

BTC22-*

Box Thin Client for Industrial Applications

Manual



With regard to the supply of products, the current issue of the following document is applicable:
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1 History of the Manual

The following editions of the manual have been released:

| Version | Comments |
|---------|---------------|
| 11/2023 | First edition |

2 Safety

2.1 Introduction

2.1.1 Content of this Document

This document contains information that you need in order to use your product throughout the applicable stages of the product life cycle. These can include the following:

- Product identification
- Delivery, transport, and storage
- Mounting and installation
- Commissioning and operation
- Maintenance and repair
- Troubleshooting
- Dismounting
- Disposal

**Note**

This document does not substitute the instruction manual.

**Note**

For full information on the product, refer to the instruction manual and further documentation on the Internet at www.pepperl-fuchs.com.

**Note**

For specific device information such as the year of construction, scan the QR code on the device. As an alternative, enter the serial number in the serial number search at www.pepperl-fuchs.com.

The documentation consists of the following parts:

- Present document
- Instruction manual
- Datasheet

Additionally, the following parts may belong to the documentation, if applicable:

- EU-type examination certificate
- EU declaration of conformity
- Attestation of conformity
- Certificates
- Control drawings
- Functional safety manual
- Additional documents

2.1.2 Content of this Document

This document contains information required to use the product in the relevant phases of the product life cycle. This may include information on the following:

- Product identification
- Delivery, transport, and storage
- Mounting and installation
- Commissioning and operation
- Maintenance and repair
- Troubleshooting

- Dismounting
- Disposal

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2.1.3**Content of this Document**

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- Mounting and installation
- Commissioning and operation
- Maintenance and repair
- Troubleshooting
- Dismounting
- Disposal

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- Functional safety manual
- Additional documents

2.1.4 Manufacturer

| |
|--|
| Pepperl+Fuchs Group Lilienthalstraße 200, 68307 Mannheim, Germany |
| Internet: www.pepperl-fuchs.com |

2.1.5 Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismantling lies with the plant operator.

Only appropriately trained and qualified personnel may carry out mounting, installation, commissioning, operation, maintenance, and dismantling of the product. The personnel must have read and understood the instruction manual and the further documentation.

Prior to using the product make yourself familiar with it. Read the document carefully.

2.1.6 Symbols Used

This document contains symbols for the identification of warning messages and of informative messages.

Warning Messages

You will find warning messages, whenever dangers may arise from your actions. It is mandatory that you observe these warning messages for your personal safety and in order to avoid property damage.

Depending on the risk level, the warning messages are displayed in descending order as follows:



Danger!

This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.



Warning!

This symbol indicates a possible fault or danger.

Non-observance may cause personal injury or serious property damage.



Caution!

This symbol indicates a possible fault.

Non-observance could interrupt the device and any connected systems and plants, or result in their complete failure.

Informative Symbols



Note

This symbol brings important information to your attention.



Action

1. This symbol indicates a paragraph with instructions. You are prompted to perform an action or a sequence of actions.

3 Product Description

3.1 Application

The BTC22 is a rugged, industrial strength box thin client optimized for 24/7 operation. The BTC22 has been specially designed for immunity to shock, vibration, and temperatures within an optional extended range of -20°C to +60°C (standard temperature grade) and is characterized by a fanless construction and industrial strength components.

This compact, stand alone computer features an x6413E series Intel® Atom processor and a modern integrated graphics card. Two DisplayPort™ interfaces support up to two monitors at Ultra HD resolution (4K at 60 Hz), making the BTC22 ideal for monitoring and control applications in factory and process automation.

Additionally the device features an USB Type C connector with DisplayPort capabilities.



Danger!

User access!

Warning. Do not open the device. The BTC22 is a closed unit with no user-accessible parts.



Note

Radio interference

This device has been tested and found to comply with the limits for a Class A digital device pursuant to part 15 of the FCC regulations. These limits are designed to provide reasonable protection against harmful interference when the device is used in a commercial environment. This device generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instruction manual, it may cause interference with wireless connections. Operation of this device in a residential area is likely to result in interference that the operator will have to correct at the operator's own expense.

Dual Monitor Setup



Figure 3.1 Two monitors with Ultra HD resolution (4K at 60 Hz)

The BTC22 is optimized for modern, Ultra HD-compatible monitors. In a standard scenario, up to two Ultra HD-capable monitors can be connected to the native DisplayPorts™. Additionally an third Ultra HD Monitor can be connected via the USB Type C port.

The DP++ functionality in the DisplayPort™ interface also allows the connection of monitors with an HDMI interface. Passive DisplayPort™ to HDMI adapter cables can be used and are available as accessories. When using an adapter, the maximum supported resolution is limited to Full HD.

An active DisplayPort™ to HDMI 2.0 adapter is required to connect an Ultra HD-capable monitor or TV through an HDMI 2.0 interface. These adapters are available as accessories.

DisplayPort™ Multi-Stream Transport (MST) protocol technology allows a series connection of up to three monitors. This requires monitors that have a DisplayPort™ MST hub. Monitor 1 is connected direct to the BTC22 DisplayPort™ and the video signal is connected to monitor 2 and monitor 3 in series.

Note

The BTC22 allows a series connection of up to three monitors.



3.2 Firmware

Shell 6

Pepperl+Fuchs VisuNet Remote Monitors (RMs) and Box Thin Clients (BTC) are industrial-grade thin-client solutions that provide a simplified, modern user interface for operators. The firmware of an RM, called VisuNet RM Shell, enables users to easily access applications that run on a host system (e.g., workstation PC or server) via Ethernet.

With VisuNet RM Shell, the latest versions of common remote protocols, such as RDP 10 or VNC are supported. With these protocols, the RMs / BTCs can be easily integrated into all major process control systems—whether they are virtualized or conventional workstation-based setups.

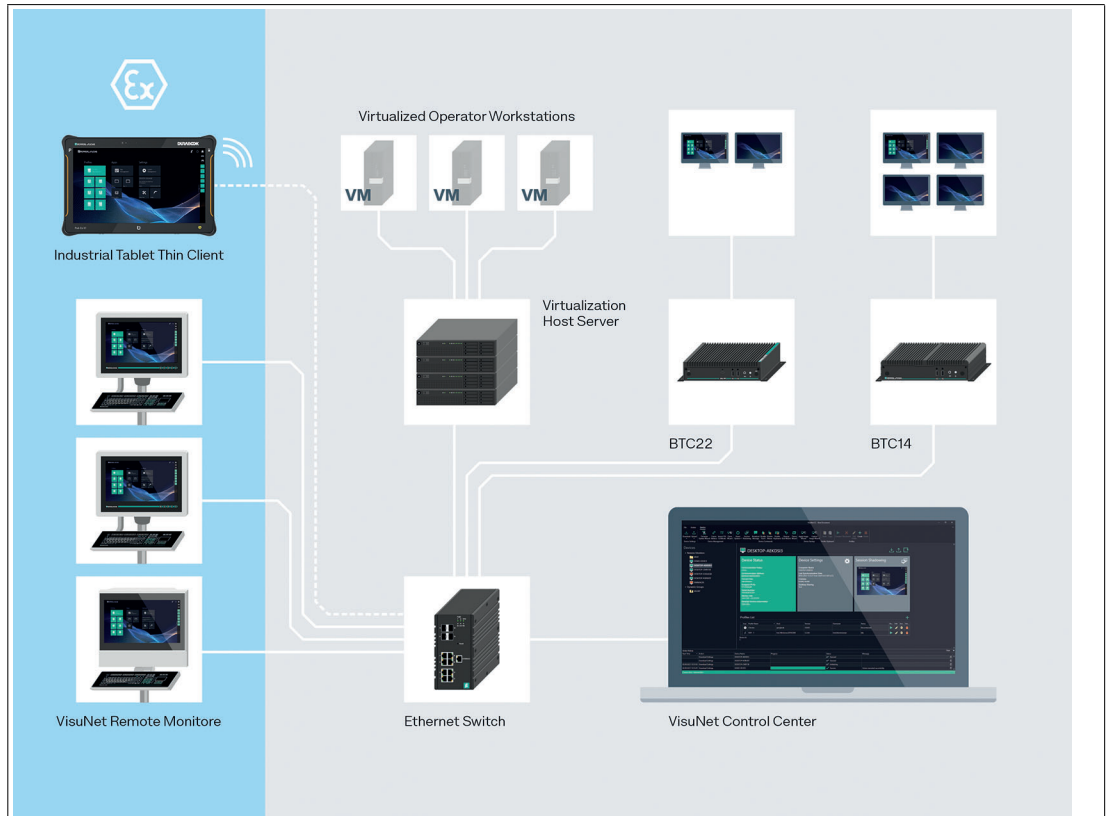


Figure 3.2

Further, VisuNet RM Shell has a tailored user interface, which only shows the important system aspects that are relevant for the configuration of the RM / BTC. This makes the integration of an RM / BTC into the process control system simpler than ever before. Configuring a new RDP connection, for example, can be done in a few steps. This is achieved via a consistent, touch-screen-optimized design across all protocol editors.

VisuNet RM Shell also helps increase process stability. It ensures a stable connection to the process control host system and an error-free display of the process pictures.

The auto-connect function can be used to configure RMs / BTCs in such a way that they automatically establish a connection to a designated host system, without any further intervention from the user. While temporarily interrupted connections are automatically re-established, backup hosts can be specified in VisuNet RM Shell to which an RM / BTC can automatically connect if a host system fails.

In addition to support for remote protocols, VisuNet RM Shell also offers restricted web browser features, which can be enabled via an optional professional license key. This allows fixed addresses to web applications like web-based Manufacturing Execution Systems (MES) to be defined. Users with administrator rights can restrict operator access to these pre-defined web-sites. This increases system security and reduces the risk of malware infiltration.

The Shell 6 manual describes the features and functions of VisuNet RM Shell 6 in detail.

3.3 Technical Data



Note

The standard version of the BTC22 is BTC22-NA-1BA1-NN0.

| Hardware | |
|--------------|---------------------------------|
| Processor | Intel® Elkhart Lake Atom x6413E |
| RAM | 8 GB DDR4 |
| Mass storage | 64 GB eMMC |

| Supply | |
|--|---|
| Power supply | Input voltage: 12 ... 28 V DC Input current: max. 2 A - 1 A Input via 2.5-mm power socket (with double insulation from the mains) |
| Maximum load (2x FHD Displays, CPU full load, 14W USB loads) | |
| 4GB RAM: | Maximum load (@1.56A): max. 29.6W |
| 8GB RAM: | Maximum load (@1.7A): max. 32.3W |

| Interface | |
|----------------|--|
| Interface type | Front Side: 1x USB 3.2 Gen1 w/ DP alt mode, Type C 2x USB 2.0 Type A, power button, audio line out Back side: 3x 2500Base-T Ethernet, 2x DisplayPort 1.4, 1x DC (DC jack 5.5 x 2.5 mm with lock mechanism), 2x USB 3.2 Gen 1 Type A, 1x RS-232/RS-485 with RJ45 connector |

| Directive conformity | |
|-------------------------------|---|
| Electromagnetic compatibility | |
| Directive 2014/30/EU | EN 61326-1:2013 EN 55032:2015, AC:2016 |
| RoHS | |
| Directive 2011/65/EU (RoHS) | EN 50581:2012 |

| Software | |
|------------------|---|
| Operating system | VisuNet RM Shell 6.x (based on Microsoft® Windows® 10 IoT Enterprise 2021 LTSC) |

| Ambient conditions | |
|-----------------------|---|
| Operating temperature | Temperature classes: A: Industrial temperature grade 0° ... 55° C (32 ... 131 °F) |
| Storage temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Relative humidity | ≤ 95% at 40°C (non-condensing acc. to EN 60068-2-78) |
| Shock resistance | 40 g (11 ms) when operating |
| Vibration resistance | 3 g _{rms} 5 ... 500 Hz |

| Mechanical specifications | |
|---------------------------|---|
| Housing material | Aluminum body and sheet metal, painted/powder-coated |
| Degree of protection | IP40 |
| Mass | 1.32 kg |
| Dimensions | 216 mm x 130 mm x 47 mm |
| Mounting | Desktop or wall mounting, VESA mount (100 x 100 mm and 75 x 75 mm) and DIN rail mounting via optional adapter |
| Note | Passive cooling, no moving parts Power supply not included. |

3.4 Dimensions and Nameplates

Dimensions

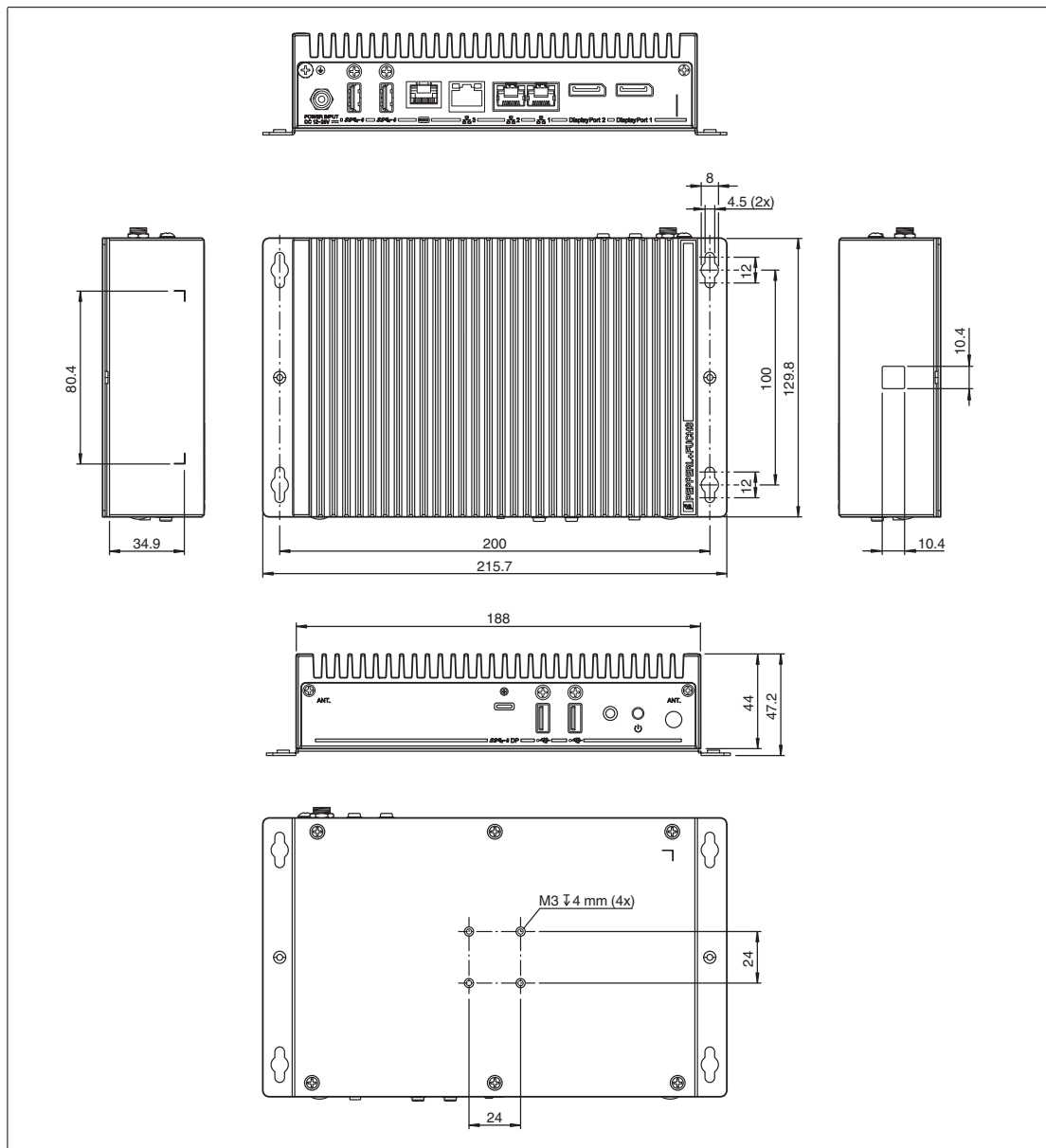


Figure 3.3 BTC22 dimensions

Labels

The following labels are attached to the BTC22.

Nameplate



Operator needs consult this manual, all warnings as applicable need to be taken into consideration.



Hot surface



Certificate of Authenticity (COA)



The data can be found on the product marking and on the COA label. The product marking is located on the side of the device. The COA label is only available with pre-installed Windows® operating systems and is affixed to the back of the device.

4 Installation

4.1 Mounting



Warning!

Installation!

The device must be installed by competent personnel in accordance with the instructions. All applicable laws and regulations must be carefully observed.

Preparation for Installation

Check the package contents and all accessories ordered for completeness and signs of damage. If the contents are incomplete, damaged, or do not match your order, contact your delivery service immediately.

Mounting

The device is intended for indoor use. If placed in a suitable housing, the device can also be used outdoors.



Note

If the device is used in a manner not prescribed by the manufacturer, the built-in protective function of the device may be impaired.

The device is cooled passively. Natural airflow is required to ensure proper cooling. If the device is installed in a housing, power dissipation from the device must be taken into account (see chapter 4.2).

Vertical installation provides optimal cooling since air passes through the cooling fins.

Observe the following recommended distances to other electrical components or to a housing wall:

- Below the device (if mounted vertically): ± 100 mm
- All other sides: ± 50 mm

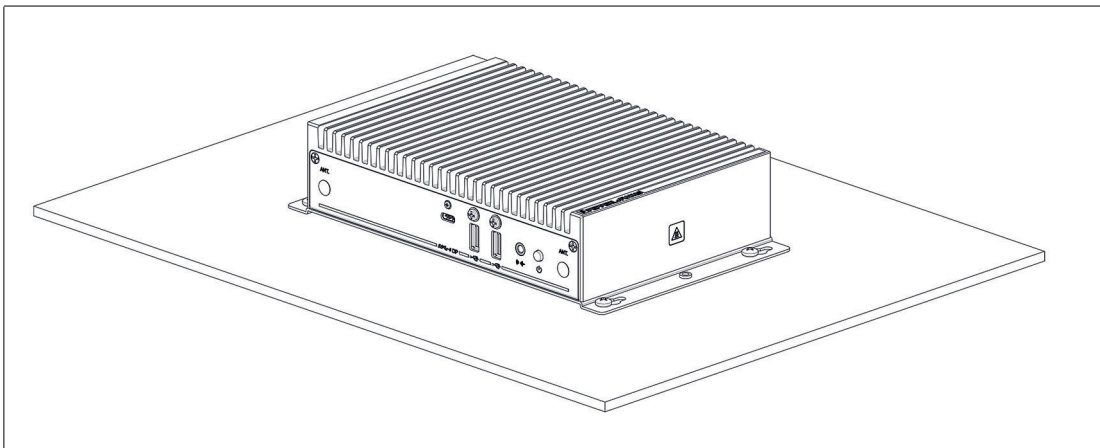


Figure 4.1 Horizontal mounting/desktop mounting

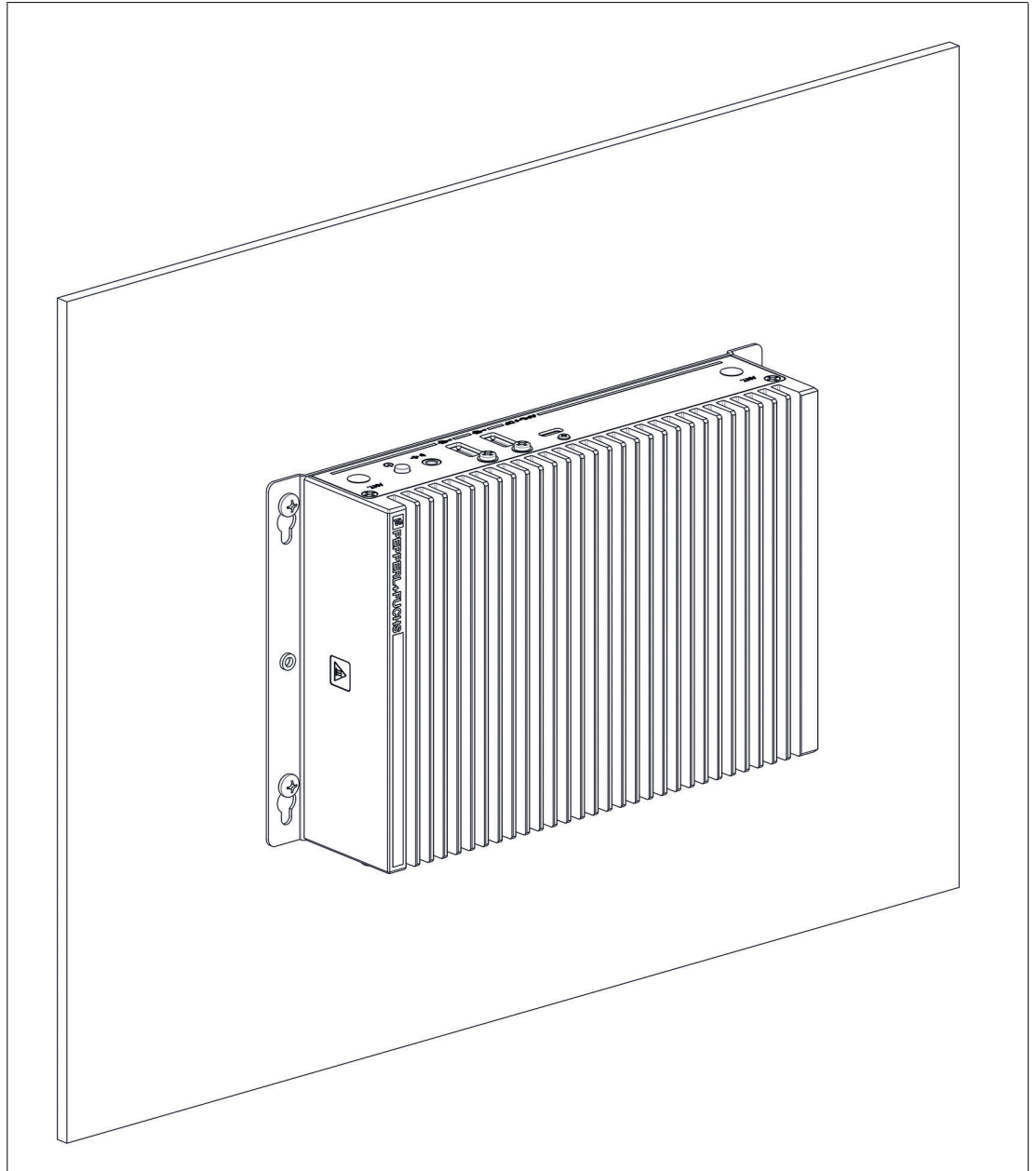


Figure 4.2 Vertical mounting



Danger!

Ambient conditions!

Do not operate the device outside the specified ambient temperature.



Warning!

Hot surface!

The surface of the device may become hot during operation.



DIN Rail Mounting

Following tools and installation materials required:

- Screwdriver,
- 4 anchors,
- 4 screws (included in scope of delivery).

1. Attach the DIN rail adapter to the back of the BTC22. Use the thread on the bottom of the BTC22 to secure the adapter. Tighten the supplied screws to a tightening torque of 0.4 Nm.

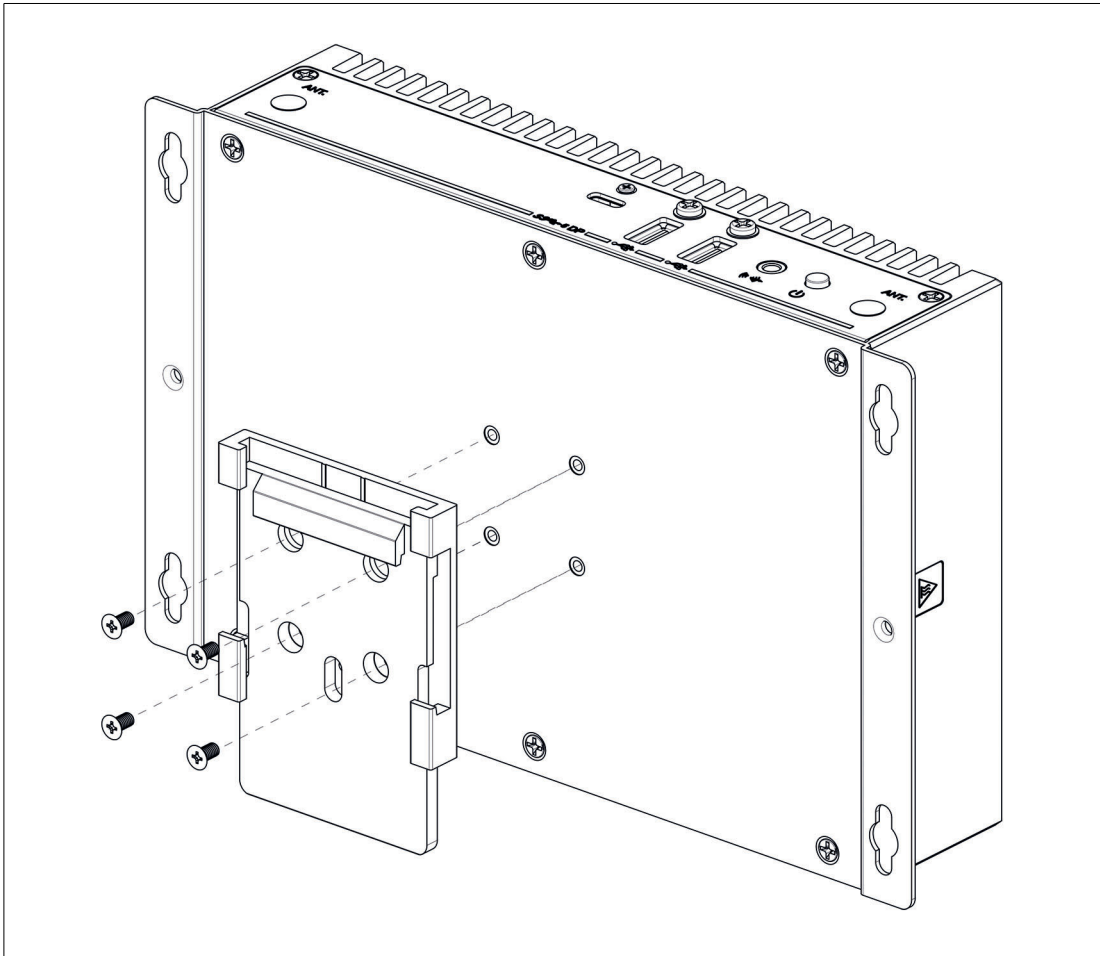


Figure 4.3

2. There is a movable clamp on the top of the DIN rail adapter. Install the BTC22 at a slight angle with the movable clamp over the DIN mounting rail. Apply light pressure to pull the BTC22 downward and clamp the adapter into the rail.

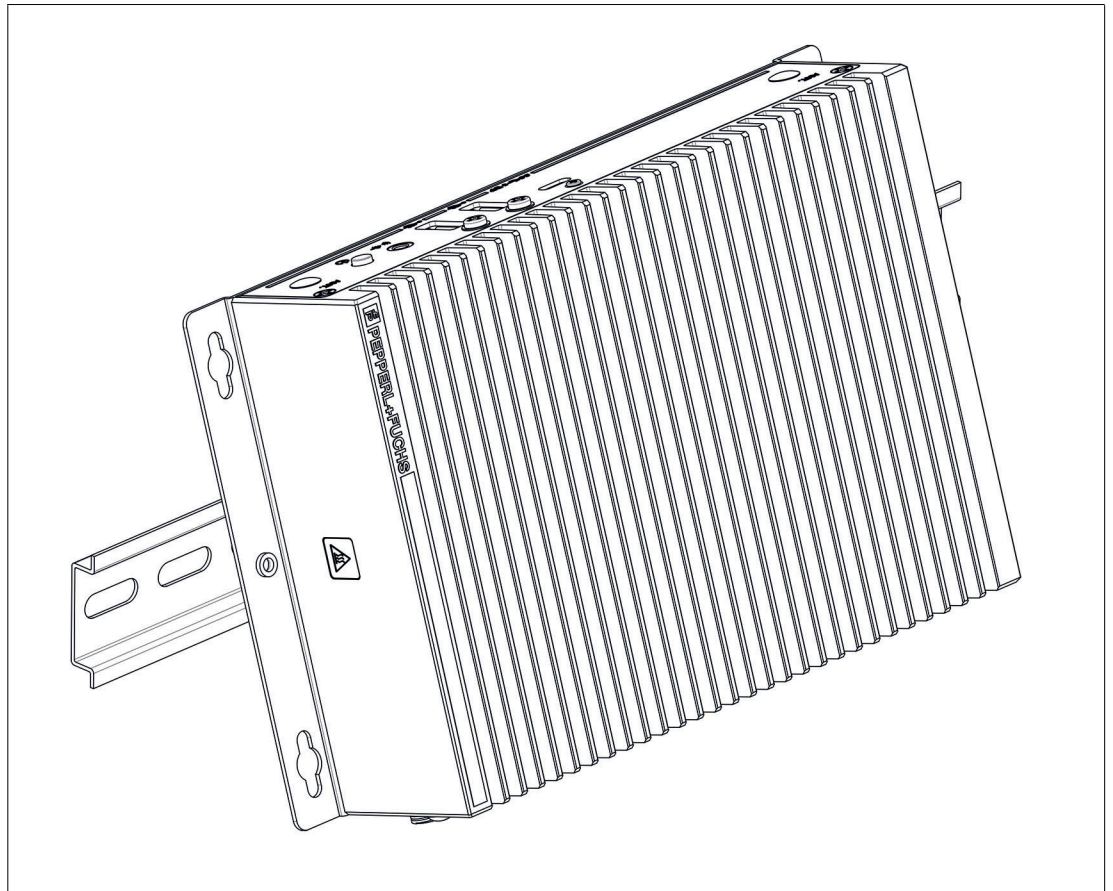


Figure 4.4

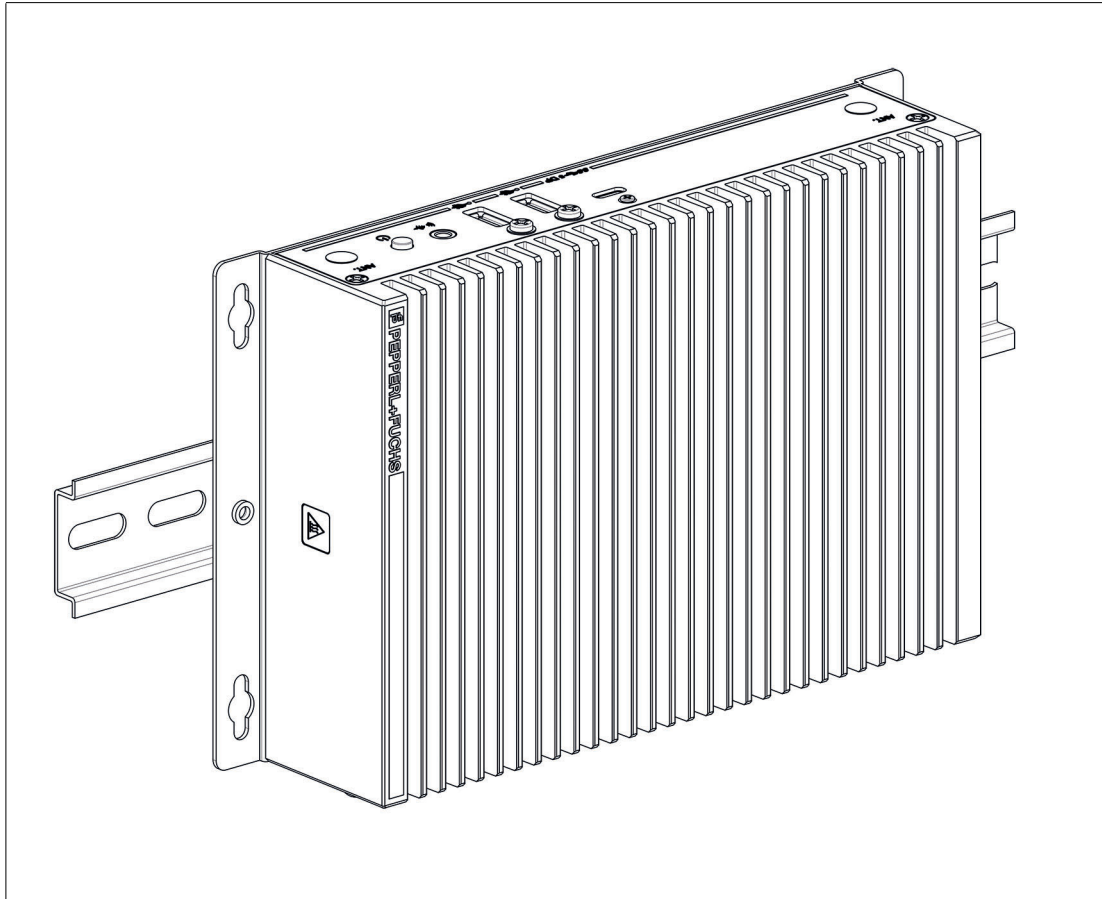


Figure 4.5



Wall Mounting



Caution!

Insufficient load capacity!

If the mounting surface for wall and vertical mounting does not have sufficient load capacity, the device may fall and be damaged.

It is the responsibility of the installer to select a suitable location with sufficient strength for the equipment.

Use suitable mounting screws with a diameter of 4 mm (not included in the scope of delivery) and the following installation diagram to secure the device to the wall. Use wall anchors if necessary.

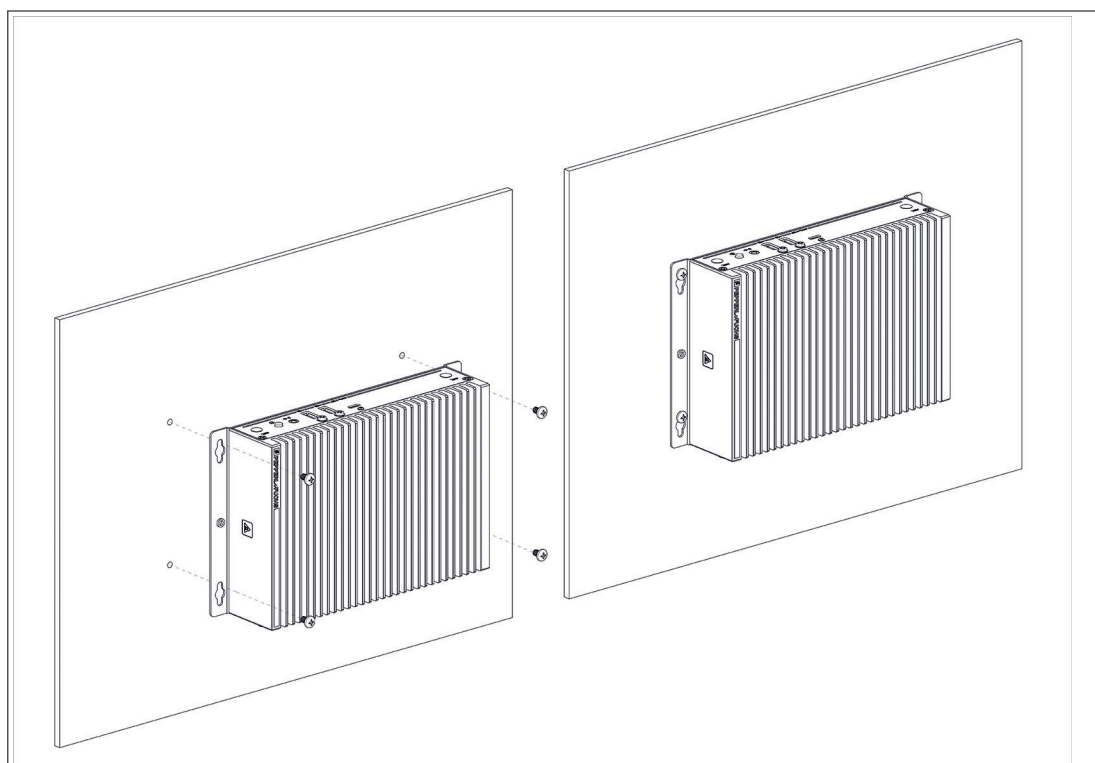


Figure 4.6

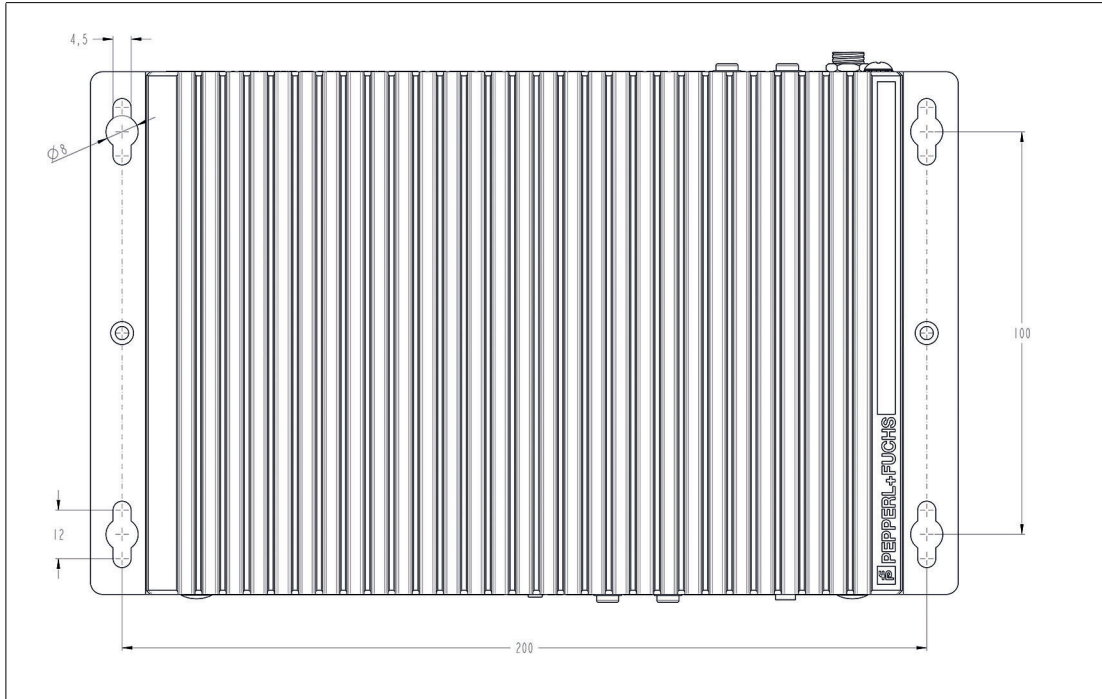


Figure 4.7 Installation diagram



VESA Mounting

1. Attach the VESA fixture (100 x 100 mm or 75 x 75 mm) to the VESA arm or the back panel of the monitor (using the screws provided by the monitor manufacturer).

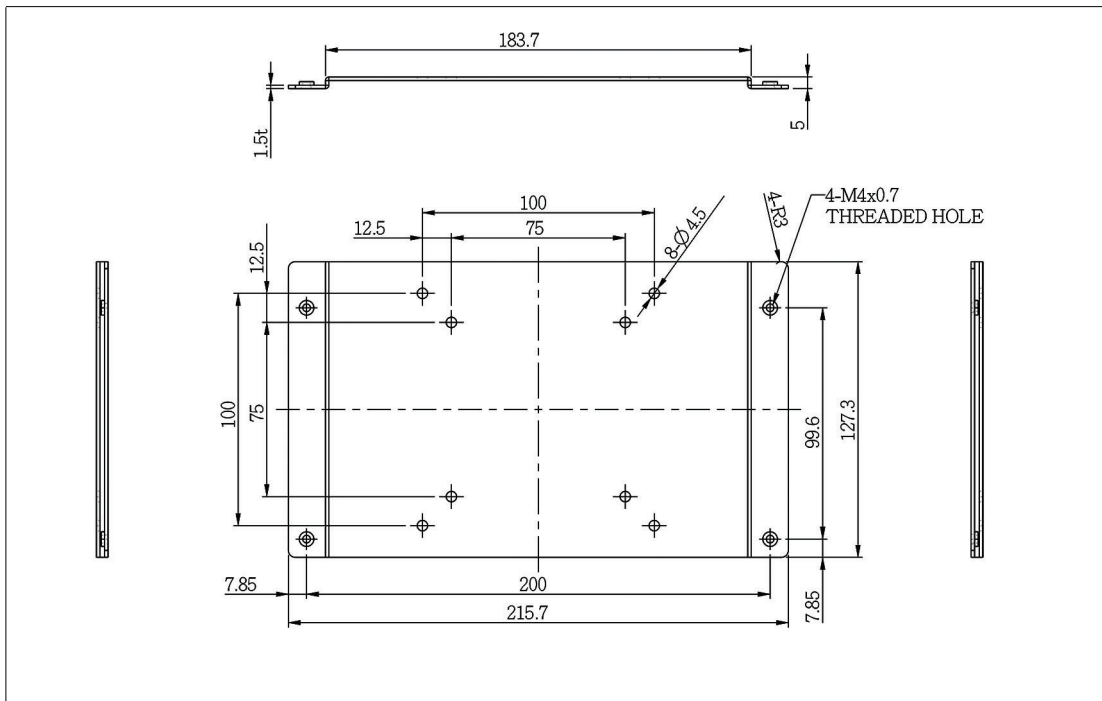


Figure 4.8

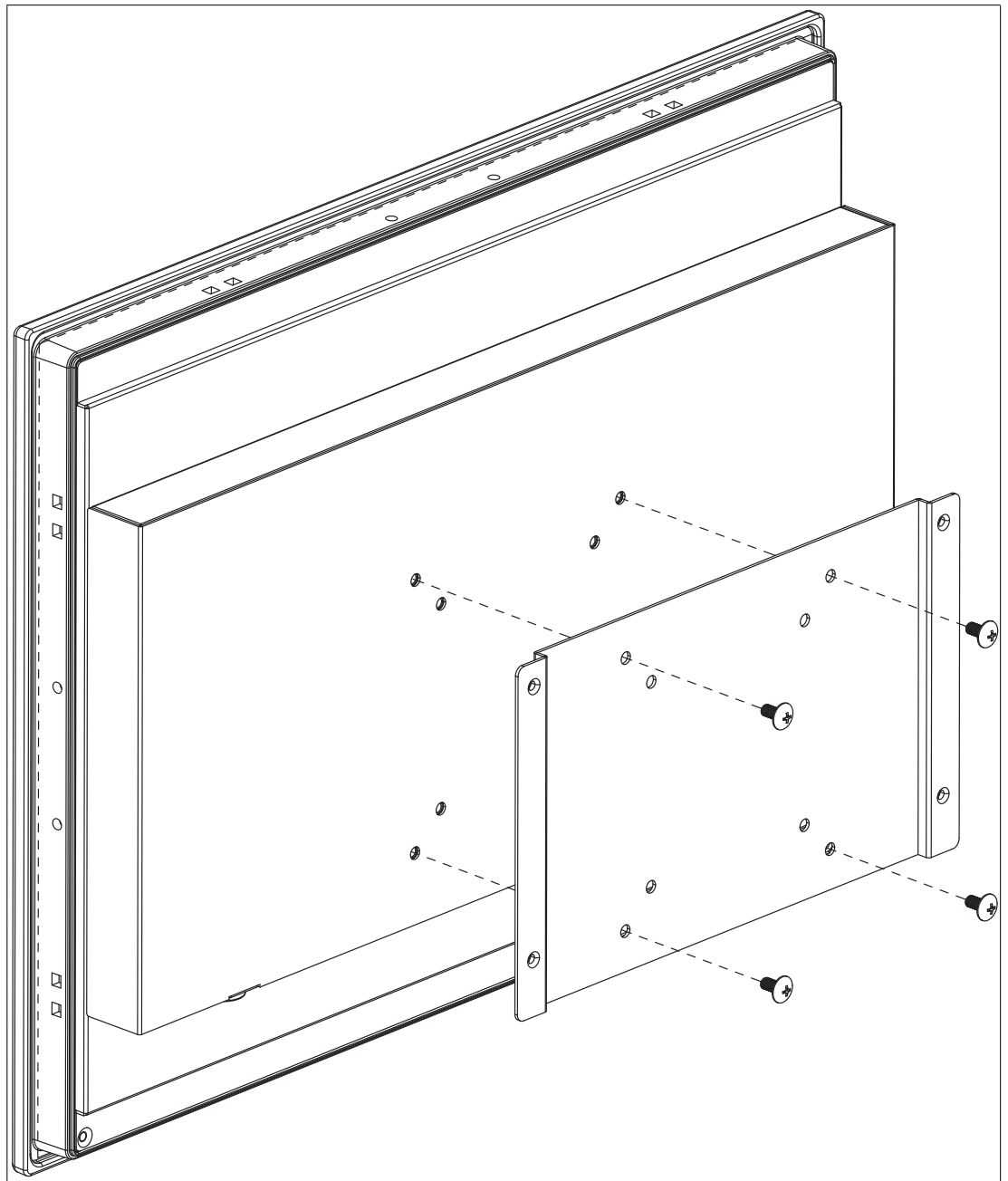


Figure 4.9



Danger!

Ambient temperature range

Warning. The ambient temperature range needs to be taken into consideration for use in hazardous locations.

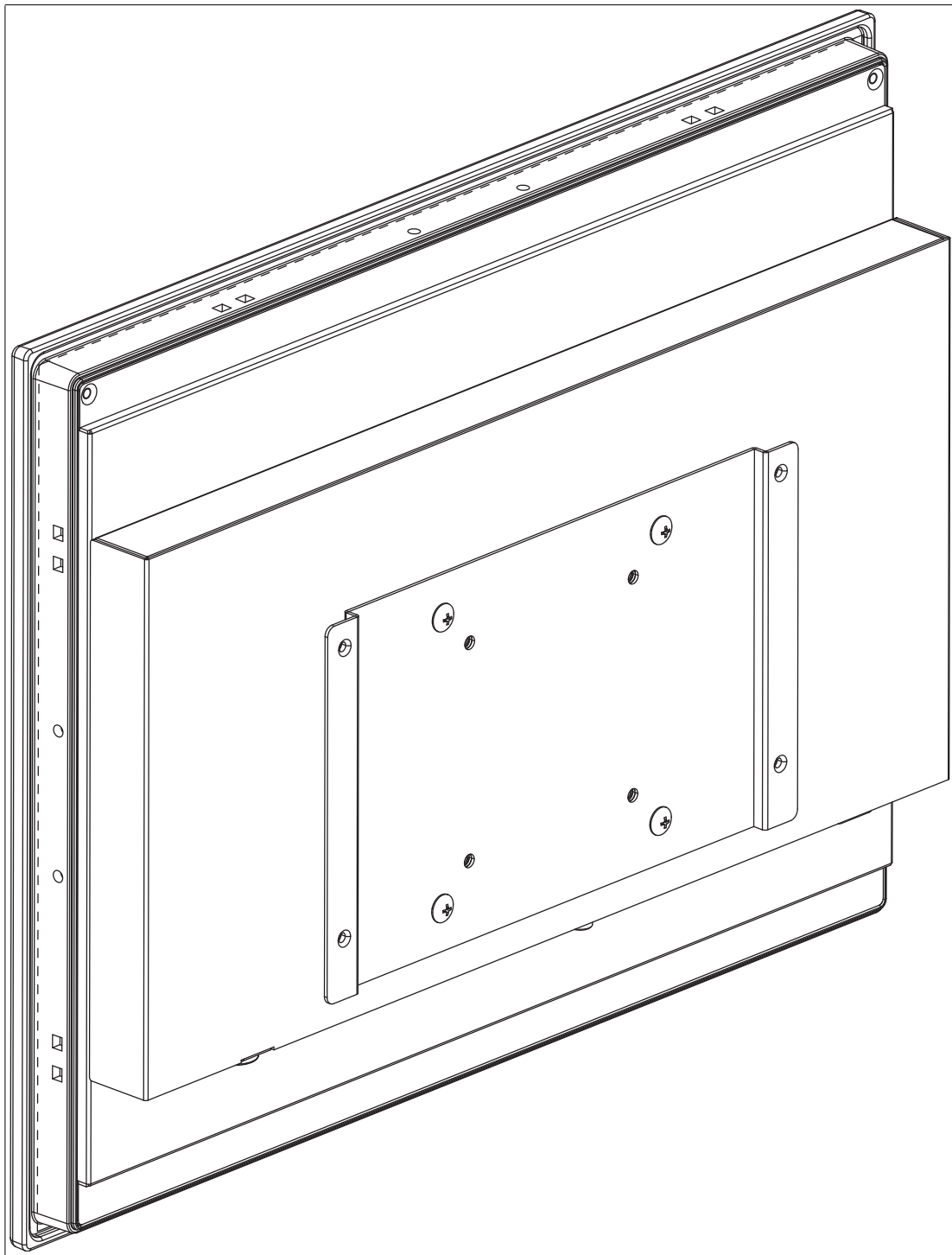


Figure 4.10

2. Secure the BTC22 to the VESA fixture using the supplied screws.

3. Screw M4, tightening torque: 0.7 ± 0.1 Nm

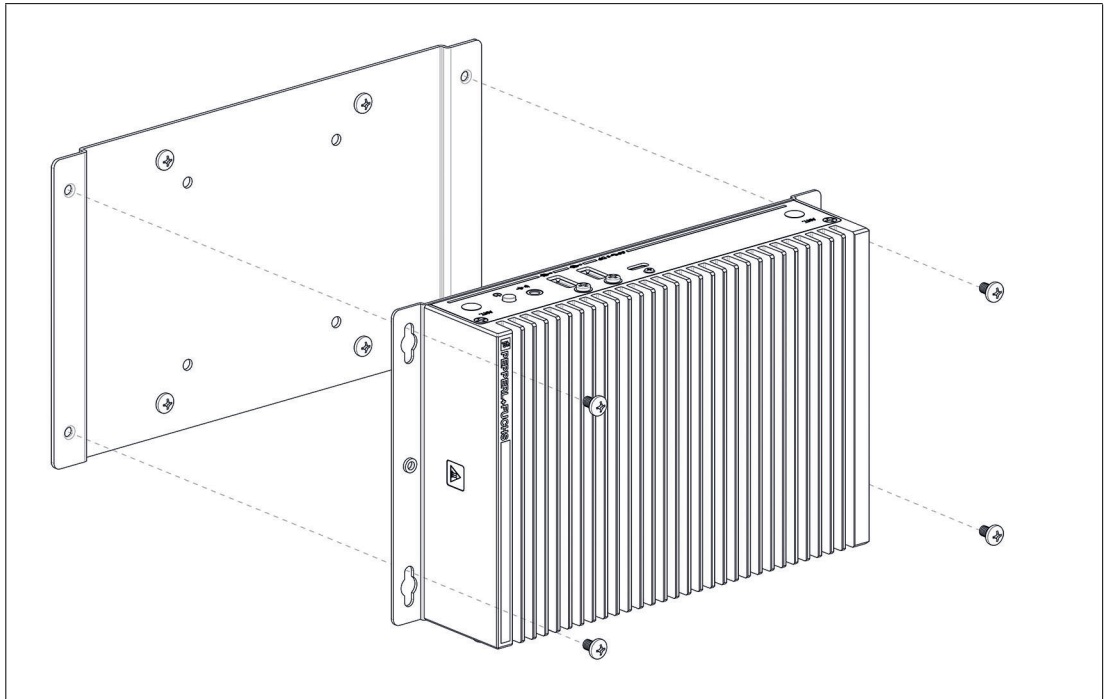


Figure 4.11

4.2 Electrical Connection

Power consumption at 19 V supply voltage:

- Maximum load: 33 W (2x FHD Monitore, CPU full load, 14W USB loads)
- Normal operation: 18.5 (2x FHD Monitore, CPU full load, Mouse, Keyboard)



Commissioning

1. Remove the dummy plugs from the ports where connections are to be made. To prevent dust ingress, leave the dummy plugs in ports that are not in use.
2. Connect the BTC22 to the network via the Ethernet port.
3. Connect the BTC22 to the mouse and keyboard via the USB 2.0 port.
4. Connect the BTC22 to the display via a DisplayPort™. The DisplayPort™ interface provides mechanical strain relief to protect against vibration. Locking mechanisms are available as accessories for additional strain relief.
5. Optional strain-relief locking mechanisms can also be attached to the USB ports.
6. Connect the BTC22 to the AC/DC power supply (e.g., FSP065-REBN2).



Note

Strain-relief locking mechanisms are available as accessories. The screws required to secure the locking mechanisms are supplied in the scope of delivery for the BTC22.

4.3 I/O Connection



Tip

Connections should be mechanically secured by e.g. the "yellow" cable retainer and/or the screws for each type of connection.

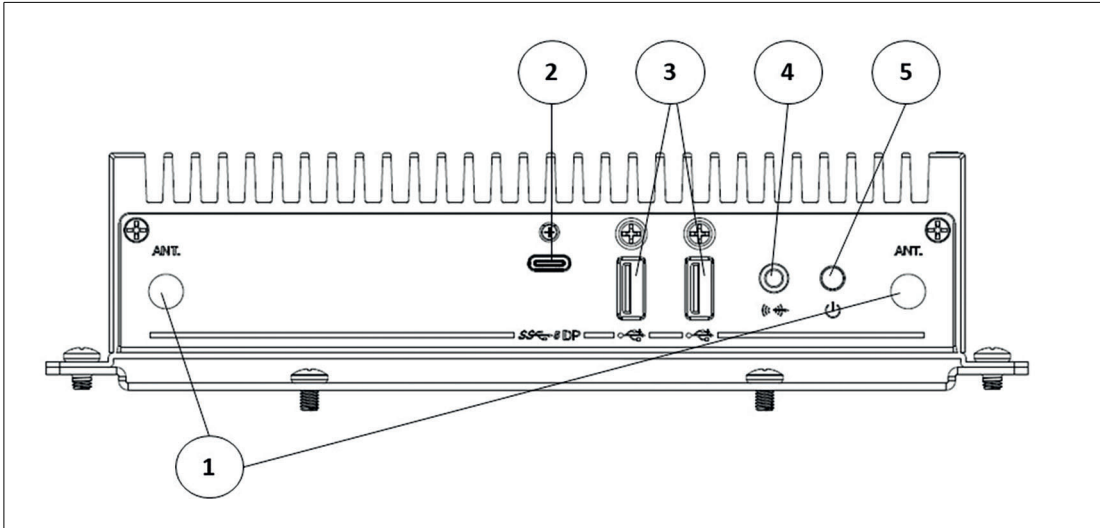


Figure 4.12 BTC22 ports, front

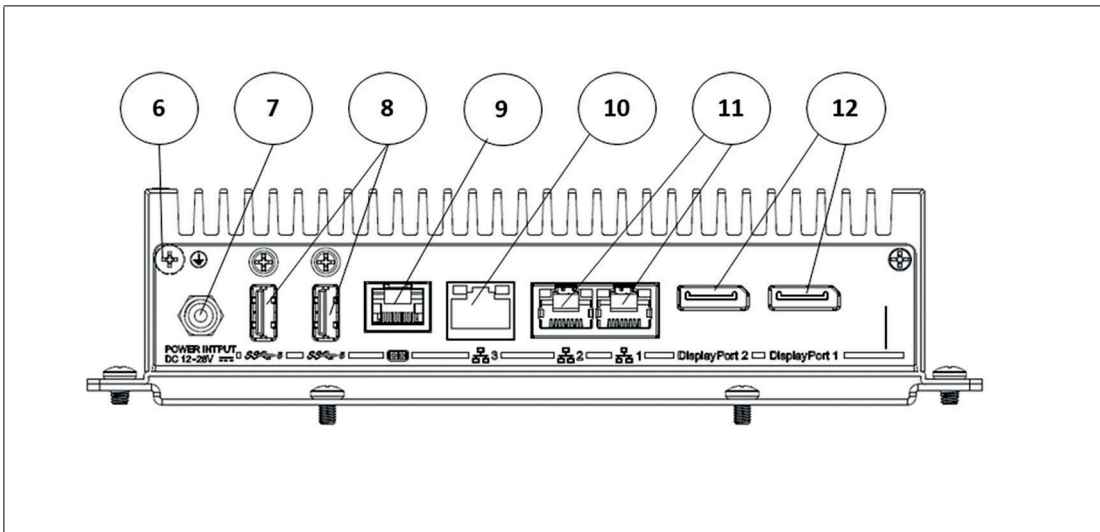



Figure 4.13 BTC22 ports, rear

Port Overview

| Number | Interface type | Description |
|--------------|----------------------------------|--|
| Front | | |
| 1 | Antenna opening x 2 (dummy plug) | Dummy plug antenna connections, one on the left and one on the right |
| 2 | USB Type C | 3.2 Gen 1 with DisplayPort alt mode |
| 3 | USB ¹ | USB 2.0 x 2 |

2023-11

| Number | Interface type | Description |
|-------------|---|---|
| ④ | Audio | Line output x 1 ² |
| ⑤ | Symbol | On/off switch |
| Back | | |
| ⑥ | Ground connection | Not required for standard installations |
| ⑦ | Power plug | 5.5 x 2.5 mm DC jack bush with locking mechanism (M8 screw) 12 VDC to 28 VDC  Polarity |
| ⑧ | USB | USB 3.1 (Gen 1) x 2 |
| ⑨ | COM | RS-232/RS-485 port with RJ45 connector x 1 |
| ⑩ | Ethernet 3 (tertiary port) 1000BaseT RJ45 plug | 1000BaseT RJ45 plug |
| ⑪ | (Secondary port) Ethernet 1 (Primary port) | 1000BaseT RJ45 plug |
| ⑫ | DisplayPort™ 1 DisplayPort™ 2 | DP 1.2 up to 2 x 4K (Ultra-HD) at 60 Hz (Up to 3 Full HD monitors via series connection) |

1. Only four of these USB ports can be operated simultaneously in high-current mode, max. 14 W.

2. This port is not to be used in a hazardous location

RJ45 Port RS-232 Pinout

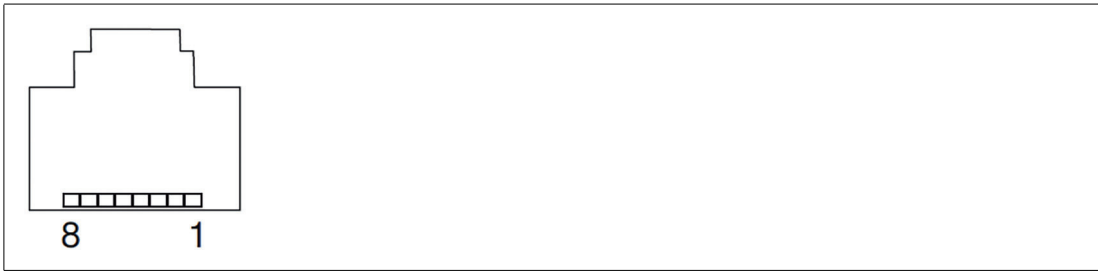


Figure 4.14 RJ-45

| Pin | RJ-45 | DSUB DE-9 | Description |
|-----|-------|-----------|-------------------------|
| 1 | DSR | DCD | Data Carrier Detect (E) |
| 2 | DCD | RXD | Received Data (E) |
| 3 | DTR | TXD | Transmitted Data (A) |
| 4 | GND | DTR | Data Terminal Ready (A) |
| 5 | RXD | GND | Ground |
| 6 | TXD | DSR | Data Set Ready (E) |
| 7 | CTS | RTS | Request to Send (E) |
| 8 | RTS | CTS | Clear to Send (E) |

RJ45 Port RS-485 Pinout

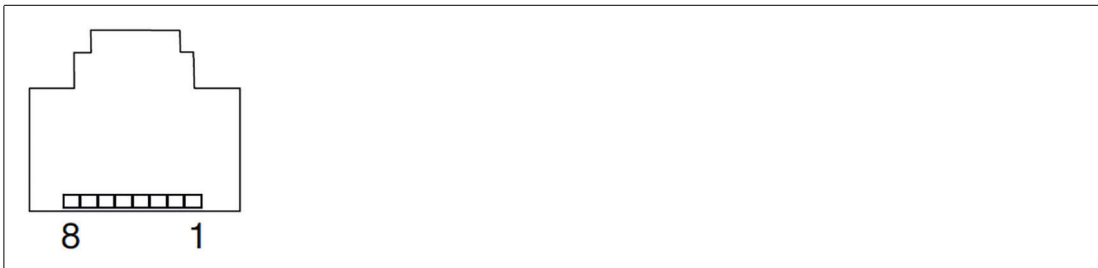


Figure 4.15 RJ-45

| Pin | RJ-45 | DSUB DE-9 |
|-----|---------------------------|---------------------------|
| 1 | COM_POWER (Jumper option) | RS-485_D- |
| 2 | RS-485_D- | RS-485_D+ |
| 3 | | - |
| 4 | GND | - |
| 5 | RS-485_D+ | GND |
| 6 | | COM_POWER (Jumper option) |
| 7 | | - |
| 8 | | - |

RJ45 Port RS-422 Pinout



Figure 4.16 RJ-45

| Pin | RJ-45 | DSUB DE-9 |
|-----|---------------------------|---------------------------|
| 1 | COM_POWER (Jumper option) | RS-422_TX- |
| 2 | RS-422_TX- | RS-422_TX+ |
| 3 | RS-422_RX- | RS-422_RX+ |
| 4 | GND | RS-422_RX- |
| 5 | RS-422_TX+ | GND |
| 6 | RS-422_RX+ | COM_POWER (Jumper option) |
| 7 | | |
| 8 | | |

RJ45 Port

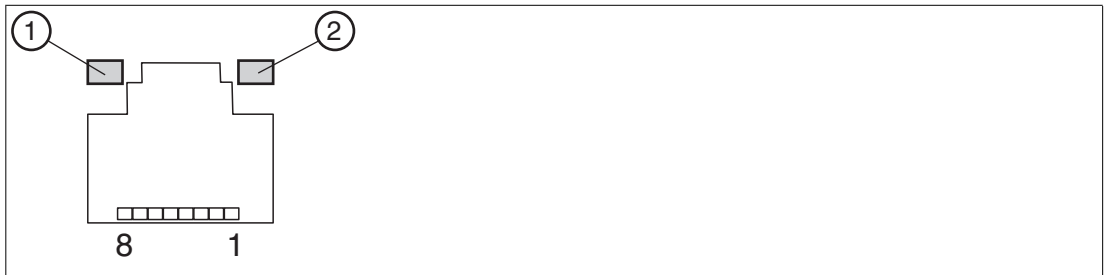


Figure 4.17 RJ45 pinout with LED display

| Pin | Type | Color |
|-----|---------------------|-------------|
| 1 | Transceive Data+ | WH/OR |
| 2 | Transceive Data- | OR/WH or OR |
| 3 | Receive Data+ | WH/GN |
| 4 | Bidirectional Data+ | BU/WH or BU |
| 5 | Bidirectional Data- | WH/BU |
| 6 | Receive Data- | GN/WH or GN |
| 7 | Bidirectional Data+ | WH/BN |
| 8 | Bidirectional Data- | BN/WH or BN |

LED Indicator

| No. | Type | Description |
|-----|-----------|---|
| ① | Right LED | Yellow Off – No Connection / No Link Yellow On – Connection / Link Established Yellow Flashing – Connection / Link Established with Data actively being transmitted |
| ② | Left LED | LED Off – 10 Mbps Speed detected Green On – 100 Mbps Speed detected Orange – 1 Gbps Speed detected |

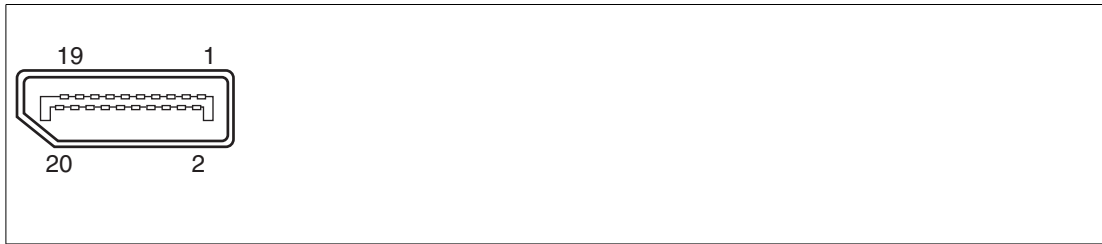
DisplayPort™

Figure 4.18

| Pin | Type | Description | Input/output |
|-----|----------------|-------------------------|--------------|
| 1 | ML_Lane0+ | DP Data 0+ | Output |
| 2 | GND | Ground | - |
| 3 | ML_Lane0- | DP Data 0- | Output |
| 4 | ML_Lane1+ | DP Data 1+ | Output |
| 5 | GND | Ground | - |
| 6 | ML_Lane1- | DP Data 1- | Output |
| 7 | ML_Lane2+ | DP Data 2+ | Output |
| 8 | GND | Ground | - |
| 9 | ML_Lane2- | DP Data 2- | Output |
| 10 | ML_Lane3+ | DP Data 3+ | Output |
| 11 | GND | Ground | - |
| 12 | ML_Lane3- | DP Data 3- | Output |
| 13 | CONFIG1 CAD | Cable-adapter detection | Input |
| 14 | CONFIG2 | Ground (pull down) | - |
| 15 | AUX_CH+ | Auxiliary channel+ | Input/output |
| 16 | GND | Ground | - |
| 17 | AUX_CH- | Auxiliary channel- | Input/output |
| 18 | HPD | Hot Plug Detect | Input |
| 19 | GND | Ground | - |
| 20 | DP_PWR | +3.3 V (fused) | Output |

USB Ports



Figure 4.19 USB 2.0

| Pin | Type | Description |
|-----|-----------------------|--------------|
| 1 | USB_P5V_ fused (A) | +5 V (fused) |
| 2 | USB_D0M (I/O) | Data- |
| 3 | USB_D0P (I/O) | Data+ |
| 4 | USB_GND | GND |



Figure 4.20 USB 3.0

| Pin | Type | Description | Input/output |
|-----|------|----------------------|--------------|
| 1 | VBUS | + 5 V (fused) | Output |
| 2 | D- | Data channel USB 2.0 | Input/output |
| 3 | D+ | Data channel USB 2.0 | Input/output |
| 4 | GND | Ground | - |
| 5 | RX- | Data channel USB 3.0 | Input |
| 6 | RX+ | Data channel USB 3.0 | Input |
| 7 | GND | Ground | - |
| 8 | TX- | Data channel USB 3.0 | Output |
| 9 | TX+ | Data channel USB 3.0 | Output |

USB Type C 3.2 Pinout

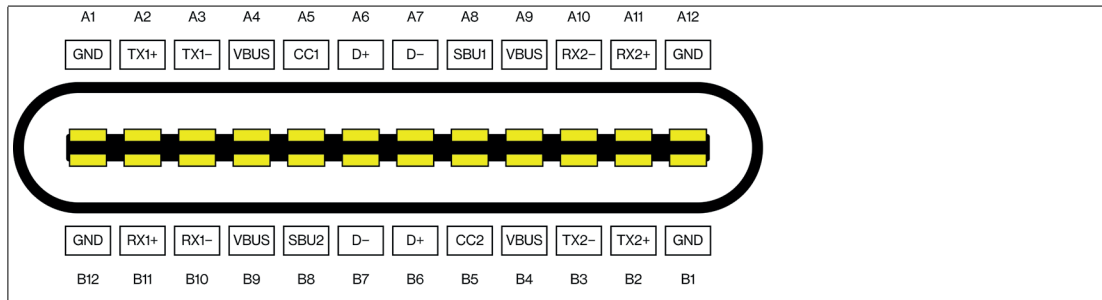


Figure 4.21

| Pin | USB Type C 3.2 |
|-----|----------------|
| A1 | GND |
| A2 | TX1+ |
| A3 | TX1- |
| A4 | VBUS |
| A5 | CC1 |
| A6 | D+ |
| A7 | D- |
| A8 | SBU1 |
| A9 | VBUS |
| A10 | RX2- |
| A11 | RX2+ |
| A12 | GND |
| B1 | GND |
| B2 | TX2+ |
| B3 | TX2- |
| B4 | VBUS |
| B5 | CC2 |
| B6 | D+ |
| B7 | D- |
| B8 | SBU2 |
| B9 | VBUS |
| B10 | RX1- |
| B11 | RX1+ |
| B12 | GND |

Ethernet Port

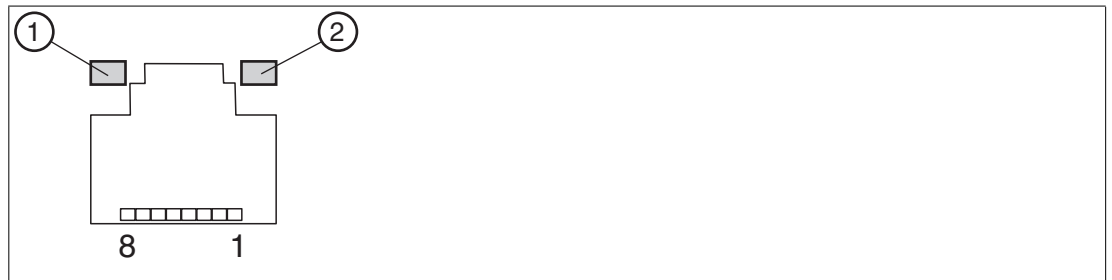


Figure 4.22

| Pin | Type | Description |
|-----|--------|-------------------------------------|
| 1 | BI_DA+ | Bidirectional data A+, input/output |
| 2 | BI_DA- | Bidirectional data A-, input/output |
| 3 | BI_DB+ | Bidirectional data B+, input/output |
| 4 | BI_DC+ | Bidirectional data C+, input/output |
| 5 | BI_DC- | Bidirectional data C-, input/output |
| 6 | BI_DB- | Bidirectional data B-, input/output |
| 7 | BI_DD+ | Bidirectional data D+, input/output |
| 8 | BI_DD- | Bidirectional data D-, input/output |

LED Indicator

| No. | Type | Description |
|-----|-----------|---|
| ① | Right LED | Yellow Off – No Connection / No Link Yellow On – Connection / Link Established Yellow Flashing – Connection / Link Established with Data actively being transmitted |
| ② | Left LED | LED Off – 10 Mbps Speed detected Green On – 100 Mbps Speed detected Orange – 1 Gbps Speed detected |

5 BIOS Settings



Caution!

Warranty

Access to the BIOS is prohibited. Any access to the BIOS is at your own risk and is not covered by the warranty for repairs. Arbitrary changes to BIOS settings may affect device functionality. The BIOS is set according to customer requirements by default.



Note

All BIOS settings are optimized for standard applications (use cases of BTC22). The BIOS is protected by the default password: `pepper1`. You must enter the password each time you enter the BIOS. To prevent unauthorized access and changes to the BIOS, we advise you to set your own strong administrator password once you have installed the device.



Getting Started

1. Switch on the device.
2. During power-on, press DELETE on the keyboard.
3. Enter "pepper!" for the password.
4. Press ENTER.

Navigation

| Shortcut | Function | Description |
|-----------------------------|--------------------------|---|
| Left/right arrow keys | Select screen | Menu bar and select a BIOS setup page, e.g., the main page |
| Up/down arrow key and click | Select element | Select a BIOS setup element or a subpage |
| Enter/double-click | Select | Select an option to edit its value or access a submenu |
| + - | Change option | Change the field value of a specific setup element, e.g., date, time |
| F1 | General Help | Displays the general Help window. |
| F2 | Previous values | Loads previous values into the BIOS setup menu |
| F9 | Optimized default values | Loads optimized default values into the BIOS setup menu |
| F10 | Save and exit | Saves the current configuration and exits the BIOS setup menu |
| ESC | Exit | The <ESC> key allows the user to discard all changes and exit the BIOS setup menu. Press the <ESC> key to exit the BIOS setup menu without saving any changes. The following screen appears: Press the <Enter> key to discard changes and exit the menu. Or use the arrow keys to select "No" and then press the <Enter> key to cancel this function and return to the previous screen. |

BIOS Setup Menu

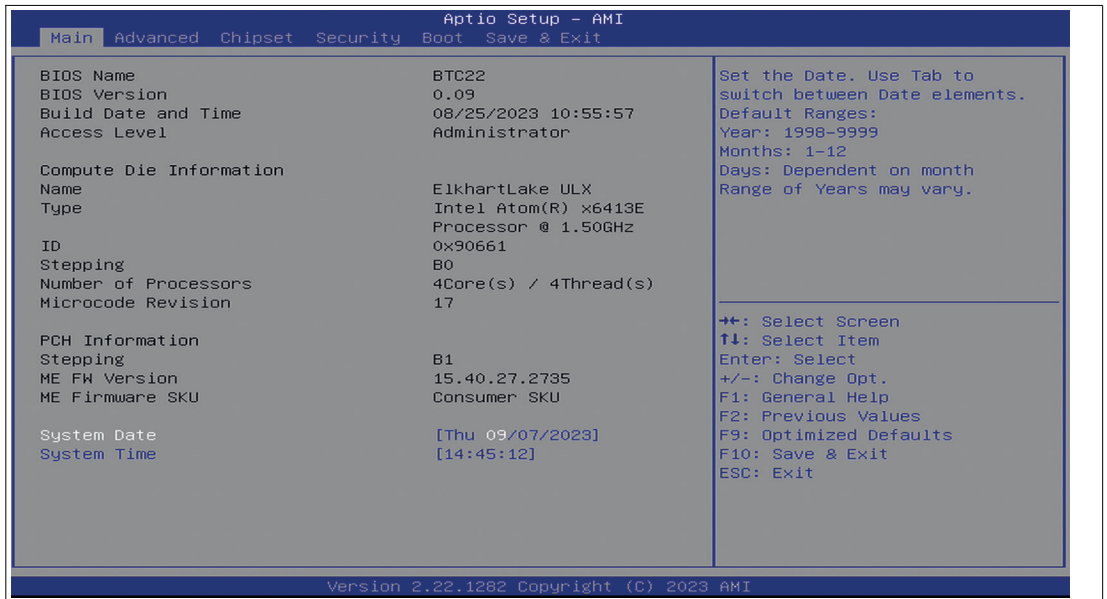


Figure 5.1 BIOS setup menu—home screen



Setting the System Date

1. Use the arrow keys to set the date.
2. Navigate to month, day, and year in sequence. Enter the appropriate value. Press ENTER to move to the next field.
3. Press F10 to save the changes.



Setting the System Time

1. Use the arrow buttons to set the time.
2. Navigate to hour, minute, and seconds in sequence. Enter the appropriate value. Press ENTER to move to the next field.
3. Press F10 to save the changes.

5.1 Creating a New BIOS Password

Select *Security* from the BIOS setup page to open the "Security" BIOS setup page.

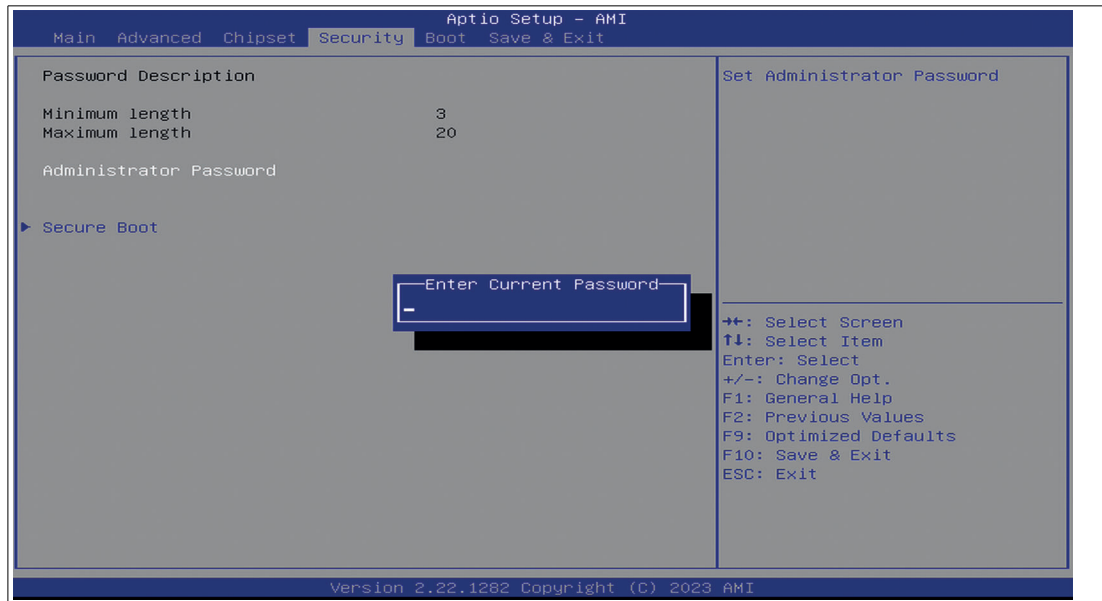


Figure 5.2 "Security" BIOS menu



Changing the BIOS Password

The "Security" setup page allows you to set an administrator password for the BIOS.

1. Select *Setup Administrator Password* using the arrow keys and press Enter.
2. Enter a password of at least 3 characters. The password can be up to 20 characters long and is case sensitive.
3. Re-enter the password when the pop-up window appears prompting you to confirm the password.



Note

After changing, note down the password and keep it in a safe place. Pepperl+Fuchs assumes no liability in the event that the password is lost. If you forget the password, the device must be returned to Pepperl+Fuchs for a complete reset.

5.2 Changing Serial Interface Mode (RS-232, RS-485)

Select Advanced from the BIOS setup page.

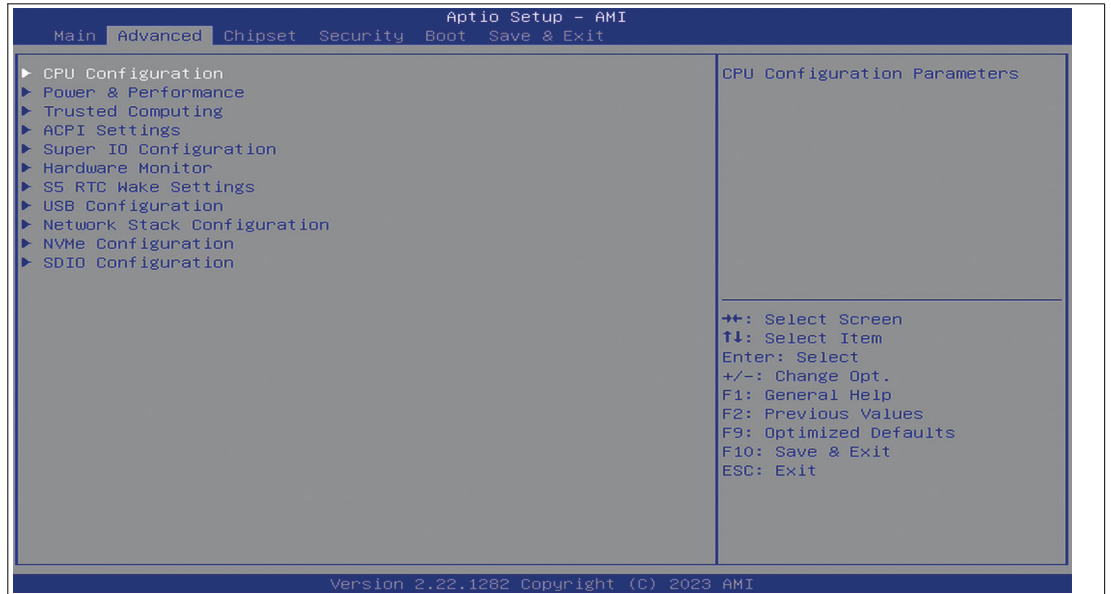


Figure 5.3 "Advanced" BIOS menu



Configuring Advanced Settings

Super IO Configuration allows you to view and configure the Super I/O Chip parameters.

1. Select "Serial Port 1 Configuration". Press ENTER.
2. Select Enabled or Disabled. Press ENTER in the pop-up window.
3. Select the desired serial mode.

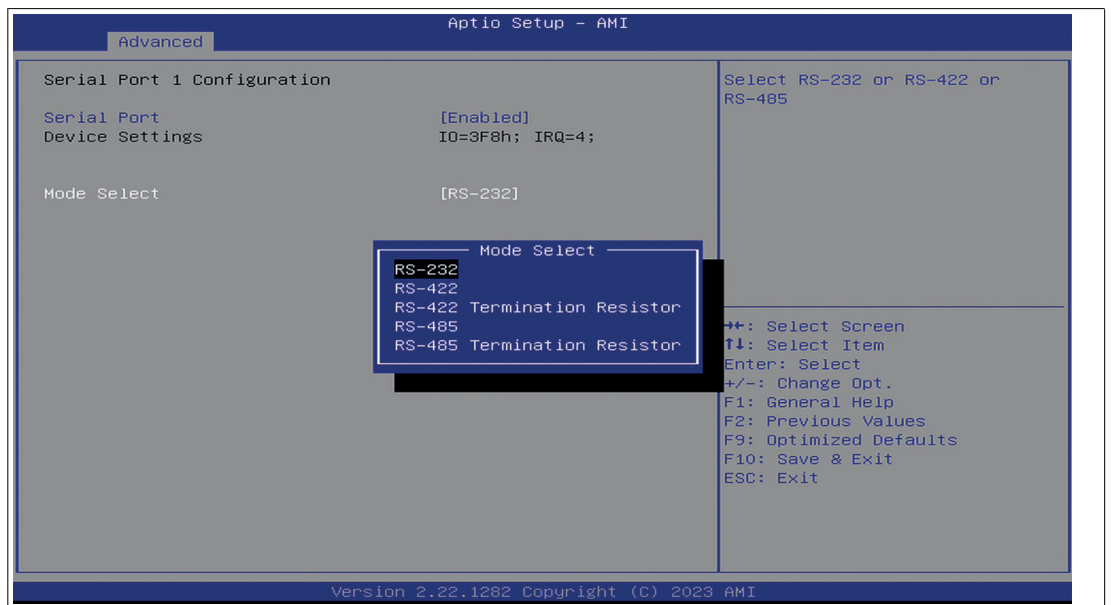


Figure 5.4 Select mode

Settings for Serial Port 1

| Mode select |
|-----------------------------|
| RS-232 |
| RS-422 |
| RS-422 Termination Resistor |
| RS-485 |
| RS-485 Termination Resistor |

5.3 USB Configuration

USB Configuration allows you to view and configure USB parameters.

The USB device displays the USB device detected by the BIOS during the power-on self-test.

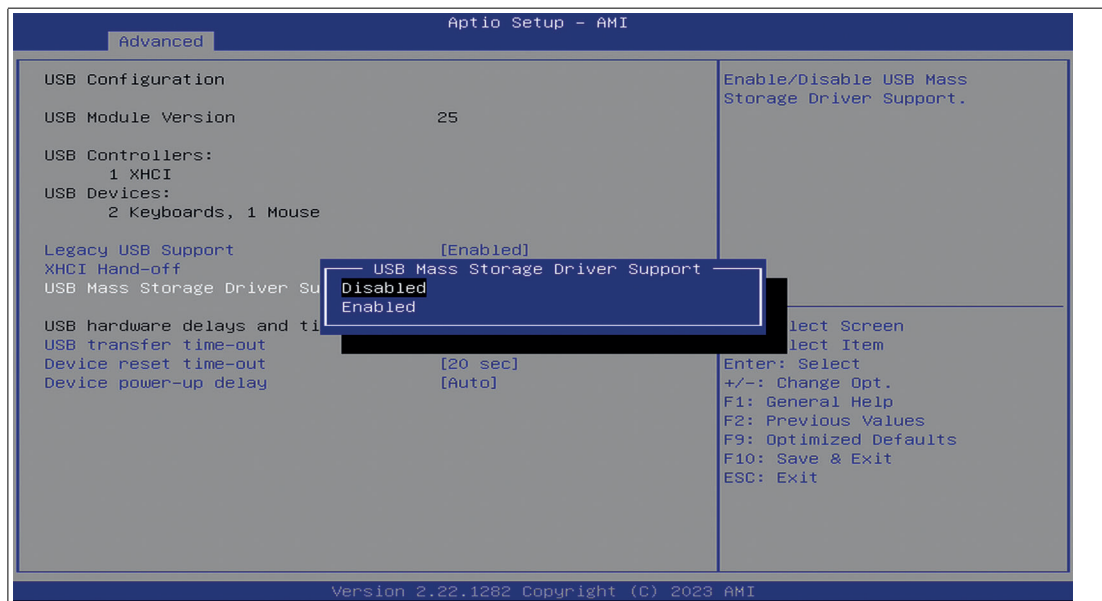


Figure 5.5 Enabling and disabling the USB device



Enabling and Disabling the USB Device

1. Select `USB Mass Storage Driver Support` using the arrow keys and press `Enter`.
2. Select `Enabled` or `Disabled` as needed. Press `Enter` in the pop-up window.

5.4 Boot Configuration

Select **Boot** from the BIOS setup page.

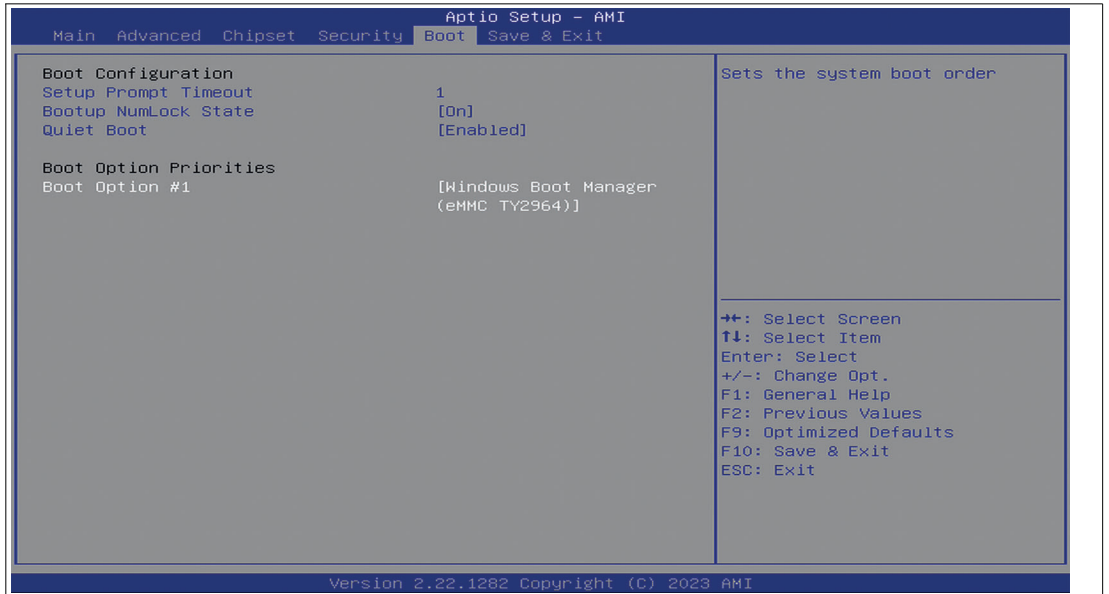


Figure 5.6 "Boot" BIOS menu

You can change the following settings on the "Boot" configuration page:

- Setup Prompt Timeout: Sets the time period within which the Delete key must be pressed to enter the BIOS at power-on.
- BootUp NumLock State: Enables and disables the numeric keys on the keyboard.

Set the PXE-ROM before changing boot options.



Enabling Boot via LAN (PXE)

1. Select the "Advanced" tab.
2. Select **Network Stack Configuration** with the arrow keys and press ENTER.

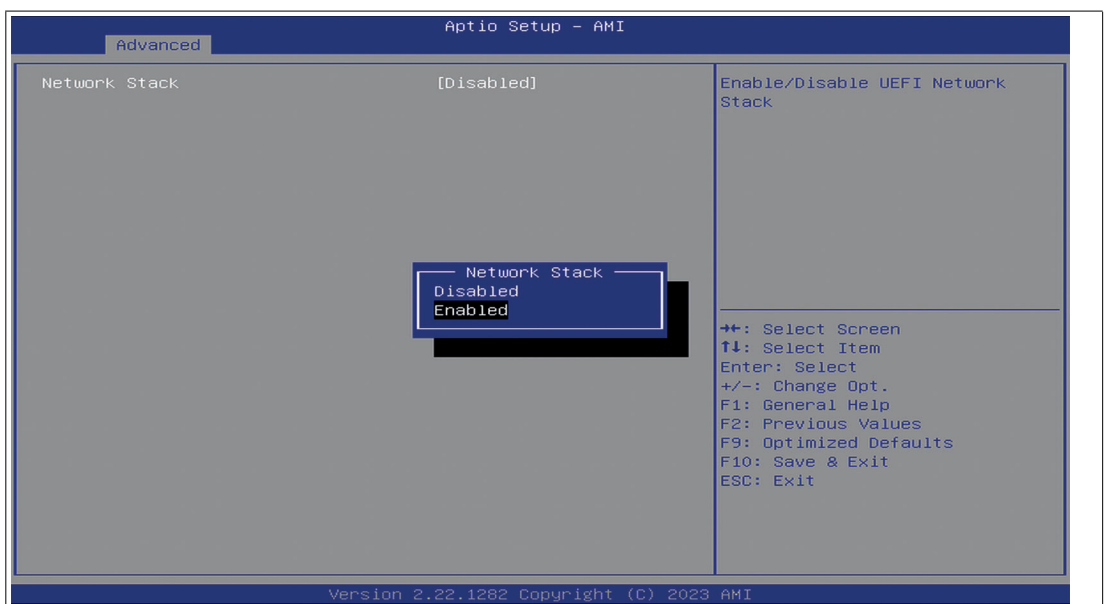


Figure 5.7 Configuring the compatibility support module

3. Enable "Network Stack" to enable network boot.

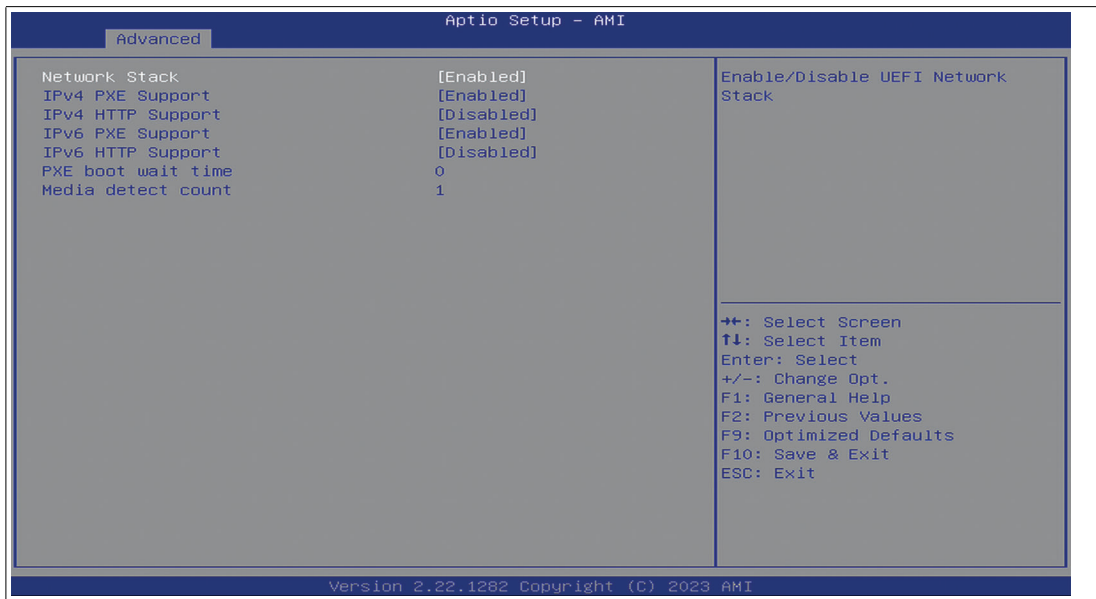


Figure 5.8



Setting Priorities for Boot Options

The "Boot" page allows you to set the priority of all boot devices.

- Using the arrow keys, select the Boot Option Priority you wish to change. Press ENTER. The options window will open.

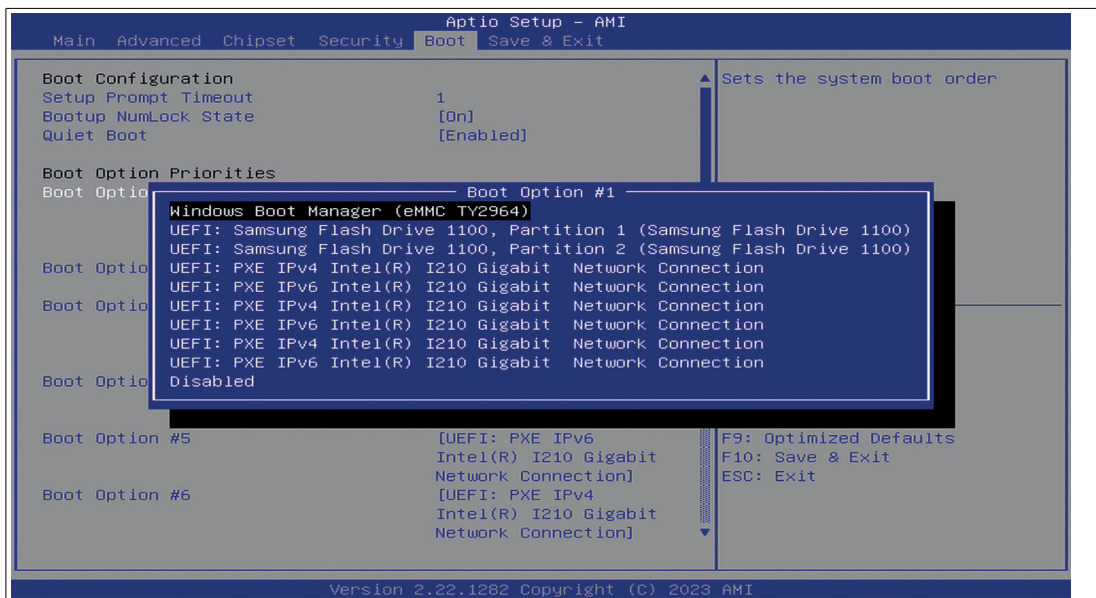


Figure 5.9 Boot option priorities

- When enabled and connected a Network or USB Boot, those options are additionally shown to the default boot option "Windows Boot Manager (eMMC TY2964)".

Power Management

The system starts automatically when the power supply is turned on. In the event of a power failure, the device will also automatically power up after the power supply has been restored. Can be changed at section "Chipset" --> PCH-IO Configuration --> Power on after power fail
Add a screenshot too like BTC14 and BPC.

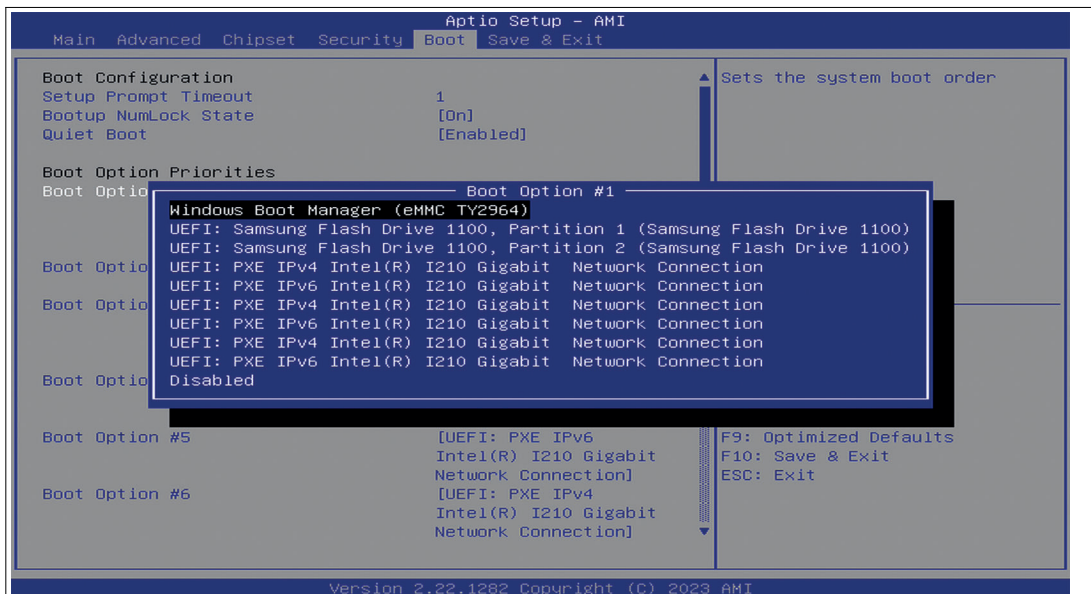


Figure 5.10

Save Options

Select "Save & Exit" from the BIOS setup page.

Save the changes and exit the system.

When you have finished making changes to the system configuration, save the changes using the following instructions.



Saving Configuration Changes

1. Select **Save Changes** and "Exit" using the arrow keys. Press ENTER.
2. Select **Yes**. Press ENTER to save the changes and exit the system.
3. Select **No** to exit the process without saving the changes.

The new system configuration settings take effect after the system is restarted.



Discarding Changes and Exiting the System

Use the following instructions to exit the system without saving the changes.

1. Using the arrow keys, select **Discard Changes** and "Exit." Press ENTER.
2. Select **Yes**. Press ENTER to discard the changes and exit the system.
3. Select **No** to exit the process.

5.4.1 Advanced - Booting from USB Stick



1. Go to the "Advanced" tap
2. Go to USB Configuration If you want to boot with USB stick, USB Mass Storage Driver Support must be set to Enabled.

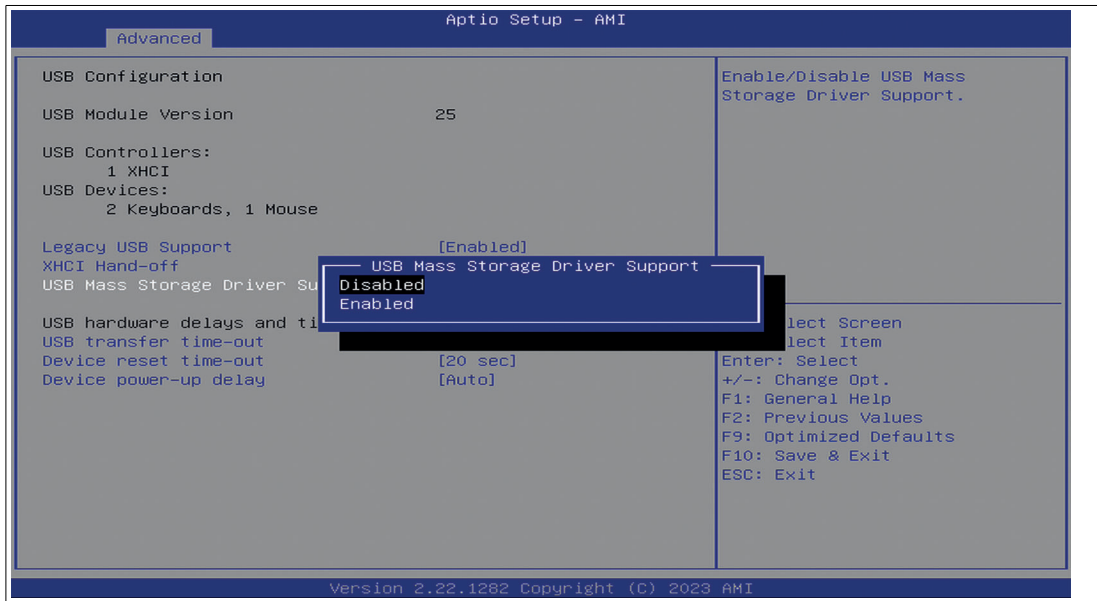


Figure 5.11

3. Select "Save and exit" or press the F10 key.
4. The system reboots automatically.
5. Click "Delete" to enter BIOS again.
6. Go to "Boot" tab and select the USB flash drive as boot option (Boot Option #1).

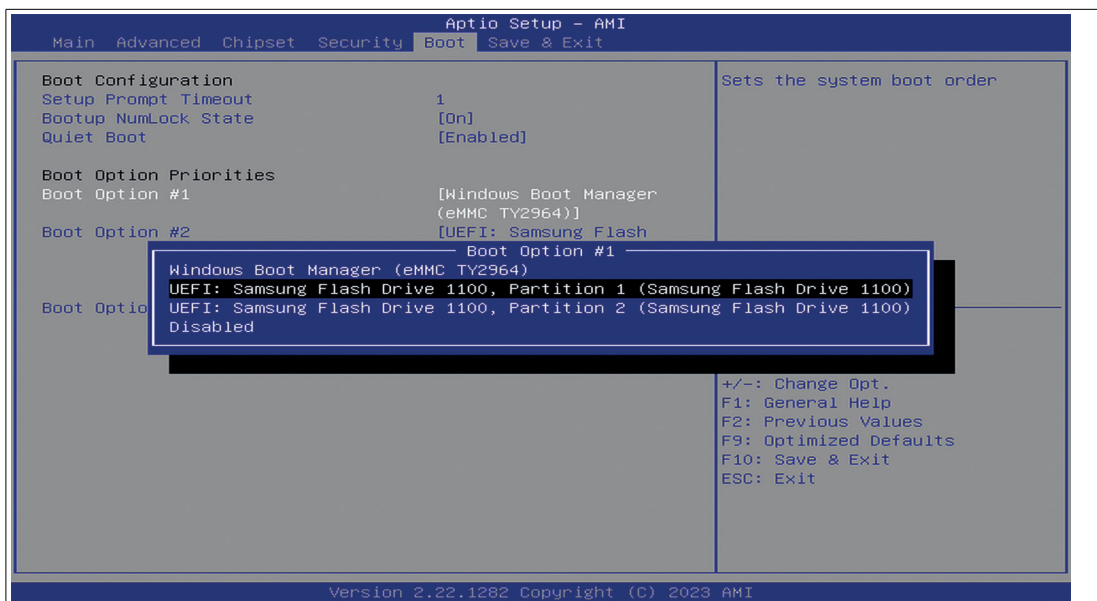


Figure 5.12

2023-11

7. Select "Save and exit" or press the F10 key.

5.5 Resetting the BIOS to Factory Settings



Restoring Default Settings

You can restore the system using the following instructions.

1. Use the arrow keys to select `Restore Defaults`. Press `ENTER`.
2. Select `Yes`. Press `ENTER` to load the optimized default settings.
3. Select `No` to exit the process.



Restoring the Factory Settings with F9

1. Press `F9`: `Optimized Defaults`. Press `ENTER`.
2. Select `Yes`. Press `ENTER` to load the optimized default settings.
3. Select `No` to exit the process.

5.6 Secure Boot



Note

Secure Boot is enabled by default.



Secure Boot

1. Go to "Security" tab to enable Secure Boot.

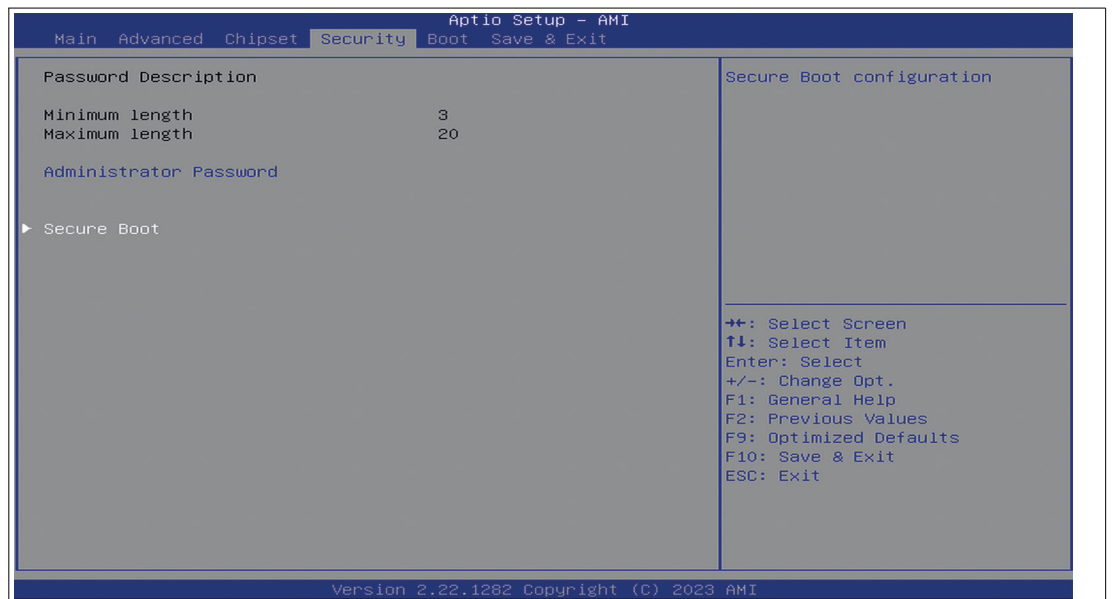


Figure 5.13

2. Enable Secure Boot.

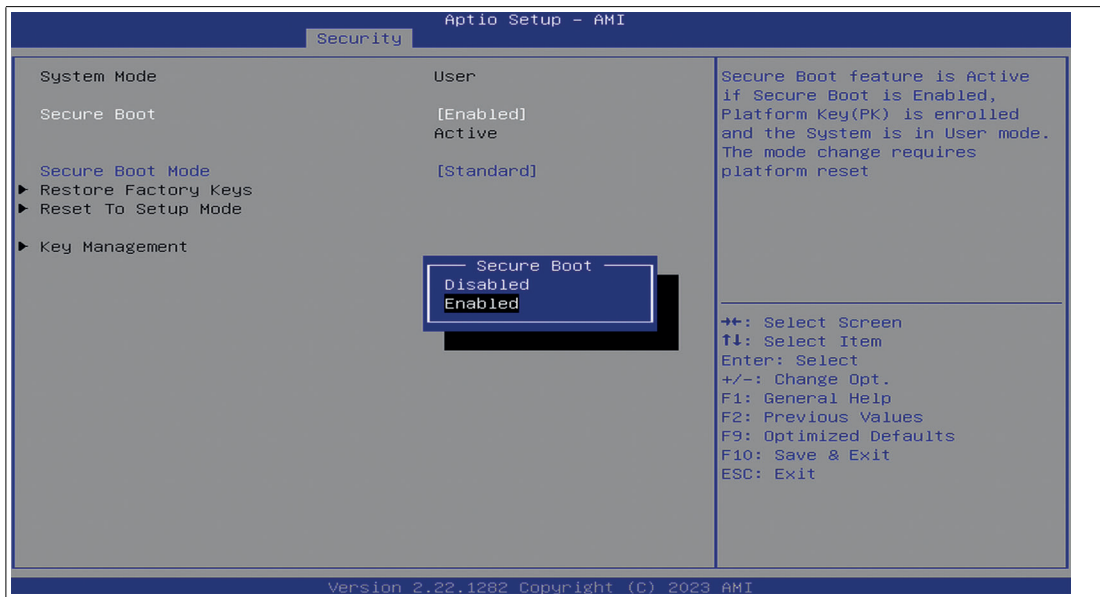


Figure 5.14



S5 RTC Wake Settings

Enable system to wake from S5 using RTC alarm. It is used to wake the system at a specific time.

1. Go to the "Advanced" tab
2. Select "S5 RTC Wake Settings"

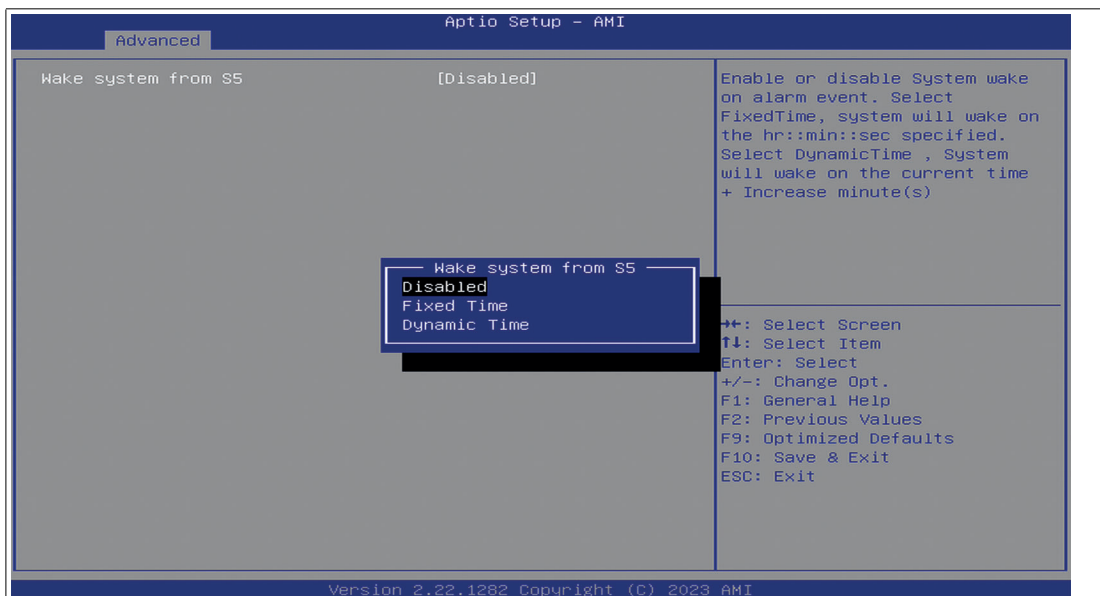


Figure 5.15

3. Chose between Fixed Time and Dynamic Time and configure the desired settings.



Deactivate LAN ports LAN ports can be deactivated

1. Go to the "Chipset" tab. Select "PCH-IO Configuration" and then "PCI Express Configuration".
2. Choose the LAN Port you like to enable / disable and select LANx Enabled/Disabled.

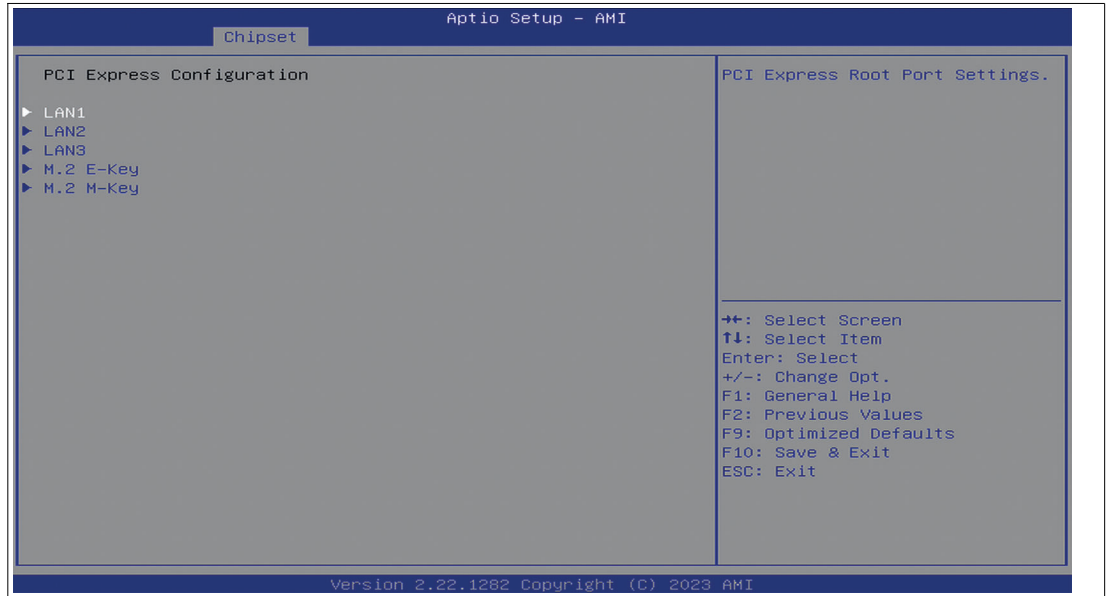
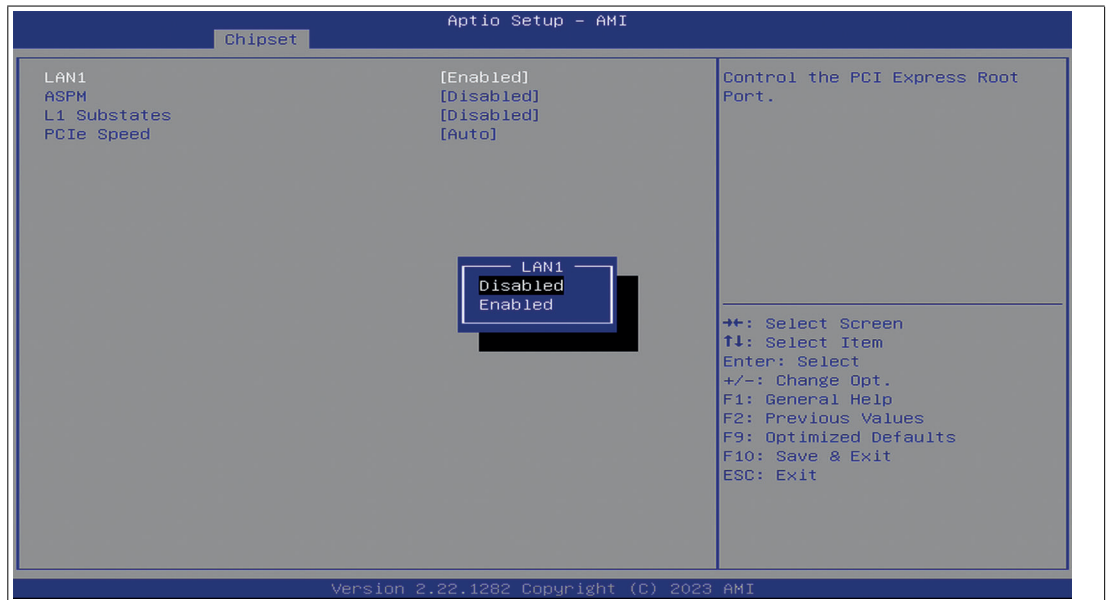


Figure 5.16

3. Disable/Enable the desired LAN port.



6 Service and Support

For more information about the products described in this document, visit www.pepperl-fuchs.com.

Please have the following information ready when contacting your local representative or technical support:

- Product name
- Serial number of the product
- Image version and RM shell version

7 Accessories

Power Supply, Cables, and Connectors

| Part number | Type code | Description |
|-------------|------------------------|--|
| 548328 | FSP065-RBBN3 | AC/DC power supply Input: 100 VAC – 240 VAC, 50 Hz – 60 Hz Output: 19 VDC Maximum current: 3.42 A Connector: 2.5 mm DC socket with locking mechanism Approvals: CE, FCC class B, UL listed, GS, CCC Power cable: 1 x EU type and 1 x US type |
| 548400 | ATEN-LockPro | Locking device for securing cables on the BTC22 Each pack contains 10 locks |
| 70105588 | S-BN-19/1800-UK1 | Power supply cable with protective conductor Type: IEC-60320-C5 Country: United Kingdom, Ireland (Type G, BS 1363) Length: approx. 1.8 m |
| 70105589 | S-BN-19/1800-AU1 | Power supply cable with protective conductor Type: IEC-60320-C5 Country: Australia (Type I, AS 3112) Length: approx. 1.8 m |
| 70105590 | S-BN-19/1800-CH1 | Power supply cable with protective conductor Type: IEC-60320-C5 Country: Switzerland (Type J, SEV 1011) Length: approx. 1.8 m |
| 70105591 | S-BN-19/1800-IT1 | Power supply cable with protective conductor Type: IEC-60320-C5 Country: Italy (Type L, CEI 23-16-VII) Length: approx. 1.8 m |
| 70105592 | S-BN-19/1800-DK1 | Power supply cable with protective conductor Type: IEC-60320-C5 Country: Denmark (Type K, IEC 60906-1) Length: approx. 1.8 m |
| 70100504 | BTC12-CBL-DC-JACK-2100 | Connector: 5.5/2.5 mm DC socket with locking mechanism Open cable ends with wire end ferrules Cable length: 2.1 m |
| 70172207 | ADAPTER-RJ45-DE9 | Adapter cable RJ45 to D-SUB9 Cable length: 19.5 cm |

Mounting Aids

| Part number | Type code | Description |
|-------------|----------------------|--|
| 548401 | BTC12-KIT-DIN-RAIL | DIN rail mounting kit for BTC |
| 548402 | BTC12-KIT-VESA-MOUNT | VESA mounting bracket kit for BTC (100 x 100mm and 75 x 75 mm) |

Video Cables and Video Adapters

| Part number | Type code | Description |
|-------------|------------------|---|
| 548403 | CLUB3D-CAC-1073 | Active adapter cable for BTC DisplayPort™ 1.2 connector to HDMI 2.0 UHD connector (4K at 60 Hz) Cable length: 3 m |
| 548404 | CLUB3D-CAC-1056 | Passive adapter cable for BTC DisplayPort™ 1.1 connector to HDMI 1.4 socket Cable length: 0.2 m |
| 548405 | CLUB3D-CAC-2070 | Active adapter cable for BTC DisplayPort™ 1.2 connector to HDMI 2.0 UHD socket (4K at 60 Hz) Cable length: 0.2 m |
| 548406 | STARTECH-DP2DVI2 | Passive adapter cable for BTC DisplayPort™ 1.1 connector to DVI-D socket Cable length: 0.15 m |
| 548407 | STARTECH-DP2VGA3 | Active adapter cable for BTC DisplayPort™ 1.1 connector to VGA socket Cable length: 0.23 m |

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- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- Fieldbus Modules
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