

Industrial PC XP-504



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Service page: [Eaton.com/aftersales](https://www.eaton.com/aftersales)

Original Operating Instructions

is the German-language edition of this document

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DANGER!

Hazardous electrical voltage!

Before starting with the installation

- Installation requires qualified electrician
 - Disconnect the power supply of the device.
 - Secure against retriggering
 - Verify isolation from the supply
 - Ground and short-circuit
 - Cover or enclose any neighboring live parts.
 - Follow the engineering instructions (IL) of the device concerned.
 - Only suitably qualified personnel in accordance with EN 50110-1/-2 (VDE 0105 part 100) may work on this device/system.
 - Before installation and before touching the device ensure that you are free of electrostatic charge.
 - The functional earth (FE) must be connected to the protective earth (PE) or to the equipotential bonding. The system installer is responsible for implementing this connection.
 - Connecting cables and signal lines should be installed so that inductive or capacitive interference does not impair the automation functions.
 - Install automation devices and related operating elements in such a way that they are well protected against unintentional operation.
 - Suitable safety hardware and software measures should be implemented for the I/O interface so that a line or wire breakage on the signal side does not result in undefined states in the automation devices.
 - Deviations of the mains voltage from the nominal value must not exceed the tolerance limits given in the specifications, otherwise this may result in malfunction and hazardous states.
 - Emergency-Stop devices complying with IEC/EN 60204-1 must be effective in all operating modes of the automation devices. Unlatching the emergency switching off devices must not result in an automatic restart.
 - Built-in devices for enclosures or cabinets must only be run and operated in an installed state;
- desktop devices and portable devices only when the housing is closed.
- Measures should be taken to ensure the proper restarting of programs interrupted after a voltage dip or outage. This should not result in dangerous operating states even for a short time. If necessary, emergency switching off devices should be implemented.
 - Wherever faults in the automation system may cause damage to persons or property, external measures must be implemented to ensure a safe operating state in the event of a fault or malfunction (for example, by means of separate limit switches, mechanical interlocks, etc.).

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0.1 About this documentation

0.1 About this documentation

This Manual contains all the information you will need in order to use the XP-504 safely and effectively.

The Manual XP-504 manual is considered an integral part of the device and must always be readily available in the device's close proximity so that users have access to it.

This Manual describes all of the devices' lifecycle stages: transportation, installation, commissioning, operation, maintenance, storage, and disposal.

It does not, however, go over the corresponding operating system or application software.

Make sure to always use the latest documentation for your device.

The latest version of this documentation, as well as additional references, is available for download on the Internet. → Section "Further usage information", page 133

Please send any comments, recommendations, or suggestions regarding this document to: DocumentationEGBonn@eaton.com

0.1.1 List of revisions

The following significant amendments have been introduced since previous issues:

Publication date	Page	Keyword	New	Modification	Deleted
09/2021		New edition, panel-PC, CE, UKCA	✓		
01/2022		Panel-PC, UL approval	✓		
04/2022		Device series expanded with box PC, extender module, terminal, and terminal with extender	✓		
07/2022		UL approval Box PC, Extender module, ATEX approval Widescreen devices	✓		
07/2022	75	Legend added No. 4		✓	
11/2022		Catalog numbers for the American market added XP-504-BP-... and XP-504-..-TERM-EXT		✓	

0.1.2 Target group

This manual XP-504 is intended for engineers, electricians, and automation technicians. Electrical engineering and physics-related knowledge and skills will be required in order to be able to commission the corresponding devices.



CAUTION

Installation requires qualified electrician



Follow the safety instructions for the XP-504!

The section on safety instructions must be read and understood by everyone who will be working with the XP-504 before the actual work is performed Human-machine interface.



WARNING

Incomplete documents

Working with individual pages taken out from the information for use may lead to bodily injury and property damage due to failure to observe relevant safety information.

- ▶ Always work with the latest and full document.

0.1 About this documentation

0.1.3 Legal disclaimer

All the information in this manual has been prepared to the best of our knowledge and in accordance with the state of the art. However, this does not exclude the possibility of there being errors or inaccuracies. We assume no liability for the correctness and completeness of this information. In particular, this information does not guarantee any particular properties.

Do not use the XP-504 before reading and understanding this manual.

Hazards posed by the XP-504 cannot be eliminated if the safety instructions are not observed – especially if the XP-504 is installed and commissioned by unqualified personnel and/or is used improperly. Eaton assumes no liability for any damages resulting from cases such as these.

0.1.4 Device designations and abbreviations

The following general terms are used throughout this manual:

Short designation	Explanation
Human-machine interface	Human Machine Interface
XP-504	all XP-504 devices
Panel-PC	Industrial PC with integrated multi-touch screen for flush mounting
Box-PC	Industrial PC for installation on DIN-rail
Terminal	Capacitive multi-touch screen for operating HMIs
Extender TX	Transmitter module
Terminal with Extender RX	Capacitive multi-touch screen for operating HMIs with receiver




For the exact designation for your XP-504, please refer to the → "Name-plate", page 20.

0.1.5 Writing conventions


Award	Description
Bold text	Used for all graphical user interface elements
Text	Used for the button labels
<i>Menu/command</i>	Used for menus and commands on the device
<name>	Angle brackets are used to indicate variable values that you must replace with your own values

0.1.5.1 Warning labels


Risk of personal injury warning.




DANGER
Warns of hazardous situations that result in serious injury or death.



WARNING
Warns of the possibility of hazardous situations that could result in serious injury or even death.




DANGER!
Dangerous Electrical Voltage!




CAUTION
Warns of the possibility of hazardous situations that can cause injury.

Property damage warning

CAUTION
Warns about the possibility of material damage.



Prohibited uses, actions, etc.
Explains the prohibition



Bid
Explains the instruction

0.1 About this documentation

Notes



Indicates useful tips.




Indicates instructions to be followed



Additional information, background information, information worth knowing, useful additional information


0.1.5.2 Additional user information

Documents (such as manuals) are listed after the  icon together with the corresponding name and Eaton number.



Publication title

For identifying the Eaton publication code

External Internet addresses. They will be shown after the  icon.



Destination address

1. Description

XP-504 devices can be used as control and monitoring devices.

XP-504 devices are the answer to the growing demand of machine and system manufacturers for high-precision, cost-effective HMI solutions with industrial-grade capacitive multi-touch technology. Accordingly, the XP-504 series offers Widescreen devices with sizes of 10.1", 15.6", and 21.5". Their slim design, featuring a non-reflective glass front, delivers a modern look. Finally, the robust, scratch-resistant front and open device concept on XP-504 devices make them suitable for use in virtually all branches of industry related to mechanical and plant engineering.

The XP-504 series features a modular design that makes it possible to put together custom solutions out of standard components:



Fig. 1: XP-504 devices

- Panel-PC: PC with integrated Multi-touch touch panel
- Box-PC: Compact DIN-rail PC
- Terminal: Remote Multi-touch touch panel
- Extender TX: Transmitter module for transmitting video and USB data
- Terminal with Extender RX: Remote Multi-touch touch panel with integrated video and USB data receiver

The II 3D Ex tc IIIC T70°C Dc U and II 3G Ex ec IIC T105°C Gc U ATEX certification is only valid for the Widescreen device:

Panel-PCs, Terminals, and Terminal with Extender RX, which are professionally placed in an enclosure: IP54 for Zone 2 ("gas"), IP6x for Zone 22 ("dust").



Panel-PC



Box-PC



Extender TX

Terminal

Terminal with Extender RX

1. Description

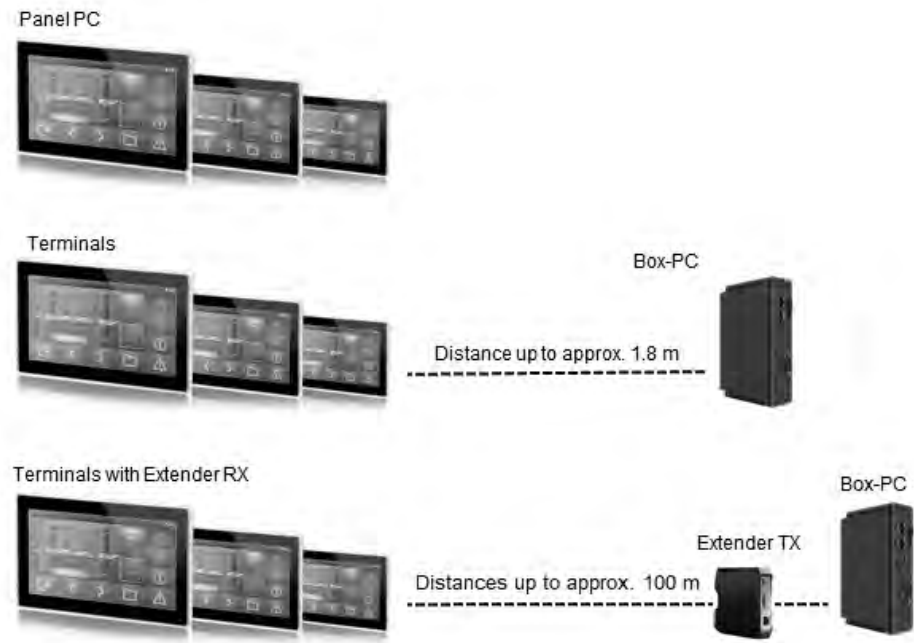


Fig. 2: Series overview

Combining XP-504 devices with each other

Each PC can be connected to a maximum of two terminals.

Each Panel-PC or Box-PC can be expanded with two Terminals, two Terminal with Extender RX, or one Terminal and one Terminal with Extender RX.

When choosing devices, it is necessary to take into account the distances between the devices and the connections between them. An Extender TX module needs to be used for distances greater than 1.8 m.

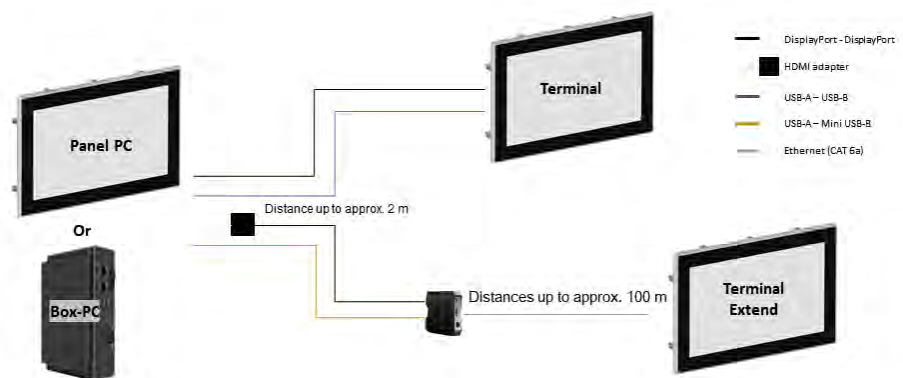


Fig. 3: Device concept overview

1.1 Use as intended

The devices of the XP-504 series are primarily intended for use in machine and system building applications.

They are suitable for use in industrial environments and are typically used indoors for automation purposes.

Any other use must be discussed and agreed upon with the manufacturer in advance.

Using the device in a way not specified by the manufacturer may negatively affect the protection provided by the device.



Bid

Each device in the XP-504 series must be used only in locations for which this series of devices is approved. Make sure to read and follow the information and labels on the nameplate for the devices, as well as section Approvals and declarations in the appendix.



Prohibited uses, actions, etc.

It is strictly prohibited to use the device in order to implement safety-relevant functions (in the sense of personal and machine protection).

1.2 Device models

1.2.1 Features on XP-504 PCs

The PCs' computer core is always the same. Every Panel-PC and every Box-PC features:

1. Powerful CPU, processor Intel Atom QuadCore E3950 2GHz
2. MSATA memory 64 GB mSATA
3. SD memory card slot for 8 GB SD card
4. Operating System Windows 10 Enterprise LTSC, IoT, 64 bit, 8GB DDR3 RAM
5. Integrated interfaces:
 - 2 x Ethernet ports (1000/100/10 Mbps Ethernet / GbE-Ethernet) for use as a communication or field bus interface
 - 4x USB 3.0
 - One RS232/RS422/RS485 (COM) port for communicating with PLCs or devices,
 - 1x DisplayPort
 - 1x HDMI

1. Description

1.2 Device models

Up to two Widescreen device terminals of the XP-504 series can be connected to each XP-504 PC.

1.2.2 Configuration of the XP-504-Widescreen device

In addition, every Widescreen device is a Color display, TFT and can be used with gestures (Multi-touch touch panel).

In order for this functionality to work properly, you must press on the Projected Capacitive Touch (PCT) display with a finger or stylus.



The USB Type-B port on the Terminal is required for the touch functionality and cannot be used for anything else.

1.2.3 Device variants

1.2.3.1 XP-504 series visualization software

The Panel-PC and Box-PC configurations differ from each other in terms of the runtime license for the optional visualization software – Galileo Open or Visual Designer.

1.2.3.2 Widescreen device sizes

Panel-PCs, Terminals, and Terminal with Extender RX are available in various display sizes.

- XP-504-10-... - Screen diagonal 10.1" (25.65 cm),
Screen mode: 16:10, visible screen area 216.96 mm x 135.26 mm, 1280 x 800 px
- XP-504-15-... - Screen diagonal 15.6" (39.6 cm),
Screen mode: 16:9, visible screen area 344.23 mm x 193.54 mm, 1366 x 768 px
- XP-504-21-... - Screen diagonal 21.5" (54.6 cm),
Screen mode: 16:9, visible screen area 476.06 mm x 276.79 mm, 1920 x 1080 px

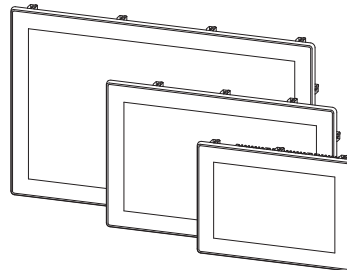


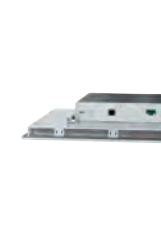



Fig. 4: Display size comparison

1.2.3.3 Interfaces

The number and type of interfaces on the devices in the XP-504 series varies.

Panel-PC/ Box-PC	Terminal	Terminal with Extender RX	Extender TX
			
<p>2 x Ethernet, 4 x USB3.0, 1 x RS232/RS422/485, 1 x HDMI, 1 x DP, Slot for SD card</p>	<p>1 x USB Type-B (used by the touch functionality) 1 x DVI-I, 1 x DP</p>	<p>1 x RJ45 (Extender RX)</p>	<p>1 x RJ45 (Extender TX), 1 x Mini USB-B, 1 x DP</p>

1. Description

1.3 Nameplate

1.3 Nameplate

The device has a nameplate on rear.
This nameplate includes the following information:

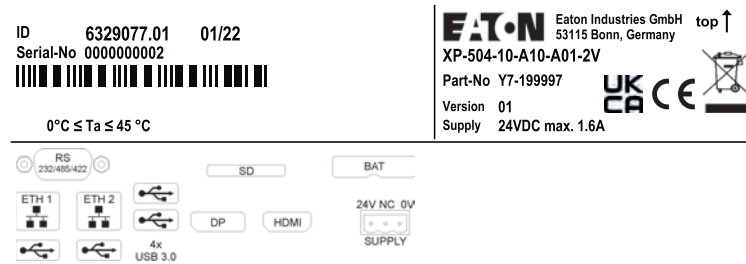


Fig. 5: Example: nameplate on Panel-PC

- Manufacturer
- Part number
- Part-No.
- Power supply requirement
- Serial-No.
- Type approval and certification marks and information
- Layout of interfaces

To get fast and effective support, make sure to always provide Customer Service with the following information from the nameplate:

- Article No. (part No. or article No.)
- Serial No.

1.4 What the different parts of the part number mean

1.4 What the different parts of the part number mean

The Part number includes information that specifies the version and model of the specific device being used. The Part number can be found at the type plate of the XP-504.

Panel-PC

XP-504	Display size	Interfaces	Version	Visualization software
	10 10.1" (25.65 cm)	A10 Basic	A01 ATEX-compliant design	
	15 15.6" (39.6 cm)			
	21 21.5" (54.6 cm)			

Box-PC

XP-504	Type	Interfaces	Version	Visualization software
	BP Box-PC for USA	A10 Basic	A00 Standard	
	BOXPC otherwiseBox-PC	A10 Basic	A00 Standard	

Tab. 1: Bundles with visualization software

2B Windows 10 Enterprise LTSC, runtime license for GALILEO visualization software

2V Windows 10 Enterprise LTSC, runtime license for Visual Designer visualization software

Terminal, Terminal with Extender RX

XP-504	Display size (screen diagonal)	Type	
	10 10.1" (25.65 cm)	TERMINAL	Terminal
	15 15.6" (39.6 cm)	TERM-EXT TERMINAL-EXT	TERM-EXT for USA otherwise TERMINAL-EXT Terminal with Extender RX
	21 21.5" (54.6 cm)		

Extender TX transmitter module

XP-504	Type
	EXT-MODUL

1. Description

1.5 Accessory devices

1.5 Accessory devices

A variety of accessories are available for XP-504 devices.

CAUTION

Only use original accessories.



Order accessories through your supplier or through the Eaton online catalog



Eaton.com/ecat

1.6 Support

To get fast and effective support, make sure to provide Customer Service with the following information from the nameplate:

- Part-No.
- Serial-No

For service and support, please contact your local sales team.

Contact info: Eaton.com/contact

Service page: Eaton.com/aftersales

1.7 Conditions for Underwriters Laboratories Inc. (UL) listing

1.7 Conditions for Underwriters Laboratories Inc. (UL) listing

Approval according to standard UL 61010-2-201 for the operation of the device series XP-504 has been granted.

The requirements for this approval of each device can be found in the chapter Installation, section Technical conditions for acceptance by Underwriters Laboratories Inc. (UL).

- Panel-PC: → page 45
- Terminal: → page 46
- Terminal with Extender RX: → page 47
- Box-PC: → page 48
- Extender TX: → page 48

1. Description

1.8 Conditions for Underwriters Laboratories Inc. (UL) listing in hazardous locations - UL-EX

1.8 Conditions for Underwriters Laboratories Inc. (UL) listing in hazardous locations - UL-EX

Approval has been granted for the XP-504-..-TERMINAL and XP-504-..-TERMINAL-EXT devices.



EXPLOSION HAZARD

Only these devices:

- XP-504-..-A10-A01-2. (Panel-PC)
- XP-504-..-TERMINAL and
- XP-504-..-TERM-EXT or XP-504-..-TERMINAL-EXT

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D, Class II, Division 2 Groups F and G, Class III or non-hazardous locations only.

- ▶ Use XP-504 devices in non-hazardous-location environments
- ▶ For safe installation, as well as to meet approval requirements, make sure to adhere to the specifications for holding brackets and tightening torques in the respective instruction leaflet for the device.
- ▶ USB and HDMI Connectors are for maintenance only, except when installed together with strain relief metal plate with the cable ties provided.
- ▶ The devices shall be installed inside or as part of a tool secured enclosure.



EXPLOSION HAZARD

LITHIUM BATTERY

The lithium battery inside the Panel-PC may explode if handled incorrectly.

- ▶ Batteries must only be changed in an area known to be non-hazardous.
- ▶ Dispose of the XP-504 unit professionally.

1.9 Use in hazardous locations - ATEX

The II 3D Ex tc IIIC T70°C Dc U and II 3G Ex ec IIC T105°C Gc U ATEX certification is only valid for the Widescreen device:

Panel-PCs, Terminals, and Terminal with Extender RX, which are professionally placed in an enclosure: IP54 for Zone 2 ("gas"), IP6x for Zone 22 ("dust").

1. Description

1.9 Use in hazardous locations - ATEX



EXPLOSION HAZARD

Death, serious injury, and property damage may occur if the device is being used in a potentially explosive (classified) location and, during operation, an electrical plug-in connection is disconnected or the device is exposed to dangerous impacts or other types of dangerous mechanical shock.

- ▶ Use the device in the following environments only:
 - Non-hazardous (non-explosive) areas
 - Potentially explosive atmosphere, Zone 2 and Zone 22 (according to ATEX Directive), only these Widescreen devices:
 - XP-504-...-A10-A01-2., XP-504-...-A40-A01...(Panel-PC)
 - XP-504-...-TERMINAL and
 - XP-504-...-TERM-EXT or XP-504-...-TERMINAL-EXT
- ▶ The ground resistance of accessible metal parts must be less than 10^9 ohms
- ▶ Make sure that the device is not exposed to dangerous impacts and other types of dangerous mechanical shock.
- ▶ De-energize the device before disconnecting plug connections.
- ▶ Clean only with a clean soft antistatic damp cloth.
- ▶ When used in a potentially explosive atmosphere, Zone 2:
The Widescreen device are designed for installation in the front of enclosures in protection type "ec" (alternatively "eb"). The installation must be made in an enclosure with min. IP-54. This installation must be tested and certified separately. The maximum surface temperature at the outer surface is set to 105°C at the maximum ambient temperature of 45°C.
- ▶ When used in a potentially explosive atmosphere, Zone 22:
The Widescreen device are designed for installation in the front of enclosures in protection type "tc" (alternatively "ta" or "tb"). This installation must be tested and certified separately. The maximum surface temperature at the outer surface is set to 70°C at the maximum ambient temperature of 45°C.
- ▶ For booths Zone 2 and Zone 22 valid: The environment has to be designed to avoid any bunch discharge. For safe installation, comply with the specification to holding brackets and tightening torque in the respective Instruction leaflet for the device.

1.10 Marine approvals

An application for approval for the XP-504 has been submitted to Det Norske Veritas.

2. Safety regulations

2.1 Basics

2. Safety regulations

2.1 Basics

XP-504 devices have been designed according to the state of the art and all generally accepted safety rules and standards. However, this alone cannot eliminate all potential hazards, which is why it is necessary for you to be aware of all hazards and residual risks.

Do not run any XP-504 device unless it is in perfect technical condition. Make sure to always operate it as specified in this document and as intended.



Follow the safety instructions for the XP-504!

The section on safety instructions must be read and understood by everyone who will be working with the XP-504 before the actual work is performed Human-machine interface.

ATTENTION

Pay attention to the hazard severity levels used throughout this documentation whenever a hazard is indicated. The hazard symbol and signal word used and the corresponding text will provide information regarding the specific hazard and how to avoid or prevent it.

2.2 Mandatory requirements, personnel requirements

2.2.1 Occupational safety

All generally accepted occupational health and safety rules and standards (internal and national) must be complied with, as must be all applicable laws and regulations in the relevant country.

2.2.2 Personnel qualifications

The personnel responsible for installation, operation, maintenance, and repairs must have the necessary qualifications for the work they will be performing. They must be appropriately trained and/or briefed and be informed of all hazards and risks associated with the device.

2. Safety regulations

2.2 Mandatory requirements, personnel requirements

2.2.3 Information on how to use the device

This manual is considered an integral part of the information on how to use the XP-504 and must always be readily available in the device's close proximity so that users have access to it.

Make sure that every person who will be working with the XP-504, regardless of the lifecycle stage involved, has read and understood the relevant parts of the information for use for the XP-504.

Additional parts of the documentation and information for the XP-504, including the installation instructions, can be found at the Eaton Download Center - Documentation and at the product pages on the Internet



WARNING

Incomplete documents

Working with individual pages taken out from the information for use may lead to bodily injury and property damage due to failure to observe relevant safety information.

- ▶ Always work with the latest and full document.

2.2.4 Installation, maintenance, and disposal

Make sure that devices of the XP-504 series are connected, installed, serviced, and disposed of professionally and in line with all relevant standards and safety rules.



CAUTION

Installation requires qualified electrician



Prohibited uses, actions, etc.

It is strictly prohibited to use the device in order to implement safety-relevant functions (in the sense of personal and machine protection).



Bid

Dispose of recyclables as required by your local recycling regulations.

Devices of the XP-504 series no longer being used must be professionally disposed of as per local standards or returned to the manufacturer or relevant sales department.

2. Safety regulations

2.2 Mandatory requirements, personnel requirements

2.2.5 Prerequisites for proper operation

In order for XP-504 devices to be able to meet the contractually stipulated terms, the following must be observed:

- Only qualified personnel should be allowed to work with the XP-504.
- The personnel working with the XP-504 must have read the manual and must follow all the instructions in it.
- The required ambient conditions must be met.
- Maintenance work must be carried out correctly.



Make sure to read the → "Legal disclaimer", page 12.

We assume no liability for damages, consequential damages, and/or accidents caused by the following:

- Failure to follow any applicable occupational health and safety rules, standards, and/or regulations
- Device failures or function disturbances
- Improper use and/or handling
- Not following the instructions or observing the information in the documentation for the XP-504
- Alterations, changes, and repairs to the XP-504

2.3 Device-specific hazards



EXPLOSION HAZARD

Only these devices:

- XP-504-...-A10-A01-2. (Panel-PC)
- XP-504-...-TERMINAL and
- XP-504-...-TERM-EXT or XP-504-...-TERMINAL-EXT

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D, Class II, Division 2 Groups F and G, Class III or non-hazardous locations only.

- ▶ Use XP-504 devices in non-hazardous-location environments
- ▶ For safe installation, as well as to meet approval requirements, make sure to adhere to the specifications for holding brackets and tightening torques in the respective instruction leaflet for the device.
- ▶ USB and HDMI Connectors are for maintenance only, except when installed together with strain relief metal plate with the cable ties provided.
- ▶ The devices shall be installed inside or as part of a tool secured enclosure.

2. Safety regulations

2.3 Device-specific hazards



EXPLOSION HAZARD

Death, serious injury, and property damage may occur if the device is being used in a potentially explosive (classified) location and, during operation, an electrical plug-in connection is disconnected or the device is exposed to dangerous impacts or other types of dangerous mechanical shock.

- ▶ Use the device in the following environments only:
 - Non-hazardous (non-explosive) areas
 - Potentially explosive atmosphere, Zone 2 and Zone 22 (according to ATEX Directive), only these Widescreen devices:
 - XP-504-...-A10-A01-2., XP-504-...-A40-A01...(Panel-PC)
 - XP-504-...-TERMINAL and
 - XP-504-...-TERM-EXT or XP-504-...-TERMINAL-EXT
- ▶ The ground resistance of accessible metal parts must be less than 10^9 ohms
- ▶ Make sure that the device is not exposed to dangerous impacts and other types of dangerous mechanical shock.
- ▶ De-energize the device before disconnecting plug connections.
- ▶ Clean only with a clean soft antistatic damp cloth.
- ▶ When used in a potentially explosive atmosphere, Zone 2:
The Widescreen device are designed for installation in the front of enclosures in protection type "ec" (alternatively "eb"). The installation must be made in an enclosure with min. IP-54. This installation must be tested and certified separately. The maximum surface temperature at the outer surface is set to 105°C at the maximum ambient temperature of 45°C.
- ▶ When used in a potentially explosive atmosphere, Zone 22:
The Widescreen device are designed for installation in the front of enclosures in protection type "tc" (alternatively "ta" or "tb"). This installation must be tested and certified separately. The maximum surface temperature at the outer surface is set to 70°C at the maximum ambient temperature of 45°C.
- ▶ For booths Zone 2 and Zone 22 valid: The environment has to be designed to avoid any bunch discharge. For safe installation, comply with the specification to holding brackets and tightening torque in the respective Instruction leaflet for the device.



EXPLOSION HAZARD
LITHIUM BATTERY

The lithium battery installed in Panel-PC or Box-PC may explode if handled incorrectly.

- ▶ Do not replace batteries in hazardous locations
- ▶ Dispose of the XP-504 unit professionally.



CAUTION
DESTRUCTION

The XP-504 should only be opened by the manufacturer or by an authorized center. Operate the device until only with the enclosure fully closed and sealed.



CAUTION
ELECTROSTATIC DISCHARGE

Do not touch components (e.g., connector pins) that are electrostatic-sensitive.

- ▶ Discharge any static electricity from your body before touching the XP-504 (e.g., by touching an earthed metal object).

Electrostatic discharges may damage or ruin assembly parts.

Because of this, it is necessary to take precautions whenever handling the XP-504 cards.

Please refer to the guidelines for electrostatic-sensitive components for more information (ESD guidelines).



CAUTION
INTERFERENCES

The values specified in the technical data, as well as the device's electromagnetic compatibility (EMC), cannot be guaranteed if the following are used: unsuitable cables, improperly assembled and terminated cables, and/or wiring that does not conform to the applicable standards.

Only use cables assembled and terminated by professionals.

The cables being used must be assembled and terminated as required by the port/interface description in this document.

When wiring the XP-504, follow all instructions regarding how to wire the corresponding port/interface.

All general Directives and standards must be complied with.

2. Safety regulations

2.3 Device-specific hazards



CAUTION INTERFERENCES

Screw all plug-in connections or lock them into place in order to improve screening.

Signal cables must not be routed in the same cable duct with power cables.

Before putting the system into operation, check all cable connections to make sure that everything has been wired properly.

Make sure that all voltages and signals have the required values as per the specification.



CAUTION SAFELY DIVERTING ELECTRICAL INTERFERENCE CURRENTS

XP-504The must be connected to a central earth point with a conductor that is as short and has as low a resistance as possible.

- Ground connection characteristics:
Wire cross-sectional area $\geq 6 \text{ mm}^2$,
length $\leq 350 \text{ mm}$, width $\geq 20 \text{ mm}$

The XP-504 needs to be connected to the conductive structure in, e.g., the control panel using the central earth point. This method of earthing is mandatory required for proper function.



DANGER STRAY CURRENTS

Large equalizing currents between the functional earthing system and the ground system of different devices may result in fire or in malfunctions due to signal interference.

- ▶ If necessary, route an equipotential bonding conductor, with a cross-sectional area that is several times larger than that of the cable shielding, parallel to the cable.



CAUTION NON-GALVANICALLY-ISOLATED INTERFACES

The device may be damaged by potential differences.

- ▶ The GND terminals of all bus modules must be connected.
- ▶ The device must be de-energized before connecting or disconnecting any connections to it.

2. Safety regulations

2.3 Device-specific hazards



CAUTION DATA LOSS

If the SD card is being written to and a voltage drop occurs or the card is removed, data may be lost or the SD card may be ruined.

- ▶ Insert the SD card only when the XP-504 is de-energized.

Avoid writing to SD cards. Reasons:

- SD cards have a limited number of write cycles.
 - If there is a voltage drop while a write operation is in progress, data loss is highly likely to occur.
- ▶ Remove the SD card only when the XP-504 is de-energized.
 - ▶ Before switching off the device, make sure that there are no programs writing to the SD card.



CAUTION SHORT-CIRCUIT HAZARD

If the device is or has been exposed to environmental fluctuations (ambient temperature, air humidity), condensation may form on or inside it. As long as this condensation is present, there will be a short-circuit hazard.

Do not switch on the device when it has condensation in or on it.

If the device has condensation in or on it, or if the panel has been exposed to environmental fluctuations, let the panel settle into the existing ambient temperature before switching it on. Do not expose the device to direct thermal radiation from heating appliances.



CAUTION UV LIGHT

Plastics will become brittle when exposed to UV light. This artificial aging will reduce the XP-504 unit's lifespan. Protect the XP-504 series devices from direct sunlight and other sources of UV radiation.

2. Safety regulations

2.3 Device-specific hazards



CAUTION

POINTY, SHARP OBJECTS AND CORROSIVE LIQUIDS

When cleaning the XP-504:

- Do not use any pointy or sharp objects (e.g., knives).
- Do not use aggressive or abrasive cleaning products or solvents.

Make sure that no liquids get into the XP-504 unit (short-circuit hazard) and that the XP-504 unit is not damaged in any way.



CAUTION

INSTALLATION CUT-OUT HUMAN-MACHINE INTERFACE

The mounting cutout for Panel-PC, Widescreen device and Terminal with Extender RX must be located in a position that will not defeat the purpose of stabilizing webs or other reinforcing elements in the control panel. If necessary, reinforcing elements must be installed/added.

An IP65 degree of protection will only be ensured if there is sufficient stiffness and the device is properly mounted.

- Minimum sheet thickness of control cabinet where the device will be flush mounted:
 $1.5 \text{ mm (0.06")} \leq d \leq 4 \text{ mm (0.16")}$
- In order for the device to be properly mounted, every single one of the holding brackets must be used at its intended spot.



CAUTION

When using commercially available peripheral devices (e.g., with the USB port), it is important to keep in mind that their EMC interference immunity parameters may render them unsuitable for use in industrial environments.

The USB and HDMI Connectors are for maintenance only, except when installed together with strain relief metal plate with the cable ties provided.

2. Safety regulations

2.3 Device-specific hazards



CAUTION **FORCES ON THE RJ45 INTERFACE**

Communications may be affected, and the connection's mechanical components may be damaged, if the RJ45 interface is subjected to strong vibrations or the RJ45 plug-in connection is subjected to pulling.

- Protect the RJ45 plug-in connection from strong vibrations.
- Protect the RJ45 plug-in connection from tensile forces at the socket.



WARNING

XP-504 units are products designed for use in industrial environments as defined in ICE/EN 61000-6-4. These products can cause radio interference in domestic environments. In this case, the party operating the products must implement appropriate radio interference suppression measures.



CAUTION

Installation requires qualified electrician

3. Installation

3. Installation



CAUTION

Installation requires qualified electrician



CAUTION

ELECTROSTATIC DISCHARGE

Do not touch components (e.g., connector pins) that are electrostatic-sensitive.

- ▶ Discharge any static electricity from your body before touching the XP-504 (e.g., by touching an earthed metal object).

Electrostatic discharges may damage or ruin assembly parts.

Because of this, it is necessary to take precautions whenever handling the XP-504 cards.

Please refer to the guidelines for electrostatic-sensitive components for more information (ESD guidelines).

ATTENTION

Arrange for an electrician to install and connect the power supply.

- The controls and connectors must remain accessible even after the device has been installed.
- No direct sunlight on the devices.



CAUTION

UV LIGHT

Plastics will become brittle when exposed to UV light. This artificial aging will reduce the XP-504 unit's lifespan. Protect the XP-504 series devices from direct sunlight and other sources of UV radiation.

- Make sure that the XP-504 devices do not overheat.
- The minimum clearance to components that radiate heat, such as transformers under heavy loads, is 15 cm.
- The controls and connectors must remain accessible even after the device has been installed.

3.1 Temperatures

The environmental ambient conditions for operation at the installation site must not exceed the specified values:

Ambient climatic conditions	
Air pressure (in operation)	795 - 1080 hPa Max. 2000 m above sea level
Temperature Operation	Ambient temperature t_a if using natural convection $\pm 0 - +45$ °C ($+32 - +113$ °F) [System with SD- or mSATA memory]
Storage / Transport	$-20 - +60$ °C ($-4 - +140$ °F)
Humidity	Relative humidity 20 - 85 %, no condensation
Condensation	non-condensing
Ambient air	Free of corrosive gases

3.1.1 Aeration and de-aeration

- Do not cover the ventilation openings, cooling fins and housing of the XP-504 PCs during installation:
They are designed to allow air to circulate in order to cool the device.
- The XP-504 uses natural convection-based passive cooling, i.e., it does not use fans.
- The heat from the CPU and the power semiconductors in the power supply unit is brought together through a heat spreader and then dispersed into the surrounding air through the cooling fins on the PC's housing.

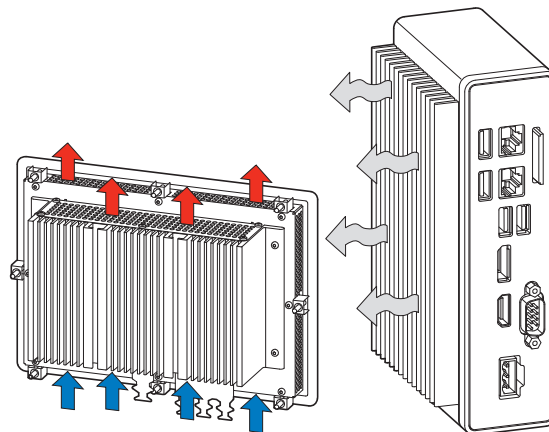


Fig. 6: Example: Panel-PC airflow, heat dissipation through cooling fins on Box-PC

- Make sure that there will be enough volume for air changes inside the control cabinet, etc.
Maintain the specified clearance around the XP-504 devices.

3. Installation

3.1 Temperatures

- *Clear Zone*

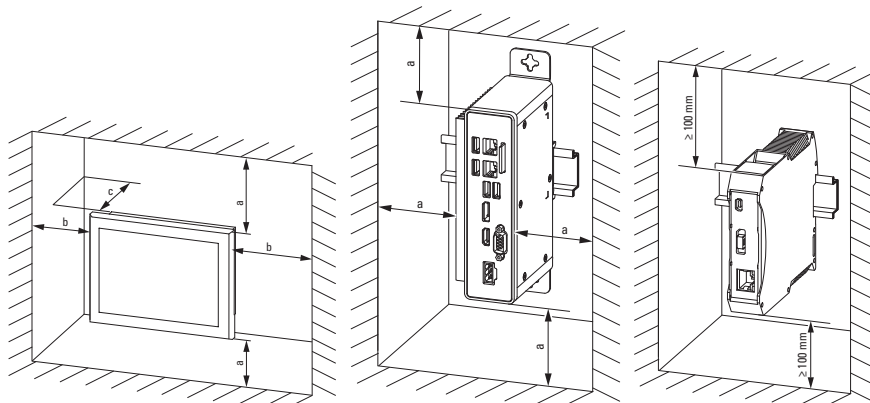


Fig. 7: Mounting distance $a, b \geq 50 \text{ mm (1.97")}$, $c \geq 20 \text{ mm (0.79")}$

- If you will be installing the XP-504 devices in complex systems together with other assemblies, you must ensure that there will be enough air circulation in order to prevent overheating.

Ambient temperature with natural convection: $\theta: 0^\circ\text{C (32}^\circ\text{F)} \leq T \leq 45^\circ\text{C (113}^\circ\text{F)}$

The panel builder is responsible for the temperature rise calculation.

Eaton will provide heat dissipation data as necessary for design verification in conformity with IEC EN 61439 – please refer to the data sheet for the XP-504 in the online catalog at [Eaton.com/ecat](https://www.eaton.com/ecat)

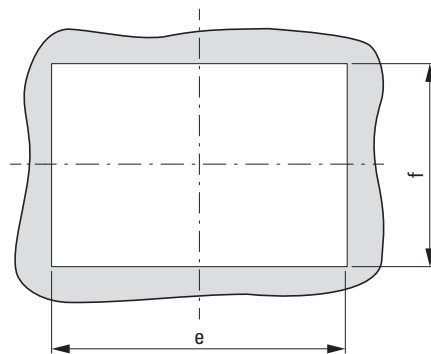
3.2 Installation position

3.2.1 Panel-PC, Terminal and Terminal with Extender RX

3.2.1.1 Mounting position

The following must be taken into account when selecting the installation position indoors:

- The size of the installation cutout depends on the device type:
 10.1" (25.65 cm): $e = 256 \text{ mm (10.07") } \pm 0.5 \text{ (0.02")}$, $f = 175 \text{ mm (6.88") } \pm 0.5 \text{ (0.02")}$
 15.6" (39.6 cm): $e = 388 \text{ mm (15.28") } \pm 0.5 \text{ (0.02")}$, $f = 239 \text{ mm (9.40") } \pm 0.5 \text{ (0.02")}$
 21.5" (54.6 cm): $e = 519 \text{ mm (20.43") } \pm 0.5 \text{ (0.02")}$, $f = 313 \text{ mm (12.32") } \pm 0.5 \text{ (0.02")}$



- Make sure that the material at the installation location is sufficiently thick
 Material thickness of $1.5 \text{ mm (0.06") } \leq d \leq 4 \text{ mm (0.16")}$
 and flatness of $\square \leq 0.5 \text{ mm (0.02")}$ at the installation cutout with a surface roughness $\checkmark Rz \leq 120$; IP 65 → DIN ISO 2768-2 (K)

3.2.1.2 Mounting position

The Panel-PC, Terminal, and Terminal with Extender RX devices in the XP-504 series are designed for installation in landscape or portrait orientation.

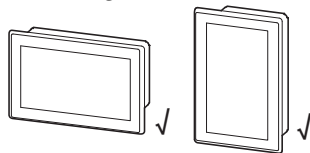


Fig. 8: Mounting position

It can be mounted in a perfectly vertical position or at an angle of up to max. $-45^\circ \leq \alpha \leq \text{max.} + 10^\circ$ in the directions shown below.

If the device is not mounted in a perfectly vertical position, make sure that air will still be able to circulate properly through the openings in the housing.

3. Installation

3.2 Installation position

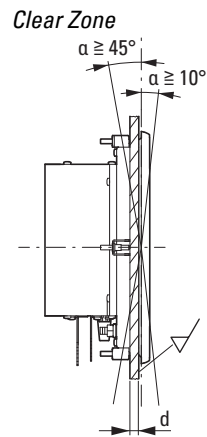


Fig. 9: Mounting position using Panel-PC as an example

- The controls and connectors must remain accessible even after the device has been installed.



The interfaces are located on the bottom of the computer core on Panel-PC, Terminal and Terminal with Extender RX.

Make sure to consider the space required to remove the SD card and replace the battery, as well as the space needed for the interface connections.

3.2.2 Box-PC

3.2.2.1 Mounting position

The XP-504-BP-... or XP-504-BOXPC-... is designed to be vertically flush-mounted in control cabinets.

A mounting bracket is used for installation on the DIN-rail in the control cabinet.

Alternatively, the device can be installed in a horizontal or vertical position on a mounting wall with the help of the two mounting plates.

➔ The mounting wall where the Box-PC is installed must be able to bear four times the device weight, including the corresponding retaining elements.

3.2.2.2 Mounting position

The device can be mounted horizontally and vertically provided that the required air-flow clearances are maintained.

➔ Make sure to install the device in the right position.

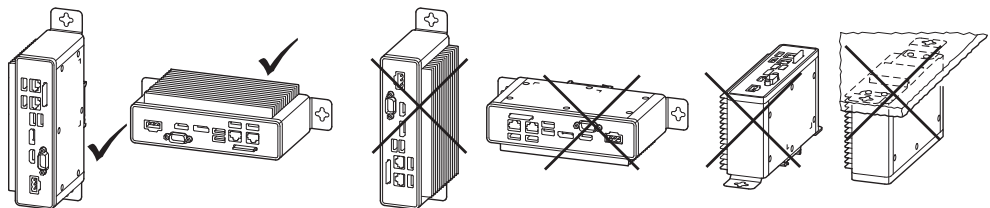


Fig. 10: Mounting position Box-PC

- Correct mounting position: Power connector at the bottom or heat sink at the top.
- The controls and connectors must remain accessible even after the device has been installed.

➔ The interfaces are located on the front of the Box-PC. Make sure to consider the space required to remove the SD card and replace the battery, as well as the space needed for the interface connections.

3.2.3 Extender TX

3.2.3.1 Mounting position

The Extender TX is designed to be vertically flush-mounted in control cabinets.

A mounting bracket is used for installation on the DIN-rail in the control cabinet.

3.2.3.2 Mounting position

Only vertical mounting is allowed, and all airflow clearances must be maintained.

3. Installation

3.2 Installation position

➔ Make sure to install the device in the right position.

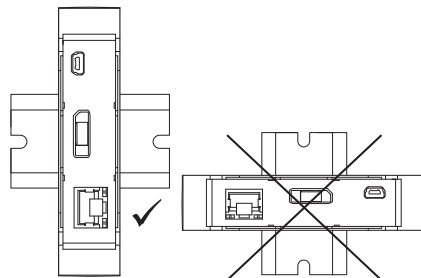


Fig. 11: Mounting position Extender TX

- Power connector at the top
- The connectors must remain accessible even after the device has been installed.

➔ The interfaces are located on the front of the Extender TX.
Make sure to maintain the required space for the interface connections.

3.3 Technical conditions for acceptance by Underwriters Laboratories Inc. (UL)

3.3 Technical conditions for acceptance by Underwriters Laboratories Inc. (UL)

3.3.1 Panel-PC

The following conditions must be met in order for the certification of UL 61010-2-201 as per Panel-PC to apply:

Do not exceed a mounting position range between 45° towards the back and 10° towards the front for landscape and vertical installation

Operation up to an altitude of 2000 m (above sea level)

Overvoltage category II

Pollution Degree 2

Suitable power supply for class III (SELV in conformity with UL 61010-2-201)

Permissible voltage range -25%/+50% of rated operating voltage 24 V_{DC}.

USB power restricted to a maximum total connected load of 9 W

Type rating

Use in type 4X or type 12 enclosures, use indoors only, at dry locations only

IP65 not evaluated by UL

Ambient temperature 0°C to 45°C

Maximum relative humidity of 95% for temperatures of up to 45 °C, derated linearly to a relative humidity of 50% at 40 °C.

The torque used to tighten the screw terminals on the plug-in connection for the supply voltage must not exceed 0.5 - 0.6 Nm (4.4 -5.3 lb-in).

The devices shall be installed inside or as part of a tool secured enclosure.

USB and HDMI Connectors are for maintenance only, except when installed together with strain relief metal plate with the cable ties provided.

3. Installation

3.3 Technical conditions for acceptance by Underwriters Laboratories Inc. (UL)

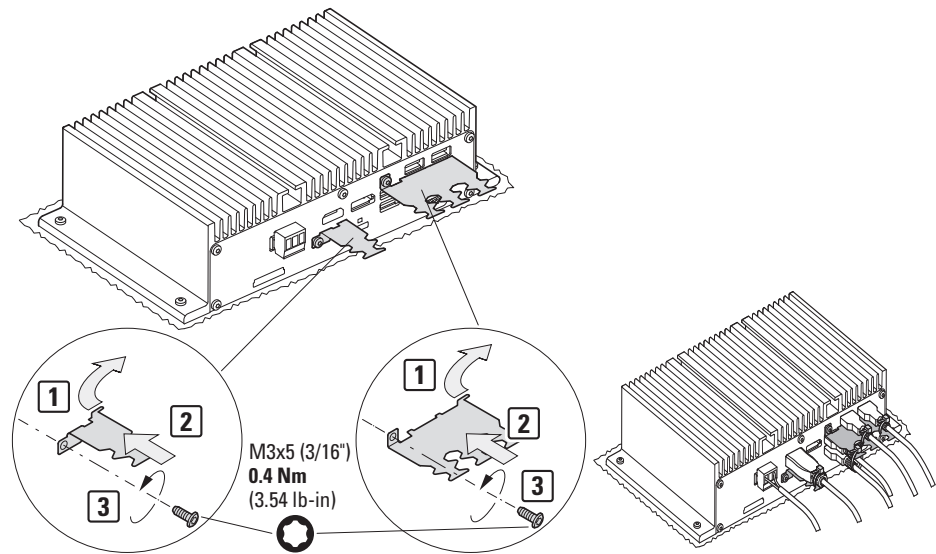


Fig. 12: Mounting the strain reliefs on the Panel-PC

3.3.2 Terminal

The following conditions must be met in order for the certification of UL 61010-2-201 as per Terminal to apply:

Do not exceed a mounting position range between 45° towards the back and 10° towards the front for landscape and vertical installation

Operation up to an altitude of 2000 m (above sea level)

Overtoltage category II

Pollution Degree 2

Suitable power supply for class III (SELV in conformity with UL 61010-2-201)

Permissible voltage range -15%/+20% of rated operating voltage 24 V_{DC}

Type rating

Use in type 4X or type 12 enclosures, use indoors only, at dry locations only

IPxx not evaluated by UL

Ambient temperature 0°C to 45°C

Maximum relative humidity of 95% for temperatures of up to 45 °C, derated linearly to a relative humidity of 50% at 40 °C.

The torque used to tighten the screw terminals on the plug-in connection for the supply voltage must not exceed 0.5 - 0.6 Nm (4.4 -5.3 lb-in).

The devices shall be installed inside or as part of a tool secured enclosure.

USB shall be installed together with strain relief metal plate with the cable tie provided.

3.3 Technical conditions for acceptance by Underwriters Laboratories Inc. (UL)

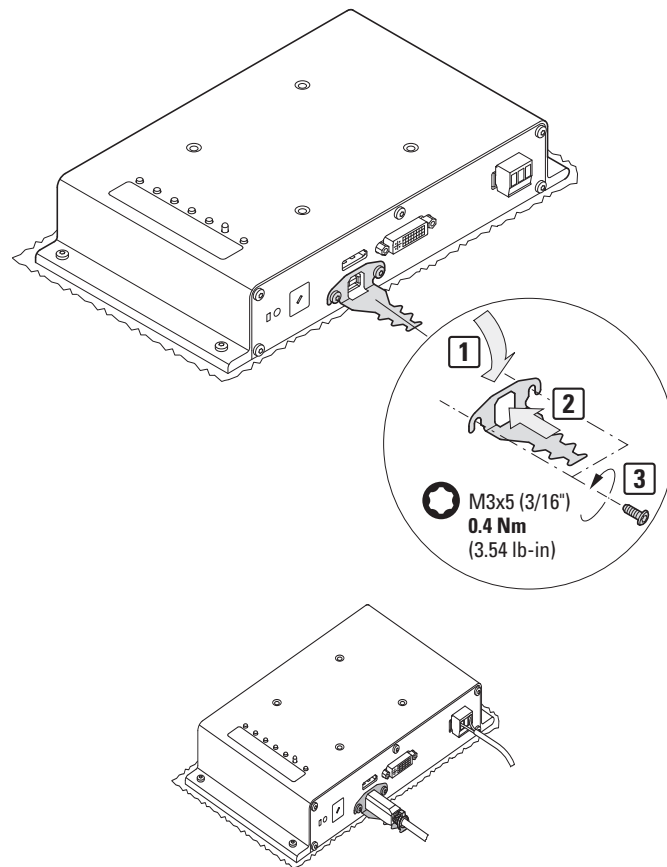


Fig. 13: Mounting the strain reliefs on the Terminal

3.3.3 Terminal with Extender RX

The following conditions must be met in order for the certification of UL 61010-2-201 as per Terminal with Extender RX to apply:

Do not exceed a mounting position range between 45° towards the back and 10° towards the front for landscape and vertical installation

Operation up to an altitude of 2000 m (above sea level)

Overvoltage category II

Pollution Degree 2

Suitable power supply for class III (SELV in conformity with UL 61010-2-201)

Permissible voltage range -25%/+50% of rated operating voltage 24 V_{DC}.

Type rating

Use in type 4X or type 12 enclosures, use indoors only, at dry locations only

IPxx not evaluated by UL

Ambient temperature 0°C to 45°C

Maximum relative humidity of 95% for temperatures of up to 45 °C, derated linearly to a relative humidity of 50% at 40 °C.

3. Installation

3.3 Technical conditions for acceptance by Underwriters Laboratories Inc. (UL)

The torque used to tighten the screw terminals on the plug-in connection for the supply voltage must not exceed 0.5 - 0.6 Nm (4.4 -5.3 lb-in).

The devices shall be installed inside or as part of a tool secured enclosure.

3.3.4 Box-PC

The following conditions must be met in order for the certification of UL 61010-2-201 as per Box-PC to apply:

Vertical mounting with power-terminal at the bottom or horizontal mounting with heat sink at the top

Operation up to an altitude of 2000 m (above sea level)

Overvoltage category II

Pollution Degree 2

Suitable power supply for class III (SELV in conformity with UL 61010-2-201), rated 24 VDC (12 .. 32V), which fulfill the requirements on a limited-energy circuit according to clause 9.4 of the standard UL/EN 61010-1 or circuits which fulfill the requirements of NEC Class 2 of the standard UL 1310

USB power restricted to a maximum total connected load of 14 W

Use indoors only, at dry locations only

IP20 not evaluated by UL

Ambient temperature -10°C to +45°C

Relative humidity from 10% to 90%

3.3.5 Extender TX

The following conditions must be met in order for the certification of UL 61010-2-201 as per transmitter module Extender TX to apply:

Only vertical mounting with power-terminal at the top is allowed

Operation up to an altitude of 2000 m (above sea level)

Overvoltage category II

Pollution Degree 2

Suitable power supply for class III (SELV in conformity with UL 61010-2-201)

Permissible operating voltage range from 4.6 V_{DC} to 31.2 V_{DC}.

Use indoors only, at dry locations only

IP20 not evaluated by UL

Ambient temperature -20°C to +50°C

Relative humidity from 10% to 80%

3.4 Unpacking and checking the equipment supplied

3.4 Unpacking and checking the equipment supplied

- ▶ Check the packaging for transit damage.
- ▶ Carefully remove the packaging in order to avoid damaging the device.
- ▶ Check the package contents for visible transit damage.
- ▶ Use the information in the → "Std. packPanel-PC", page 49 table to make sure that the contents are complete.



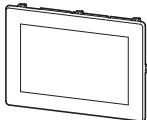




Keep the original packaging so that you will be able to use it in the future if you need to transport or ship the Panel-PC. Make sure to also keep the documents enclosed with the device and/or to give them to the end customer.

Missing parts or damage

If you notice anything wrong, please contact your distributor or Eaton Service +1 877-386-2273 (en) / 877-ETN-CARE (877-386-2273)

The packages for this device series come with:





Tab. 2: Std. packPanel-PC

Unit	XP-504-...
1 x	Installation instructions IL048016ZU
1 x 	Panel-PC
1 x 	Plug connector MSTBT 2.5/3-ST-5.08
	Holding bracket with set screw Internal hexagon M 4 x 25 DIN 914 galvanized
	8 x XP-504-10-...
	10 x XP-504-15-...
	12 x XP-504-21-...
5 x 	Cable binder
2 x 	Strain relief metal plate

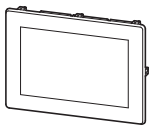




3. Installation

3.4 Unpacking and checking the equipment supplied

Tab. 3: Std. packBox-PC

Unit	Description
1 x	Installation instructions IL048017ZU
1 x 	XP-504-BP-... or XP-504-BOXPC-...
2 x 	Mounting plates with M3x5 (3/16") TORX T10 A2 ISO14583
4 x 	
1 x 	Plug connector MSTBT 2.5/3-ST-5.08

Tab. 4: Std. packTerminal

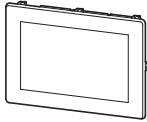


Unit	Description	
1 x	Installation instructions IL048018ZU	
1 x 	XP-504-...-TERMINAL	
1 x 	Plug connector MSTBT 2.5/3-ST-5.08	
	Holding bracket with set screw Internal hexagon M 4 x 25 DIN 914 galvanized	
	8 x	XP-504-10-...
	10 x	XP-504-15-...
	12 x	XP-504-21-...
1 x	USB-A to USB-B cable	
1 x	DisplayPort cable	
1 x 	Cable binder	
1 x 	Strain relief metal plate	

Tab. 5: Std. packTerminal with Extender RX

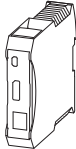

Unit	Description
1 x	XP-504-...-TERM-EXT or XP-504-...-TERMINAL-EXT

3. Installation

3.4 Unpacking and checking the equipment supplied

Unit	Description
	
1 x 	Plug connector MSTBT 2.5/3-ST-5.08
1 x 	Installation instructions IL048018ZU Holding bracket with set screw Internal hexagon M 4 x 25 DIN 914 galvanized
8 x	XP-504-10-...
10 x	XP-504-15-...
12 x	XP-504-21-...
1 x	USB-A to Mini-USB cable
1 x	DisplayPort cable

Tab. 6: Std. packXP-504-EXT module

Unit	Description
1 x 	XP-504-EXT module
1 x	Installation instructions IL048019ZU
1 x 	Plug connector MSTBT 2.5/4-ST-5.08

The XP-504 series is sturdily built, but the components inside it are sensitive to excessively strong vibrations and/or mechanical shock.

Accordingly, make sure to protect the XP-504 from mechanical loads that exceed the scope of the unit's intended use.

The device should only be transported in its original packaging after being packed properly.

3. Installation

3.5 Mounting

3.5 Mounting

3.5.1 Panel-PC, Terminal and Terminal with Extender RX

CAUTION

Arrange for a professional technician to mount the device.



CAUTION

INSTALLATION CUT-OUT HUMAN-MACHINE INTERFACE

The mounting cutout for Panel-PC, Widescreen device and Terminal with Extender RX must be located in a position that will not defeat the purpose of stabilizing webs or other reinforcing elements in the control panel. If necessary, reinforcing elements must be installed/added.

An IP65 degree of protection will only be ensured if there is sufficient stiffness and the device is properly mounted.

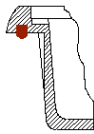
- Minimum sheet thickness of control cabinet where the device will be flush mounted:
 $1.5 \text{ mm (0.06")} \leq d \leq 4 \text{ mm (0.16")}$
- In order for the device to be properly mounted, every single one of the holding brackets must be used at its intended spot.

List of tools:

- Wrench for 2 mm Allen key (5/64")
- PZ2 Pozidriv screwdriver
- Open-ended wrench SW10
- Ground strap: length $\leq 35 \text{ cm}$, width $\geq 20 \text{ cm}$ with eyelet
- Torque wrench with Newton meter scale

3.5.1.1 Preparations

1. Select the installation location you want for the device.
Make sure that all site criteria are met → page 41.
2. Make a cutout with the right size for the HMI at the location you selected.
3. Make sure that the mounting cutout has the right size.
4. Check that the gasket is resting properly inside the groove at the back of the Widescreen device.



5. Pre-assemble the holding brackets with the set screws.
Screw the Internal hexagon M 4 x 25 DIN 914 galvanized set screws into the holding brackets.

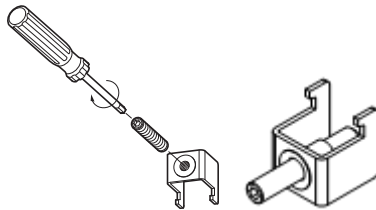


Fig. 14: Pre-installing the holding brackets

The holding brackets are included as accessories with the HMI. The number of brackets will depend on the specific device model

8 x 10" devices

10 x 15" devices

12 x 21" devices

- ➔ All holding brackets need to be installed in order to get an IP65 degree of protection.
- ➔ All holding brackets need to be installed for the UL listing.
- ➔ Together with the gasket, the holding brackets are the main element required for achieving an IP65 (at front) degree of protection.

The purpose of the holding brackets is to secure the Panel-PC, Terminal and Terminal with Extender RX in the installation cutout, e.g., on the control panel door. To this end, the brackets must be hooked into the enclosure and screwed against the control panel door, etc.

3. Installation

3.5 Mounting

10" devices

Locations for eight holding brackets for an IP65 degree of protection and for devices used in hazardous locations

- On the top and bottom sides of the device:
One holding bracket each at the left and right outer fixing positions, as well as at the center
- On the left and right sides of the device:
One holding bracket each at the center fixing position

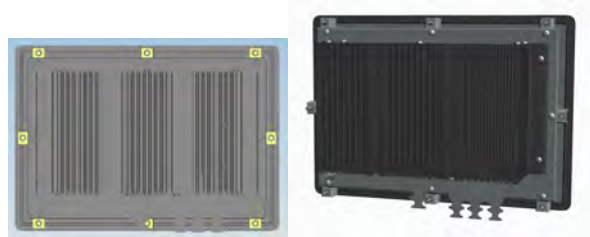


Fig. 15: Location of holding brackets for IP65 on the XP-504-10-...

15" devices

Locations for ten holding brackets for an IP65 degree of protection and for devices used in hazardous locations

- On the top and bottom sides of the device:
One holding bracket each at the left and right outer fixing positions, as well as at the center
- On the left and right sides of the device:
One holding bracket each at the upper and lower fixing positions

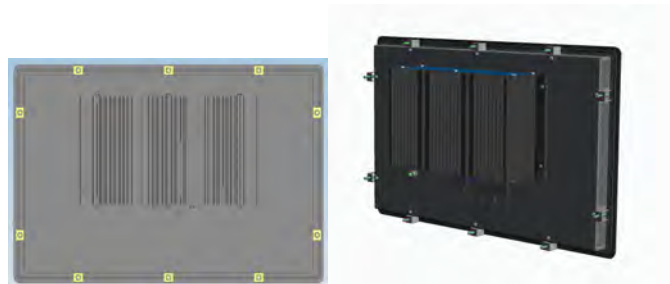


Fig. 16: Location of holding brackets for IP65 on the XP-504-15-...

21" devices

Locations for twelve holding brackets for an IP65 degree of protection and for devices used in hazardous locations

- On the top and bottom sides of the device:
One holding bracket each at the left and right outer fixing positions, as well as to the left and right of the center
- On the left and right sides of the device:
One holding bracket each at the upper and lower fixing positions

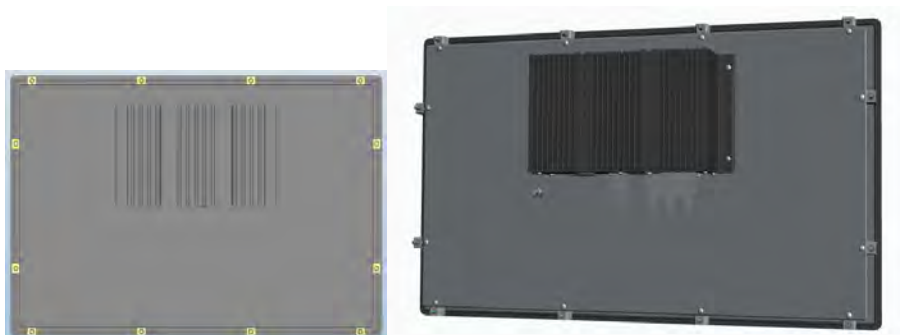


Fig. 17: Location of holding brackets for IP65 on the XP-504-21-...

IP rating

If the gasket is resting in the correct position and the holding brackets are installed properly, the following IP degrees of protection will be achieved:

- IP65 (at front)
- IP20 (at rear)

3. Installation

3.5 Mounting

3.5.1.2 Installing the Panel-PC and Terminals

- ▶ 1. Insert the XP-504 into the mounting cutout from the front.

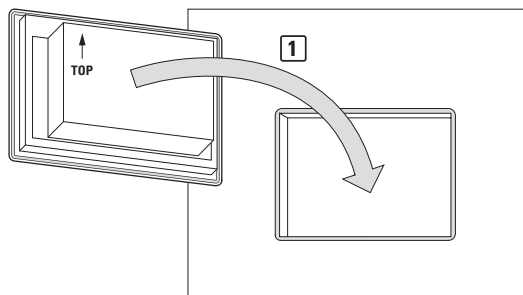


Fig. 18: Mounting in the installation cutout

- ▶ 2. As long as the device has not been secured with all holding brackets, make sure to secure it so that it will not fall down.
- ▶ 3. Insert the holding brackets into the first device cutout intended for this purpose.

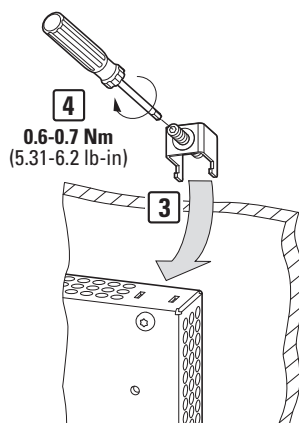


Fig. 19: Installing the holding brackets

- ▶ 4. Tighten the set screw until it comes into contact with the installation surface.
- ▶ 5. Follow steps 3 and 4 to insert the next holding bracket at a 90° angle to the last one you inserted.
- ▶ 6. Repeat steps 3 and 4 until all necessary holding brackets are installed.
- ▶ 7. Check that the device is in its correct, centered position and that the gasket is in contact all around; adjust if necessary
- ▶ 8. Tighten the set screws in a criss-cross sequence with a max. torque of 0.6 - 0.7 Nm (5.31 - 6.2 lb-in).

3.5.2 Box-PC

3.5.2.1 Rail mounting

A mounting bracket is used for vertical installation on the 35-mm IEC/EN 60715 DIN-rail in the control cabinet.

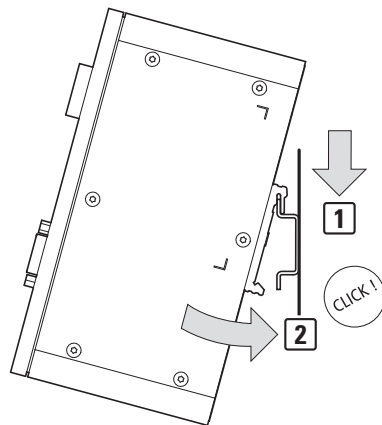


Fig. 20: Mounting Box-PC on top-hat rail

- ▶ Engage the DIN-rail with the top part of the device mounting bracket.
- ▶ Push down on the mounting bracket spring so that the device will snap into place.
To do this, push the bottom of the Box-PC onto the DIN-rail at the same time.
- ▶ Check to make sure that the device is securely mounted on the DIN-rail.

3. Installation

3.5 Mounting

3.5.2.2 Mounting wall

CAUTION

Arrange for a professional technician to mount the device if you are using this alternative mounting solution with the wall mount.

CAUTION

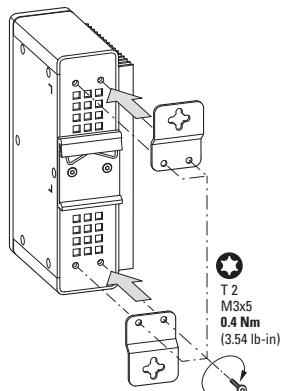
The cabinet mounting wall in which the Box-PC is installed must be able to bear four times the device weight, including the corresponding retaining elements.

The two enclosed mounting plates are identical and are included in the equipment supplied with the Box-PC together with the required four M3x5 (3/16") TORX T10 A2 ISO14583.

- ▶ Use both mounting plates.

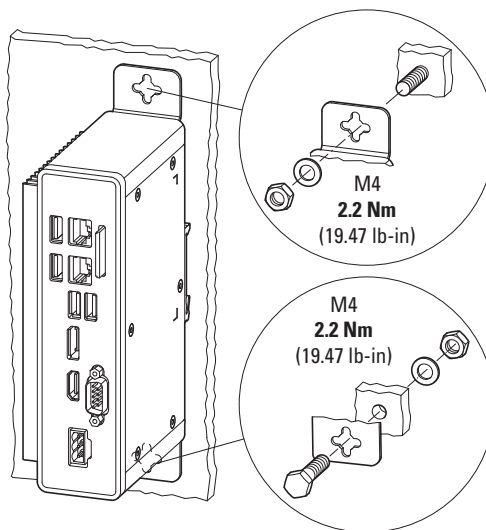


- ▶ Tighten each M3x5 (3/16") TORX T10 A2 ISO14583 with a torque of 0.4 Nm (3.54 lb-in).



For mounting on the mounting wall, you will need to use M4 screw assemblies through the mounting plates.

- ▶ Make sure to use both mounting points.
- ▶ Tighten each M4 screw assembly with a torque of 2.2 Nm (19.4716 lb-in).

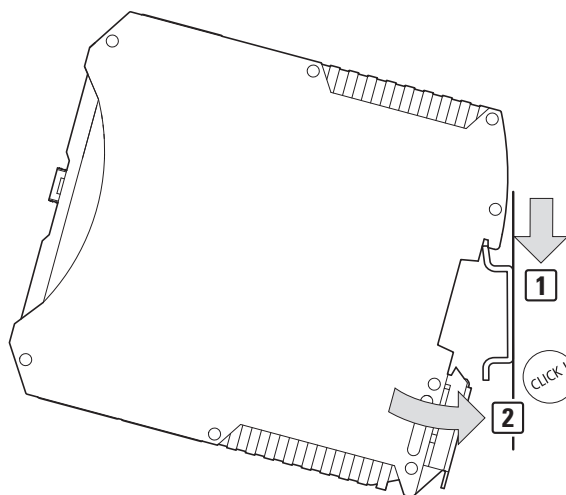


3.5.3 Extender TX

Rail mounting

A mounting bracket is used for vertical installation on the 35-mm IEC/EN 60715 DIN-rail in the control cabinet.

- ▶ Engage the DIN-rail with the device with the power supply facing up.
- ▶ Snap the spring mechanism into place on the DIN-rail.
To do this, push down on the mounting clamp spring and push the bottom of the XP-504-EXT module onto the DIN-rail.



- ▶ Check to make sure that the device is securely mounted on the DIN-rail.

3. Installation

3.6 Preparing the device for operation

3.6 Preparing the device for operation



CAUTION INTERFERENCES

Screw all plug-in connections or lock them into place in order to improve screening.

Signal cables must not be routed in the same cable duct with power cables.

Before putting the system into operation, check all cable connections to make sure that everything has been wired properly.

Make sure that all voltages and signals have the required values as per the specification.



CAUTION SAFELY DIVERTING ELECTRICAL INTERFERENCE CURRENTS

XP-504The must be connected to a central earth point with a conductor that is as short and has as low a resistance as possible.

- Ground connection characteristics:
Wire cross-sectional area $\geq 6 \text{ mm}^2$,
length $\leq 350 \text{ mm}$, width $\geq 20 \text{ mm}$

The XP-504 needs to be connected to the conductive structure in, e.g., the control panel using the central earth point. This method of earthing is mandatory required for proper function.



CAUTION SHORT-CIRCUIT HAZARD

If the device is or has been exposed to environmental fluctuations (ambient temperature, air humidity), condensation may form on or inside it. As long as this condensation is present, there will be a short-circuit hazard.

Do not switch on the device when it has condensation in or on it.

If the device has condensation in or on it, or if the panel has been exposed to environmental fluctuations, let the panel settle into the existing ambient temperature before switching it on. Do not expose the device to direct thermal radiation from heating appliances.

3.6.1 Electrical connection

Before connecting the power supply



WARNING

The device should only be run with safety extra-low voltage (functional extra-low voltage with protective separation).

The power transformer must conform to the relevant standards.



CAUTION

The voltage being applied must meet the requirements for safety extra-low voltages (SELV) set forth in IEC/UL 61010-2-201.

Pay attention to the polarity („+“ and „-“)!



CAUTION

The Box-PC should be supplied by circuits, with rated 24 VDC (12 .. 32V), which fulfill the requirements on a limited-energy circuit according to clause 9.4 of the standard UL/EN 61010-2-201 or circuits which fulfill the requirements of NEC Class 2 of the standard UL 1310

XP-504 devices feature an internal fuse and protection against polarity reversal for the galvanically isolated power supply.

The PCs in the XP-504 series and terminals with Extender RX, as well as the XP-504-EXT module, require a 24 V_{DC} rated operating voltage from a power supply with safe isolation (SELV).

A galvanically isolated power supply is only found in Panel-PCs and Terminal with Extender RX.

Power Supply			
Rated operating voltage	+ 24 VDC SELV (safety extra low voltage)		
Permissible voltage range	18-36 V DC (SELV)	Panel-PC, Terminal with Extender RX	
	12-32 V DC (SELV)	Box-PC	
	20.4-28.8 V DC (SELV)	Terminal	
	5, 12 or 24 V DC (SELV)	Extender TX	
Fuse	Yes	fuse not accessible	
Potential isolation	no	Box-PC, Terminal, Extender TX	
	Yes	Panel-PC, Terminal with Extender RX	
Electrical current I_e	Panel-PC	Terminal	Terminal with Extender RX
10.1" (25.65 cm)	1.6 A	0.3 A	0.5 A
15.6" (39.6 cm)	1.8 A	0.4 A	0.6 A
21.5" (54.6 cm)	2.0 A	0.7 A	0.9 A

3. Installation

3.6 Preparing the device for operation

Power consumption Extender TX module: max. 0.13 A, Box-PC: 1.3 A at 24V

3. Installation

3.6 Preparing the device for operation

Power consumption	
PCs of the device series XP-504	
XP-504-10-...	max. 38.4 W
XP-504-15-...,	max. 43.2 W
XP-504-21-...	max. 48.0 W
XP-504-BP-... or XP-504-BOXPC-...	max. 31.2 W
Widescreen devices of the device series XP-504	
10" terminal	max. 7.2 W
15" terminal	max. 9.6 W
21" terminal	max. 16.8 W
10" terminal EXT	max. 12 W
15" terminal EXT	max. 14.4 W
21" terminal EXT	max. 21.6 W
Extender TX module	
XP-504-EXT module	3.12 W

3. Installation

3.6 Preparing the device for operation

3.6.1.1 Functional earthing Widescreen device

The functional earth for Panel-PCs, Terminals, and Terminal with Extender RX is established with a ground strap as follows:



CAUTION

SAFELY DIVERTING ELECTRICAL INTERFERENCE CURRENTS

XP-504The must be connected to a central earth point with a conductor that is as short and has as low a resistance as possible.

- Ground connection characteristics:
Wire cross-sectional area $\geq 6 \text{ mm}^2$,
length $\leq 350 \text{ mm}$, width $\geq 20 \text{ mm}$

The XP-504 needs to be connected to the conductive structure in, e.g., the control panel using the central earth point. This method of earthing is mandatory required for proper function.

Grounding concept – instructions for low-impedance component grounding

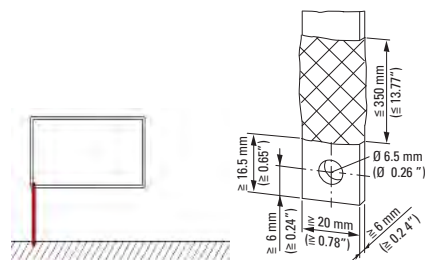


Fig. 21: Functional earth with ground strap

- Contact surfaces must be conductive and resistant to corrosion.
 - Use toothed lock washers to prevent corrosion on contact surfaces.
 - The conductive contact surface must be as large as possible.
 - Do not use ground straps with ring terminals
- The grounding point must also have a low-impedance ground connection.
- ▶ Assemble and terminate a suitable ground strap with a length $\leq 35 \text{ cm}$, width $\geq 2 \text{ cm}$, and an eyelet in advance.
- ▶ Remove the M6 nut from the set screw at the grounding point.
- ▶ Slip the ground strap eye onto the set screw.
- ▶ Tighten the M6 nut with a torque of 1.3 Nm (11.5 lb-in) back on the set screw.

3. Installation

3.6 Preparing the device for operation

Tab. 7: Earthing specifications

Functional earthing specifications	
Cross-section	at least 6 mm ²
	AWG10
Ground strap with M6 eye-let	Internal diameter = 6.5 mm
	Length \geq 350 mm
	Width \leq 20 mm
Tightening torque	1.3 Nm (11.5 lb-in) for the M6 nut

Functional earth

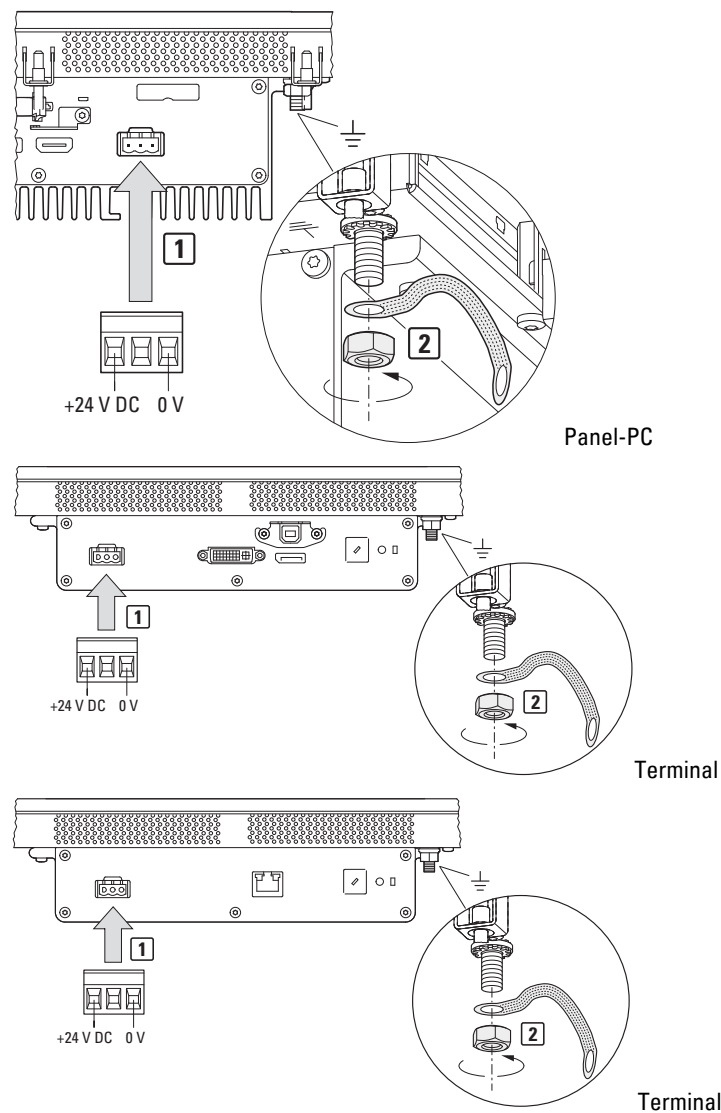


Fig. 22: Screwing the functional earth conductor/ground strap onto the enclosure, with a Panel-PC used here as an example

3. Installation

3.6 Preparing the device for operation

3.6.1.2 Functional earthing Box-PC and Extender TX

For Box-PCs and XP-504-EXT modules, a functional earth via the connection on the plug connector is enough. Make sure to observe the power supply specification.


3.6.2 Power supply via plug connector

CAUTION
Arrange for an electrician to install the power supply for the plug connectors.

The required connector for the device is included as standard.

Plug connector	need for
MSTBT 2.5/3-ST-5.08	Panel-PC , Terminal and Terminal with Extender RX
MSTBT 2.5/3-ST-5.08	Box-PC with functional earth
MSTBT 2.5/4-ST-5.08	XP-504-EXT module

▶ Connect the individual conductors.

7 mm (0.28")		Terminal capacity in mm ²
	solid	0.75 to 2.5 AWG19-AWG14

- ▶ Use the plug to terminate the connection cable for the power supply in advance.
- ▶ Plug the pre-assembled plug into the socket on the enclosure.
- ▶ Pay attention to the polarity "+24V" and "0V".
- ▶ Connect the power supply cable to a 24 VDC power supply that meets the requirements for safety extra-low voltages (SELV) set forth in IEC/UL 61010-2-201.

Tab. 8: Specifications for connection to 24 VDC power supply

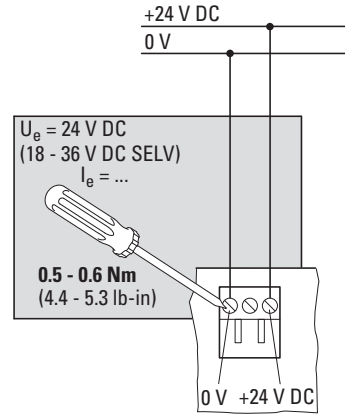
Specifications connection 24 VDC power supply	
Copper conductor	Use copper wire only, designed for a temperature of at least 65 °C
Cross-section	at least 0.75 mm ² / max. 2.5 mm ² (drain wire or conductor) min. AWG19 / max. AWG14
Tightening torque	0.5 - 0.6 Nm (4.4 -5.3 lb-in) for the screws on the respective plug connector
Strip length	7 mm

3. Installation

3.6 Preparing the device for operation

3.6.2.1 Power supply Panel-PC, Terminal and Terminal with Extender RX

XP-504-10-..., XP-504-15-..., XP-504-21-... and XP-504-...-TERM-EXT or XP-504-...-TERMINAL-EXT



XP-504-...-TERMINAL

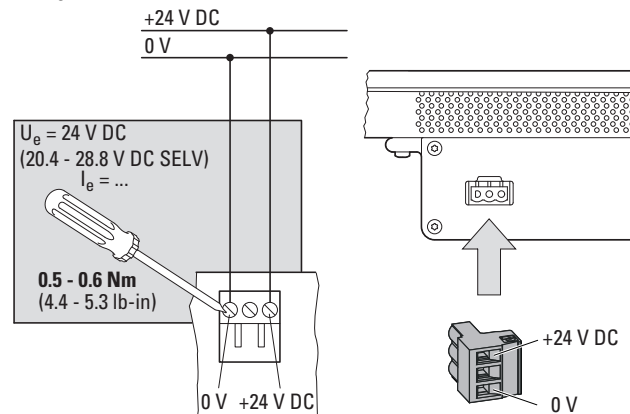


Fig. 23: Connecting the screw terminals with MSTBT 2.5/3-ST-5.08

Tab. 9: Configuration MSTBT 2.5/3-ST-5.08

	PIN	Signal	Connection	Configuration
	1	+	24 VDC	Power Supply + 24 VDC SELV (safety extra low voltage)
	2	n.c.		not used
	3	-	0 V	0 V power supply

3. Installation

3.6 Preparing the device for operation

3.6.2.2 Power supply Box-PC

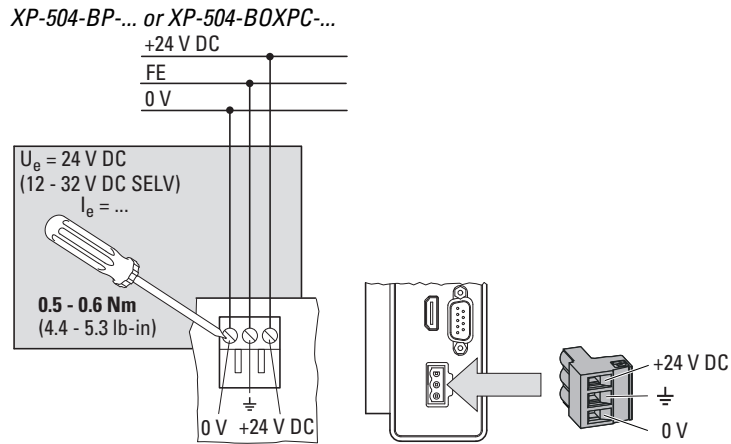


Fig. 24: Connecting the screw terminals with MSTBT 2.5/3-ST-5.08

Tab. 10: Configuration MSTBT 2.5/3-ST-5.08

	PIN	Signal	Connection	Configuration
	1	+	24 VDC	Power Supply + 24 VDC SELV (safety extra low voltage)
	2	Functional earth		Functional earth
	3	-	0 V	0 V power supply

3. Installation

3.6 Preparing the device for operation

3.6.2.3 Power supply Extender TX

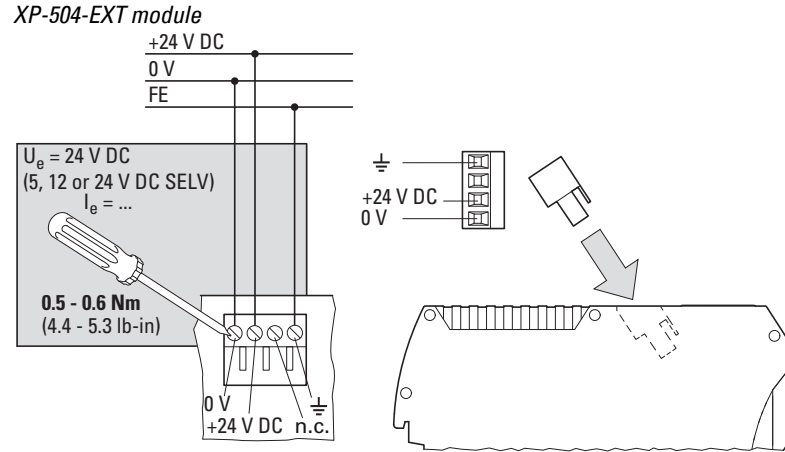
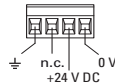


Fig. 25: Connecting the screw terminals with MSTBT 2.5/4-ST-5.08

Tab. 11: Configuration MSTBT 2.5/4-ST-5.08

PIN	Signal	Connection	Configuration
1			Functional earth
2	n.c.		Internally connected
3	+	24 VDC	Power Supply + 24 VDC SELV (safety extra low voltage)
4	-	0 V	0 V power supply



4. Using peripheral devices - External connections

With its ports, Eaton's XP-504 series makes it possible to connect a variety of peripheral devices and components.

The features on the individual devices in the XP-504 series are based on the devices' needs. Not all connectors are available on all the devices in the series.



DANGER STRAY CURRENTS

Large equalizing currents between the functional earthing system and the ground system of different devices may result in fire or in malfunctions due to signal interference.

- ▶ If necessary, route an equipotential bonding conductor, with a cross-sectional area that is several times larger than that of the cable shielding, parallel to the cable.



CAUTION INTERFERENCES

The values specified in the technical data, as well as the device's electromagnetic compatibility (EMC), cannot be guaranteed if the following are used: unsuitable cables, improperly assembled and terminated cables, and/or wiring that does not conform to the applicable standards.

Only use cables assembled and terminated by professionals.

The cables being used must be assembled and terminated as required by the port/interface description in this document.

When wiring the XP-504, follow all instructions regarding how to wire the corresponding port/interface.

All general Directives and standards must be complied with.

4. Using peripheral devices - External connections

4.1 Layout of interfaces

4.1 Layout of interfaces

4.1.1 Panel-PC

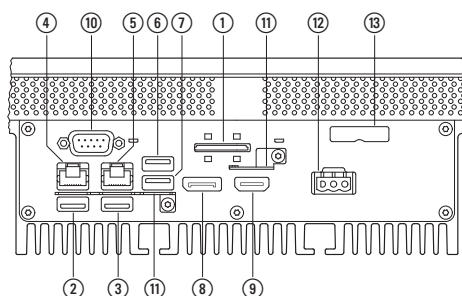


Fig. 26: Interfaces equipment Panel-PC

	Interface	Version
①	SD card slot	SD or SDHC to SDA specification 2.0, min. 8 GB
②	USB-Host 3.0	USB3.0 / 2.0, plug type A
③	USB-Host 3.0	USB3.0 / 2.0, plug type A
④	Ethernet 1 LAN	RJ-45 socket, 8-pole, 2 LEDs (CAT5e/6), LAN, 1000 MBit/s
⑤	Ethernet 2 LAN	RJ-45 socket, 8-pole, 2 LEDs (CAT5e/6), LAN, 1000 MBit/s
⑥	Dual-USB-Host 3.0	Dual-USB3.0 / 2.0 T, plug type A
⑦	Dual-USB-Host 3.0	Dual-USB3.0 / 2.0 T, plug type A
⑧	DP	Default display interface
⑨	HDMI	Default display interface 1.4b
⑩	RS232/422/485	9-pin D-sub plug, not galvanically isolated Can be configured in BIOS; default setting: RS-232 full duplex
⑪	Strain relief	Metal plate for fixing the USB and HDMI ports
⑫	24 VDC	power supply MSTBT 2.5/3-ST-5.08
⑬	Battery	BR2032 (190mAh, 3V) from Panasonic

4. Using peripheral devices - External connections

4.1 Layout of interfaces

4.1.2 Box-PC

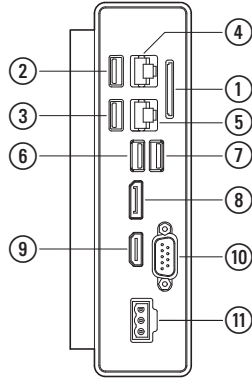


Fig. 27: Interfaces equipment Box-PC

Interface	Version
① SD card slot	SD or SDHC to SDA specification 2.0, min. 8 GB
② USB-Host 3.0	USB3.0 / 2.0, plug type A
③ USB-Host 3.0	USB3.0 / 2.0, plug type A
④ Ethernet 1 LAN	RJ-45 socket, 8-pole, 2 LEDs (CAT5e/6), LAN, 1000 MBit/s
⑤ Ethernet 2 LAN	RJ-45 socket, 8-pole, 2 LEDs (CAT5e/6), LAN, 1000 MBit/s
⑥ Dual-USB-Host 3.0	Dual-USB3.0 / 2.0 T, plug type A
⑦ Dual-USB-Host 3.0	Dual-USB3.0 / 2.0 T, plug type A
⑧ DP	Default display interface
⑨ HDMI	Default display interface 1.4b
⑩ RS232/422/485	9-pin D-sub plug, not galvanically isolated Can be configured in BIOS; default setting: RS-232 full duplex
⑪ 24 VDC	power supply MSTBT 2.5/3-ST-5.08

4. Using peripheral devices - External connections

4.1 Layout of interfaces

4.1.3 Terminal

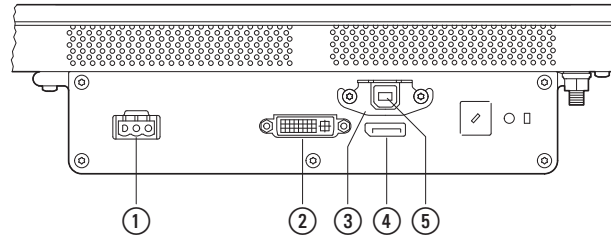


Fig. 28: Interfaces equipment Terminal

	Interface	Version
①	24 VDC	power supply MSTBT 2.5/3-ST-5.08
②	DVI-I	Default display interface
③	Strain relief	Metal plate for fixing the USB port
④	DP	Default display interface
⑤	USB-B	USB 2.0, not galvanically isolated, Type-B connector (used by the touch functionality)

4.1.4 Terminal with Extender RX

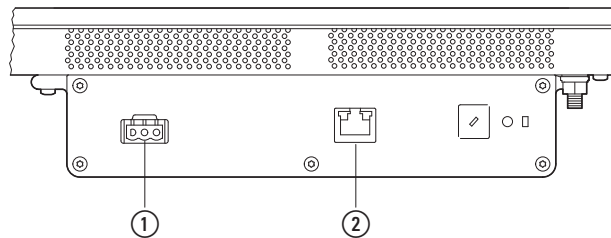


Fig. 29: Interfaces equipment Terminal with Extender RX

	Interface	Version
①	24 VDC	power supply MSTBT 2.5/3-ST-5.08
②	RJ45 (Extender RX) EXT IN	RJ-45 socket, 8-pole, 2 LEDs (CAT5e/6)



The RJ45 sockets on Terminal with Extender RX and Extender TX are used by the transmitter/receiver cable.

Do not connect the RJ45 (Extender RX) EXT IN port to an Ethernet network.

4. Using peripheral devices - External connections

4.1 Layout of interfaces

4.1.5 Extender TX

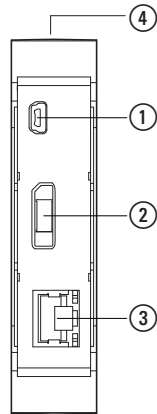


Fig. 30: Interfaces equipment Extender TX

	Interface	Version
①	Mini USB-B	Default display interface
②	DP	Default display interface
③	RJ45 (Extender TX)	RJ-45 socket, 8-pole, 2 LEDs (CAT5e/6)
④	24 VDC	power supply MSTBT 2.5/4-ST-5.08



The RJ45 sockets on Terminal with Extender RX and Extender TX are used by the transmitter/receiver cable.

Do not connect the RJ45 (Extender TX) port to an Ethernet network.

4. Using peripheral devices - External connections

4.2 SD card

4.2 SD card

Available on: Panel-PC and Box-PC

The slot for the SD card on the Panel-PC is located under the holder on the underside of the computer core.

The slot for the SD card on the Box-PC can be accessed directly on the front.



CAUTION DATA LOSS

If the SD card is being written to and a voltage drop occurs or the card is removed, data may be lost or the SD card may be ruined.

- ▶ Insert the SD card only when the XP-504 is de-energized.

Avoid writing to SD cards. Reasons:

- SD cards have a limited number of write cycles.
 - If there is a voltage drop while a write operation is in progress, data loss is highly likely to occur.
- ▶ Remove the SD card only when the XP-504 is de-energized.
 - ▶ Before switching off the device, make sure that there are no programs writing to the SD card.

Inserting the SD card



SD cards cannot be inserted the wrong way around and are locked in place in order to keep them from falling out.

Do not use force when inserting the card.

- ▶ Squeeze the sides of the holder together until the latch in the housing is released.
- ▶ Remove the holder
- ▶ Push the SD card into the SD card slot until you feel it lock into place.

Removing the SD card

- ▶ Push the SD card into the SD card slot all the way to the stop.
- ▶ Pull the SD card out of the SD card slot.
- ▶ Store the SD card in its case in order to protect it.
- ▶ Insert the holder back in place.

4. Using peripheral devices - External connections

4.2 SD card

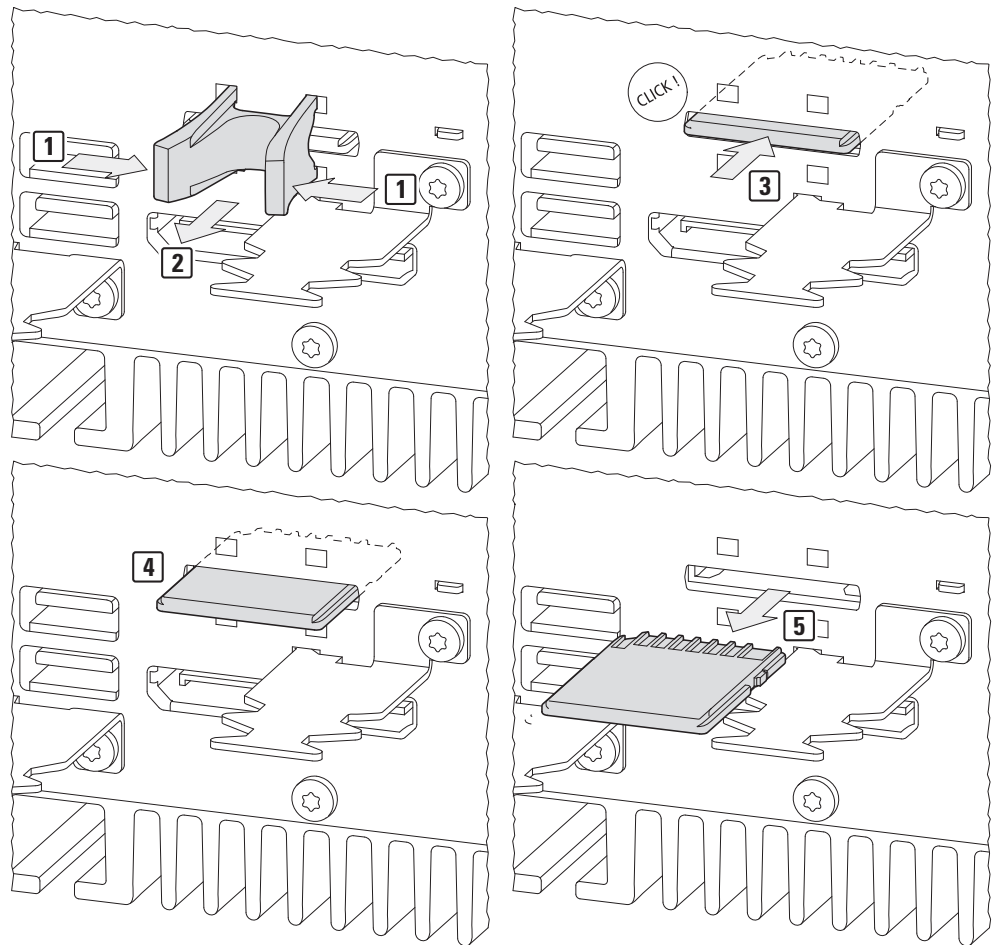


Fig. 31: Removing the SD card

4. Using peripheral devices - External connections

4.3 USB interfaces

4.3 USB interfaces

4.3.1 USB Host

Available on: Panel-PC and Box-PC

The USB host ports on the Human-machine interface support USB Type-A connectors.

The Panel-PC features two Dual USB 3.0 / 2.0 and two USB 3.0 / 2.0 ports.



CAUTION

When using commercially available peripheral devices (e.g., with the USB port), it is important to keep in mind that their EMC interference immunity parameters may render them unsuitable for use in industrial environments.

The USB and HDMI Connectors are for maintenance only, except when installed together with strain relief metal plate with the cable ties provided.



CAUTION

NON-GALVANICALLY-ISOLATED INTERFACES

The device may be damaged by potential differences.

- ▶ The GND terminals of all bus modules must be connected.
- ▶ The device must be de-energized before connecting or disconnecting any connections to it.



Only use standard USB cables with a shield.

Max. cable length: 5 m.

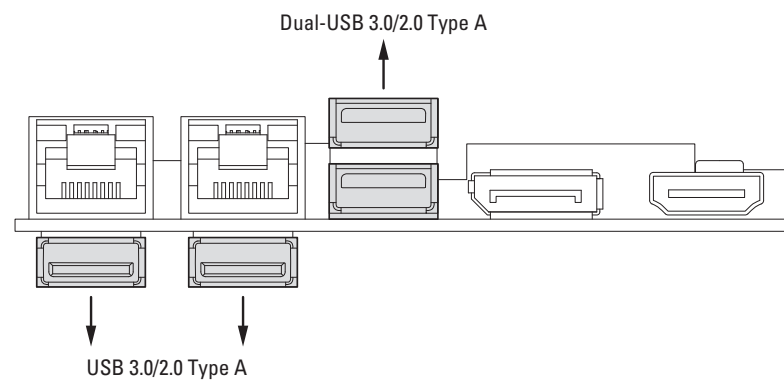


Fig. 32: USB ports on the PCs in the series

4. Using peripheral devices - External connections

4.3 USB interfaces

USB3.0 / 2.0 Type A

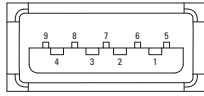


Fig. 33: Pin assignment USB3.0 / 2.0 Type A

PIN	Description	PIN	Description
1	+5 V VBUS supply voltage (power)	5	SSRX- Super Speed Receiver USB 3.0
2	D- Data cable USB 2.0	6	SSRX+ Super Speed Receiver USB 3.0
3	D+ Data cable USB 2.0	7	GND_DRAIN Earthing for Super Speed
4	GND Chassis ground	8	SSTX- Super Speed Transmitter USB 3.0
		9	SSTX+ Super Speed Transmitter USB 3.0
		10	GND Chassis ground

Dual-USB3.0 / 2.0 Type A

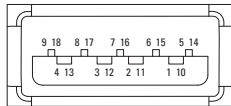


Fig. 34: Pin assignment Dual USB3.0 / 2.0 Type A

PIN	Description	PIN	Description
1	+5V VBUS supply voltage (Power)	10	+5 Volt VBUS supply voltage (Power)
2	D- (UP) Data cable USB 2.0	11	D- (DOWN) Data cable USB 2.0
3	D+ (UP) Data cable USB 2.0	12	D+(DOWN) Data cable USB 2.0
4	GND Chassis ground	13	GND Chassis ground
5	SSRX- (UP) Super Speed Receiver data cable USB 3.0	14	SSRX- (DOWN) Super Speed Receiver data cable USB 3.0
6	SSRX+ (UP) Super Speed Receiver data cable USB 3.0	15	SSRX+ (DOWN) Super Speed Receiver data cable USB 3.0
7	GND_DRAIN Earthing for Super Speed data cable	16	GND Earthing for Super Speed
8	SSTX- (UP) Super Speed Transmitter data cable USB 3.0	17	SSTX- (DOWN) Super Speed Transmitter data cable USB 3.0
9	SSTX+ (UP) Super Speed Transmitter data cable USB 3.0	18	SSTX+ (DOWN) Super Speed Transmitter data cable USB 3.0

4.3.2 USB-B

Available on: Terminal

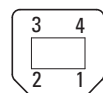


Fig. 35: USB-B 2.0, not galvanically isolated, plug type B

PIN	PIN
1	+5V 3 D+
2	D- 4 GND

4. Using peripheral devices - External connections

4.3 USB interfaces

4.3.3 Mini USB-B

Available on: Extender TX module

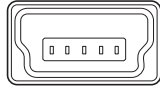


Fig. 36: Type-B mini-USB port pinout

PIN	specification	Wire	Function
1	Power	Red	+ 5V
2	Data -	White	Data -
3	Data +	Green	Data +
4	n.c.	–	Host device
5	GND	Black	ground

4.4 Ethernet

Available on: Panel-PC and Box-PC.

➔ The RJ45 sockets on Terminal with Extender RX and Extender TX are used by the transmitter/receiver cable.

The Ethernet interfaces are designed as CAT 5e/6 interfaces according to the ANSI/TIA-568 standard.

Make sure to use compatible standard RJ45 Ethernet cables only.

The Ethernet controllers support transfer rates of 1000/100/10 Mbit/s.

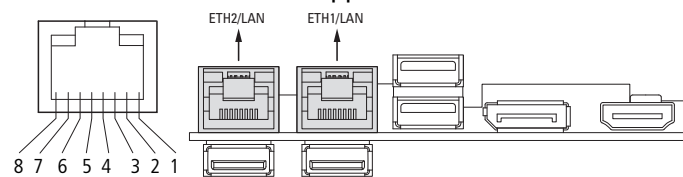


Fig. 37: LAN connections, e.g. on the Panel-PC

➔ The XP-504 is only allowed to be connected to internal Ethernet networks without this closed network being left or being subordinate to TNVs.

When the green LED lights up, this means that an active network has been detected and a LINK (2) to it has been established. When the yellow LED (1) flashes, this means that data is being transferred.

➔ For the network, use shielded twisted-pair (STP) cables only.
For connecting XP-504 devices, use a one-to-one patch cable.
Maximum cable length: 100 m.



CAUTION **FORCES ON THE RJ45 INTERFACE**

Communications may be affected, and the connection's mechanical components may be damaged, if the RJ45 interface is subjected to strong vibrations or the RJ45 plug-in connection is subjected to pulling.

- Protect the RJ45 plug-in connection from strong vibrations.
- Protect the RJ45 plug-in connection from tensile forces at the socket.

Eaton recommends implementing measures for protecting against cyberattacks.

➔ Eaton cyber security
Eaton.com/us/en-us/company/news-insights/cybersecurity.html



Eaton.com/cybersecurity

4. Using peripheral devices - External connections

4.5 Display interfaces

4.5 Display interfaces

There are two ports available for connecting additional HMI devices (terminals, monitors, touchscreens) to the Human-machine interface.

4.5.1 DisplayPort (DP)

Available on: Panel-PC, Box-PC, Terminal, and Extender TX with varying pinouts

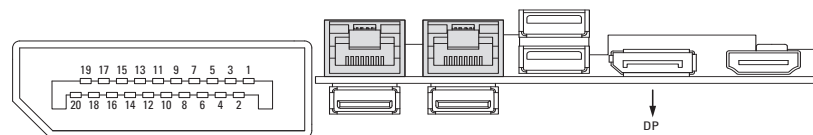


Fig. 38: Pin assignment DP

Available on: Panel-PC and Box-PC

PIN		PIN		PIN	
1	LANE 0_P	8	GND	15	AUX_DP
2	GND	9	LANE 2_N	16	GND
3	LANE 0_N	10	LANE 3_P	17	AUX_DN
4	LANE 1_P	11	GND	18	Hot Plug Detect
5	GND	12	LANE 3_N	19	GND
6	LANE 1_N	13	GND	20	+3.3V
7	LANE 2_P	14	GND		

Available on: Terminal

PIN		PIN		PIN	
1	LANE 3-	8	GND	15	AUX CH+
2	GND	9	LANE 1+	16	GND
3	LANE 3+	10	LANE 0-	17	AUX CH-
4	LANE 2-	11	GND	18	Hot Plug Detect
5	GND	12	LANE 0+	19	Return
6	LANE 2+	13	GND	20	DP Power
7	LANE 1-	14	GND		

Available on: Extender TX

PIN		PIN		PIN	
1	n.c.	8	GND	15	AUX CH+
2	GND	9	LANE 1+	16	GND
3	n.c.	10	LANE 0-	17	AUX CH-
4	n.c.	11	GND	18	Hot Plug Detect
5	GND	12	LANE 0+	19	Return
6	n.c.	13	GND	20	n.c.
7	LANE 1-	14	GND		

4. Using peripheral devices - External connections

4.5 Display interfaces

4.5.2 High Definition Multimedia Interface (HDMI)

Available on: Panel-PC and Box-PC



CAUTION

When using commercially available peripheral devices (e.g., with the USB port), it is important to keep in mind that their EMC interference immunity parameters may render them unsuitable for use in industrial environments.

The USB and HDMI Connectors are for maintenance only, except when installed together with strain relief metal plate with the cable ties provided.

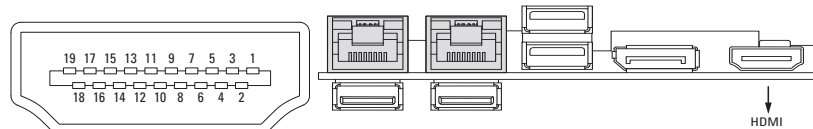


Fig. 39: Pin assignment HDMI

PIN		PIN		PIN	
1	T.D.M.S. Data 2+	8	GND	15	DDC Clock
2	GND	9	T.D.M.S. Data 0-	16	DDC DATA
3	T.D.M.S. Data 2-	10	T.D.M.S. Clock+	17	GND
4	T.D.M.S. Data 1+	11	GND	18	+5V
5	GND	12	T.D.M.S. Clock-	19	Hot Plug Detect
6	T.D.M.S. Data 1-	13	n.c.		
7	T.D.M.S. Data 0+	14	n.c.		

4. Using peripheral devices - External connections


4.6 Serial interfaces RS232/RS422/RS485

4.6 Serial interfaces RS232/RS422/RS485

Available on: Panel-PC and Box-PC

This port on the PCs can be used to connect serial devices.

The RS port has various modes, with the mode being set in the BIOS.



CAUTION
NON-GALVANICALLY-ISOLATED INTERFACES

The device may be damaged by potential differences.

- ▶ The GND terminals of all bus modules must be connected.
- ▶ The device must be de-energized before connecting or disconnecting any connections to it.

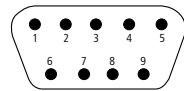


Fig. 40: Pin assignment RS232/RS422/RS485

Tab. 12: Pin assignment (RS232 mode)

PIN	Signal	Meaning	PIN	signal	Meaning
1	DCD	Data Carrier Detect	6	DSR	Data Set Ready
2	RXD	Receive Data	7	RTS	Request to Send
3	TXD	Transmit Data	8	CTS	Clear To Send
4	DTR	Data Terminal Ready	9	RI	Ring Indicator
5	GND	Signal Ground			

Tab. 13: Pin assignment (RS422 mode)

PIN	signal	PIN	signal
1	RS422 TX-	6	n.c.
2	RS422 TX+	7	n.c.
3	RS422 RX+	8	n.c.
4	RS422 RX-	9	n.c.
5	GND		



The BIOS will need to be set to RS422 mode.

Tab. 14: Pin assignment (RS485 mode)

PIN	signal	PIN	signal
1	RS485 Data+	6	n.c.
2	RS485 Data-	7	n.c.
3	n.c.	8	n.c.
4	n.c.	9	n.c.
5	GND		



The BIOS will need to be set to RS485 mode.

4.7 DVI-I

Available on: Terminal

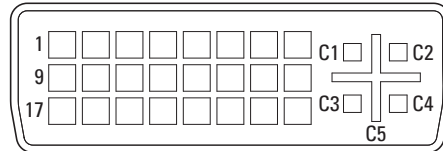


Fig. 41: Pin assignment DVD-I

PIN		PIN		PIN	
1	T.D.M.S. Data 2-	11	T.D.M.S. Data 1/3 Shield	20	n.c.
2	T.D.M.S. Data 2+	12	n.c.	21	n.c.
3	T.D.M.S. Data 2/4 Shield	13	n.c.	22	T.D.M.S. Clock Shield
4	n.c.	14	+5 Volt Power	23	T.D.M.S. Clock +
5	n.c.	15	GND	24	T.D.M.S. Clock -
6	DDC Clock		(Return for +5V, H-Sync, and V-Sync)	C1	n.c.
7	DDC Data	16	Hot Plug-Detect	C2	n.c.
8	n.c.	17	T.D.M.S. Data 0-	C3	n.c.
9	T.D.M.S. Data 1-	18	T.D.M.S. Data 0+	C4	n.c.
10	T.D.M.S. Data 1+	19	T.D.M.S. Data 0/5 Shield	C5	GND

4. Using peripheral devices - External connections

4.7 DVI-I

5. Commissioning

When the device series XP-504 is used as intended, it will often be installed in a machine or system to function as controls and will be wired accordingly. In this case, the devices will need to be switched on and off using the corresponding machine controller.



DANGER!

Electric shock hazard!

When setting up and testing the visualization interface, make sure to use a test environment that is fused as per the state of the art and in accordance with all applicable standards in order to power the devices.

The XP-504 will boot up as soon as it is energized.

If the XP-504 will not start, or if an error message appears, consult the → Section "Faults", page 103 section.

The XP-504 will be shut down as soon as it is not being powered.



CAUTION

SHORT-CIRCUIT HAZARD

If the device is or has been exposed to environmental fluctuations (ambient temperature, air humidity), condensation may form on or inside it. As long as this condensation is present, there will be a short-circuit hazard.

Do not switch on the device when it has condensation in or on it.

If the device has condensation in or on it, or if the panel has been exposed to environmental fluctuations, let the panel settle into the existing ambient temperature before switching it on. Do not expose the device to direct thermal radiation from heating appliances.

- ▶ Power the XP-504 with 24 VDC.

The XP-504 unit will boot up. As soon as the operating system loads, the application will start.

5. Commissioning

5.1 Initial commissioning

5.1 Initial commissioning

5.1.1 Connecting peripheral devices

The connectors for connecting peripherals are located on the underside or on the front and are accessible even when the housing is closed.

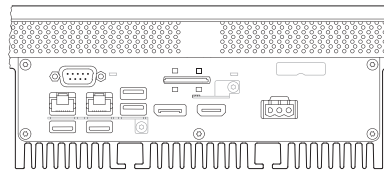


Fig. 42: Connectors for peripheral devices, e.g., on a Panel-PC



Do not plug in or disconnect any connectors during operation!
Before connecting peripherals, make sure they are designed for use in industrial environments!

The connectors conform to the corresponding standards; please refer to → Section "Using peripheral devices - External connections", page 71



Connected devices must have the CE mark (for industrial environments!).

An external keypad can be used simultaneously with the touch panel.

Keyboard	A USB keyboard can be connected to one of the USB interfaces. It may be necessary to install a USB keyboard driver the first time you use the keyboard.
Mouse	The XP-504 has been designed to work with a variety of mouse types: Serial mouse – can be connected to the serial port. The matching mouse driver must be installed and configured before being able to use the mouse. USB mouse – can be connected to one of the USB ports. It may be necessary to install a USB mouse driver the first time you use the mouse.
Printers	A printer can be connected to one of the USB ports and used once the corresponding printer driver has been installed.
USB flash drive	USB sticks can be plugged into one of the USB interfaces.
SD card	An SD card with at least 8 GB can be inserted into the SD card slot
Display	An external display unit (various display types) can be connected to the display ports (DP or HDMI).
Ethernet network	The XP-504 can be connected to various computer networks using the two RJ-45 ports that serve as Ethernet ports. Ethernet is a standard used for local networks, and requires twisted-pair cables in order to connect the computers.

5.2 Running the XP-504

Once the XP-504 has been initially commissioned, it will run whenever it is connected to the power supply.

In other words, it does not have to be separately switched on and off.



Reducing the level of brightness will increase the display back-light's lifespan.



If the Panel-PC or Box-PC will not boot, and/or an error message appears, follow the instructions in the → Section "Faults", page 103 section.

5. Commissioning

5.2 Running the XP-504

6. Operation Touch display

Concerns: Panel-PC, Terminal and Terminal with Extender RX

6.1 Safety Instructions

Using the Widescreen devices of the XP-504 series entails additional risks associated with using the multi-touch function

Observe the following instructions in order to keep you and others safe and avoid property damage.



WARNING

MALFUNCTIONS WHEN USING A TOUCH PANEL WITH MULTI-TOUCH CAPABILITIES

The incorrect use of the Touch display cannot be ruled out, and may result in bodily injury or property damage.

The following preventive measures will help prevent unintended malfunctions:

- Do not, under any circumstance, use the Touch display to control safety-relevant functions.
- Before cleaning the device, switch to a safe operating mode. Before performing maintenance work, disconnect it from the power supply.



WARNING

INCORRECTLY USING THE MULTI-TOUCH FUNCTIONS

Performing gestures incorrectly on the Touch display can result in system operation errors and, consequently, in bodily injury.

Before using the device, make sure you are thoroughly familiar with the Windows operating system's multi-touch functions, as well as with the application you will be using and its functions. Make sure that the gestures you perform on the Multi-touch touch panel will be recognized by the application. It may be necessary to practice certain gestures beforehand.

6. Operation Touch display

6.1 Safety Instructions



WARNING
RISK OF FUNCTIONS BEING TRIGGERED ACCIDENTALLY BY CONDUCTIVE MATERIAL IN SOILING

If the device's Touch display is soiled, any conductive material present in the dirt may trigger unexpected operator actions. When functions are triggered incorrectly in the system, bodily injury and property damage may occur. Keep the Touch display clean at all times and take suitable measures in order to protect it from soiling. Before using the device, check which types of potential soiling may accumulate on the Touch display and which functions may be triggered incorrectly as a result.



WARNING
POTENTIAL DAMAGE WHEN INSTALLING AND OPERATING THE DEVICE

Scratches and other damage on the device's glass panel may trigger unexpected operator actions. When functions are triggered incorrectly in the system, bodily injury and property damage may occur. Make sure that the glass panel is not damaged during installation or use.

6.2 Handling

Do not use sharp, cutting, or metal objects to operate the touch screen, as this may permanently damage the device. Improper use is not covered by the warranty. Make sure to only use your fingers or a stylus when using the touch screen.

The Widescreen device of the XP-504 series feature a Touch display with multi-touch capabilities. It is controlled by means of touching, inching, and gestures, all of which require the operator to touch the Touch display with their fingertips. More specifically, gestures can be carried out using four fingers at the same time.

To get the best possible image out of the Touch display, make sure to use the corresponding options in the Windows operating system.

Notes on gestures

If gestures are performed incorrectly on the Widescreen device, they may not be recognized or they may be recognized incorrectly.

When this occurs, the device will either not respond to the operator's input or will respond in a wrong or unexpected way.

Observe the following when using the Widescreen device:

- The Touch display responds to contact on its surface, not to pressure.
- If using your fingers:
 - Make sure to only use your fingertips when using the Touch display.
 - Do not use your fingernails.
- Do not use thick gloves when operating the Touch display, e.g., work gloves.
- Touch the Touch display perpendicularly, not at an angle.
- Make sure you do not touch the screen accidentally, e.g., with your knuckles or by leaning against the Touch display or using it for support.
- Make sure to always keep the Touch display clean.
- Always check to make sure that the device has recognized the operator actions you have entered.

6. Operation Touch display

6.3 Touch setup

6.3 Touch setup

If you connect an additional Widescreen device to an XP-504 PC, the Windows operating system may not automatically recognize both devices as input devices. In this case, touch input will only be allowed on one of the devices, making it necessary to manually change the configuration and set up both devices as touchscreens. To do so, follow the steps below:

- ▶ Connect a keyboard to the Panel-PC or Box-PC.
- ▶ Open the Control Panel and click on [Tablet PC Settings].(A)
- ▶ Under the "Display" tab, click on [Setup...].(B)

Control Panel/All Control Panel Items/Tablet PC Settings

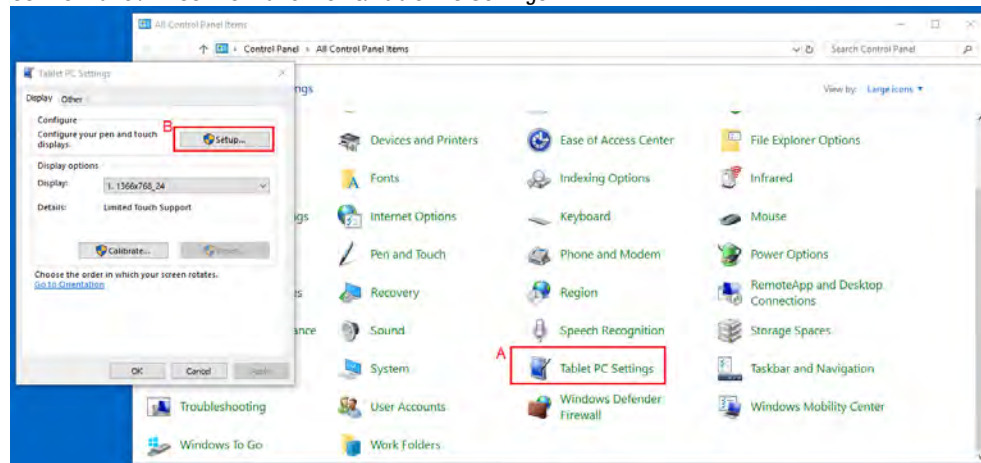


Fig. 43: Setup for configuration

A white screen with a prompt saying "Tap this screen with a single finger to identify it as the touchscreen" will appear.

- ▶ Touch the touch display with your finger.
- ▶ Then press the Enter key on your keyboard and touch the other touch display with your finger.

Once you have done this on all connected Touch displays, the setup process will be complete.

7. Operating System

7.1 Windows



Taking appropriate precautions will make it possible to prevent other malfunctions while the device is running.

SleepTime



CAUTION

MAKE SURE TO REFRESH THE DISPLAY

If the hibernation function is used, the image shown on the device may change after the device wakes up from hibernation.

► Disabling hibernation

To disable hibernation in the Windows operating system, go to

"Start → Control Panel → Hardware and Sound → Power Options" and use the corresponding options.

Screen Saver



CAUTION

TRIGGERING FUNCTIONS UNINTENTIONALLY

A wake-up event will cause the operating system to resume and the screen saver to start running. In devices with multi-touch capabilities, touching the touch panel once will cause the operating system to resume (i.e., trigger a wake-up event). If the touch panel is displaying available functions before the screen saver starts running, this first contact may cause the corresponding functions to be triggered.

► Disabling the screen saver

To disable the screen saver in the Windows operating system, go to:

"Start → Settings → Personalization → Lock screen" under the corresponding tab.



CAUTION

MAKE SURE THAT IMPORTANT OPERATING FUNCTIONS CAN ONLY BE TRIGGERED BY USING MULTIPLE FINGERS AT THE SAME TIME

Important operating functions must be programmed in such a way that they can only be triggered by gestures requiring multiple fingers on the touch panel at the same time.

7. Operating System

7.1 Windows

Static touch panel contact



CAUTION TIMEOUT

Contacts and gestures in which fingers do not move on the touch panel for more than 10 seconds will be recognized as "static contact."

If the device detects this type of contact, the desired function will no longer be carried out after approx. 10 seconds. This is intended to prevent disruptions caused by soiling on the touch display (e.g., saline solution on the glass panel).

► Avoiding static contact and continuing to run intended functions

- After approx. 10 seconds, touch the corresponding icon on the touch panel again and check the results.
- If you will be using an operator action for an extended continuous period of time, move your finger(s) slightly during the process.



CAUTION STATIC CONTACT DURING BOOTING

If there is static contact on the touch panel during booting, this may result in functional restrictions.

To prevent this, take the measures below:

- Do not touch the touch panel during booting!
- If you do touch it, make sure to move your finger(s) slightly!

7.2 Windows 10 Enterprise LTSC

The Microsoft® Windows 10 Enterprise LTSC operating system comes pre-installed on XP-504 devices with part No. XP-504-...-...-2B or XP-504-...-...-2V.

If your XP-504 is not a standard device or XP-504 is operated with a different operating system these operating system specific descriptions may or may not apply to your device.

7.2.1 Updates

Eaton releases patches and updates for its products regularly in order to protect them from identified vulnerabilities. Accordingly, Eaton encourages customers to monitor the availability of new firmware updates and install them immediately. Available firmware and software updates can be found at Eaton.com/software.

7.2.2 Common Functions

The general functions of the Windows Windows 10 Enterprise LTSC operating system can be found in the open-access system descriptions from Microsoft®.

7.2.3 Dedicated features

The following instructions describe only specific functions of the XP-504 standard devices operating with the Windows 10 Enterprise LTSC operating system.

7.2.3.1 Protect Mode (Operated with two drives, C:\ and D:\)

The Eaton XP-504 family of products running the Windows 10 Enterprise LTSC operating system have a unique and exclusive Protect Mode™ feature that safeguards the integrity of files stored on the C:\ drive of your operating system. This feature ensures that data and operating system files cannot be modified by anyone or corrupted by unexpected power disruptions. As a result, you can be confident that the XP-504 meet your rigorous industrial environmental requirements and can be protected against all unauthorized alterations.

If Protect Mode is enabled, file write operations such as "delete," "edit," and "create new" will be executed in temporary memory only. When the device is restarted, these write operations will be deleted and the protected data storage medium will have all its original data intact, i.e., the device will always start in its original state. This means that any file changes that need to be made on drive C:\ (operating system settings, installed software) must be carried out either with Protect Mode disabled or using the appropriate special Protect Mode functions in order to save the changes permanently.

7. Operating System

7.2 Windows 10 Enterprise LTSC

This applies to the following settings:

- Operating system functionality
- Time/date data
- Ethernet port settings
- Windows registry settings
- Windows driver installations
- Visualization runtime software and communications drivers
- Visualization project files

The Protect Mode feature is based on the Windows Embedded UWF (Unified Write Filter) function. Descriptions of the detailed manual operations can be found on the Internet.

7.2.3.2 Protect-Mode data organization

C:\ drive

→ Protected by Protect Mode when enabled

Files to be installed and changed only at initial device setup and should remain unchanged under normal operation.

Other drives (such as D:\)

→ Not protected, even when Protect Mode is enabled

Files to be stored through normal operations: process data, trends, recipes, alarm lists, ...



If Protect Mode is active and extensive changes are made to the C:\ drive (e.g. software installations), volatile memory may become full resulting in system errors.

Enabling Protect Mode

Protect Mode will be disabled by default. Once you have made all the changes you want on the C:\ drive (changing the default password, installing additional required software, configuring settings, etc.), enable Protect Mode. To do this, go to "Start → Eaton → Protect Mode Manager" in Windows, select the "Advanced" tab, and click on the "Enable Protect Mode" button. The system will then restart and return the XP-504 device to its normal protected state.

Disabling Protect Mode

Reasons for doing so include the need to install a software program that is very large or one that requires multiple reboots to complete its installation.

To do so, open Protect Mode Manager by selecting “Start→All Programs→Eaton→Protect Mode Manager”. From the Protect Mode Manager window select the “Advanced” tab and click on the “Disable Protect Mode Save” button. The system will then reboot. Upon reboot Protect Mode will be disabled and while in this mode the XP unit will behave like any other Windows PC, meaning that it is subject to all forms of malware including viruses, and adware and it must be shut down through the normal Windows shutdown mechanism to prevent potential corruption of the operating system.

It is recommended that the XP-504 unit be removed from any plant network while Protect Mode is disabled and that all media used for software installation to be connected to the unit are scanned for malware prior to attachment.



We recommend to operate the device always with protect mode activated.

7.2.4 Managing users and configuring the XP-504

Managing Accounts

An “XP504” user account with admin privileges is already set up on the Eaton XP-504 device by default. You will need to enter a new password for this user the first time you start the device. After making the change, make sure to restart Windows with the “Restart” option. (Shutting down the XP-504 and then starting it back up is not enough!).



A password must have at least 10 characters.

In addition, the password must include characters from at least three of the following four categories:

Uppercase letters, lowercase letters, numbers, special characters



CAUTION DATA LOSS

If the power goes out while restarting, this may result in the XP-504 no longer being able to start correctly. If this happens, please contact Support.

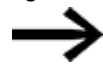
7. Operating System

7.2 Windows 10 Enterprise LTSC

7.2.5 Modifying an Account Name or Password

You can change the "XP504" username and create other users in the Windows Control Panel "Start → Windows System → Control Panel → User Accounts → User Accounts".

If you have made changes and you have configured the XP-504 for starting automatically without a login, please update the corresponding settings in the Windows Registry. The corresponding steps are described in the "Device start without user login dialog box" section.



All system changes made while Protect Mode is enabled must be permanently saved with the "Protect Mode Manager" utility or they will be reset after the device is restarted. Refer to the "Protect Mode" section for additional information.

7.2.6 Device start without user login dialog box

The following changes will leave the system more vulnerable. Check the modified configurations for your use case and make sure to protect the system with other suitable security measures.

You can use entries in the device's Registry in order to have the device start automatically without a username and password having to be entered. For information on the corresponding steps, please visit and enter "Enabling automatic logon in Windows" in the search box.

7.2.7 License Eaton Galileo-Open Runtime

XP-504-...-...-2B- device types, which are licensed for Eaton Galileo Open Runtime, are licensed at the factory for the Galileo runtime software and enabled with 340 license points. Shipped from the factory only the license is installed on the device, the Galileo Open runtime software and the project files need to be transferred by the Galileo Development Software tools to the XP-504 (device selection Galileo Open) from the development PC. For further information on these tools consult the Galileo software manuals.

7.2.8 License Eaton Visual Designer Runtime

XP-504-...-...-2V-device types, which are licensed for Eaton Visual Designer runtime, are licensed at the factory for Eaton Visual Designer runtime and enabled with 4000 tags. Shipped from the factory the license is installed on the device and a recent version of Visual Designer runtime is installed. Further information about Visual Designer and how to update the software version and download the runtime project consult the Visual Designer software manual and help files.

7.2.9 Enabling / disabling IIS communication for Visual Designer

Disabling IIS communication will make the system more secure. If it is enabled, check the modified configurations for your use case and make sure to protect the system with other suitable security measures.

Communication via IIS7 (Microsoft Internet Information Services 7) is required for certain Visual Designer functions (e.g., remote project setup and WEB visualization). There are two applications for enabling and disabling this service (and the corresponding TCP/UDP ports) that can be accessed by clicking on "Start → Eaton" in Windows:

- Activate IIS.cmd
- Deactivate IIS.cmd

Alternatively, you can also configure the required settings directly in the Windows services and Windows Firewall.

7.2.10 Enabling / disabling the automatic screen lock

Enabling this setting will make the system more secure. If it is disabled, check the modified configurations for your use case and make sure to protect the system with other suitable security measures.

The automatic screen lock will be enabled by default, which may not be ideal for certain applications. There are two applications for enabling and disabling the screen lock that can be accessed by clicking on "Start → Eaton" in Windows:

- DisableScreenLock.cmd
- EnableScreenLock.cmd

7. Operating System

7.2 Windows 10 Enterprise LTSC

8. Faults

This section provides troubleshooting information for your XP-504 in case it does not behave as expected.

Fault	Cause	Remedy
Panel-PC or Box-PC will not boot up	No 24 VDC power supply	Check the power cord and power supply
The display stays dark	Dimmed brightness	If the brightness setting has not been dimmed, the device will need to be repaired
The Projected Capacitive Touch (PCT) is not responding or is responding incorrectly when used.	The touchscreen display is soiled	Clean the display
	The set screws are too tight	Loosen the set screws → page 56
	Touch function not set up	Check touch configuration, → page 94

8. Faults

9. Maintenance

9.1 Cleaning and maintenance

9.1.1 Cleaning Multi-touch touch panel

The display of the Panel-PC and the Widescreen devices of the device series XP-504 must be cleaned regularly.



CAUTION
POINTY, SHARP OBJECTS AND CORROSIVE LIQUIDS

When cleaning the XP-504:

- Do not use any pointy or sharp objects (e.g., knives).
- Do not use aggressive or abrasive cleaning products or solvents.

Make sure that no liquids get into the XP-504 unit (short-circuit hazard) and that the XP-504 unit is not damaged in any way.

- ▶ Clean the frame and the display only with a clean soft antistatic damp cloth.

9.1.2 Replacing the Battery Panel-PC and Box-PC

Only the PCs of the device series XP-504 contain a battery. This battery can be replaced.

Replacing the battery is only required if, for example, the device is not powered for a period of more than six years.



EXPLOSION HAZARD
LITHIUM BATTERY

The lithium battery installed in Panel-PC or Box-PC may explode if handled incorrectly.

- ▶ Do not replace batteries in hazardous locations
- ▶ Dispose of the XP-504 unit professionally.



EXPLOSION HAZARD
LITHIUM BATTERY

Replace the battery exclusively with a battery of the same type. Using other batteries may pose a risk of fire or explosion.

9. Maintenance

9.1 Cleaning and maintenance



CAUTION

The battery may explode when handled improperly.

- ▶ Do not charge or disassemble the battery. Do not dispose of the battery in a fire.

CAUTION

When the battery is replaced, the device's configuration data will be cleared.

Please make sure to write down the BIOS setup settings before replacing the battery.



Dispose of used batteries properly in accordance with local regulations.

The battery in the Panel-PC can be accessed directly on a battery holder.

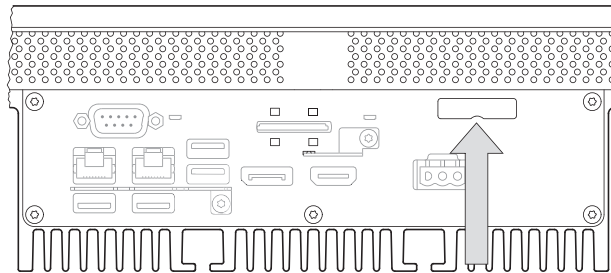
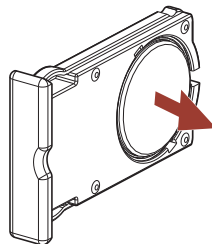


Fig. 44: Battery tray on the Panel-PC

- ▶ To get to the battery, pull out the battery holder.
- ▶ Remove the battery from the battery holder (red arrow) and insert the new battery BR2032 (190mAh, 3V) from Panasonic into the holder with the + terminal in front.



- ▶ Slide the battery holder back into its slot.

9. Maintenance

9.1 Cleaning and maintenance

The battery in the Box-PC is located inside. You will need to open the device in order to replace the battery.

ESD protection is required when working on the open device. Make sure to take all necessary ESD protection measures.



CAUTION

Installation requires qualified electrician

CAUTION

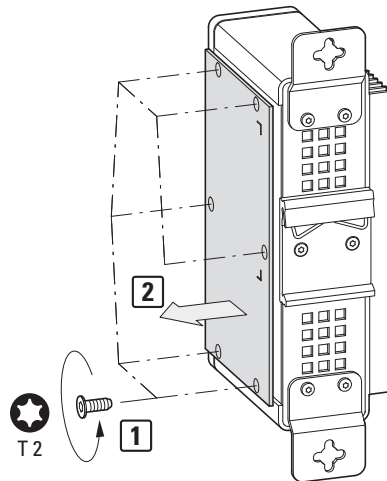
Arrange for a qualified electrician or for EATON Service to replace the battery.

In order to prevent damage to the device, do the following before opening the enclosure:

- ▶ Shut down the operating system.
- ▶ Disconnect the power supply.

Open Box-PC

- ▶ Remove the six screws (Torx A2 M3x8 ISO 14581) from the side of the enclosure without cooling fins and store them safely.



- ▶ Remove the enclosure cover.
- ▶ The battery holder for replacing the battery will be accessible inside the computer enclosure.

9. Maintenance

9.1 Cleaning and maintenance



- ▶ Unscrew the two screws on the SD card holder bracket (circled in red).
- ▶ Set the SD card holder with the bracket to the side so that you can get to the battery.



- ▶ Disconnect the plug from the motherboard and carefully remove the battery from the inside of the enclosure.
- ▶ Put in the new battery in the same place on the motherboard.



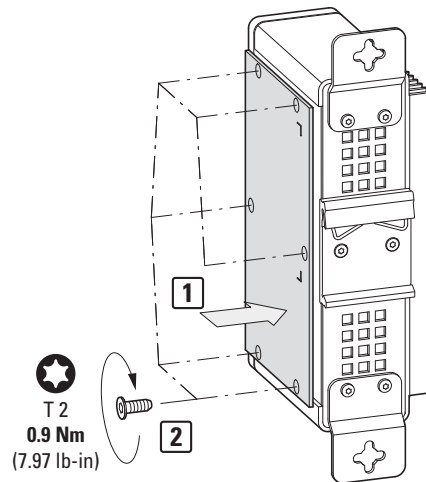
9. Maintenance

9.1 Cleaning and maintenance

- ▶ Then remove the liner from the double-sided adhesive tape and stick the battery from the inside onto the enclosure.
- ▶ Use the two screws you removed earlier to screw the SD card holder back in place.

Close Box-PC

- ▶ Put the enclosure cover back in place.
- ▶ Screw the six screws (Torx A2 M3x8 ISO 14581) back in.



- ▶ Tighten the six Torx screws with a torque of 0.9 Nm.

9. Maintenance

9.2 Repairs

9.2 Repairs

For repairs, please contact your vendor or Eaton's Technical Support.



**CAUTION
DESTRUCTION**

The XP-504 should only be opened by the manufacturer or by an authorized center. Operate the device until only with the enclosure fully closed and sealed.

Use the original packaging to ship the device.

9.3 Storage, transport and disposal

9.3.1 Storage and transport



**CAUTION
UV LIGHT**

Plastics will become brittle when exposed to UV light. This artificial aging will reduce the XP-504 unit's lifespan. Protect the XP-504 series devices from direct sunlight and other sources of UV radiation.



**CAUTION
SHORT-CIRCUIT HAZARD**

If the device is or has been exposed to environmental fluctuations (ambient temperature, air humidity), condensation may form on or inside it. As long as this condensation is present, there will be a short-circuit hazard.

Do not switch on the device when it has condensation in or on it. If the device has condensation in or on it, or if the panel has been exposed to environmental fluctuations, let the panel settle into the existing ambient temperature before switching it on. Do not expose the device to direct thermal radiation from heating appliances.

The ambient conditions must be met when transporting and storing the XP-504.

The ambient air temperature for storage and transportation must not exceed the maximum specified limit of: -20 – + 60 °C (-4 – +140 °F).

9. Maintenance

9.3 Storage, transport and disposal



CAUTION **SHORT-CIRCUIT HAZARD**

If the device is or has been exposed to environmental fluctuations (ambient temperature, air humidity), condensation may form on or inside it. As long as this condensation is present, there will be a short-circuit hazard.

Do not switch on the device when it has condensation in or on it. If the device has condensation in or on it, or if the panel has been exposed to environmental fluctuations, let the panel settle into the existing ambient temperature before switching it on. Do not expose the device to direct thermal radiation from heating appliances.



Before commissioning

If storing/transporting the device in cold weather conditions or in such a way that it will be exposed to extreme differences in temperature, make sure that no condensation forms on or inside the device.

If there is condensation in or on the device, do not switch on the device until it is completely dry.


Use the original packaging to ship the device.

The XP-504 series is sturdily built, but the components inside it are sensitive to excessively strong vibrations and/or mechanical shock.


Accordingly, make sure to protect the XP-504 from mechanical loads that exceed the scope of the unit's intended use.

The device should only be transported in its original packaging after being packed properly.


9.3.2 Disposal

 **EXPLOSION HAZARD
LITHIUM BATTERY**
The lithium battery installed in Panel-PC or Box-PC may explode if handled incorrectly.

- ▶ Do not replace batteries in hazardous locations
- ▶ Dispose of the XP-504 unit professionally.

 **Bid**
Dispose of recyclables as required by your local recycling regulations.

Panel-PC devices no longer being used must be professionally disposed or returned to the manufacturer or relevant sales department.

- ▶  Dispose of the XP-504 unit professionally.

Assembly part	Materials used
Display frame	Aluminum
Widescreen device	Surface powder-spray painted RAL 9006 white aluminum
Display enclosure	Galvanized steel, 1 mm thick
Widescreen device	
Cover glass	Tempered glass across the entire surface (ESG) tempered soda-lime glass Non-glare surface (chemically microetched); gloss: 85 Designer bezel with direct-to-glass printing RAL 9005 jet black 3 mm thick ()
Enclosure PCs	Panel-PC Galvanized steel, 1 mm thick Box-PC Powder-coated metal enclosure
Heat sink	Aluminum (heat sink) (only Panel-PC and Box-PC)
Battery Panel-PC	BR2032 (190mAh, 3V) from Panasonic, the battery for the Box-PC is available as a spare part
Electrical components	Various

Tab. 15: Materials used in the packaging

Carton	Cardboard
Inner packaging Panel-PC	Cardboard; plastic film and bag: Polyethylene (PE)


Appendix

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A.1 Technical data

A.1.1 Data sheet

The current specifications can be found in the data sheet for the device in the Eaton online catalog.

 [Eaton.com/ecat](https://www.eaton.com/ecat)

Catalog No.	Type Panel-PC
199996	XP-504-10-A10-A01-2B
199997	XP-504-10-A10-A01-2V
199998	XP-504-15-A10-A01-2B
199999	XP-504-15-A10-A01-2V
360002	XP-504-21-A10-A01-2B
360003	XP-504-21-A10-A01-2V

Catalog No.	Type Box-PC
40011	XP-504-BP-A10-A01-2B or XP-504-BOXPC-A10-A00-2B
40012	XP-504-BP-A10-A01-2V or XP-504-BOXPC-A10-A00-2V

Catalog No.	Type Extender TX
40013	XP-504-EXT-MODUL

Catalog No.	Type Terminal
400137	XP-504-10-TERMINAL
400138	XP-504-15-TERMINAL
400139	XP-504-21-TERMINAL

Catalog No.	Type Terminal with Extender RX
400140	XP-504-10-TERM-EXT or XP-504-10-TERMINAL-EXT
400141	XP-504-15-TERM-EXT or XP-504-15-TERMINAL-EXT
400142	XP-504-21-TERM-EXT or XP-504-21-TERMINAL-EXT

Appendix A.1 Technical data

A.1.2 Dimension and weight specifications

A.1.2.1 XP-504-10-... Panel-PC

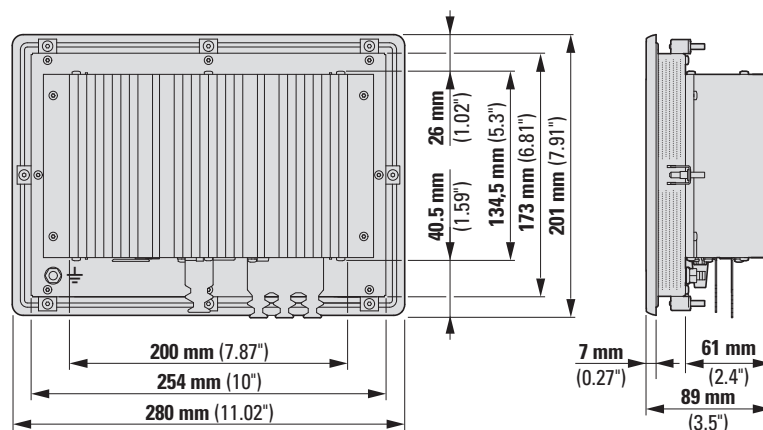
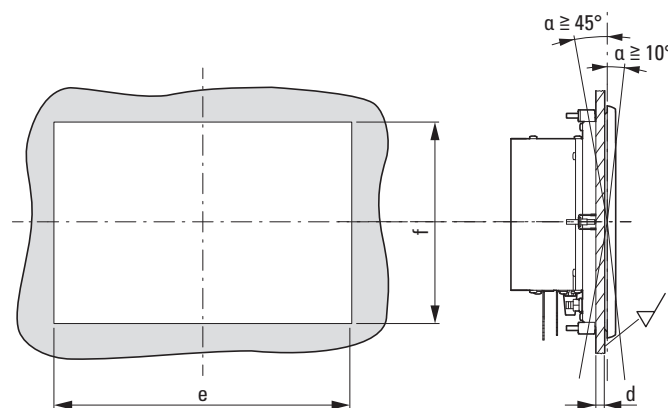


Fig. 45: Dimensions for 10.1" (25.65 cm) front mounting devices in mm (inches)

Width x Height x Depth (without plug)	280 mm x 201 mm x 89 mm (11.02" x 7.91" x 3.5") +/- 0.2 mm
Built-in depth	82.0 mm (3.22")
Weight	2.7 kg (5.95 lbs)

Hole diameter built-in



- Material thickness of $1.5 \text{ mm (0.06")} \leq d \leq 4 \text{ mm (0.16")}$ at the installation cutout
max. $-45^\circ \leq \alpha \leq \text{max.} +10^\circ$
and a flatness $\square \leq 0.5 \text{ mm (0.02")}$ with a surface roughness $\surd R_z \leq 120$; IP 65 \rightarrow DIN ISO 2768-2 (K)
- Hole diameter built-in: $e = 256 \text{ mm (10.07")} \pm 0.5 \text{ (0.02")}$, $f = 175 \text{ mm (6.88")} \pm 0.5 \text{ (0.02")}$

A.1.2.2 XP-504-15-... Panel-PC

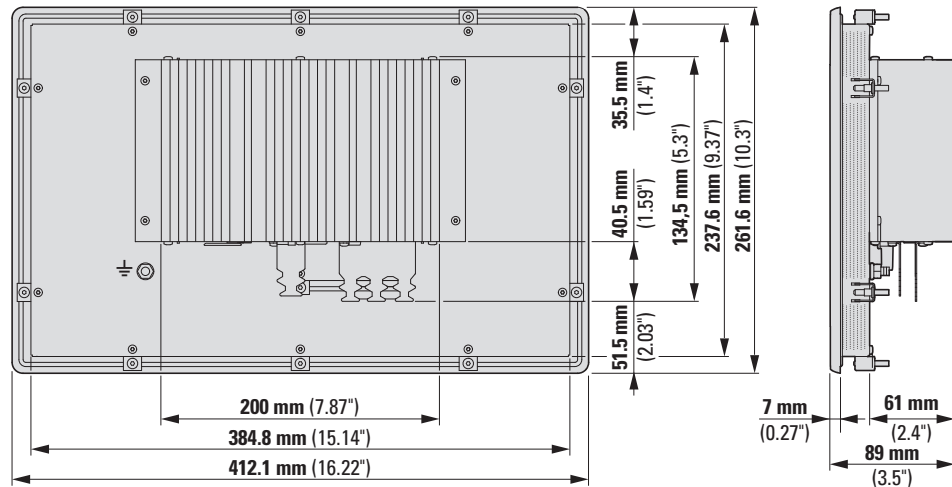
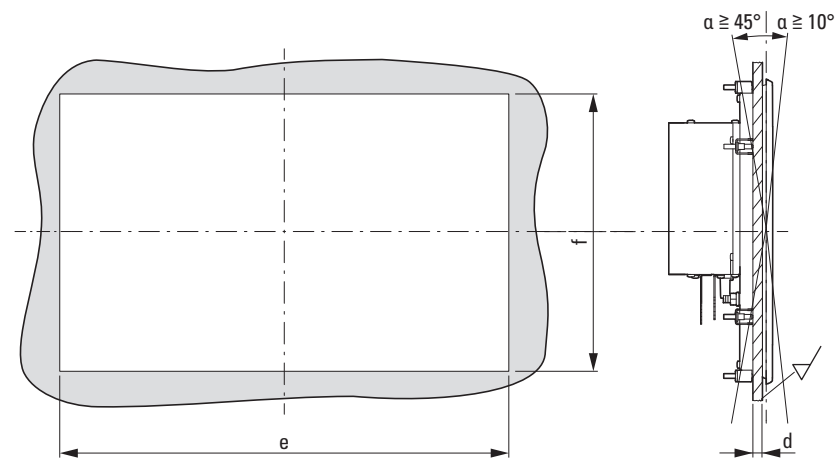


Fig. 46: Dimensions for 15.6" (39.6 cm) front mounting devices in mm (inches)

Width x Height x Depth (without plug)	412.1 mm x 261.6 mm x 89 mm (16.22" x 9.37" x 3.5") +/- 0.2 mm
Built-in depth	82.0 mm (3.22")
Weight	4.9 kg (10.91 lbs)

Hole diameter built-in



- Material thickness of 1.5 mm (0.06") ≤ d ≤ 4 mm (0.16") at the installation cutout
max. - 45° ≤ α ≤ max. + 10°
and a flatness $\square \leq 0.5 \text{ mm (0.02")}$ with a surface roughness $\surd R_z \leq 120$; IP 65 →
DIN ISO 2768-2 (K)
- Hole diameter built-in: e = 388 mm (15.28") ±0.5 (0.02"), f = 239 mm (9.40") ±0.5 (0.02")

Appendix A.1 Technical data

A.1.2.3 XP-504-21-... Panel-PC

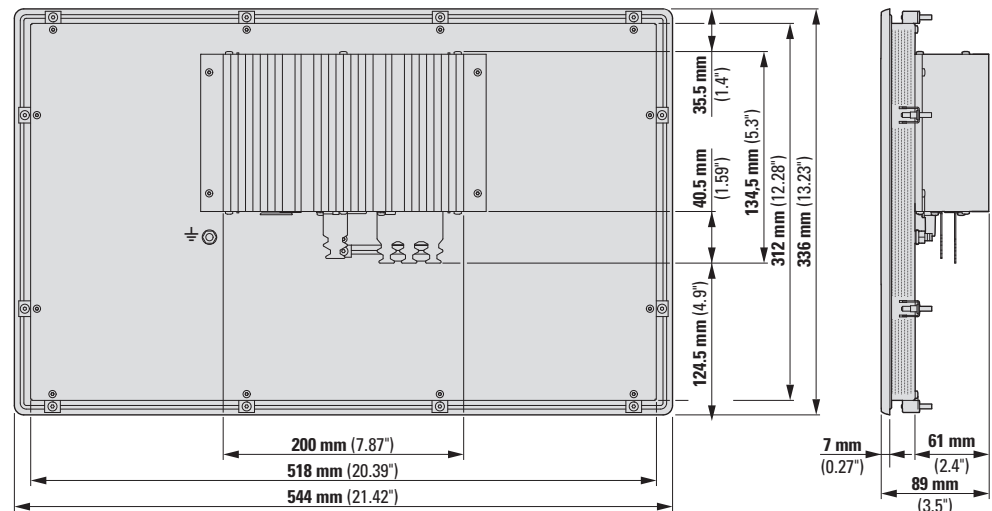
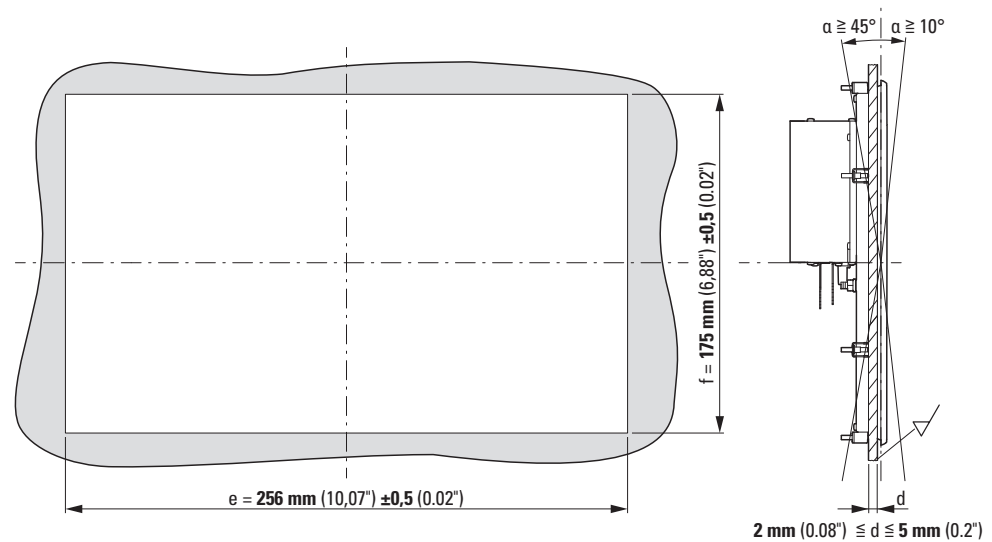


Fig. 47: Dimensions for 21.5" (54.6 cm) front mounting devices in mm (inches)

Width x Height x Depth (without plug)	544 mm x 336 mm x 89 mm (21.42" x 12.9" x 3.5") +/- 0.2 mm
Built-in depth	82.0 mm (3.22")
Weight	7.55 kg (16.64 lbs)

Hole diameter built-in



- Material thickness of $1.5 \text{ mm (0.06") } \leq d \leq 4 \text{ mm (0.16")}$ at the installation cutout
max. $-45^\circ \leq \alpha \leq \text{max.} +10^\circ$
and a flatness $\square \leq 0.5 \text{ mm (0.02")}$ with a surface roughness $\surd R_z \leq 120; \text{IP } 65 \rightarrow$
DIN ISO 2768-2 (K)
- Hole diameter built-in: $e = 256 \text{ mm (10.07") } \pm 0.5 \text{ (0.02")}$, $f = 175 \text{ mm (6.88") } \pm 0.5 \text{ (0.02")}$

A.1.2.4 XP-504-BP-... or XP-504-BOXPC-... Box-PC

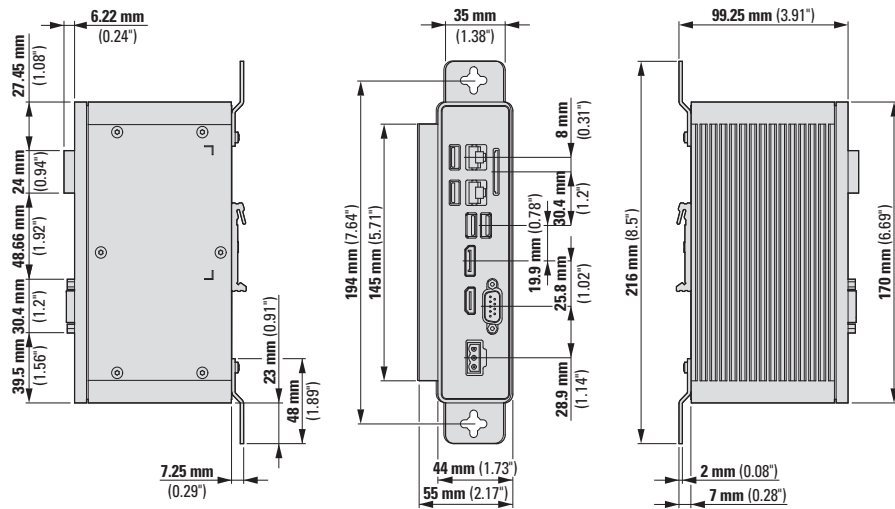


Fig. 48: Dimensions Box-PC devices in mm (Inch)

Width x Height x Depth (without plug)	55 mm x 170 mm x 92.3 mm +/- 0.2 mm
Weight	1.15 kg

Appendix A.1 Technical data

A.1.2.5 XP-504-10-...Terminal

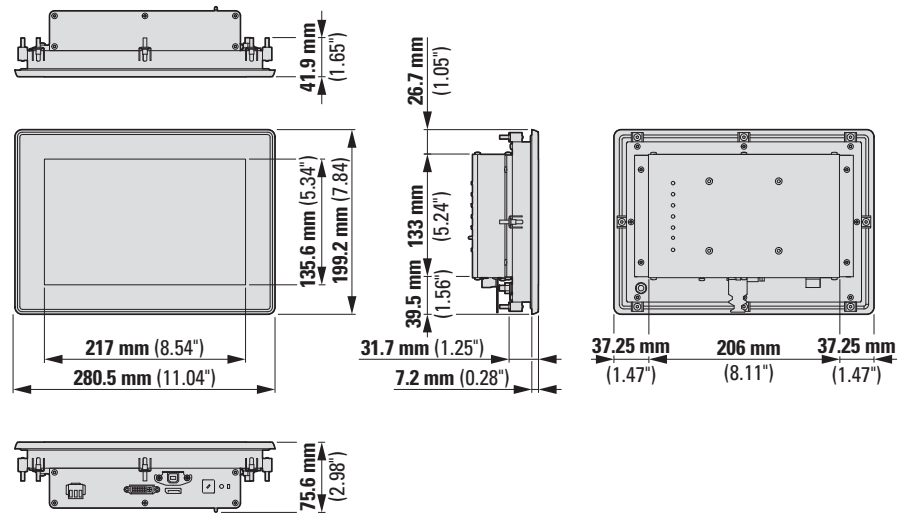
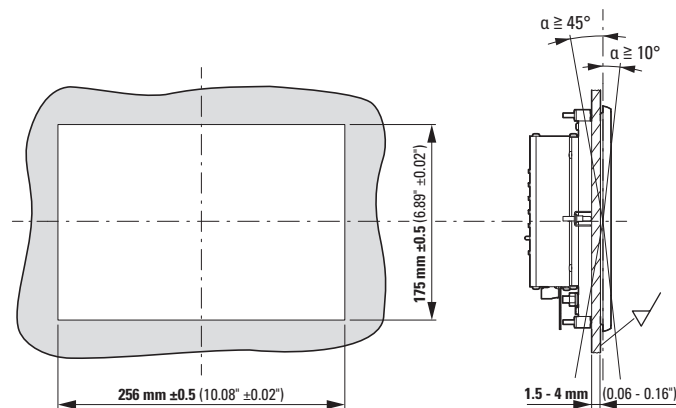


Fig. 49: Dimensions for 10.1" (25.65 cm) front mounting devices in mm (inches)

Width x Height x Depth (without plug)	280 mm x 201 mm x 89 mm (11.02" x 7.91" x 3.5") +/- 0.2 mm
Built-in depth	82.0 mm (3.22")
Weight	2.6 kg (5.73 lbs)

Hole diameter built-in



- Material thickness of 1.5 mm (0.06") $\leq d \leq$ 4 mm (0.16") at the installation cutout max. - 45° $\leq \alpha \leq$ max. + 10° and a flatness $\square \leq$ 0.5 mm (0.02") with a surface roughness $\surd Rz \leq$ 120; IP 65 → DIN ISO 2768-2 (K)
- Hole diameter built-in: e = 256 mm (10.07") ± 0.5 (0.02"), f = 175 mm (6.88") ± 0.5 (0.02")

A.1.2.6 XP-504-15-...Terminal

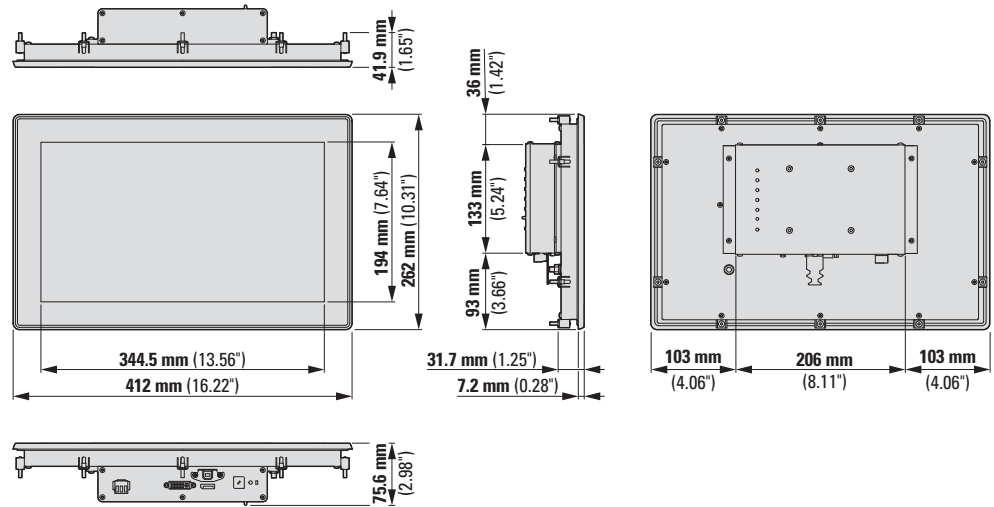
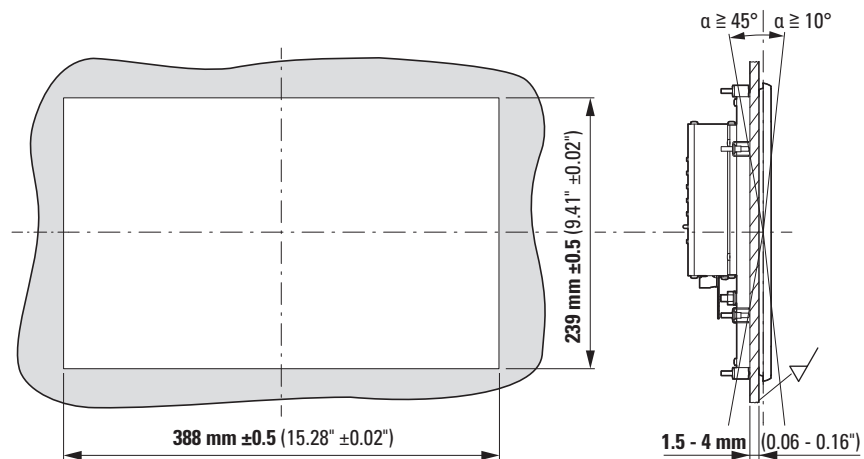


Fig. 50: Dimensions for 15.6" (39.6 cm) front mounting devices in mm (inches)

Width x Height x Depth (without plug)	412.1 mm x 261.6 mm x 89 mm (16.22" x 9.37" x 3.5") +/- 0.2 mm
Built-in depth	82.0 mm (3.22")
Weight	4.0 kg (8.81 lbs)

Hole diameter built-in



- Material thickness of 1.5 mm (0.06") $\leq d \leq 4$ mm (0.16") at the installation cutout max. $- 45^\circ \leq \alpha \leq \text{max.} + 10^\circ$ and a flatness $\square \leq 0.5$ mm (0.02") with a surface roughness $\surd Rz \leq 120$; IP 65 → DIN ISO 2768-2 (K)
- Hole diameter built-in: e = 388 mm (15.28") ±0.5 (0.02"), f = 239 mm (9.40") ±0.5 (0.02")

Appendix A.1 Technical data

A.1.2.7 XP-504-21-...Terminal

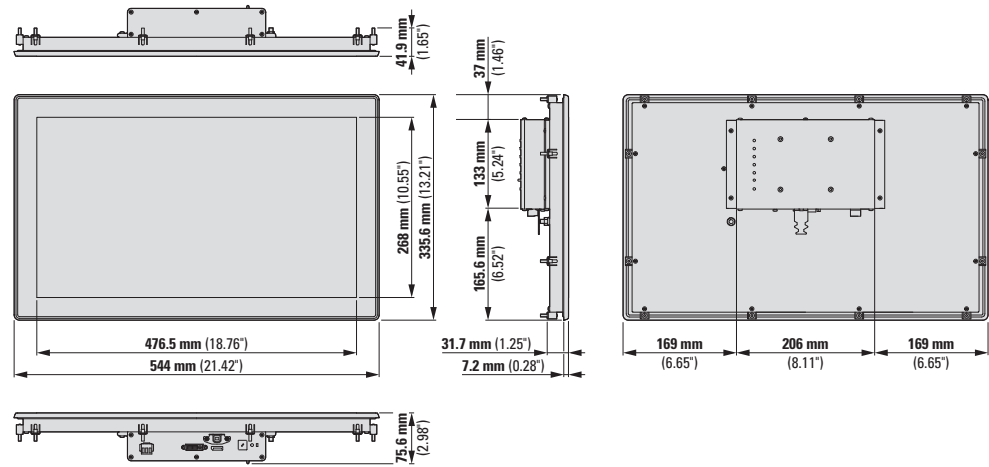
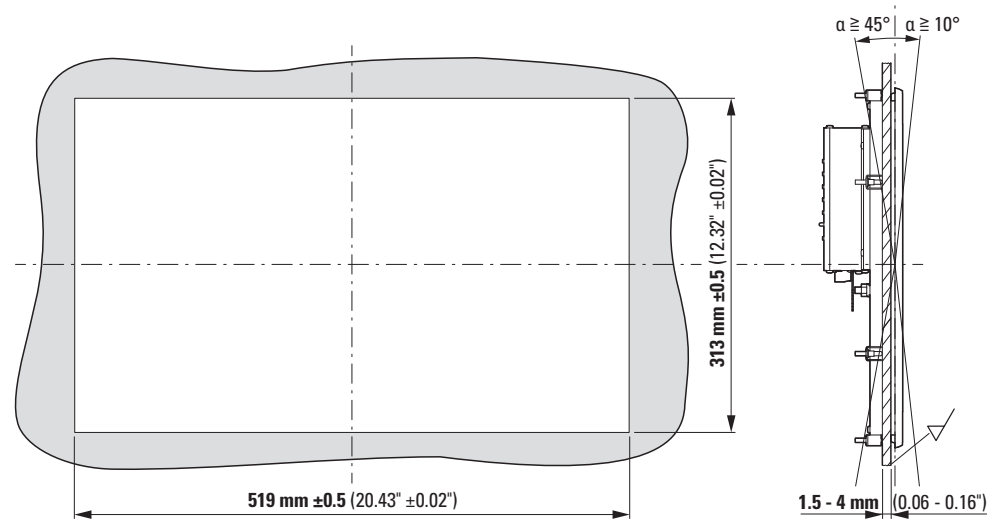


Fig. 51: Dimensions for 21.5" (54.6 cm) front mounting devices in mm (inches)

Width x Height x Depth (without plug)	544 mm x 336 mm x 89 mm (21.42" x 12.9" x 3.5") +/- 0.2 mm
Built-in depth	82.0 mm (3.22")
Weight	6.1 kg (13.48 lbs)

Hole diameter built-in



- Material thickness of 1.5 mm (0.06") ≤ d ≤ 4 mm (0.16") at the installation cutout max. - 45° ≤ α ≤ max. + 10° and a flatness $\square \leq 0.5 \text{ mm (0.02")}$ with a surface roughness $\surd R_z \leq 120; IP 65 \rightarrow$ DIN ISO 2768-2 (K)
- Hole diameter built-in: e = 519 mm (20.43") ± 0.5 (0.02"), f = 313 mm (12.32") ± 0.5 (0.02")

A.1.2.8 XP-504-10-...Terminal with Extender RX

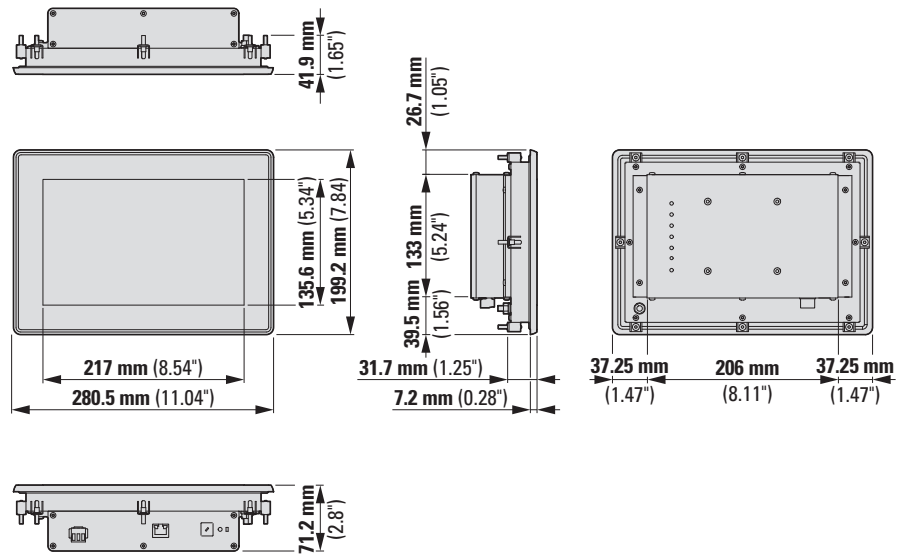
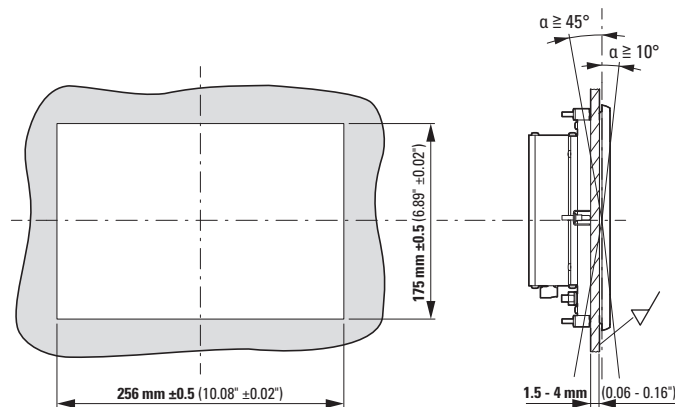


Fig. 52: Dimensions for 10.1" (25.65 cm) front mounting devices in mm (inches)

Width x Height x Depth (without plug)	280 mm x 201 mm x 89 mm (11.02" x 7.91" x 3.5") +/- 0.2 mm
Built-in depth	82.0 mm (3.22")
Weight	2.7 kg (5.95 lbs)

Hole diameter built-in



- Material thickness of 1.5 mm (0.06") $\leq d \leq 4$ mm (0.16") at the installation cutout max. $-45^\circ \leq \alpha \leq \text{max.} + 10^\circ$ and a flatness $\square \leq 0.5$ mm (0.02") with a surface roughness $\surd R_z \leq 120$; IP 65 \rightarrow DIN ISO 2768-2 (K)
- Hole diameter built-in: $e = 256$ mm (10.07") ± 0.5 (0.02"), $f = 175$ mm (6.88") ± 0.5 (0.02")

Appendix A.1 Technical data

A.1.2.9 XP-504-15-...Terminal with Extender RX

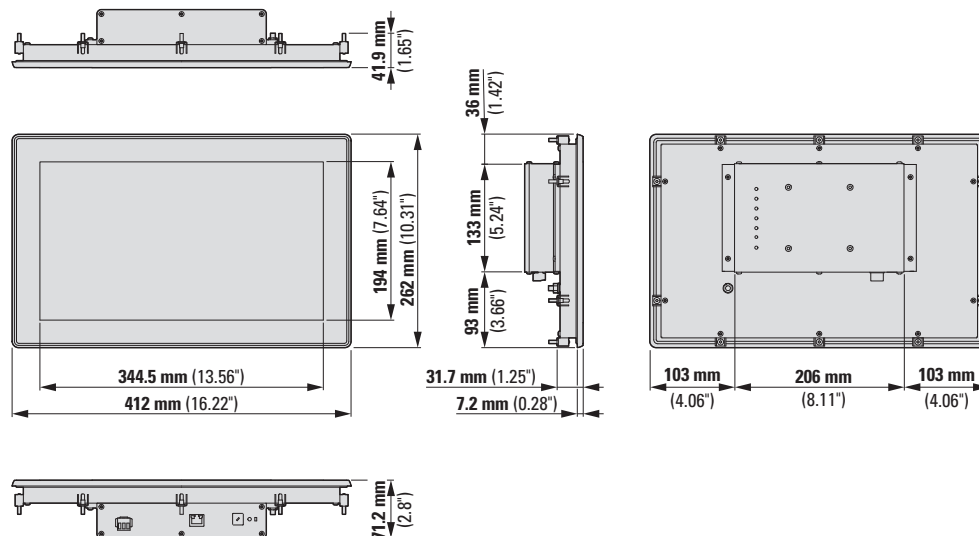
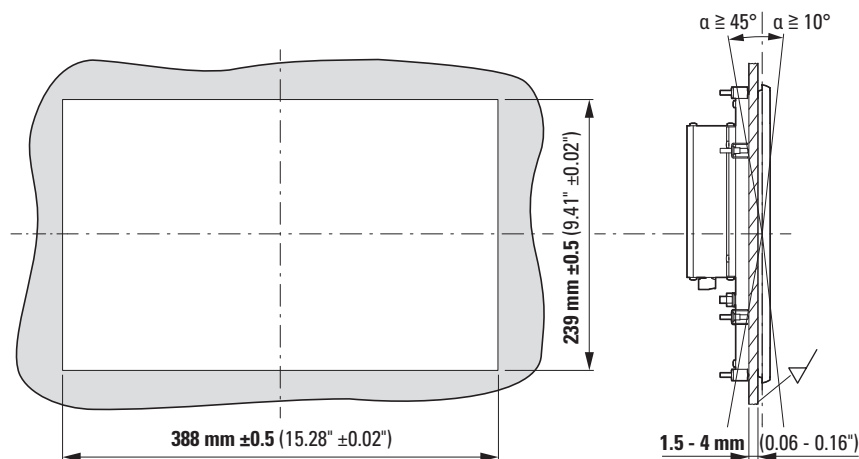


Fig. 53: Dimensions for 15.6" (39.6 cm) front mounting devices in mm (inches)

Width x Height x Depth (without plug)	412.1 mm x 261.6 mm x 89 mm (16.22" x 9.37" x 3.5") +/- 0.2 mm
Built-in depth	82.0 mm (3.22")
Weight	4.1 kg (9.03 lbs)

Hole diameter built-in



- Material thickness of 1.5 mm (0.06") $\leq d \leq$ 4 mm (0.16") at the installation cutout
max. - 45° $\leq \alpha \leq$ max. + 10°
and a flatness $\nabla \leq$ 0.5 mm (0.02") with a surface roughness $\checkmark Rz \leq$ 120; IP 65 \rightarrow
DIN ISO 2768-2 (K)
- Hole diameter built-in: e = 388 mm (15.28") ± 0.5 (0.02"), f = 239 mm (9.40") ± 0.5 (0.02")

A.1.2.10 XP-504-21-...Terminal with Extender RX

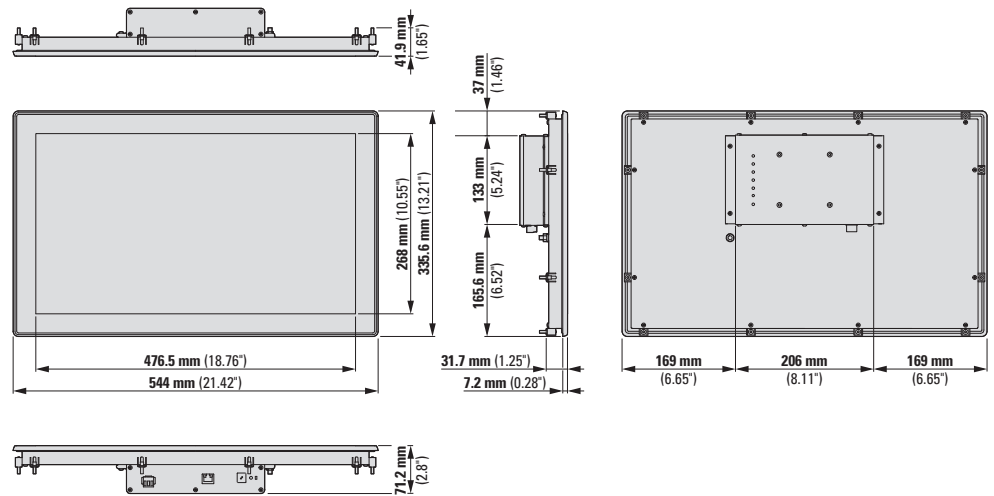
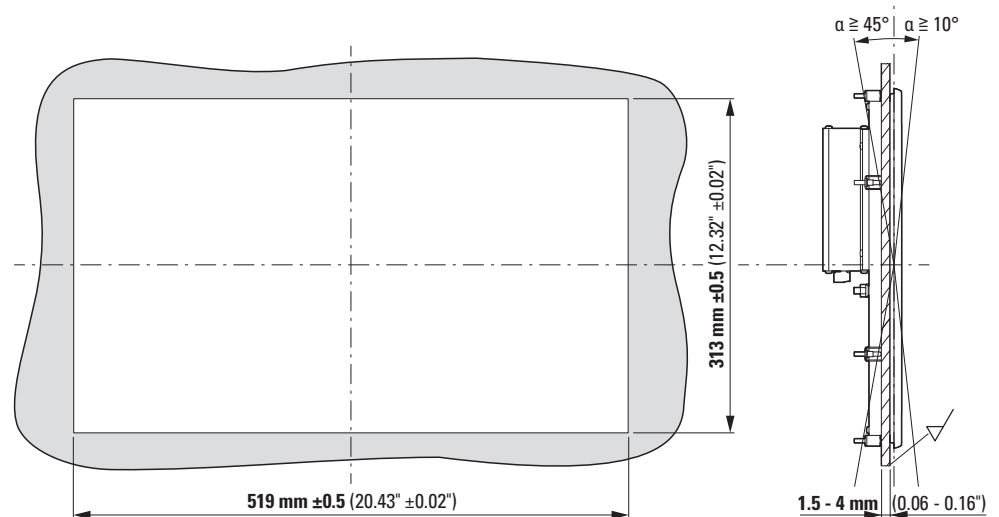


Fig. 54: Dimensions for 21.5" (54.6 cm) front mounting devices in mm (inches)

Width x Height x Depth (without plug)	544 mm x 336 mm x 89 mm (21.42" x 12.9" x 3.5") +/- 0.2 mm
Built-in depth	82.0 mm (3.22")
Weight	6.2 kg (13.66 lbs)

Hole diameter built-in



- Material thickness of 1.5 mm (0.06") ≤ d ≤ 4 mm (0.16") at the installation cutout max. - 45° ≤ α ≤ max. + 10° and a flatness $\square \leq 0.5 \text{ mm (0.02")}$ with a surface roughness $\surd R_z \leq 120$; IP 65 → DIN ISO 2768-2 (K)
- Hole diameter built-in: e = 519 mm (20.43") ±0.5 (0.02"), f = 313 mm (12.32") ±0.5 (0.02")

Appendix
A.1 Technical data

A.1.2.11 XP-504-EXT module

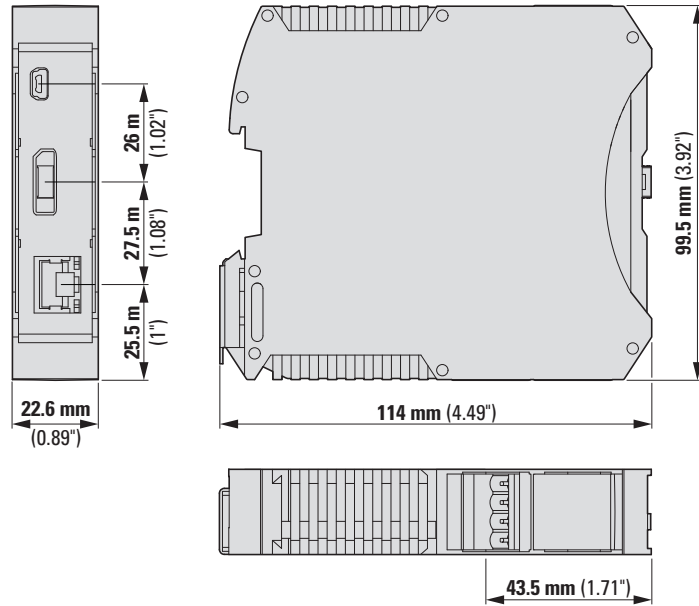


Fig. 55: Dimensions XP-504-EXT module in mm (Inch)

Width x Height x Depth (without plug)	22.6 mm x 99.35 mm x 113.65 mm +/- 0.2 mm
Weight	0.17 kg

A.1.3 General data

The following specifications apply to all XP-504 units or to the specified part nos. where applicable.

Ambient climatic conditions	
Air pressure (in operation)	795 - 1080 hPa Max. 2000 m above sea level
Temperature Operation	Ambient temperature t_a if using natural convection $\pm 0 - +45$ °C ($+32 - +113$ °F) [System with SD- or mSATA memory]
Storage / Transport	$-20 - +60$ °C ($-4 - +140$ °F)
Humidity	Relative humidity 20 - 85 %, no condensation
Condensation	non-condensing
Ambient air	Free of corrosive gases

Degree of protection / tightness	
Panel-PC, Terminal Terminal with Extender RX	IP65 (at front), NEMA4x, for UL use: UL 50E, Type 4X (indoor use), Type 12 (front) IP20 (at rear)
Box-PC, Extender TX	IP20_x

EMC	
Emitted interference XP-504	Class A

Assembly part	Materials used
Display frame	Aluminum
Widescreen device	Surface powder-spray painted RAL 9006 white aluminum
Display enclosure Widescreen device	Galvanized steel, 1 mm thick
Cover glass	Tempered glass across the entire surface (ESG) tempered soda-lime glass Non-glare surface (chemically microetched); gloss: 85 Designer bezel with direct-to-glass printing RAL 9005 jet black 3 mm thick ()
Enclosure PCs	Panel-PC Galvanized steel, 1 mm thick Box-PC Powder-coated metal enclosure
Heat sink	Aluminum (heat sink) (only Panel-PC and Box-PC)
Battery Panel-PC	BR2032 (190mAh, 3V) from Panasonic, the battery for the Box-PC is available as a spare part
Electrical components	Various

Panel-PC	
Touchsensor	Projected Capacitive Touch (PCT)

Appendix

A.1 Technical data

Panel-PC	
	Multi-touch capable, 4-point touch operation
	PCT sensor laminated on the back of the glass panel
	Touch controller connected to computer board via USB interface
	Safe PCT function by using a functional earth with as low a resistance as possible: minimum cross-sectional area of 6 mm ²
Computer platform	Single-Board-Computer
BIOS	AMI UEFI
CPU	Intel Atom QuadCore E3950 2GHz
Cache memory	8GB DDR3L RAM
Flash memory	Industrial flash technology
mSATA	64 GB mSATA
Slot for SD card	1 x SD card slot (externally accessible), SD or SDHC to SDA specification 2.0, min. 8 GB
Operating System	Windows 10 Enterprise LTSC
Cooling	Fanless CPU and system cooling, natural convection-based passive cooling
Battery	BR2032 (190mAh, 3V) from Panasonic
lifespan, backup time (at zero voltage)	Maintenance-Free, normally 5 years at 25° C (77°F)

Display - Widescreen device		
Display - Type		
	XP-504-10-...	Color active-matrix TFT-LCD, 16.2 million colors
	XP-504-15-...	Color active-matrix TFT-LCD, 16.2 million colors
	XP-504-21-...	Color active-matrix TFT-LCD, 16.7 million colors
Resolution (width x height)		
	XP-504-10-...	WSVGA / 1280 x 800 pixels
	XP-504-15-...	WXGA / 1366 x 768 pixels
	XP-504-21-...	WUXGA / 1920 x 1080 pixels
Screen diagonal		
	XP-504-10-...	25.65 cm (10.1")
	XP-504-15-...	39.6 cm (15.6")
	XP-504-21-...	54.6 cm (21.5")
Screen area visible		
	XP-504-10-...	216.96 mm x 135.26 mm
	XP-504-15-...	344.23 mm x 193.54 mm
	XP-504-21-...	476.06 mm x 276.79 mm
Contrast ratio (Normally)		
	XP-504-10-...	normally 900:1
	XP-504-15-...	normally 500:1
	XP-504-21-...	normally 1000:1
Brightness		
	XP-504-10-...	Normally 500 cd/m2
	XP-504-15-...	Normally 400 cd/m2
	XP-504-21-...	Normally 350 cd/m2
Backlight		LED dimnable via software
Lifespan of backlight		Normally 50000 h at 25 °C
Format		
	XP-504-10-...	16:10
	XP-504-15-...	16:9
	XP-504-21-...	16:9
Viewing range [left/right/above/below]		
	XP-504-10-...	normally 85°/85°/85°/85°
	XP-504-15-...	normally 85°/85°/80°/80°
	XP-504-21-...	normally 89°/89°/89°/89°

Appendix

A.1 Technical data

A.1.4 Information on the power supply

Power Supply		
Rated operating voltage	+ 24 VDC SELV (safety extra low voltage)	
Permissible voltage range	18-36 V DC (SELV)	Panel-PC, Terminal with Extender RX
	12-32 V DC (SELV)	Box-PC
	20.4-28.8 V DC (SELV)	Terminal
	5, 12 or 24 V DC (SELV)	Extender TX
Fuse	Yes	fuse not accessible
Potential isolation	no	Box-PC, Terminal, Extender TX
	Yes	Panel-PC, Terminal with Extender RX



The voltage being applied must meet the requirements for safety extra-low voltages (SELV) set forth in IEC/UL 61010-2-201.

Electrical current I_e	Panel-PC	Terminal	Terminal with Extender RX
10.1" (25.65 cm)	1.6 A	0.3 A	0.5 A
15.6" (39.6 cm)	1.8 A	0.4 A	0.6 A
21.5" (54.6 cm)	2.0 A	0.7 A	0.9 A

Power consumption Extender TX module: max. 0.13 A, Box-PC: 1.3 A at 24V

Power consumption	
PCs of the device series XP-504	
XP-504-10-...	max. 38.4 W
XP-504-15-...,	max. 43.2 W
XP-504-21-...	max. 48.0 W
XP-504-BP-... or XP-504-BOXPC-...	max. 31.2 W
Widescreen devices of the device series XP-504	
10" terminal	max. 7.2 W
15" terminal	max. 9.6 W
21" terminal	max. 16.8 W
10" terminal EXT	max. 12 W
15" terminal EXT	max. 14.4 W
21" terminal EXT	max. 21.6 W
Extender TX module	
XP-504-EXT module	3.12 W

A.1.5 Approvals and declarations

Approvals and declarations							
CE	The XP-504 devices comply with all applicable European Union (EU) Directives and feature the CE marking.						
UKCA	XP-504 devices are conform to the applicable regulations in the United Kingdom						
UL	cULus (UL 61010-2-201) certification, UL File No. E205091						
Explosion protection (relevant for CE)	<p>The II 3D Ex tc IIIC T70°C Dc U and II 3G Ex ec IIC T105°C Gc U ATEX certification is only valid for the Widescreen device:</p> <p>Panel-PCs, Terminals, and Terminal with Extender RX, which are professionally placed in an enclosure: IP54 for Zone 2 ("gas"), IP6x for Zone 22 ("dust").</p> <p>This installation must be tested and certified separately.</p> <p>(U = marking for Ex components, see DIN EN IEC 60079-0:2019, 29.10) Special conditions for safe use ("U")</p> <p>Zone 2, Category 3G and Zone 22, Category 3D</p> <p>Special conditions for safe use Zone 2</p> <p>Widescreen devices are designed for installation in the front of enclosures in protection type "ec" (alternatively "eb").</p> <p>The maximum surface temperature at the outer surface is set to 105°C at the maximum ambient temperature of 45°C.</p> <p>Special conditions for safe use Zone 22</p> <p>Panel-PC is designed for installation in the front of enclosures in protection type "tc" (alternatively "ta" or "tb").</p> <p>The maximum surface temperature at the outer surface is set to 70°C at the maximum ambient temperature of 45°C.</p> <p>For safe installation, comply with the specification to holding brackets and tightening torque in the Instruction Leaflet ILO48016ZU.</p> <p>2011/65/EU and 2015/863/EU RoHS Directive 2014/30/EU EMC Directive 2014/34/EU ATEX Directive 2011/65/EU and 2015/863/EU RoHS-Directive 2014/30/EU EMC-Directive 2014/34/EU ATEX-Directive</p>						
Applied standards and directives							
EMC (relevant for CE)	2014/30/EU EMC Directive						
RoHS	-compliant 2011/65/EU and 2015/863/EU RoHS Directive						
Explosion protection (relevant for CE)	2014/34/EU ATEX Directive						
	<table border="1"> <tbody> <tr> <td>EN 61000-6-4:2007/A1:2011</td> <td>Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments</td> </tr> <tr> <td>EN 61000-6-2:2005/AC:2005</td> <td>Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments</td> </tr> <tr> <td>EN 61131-2:2007</td> <td>Programmable controllers - Part 2: Equipment requirements and tests</td> </tr> </tbody> </table>	EN 61000-6-4:2007/A1:2011	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments	EN 61000-6-2:2005/AC:2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments	EN 61131-2:2007	Programmable controllers - Part 2: Equipment requirements and tests
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EN 61131-2:2007	Programmable controllers - Part 2: Equipment requirements and tests						
Safety	<table border="1"> <tbody> <tr> <td>UL 61010-2-201, CSA C22.2 No. 142-M1987</td> <td>Industrial Control Equipment → Section "Conditions for Underwriters Laboratories Inc. (UL) listing ", page 23</td> </tr> <tr> <td>DIN EN 60529</td> <td>Degrees of protection provided by enclosures</td> </tr> <tr> <td>NEMA 250-2003</td> <td>NEMA Standard Enclosures for Electrical Equipment (1000 Volts Maximum)</td> </tr> </tbody> </table>	UL 61010-2-201, CSA C22.2 No. 142-M1987	Industrial Control Equipment → Section "Conditions for Underwriters Laboratories Inc. (UL) listing ", page 23	DIN EN 60529	Degrees of protection provided by enclosures	NEMA 250-2003	NEMA Standard Enclosures for Electrical Equipment (1000 Volts Maximum)
UL 61010-2-201, CSA C22.2 No. 142-M1987	Industrial Control Equipment → Section "Conditions for Underwriters Laboratories Inc. (UL) listing ", page 23						
DIN EN 60529	Degrees of protection provided by enclosures						
NEMA 250-2003	NEMA Standard Enclosures for Electrical Equipment (1000 Volts Maximum)						

Appendix






A.1 Technical data

Applied standards and directives		
Product standards		
	DIN EN 60898-1:2006-03	Electrical accessories - Circuit-breakers for overcurrent protection for household and similar installations
	EN 50178	Electronic equipment for use in power installations
	IEC/EN 61131-2	Programmable controllers: Equipment requirements and tests
Mechanical shock resistance	IEC/EN 60068-2-27	15g /11ms
Vibration	IEC/EN 60068-2-6	Displacement amplitude: 5–9 Hz: 3.5 mm; 9–60 Hz: 0.15 mm Acceleration amplitude: 60–150 Hz: 2 g
Free fall, packaged	IEC/EN 60068-2-32	
Climatic proofing	Cold to IEC 60068-2-1	
	Damp heat as per EN 60068-2-3	
	Dry heat to IEC60068-2-2	

A.2 Further usage information

Documentations

For more information on additional devices and modules, please refer to the following documentation:

 Instruction Leaflet XP-504 Panel-PC	IL048016ZU
 Instruction Leaflet XP-504 Box-PC	IL048017ZU
 Instruction Leaflet Widescreen devices of the device series XP-504	IL048018ZU
 Instruction Leaflet Extender TX	IL048019ZU
 Networks in Brief Information on networks in general and on how to integrate PCs and touch displays in networks	MN05010009Z

Download Center, Eaton Online Catalog

Enter "XP500" into the search box and the catalog will take you directly to the corresponding product group in the Automation, Control and visualization section.

 [Eaton.com/documentation](https://www.eaton.com/documentation)

 [Eaton.com/ecat](https://www.eaton.com/ecat)

Product information

For up-to-date information on the series, please consult the product page on the Internet

 [Eaton.com/xp500](https://www.eaton.com/xp500)

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A.2 Further usage information

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