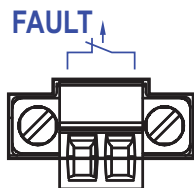


Figure 2: 2-pin terminal block

WARNING

ELECTRIC SHOCK

Never insert sharp objects (small screwdrivers, wires, etc.) into the connection terminals for the signal lines, and do not touch the terminals!

Non-adherence to these instructions can lead to death, serious physical injury or material damage.

For the signal contact to be connected, make sure the following requirements are met:

- ▶ The electrical wires are voltage-free.
- ▶ The connected voltage is limited by a current limitation device or a fuse. Observe the electrical threshold values for the signal contact.
[See “General technical data” on page 16.](#)
- Remove the power connector from the device.
- Connect the signal contact wires with the connectors of the terminal block.
- Mount the terminal block for the signal contact on the front of the device using the screw locking. Check whether the terminal block is mounted correctly and screwed on.

Note: Relevant for North America:

The torque for tightening the terminal block for the signal contact on the device is 3 lb-in (0.34 Nm).

2.2 Installing the device and grounding

The device can be mounted on a flat surface, in a 19" standard switch cabinet, or on the wall.

2.2.1 Selecting the assembly location

Select the assembly location according to the safety guidelines ([see on page 4 "Safety instructions"](#)).

When selecting the assembly location, also make sure the following requirements are met:

- The assembly location can be accessed for maintenance and repair work.
- The LED display elements are clearly visible.
- Twisted-pair cables are at a sufficient distance from potential sources of electrical interference, such as power cables.
- The device has a separate power source with a ground connection. The power supply can be interrupted by means of a separate isolator or power switch. We recommend using overvoltage protection for all devices.

2.2.2 Mounting on a flat surface

Before operating the device on a flat surface, such as a table, fasten the housing feet supplied at a distance of 2 cm from the corners of the bottom of the device.

- If necessary, remove any dirt from the adhesive surfaces on the bottom of the device.
- Remove the protective foil from the adhesive surface of a housing foot and attach the housing foot.

2.2.3 Mounting in a switch cabinet

Note: Observe the instructions for installation in 19" control cabinets according to UL 60950-1.

[See "Relevant for rack mounted installations according to UL 60950-1" on page 7.](#)

Note: For more information on sliding/mounting rails and how to install them, please contact your switch cabinet manufacturer.

The devices are designed to be mounted in a 19" switch cabinet.

- Make sure there is sufficient ventilation. If necessary, provide a fan for the 19" switch cabinet. This will prevent the basic devices from overheating.
- Measure the depth of the 19" switch cabinet so as to allow the power supply cables to be fitted at the back and the data cables to be fitted at the front.
- Install the sliding/mounting rails in the 19" switch cabinet as instructed by the manufacturer, and make sure the device is resting on both rails.

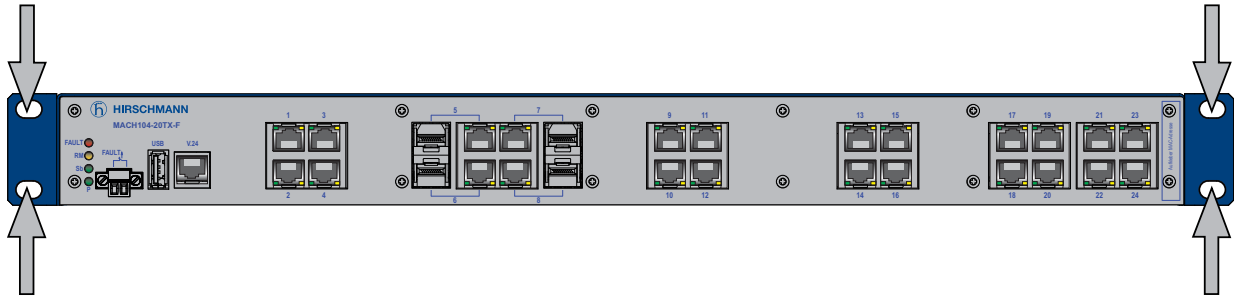


Figure 3: Mounting the MACH104 in the 19" cabinet

- Fasten the device by screwing the brackets to the switch cabinet.

Note: When operating the device in an environment with strong vibrations, you have the option to additionally fasten the back of the device to the switch cabinet using two brackets.

You can obtain additional brackets as accessories.

2.2.4 Mounting on the wall

- Use the pre-mounted brackets included in the delivery.
See figure 4 on page 13.
- Additionally attach two brackets to the back of the device.
See figure 4 on page 13.
You can obtain additional brackets as accessories.
- Fasten the device by screwing the brackets to the wall.

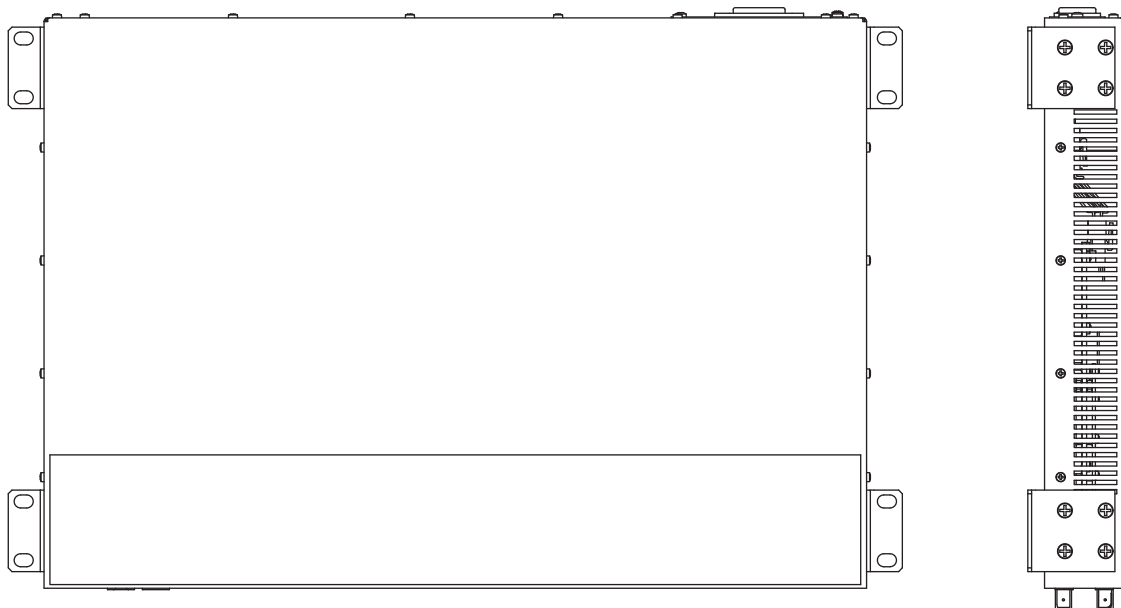


Figure 4: Vertical mounting on the wall

2.2.5 Grounding the device

The device is grounded via the operating voltage connections.

2.3 Operating the device



WARNING

ELECTRIC SHOCK

Connect solely an working voltage that corresponds to the type plate of your device.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Note: Read the safety guidelines under [“Working voltage” on page 5](#).

By connecting the voltage supply via the voltage supply socket(s), you start the operation of the device.

3 Deinstallation

3.1 Removing the device

- Disconnect the data cables.
- Disable the working voltage.
- Disconnect the operating voltage.
- Remove the power connector from the device.

- To detach the device from the switch cabinet or the wall, remove the screws from the brackets on the device.

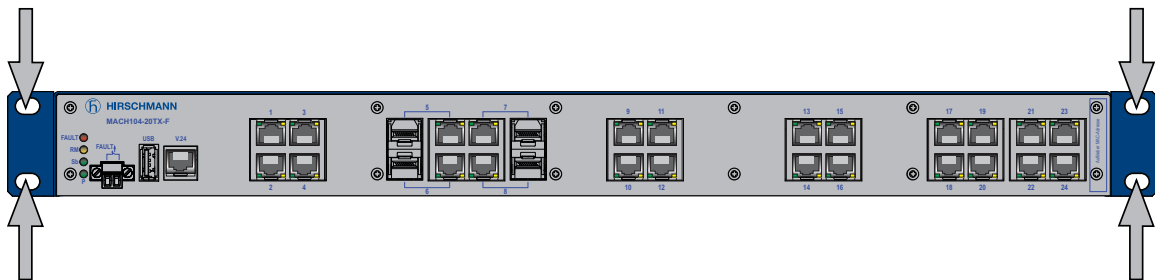


Figure 5: Disassembling the device

4 Technical data

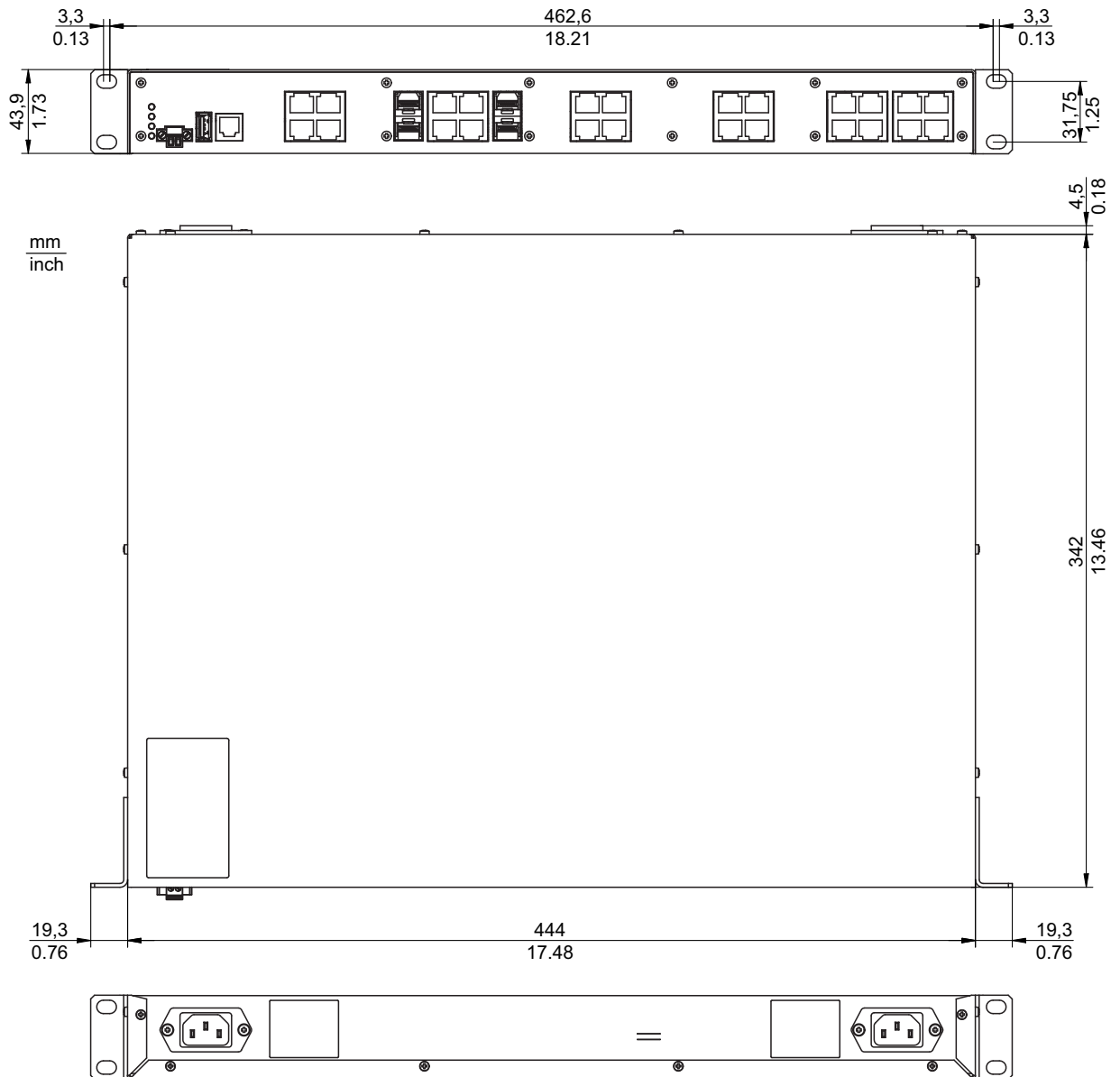
■ General technical data

| | | |
|--------------------------------------|---|---|
| Dimensions | See "Dimension drawings" on page 17. | |
| Weight | MACH104-20TX-F... | 4.2 kg |
| | MACH104-20TX-FR... | 4.4 kg |
| | MACH104-20TX-F-4PoE... | 4.6 kg |
| Operating voltage | Rated voltage range AC | 100 V ... 240 V, 50 Hz ... 60 Hz |
| | Voltage range AC incl. maximum tolerances | 90 V AC - 265 V AC, 47 Hz - 63 Hz |
| Current consumption | Rated current for devices without PoE | max. 0.3 A (240 V AC) max. 0.5 A (100 V AC) |
| | Rated current for devices with PoE | max. 0.9 A (240 V AC) |
| | | max. 1.7 A (100 V AC) |
| Activation current | typ. <40 A at 265 V AC and cold start | |
| PoE power | Maximum number of Powered Devices (PDs) | This applies to the following device variants only: MACH104-20TX-F-4PoE... 4 × Powered Device (PD) class 0 (15.4 W) |
| Power failure bypass | > 12 ms (115 V AC) | |
| Overload current protection at input | Non-replaceable fuse | |
| Climatic conditions during operation | Ambient air temperature ^a . | +32 °F ... +122 °F (0 °C ... +50 °C) |
| | Humidity | 20 % ... 90 % (non-condensing) |
| | Air pressure | minimum 795 hPa (+9842 ft; +2000 m) maximum 1060 hPa (-1312 ft; -400 m) |
| Climatic conditions during storage | Ambient air temperature ^b . | -4 °F ... +185 °F (-20 °C ... +85 °C) |
| | Humidity | 10 % ... 95 % (non-condensing) |
| | Air pressure | minimum 700 hPa (+9842 ft; +3000 m) maximum 1060 hPa (-1312 ft; -400 m) |
| Signal contact | Switching current | max. 1 A, SELV |
| | Switching voltage | max. 60 V DC or max. 30 V AC, SELV |
| Pollution degree | 2 | |
| Protection classes | Laser protection | Class 1 in compliance with IEC 60825-1 |
| | Degree of protection | IP 30 |

a. Temperature of the ambient air at a distance of 2 inches (5 cm) from the device

b. Temperature of the ambient air at a distance of 2 inches (5 cm) from the device

■ Dimension drawings



■ Power consumption/power output

| MACH104device | Maximum power consumption | Maximum power output |
|---|---------------------------|----------------------|
| MACH104-20TX-F... | 35 W | 119 Btu (IT)/h |
| MACH104-20TX-FR... | 35 W | 119 Btu (IT)/h |
| MACH104-20TX-F-4PoE..., when 4 x Class 0 Powered Device connected | 110 W | 170 Btu (IT)/h |

■ Scope of delivery

| Number | Article |
|--------|--|
| 1 x | Device |
| 1 x | 2-pin terminal block for signal contact |
| 2 x | Brackets with fastening screws (pre-mounted) |
| 1 x | Housing feet, stick-on |

| Number | Article |
|--------|--|
| 1 × | Non-heating appliance cable (Euro model) |
| 1 × | Mounting instruction |
| 1 × | CD/DVD with manual |

■ **Underlying technical standards**

The device generally fulfills the norms and standards named in their current versions.

The device has an approval based on a specific standard or de facto standard solely if the approval indicator appears on the housing.

If your device has a shipping approval according to Germanischer Lloyd, you find the approval mark printed on the device label. You will find out whether your device has other shipping approvals on the Hirschmann website under www.hirschmann.com in the product information.



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