Original User Manual

Touch Industrial PC VESA 12.1 OEM

Christ Electronic Systems GmbH

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Instruction Manual: Touch Industrial PC VESA 12.1 OEM

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1 Identification

Target group

This document is not intended for end customers! Necessary safety instructions for the end customer must be passed on by the machine builder or system provider and adopted in the respective national language.

Intended use

The devices described in this documentation are intended to enable the user to control, operate, observe, drive and visualise certain processes in industry or industrial contexts / environments. The devices must be used within the conditions and limits described in this documentation.

Improper use

The devices have not been designed and manufactured for use in applications where serious danger to life and health may occur. The equipment must not be used for the following purposes:

- Control of nuclear reactions in nuclear power plants
- Control systems of weapons
- Automatic control of aircraft air traffic control and mass transport systems
- Medical equipment for life support

Technical changes

Christ Electronic Systems GmbH reserves the right to change the information, designs and technical data contained in this documentation without prior notice.

History

The following editions of the manual have already been published:

Version	Comment
07/2023 Rev. 00	First edition
09/2023 Rev. 01	Chapter 4.2.3 Replacing the cable grommets: Link to icotek hopepage inserted Chapter 7.2.1 Replacing the battery: inserted
10/2023 Rev. 02	Chapter 1 Identification: intended use adapted; improper use inserted Chapter 9.5 FCC Approval: inserted Chapter 9.6 Environmentally Appropriate Disposal: Directive 2006/66/EC replaced by Regulation 2023/1542

Table 1: History

Design of safety instructions

The general structure of the safety instructions is shown below:

NOTICE	
	**Type of hazard and source of hazard** Consequences in the event of non-compliance with the guideline ➢ Measures to avoid hazards

The meaning of the colours of the safety instructions is shown below:

⚠ DANGER	
	**Indicates an imminent danger** Failure to follow the instructions may result in death or serious injury.

⚠ WARNING	
	**Indicates a dangerous situation** Failure to follow the instructions may result in serious injury.

⚠ CAUTION	
	**Indicates a possible dangerous situation** Failure to follow the instruction may result in injury.

NOTICE	
	**Indicates user tips and useful information** Important information to avoid malfunctions.

2 Product description

2.1 System Overview

CPU	Intel® Celeron™ 3965U 2.2 GHz
Graphic	Intel® HD Graphics 610
Memory	4 GB DDR4
Mass Storage	64 GB 3D TLC SSD
BIOS	AMI Optio 5 BIOS
Interfaces	1 x M8 3-pin male connector A coded, Power; M8 4-pin male connector A coded, Power / CAN-IN 2 x USB Host 3.0 (Type A), X33, X34 2 x USB Host 2.0 (Type A), X31, X32 2 x USB Host 2.0 (Type A) (side) (max. total current: 0.5 A) 2 x 1 Gbit Ethernet (1x RJ45 Intel® I211-AT, ETH X21; 1x RJ45 Intel® I210-AT, ETH X22) 1 x RS-232 / RS-485 / RS-422 (Sub-D) (BIOS setting), Serial X41 1 x CAN-IN (M8 4-pin male connector A coded), Power / CAN-IN 1 x CAN-OUT (M8 4-pin female connector A coded), Power / CAN-OUT 1 x Display Port 1.1, DP X71

Table 2: System overview

2.2 Housing

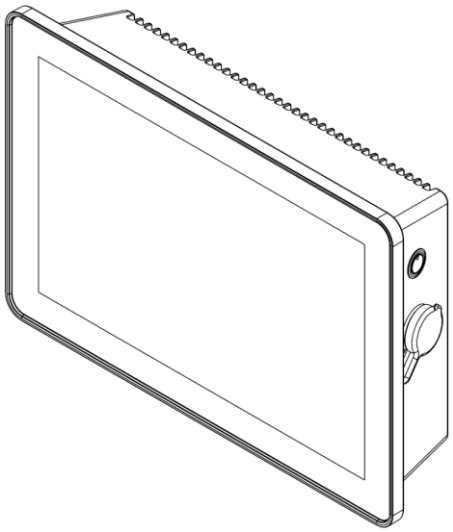


Illustration 1: Front

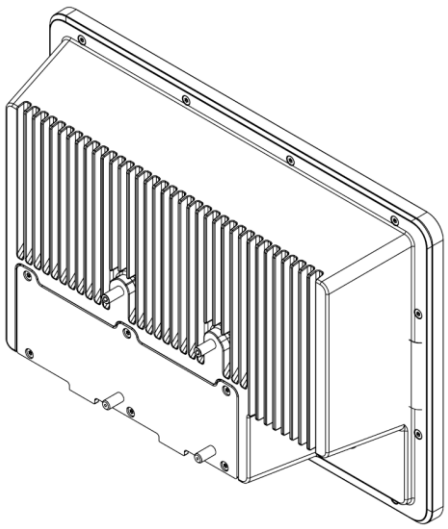


Illustration 2: Rear

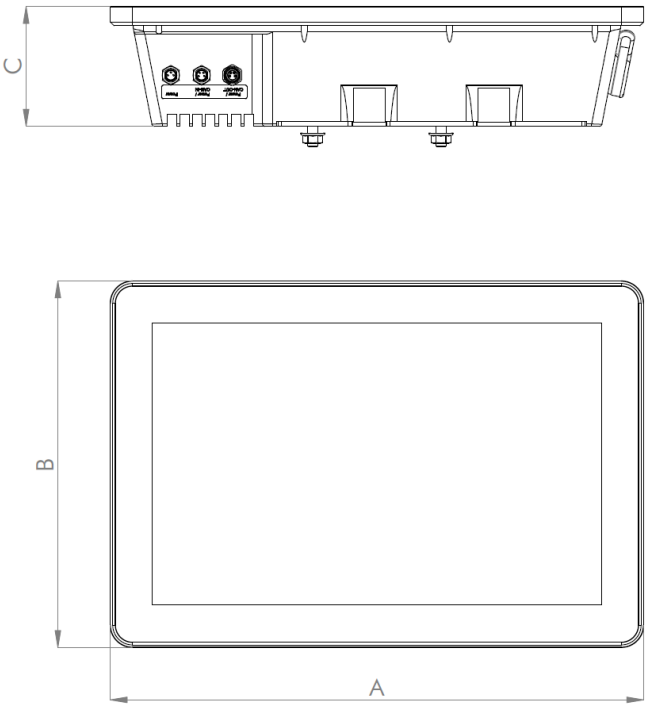


Illustration 3: Dimensions

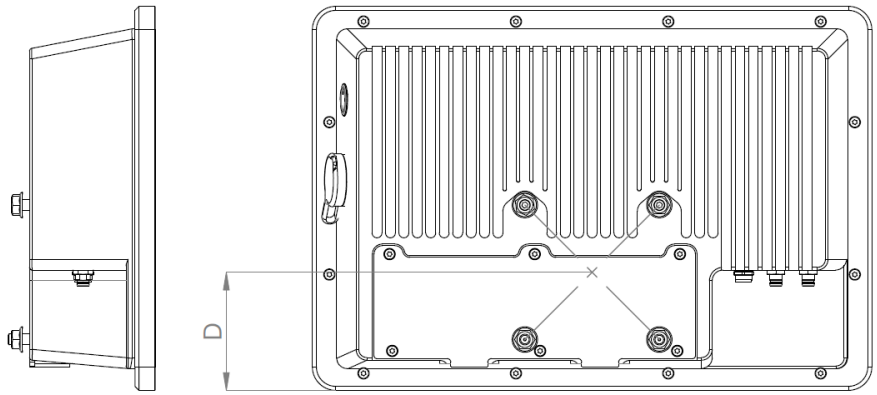


Illustration 4: Dimensions Rear

Dimensions are given in millimeters.

Size	A	B	C	D
12.1"	312	214	70	66

Table 3: Dimensions

3 Description Hardware

The description of the hardware refers to the device interfaces and the possible extensions for the device.

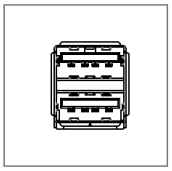
3.1 External Interfaces

NOTICE	
	**External cable for Power Supply** Malfunction occur ➢ Prepare a proper earth connection on the power supply

NOTICE	
	**Signal and data cables** Malfunction occur ➢ Signal and data cables must be shielded and of high quality.

NOTICE	
	**Operating the interfaces outside their intended specification** Malfunctions occur and the electronics of the device can be damaged or completely broken ➢ All interfaces must be operated within their specification. Only cables and components that meet the requirements for the intended use of the interfaces may be connected.

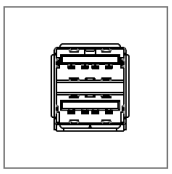
USB Host 2.0 (Type A)



PIN	Function	Description
1	VBUS	USB VCC
2	D-	USB Data-
3	D+	USB Data+
4	GND	USB Ground

Table 4: Pinout USB 2.0

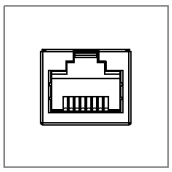
USB Host 3.0 (Type A)



PIN	Function	Description
1	VBUS	USB VCC
2	D-	USB Data-
3	D+	USB Data+
4	GND	USB Ground
5	StdA_SSRX-	SuperSpeed transmitter differential pair
6	StdA_SSRX+	SuperSpeed transmitter differential pair
7	GND_DRAIN	Ground for signal return
8	StdA_SSTX-	SuperSpeed receiver differential pair
9	StdA_SSTX+	SuperSpeed receiver differential pair

Table 5: Pinout USB 3.0

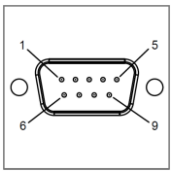
Ethernet Gigabit



PIN	Function	Description
1	D1+	Transmit Data +
2	D1-	Transmit Data -
3	D2+	Receive Data+
4	D3+	Bidirectional +
5	D3-	Bidirectional -
6	D2-	Receive Data -
7	D4+	Bidirectional +
8	D4-	Bidirectional -

Table 6: Pinout Ethernet Gigabit

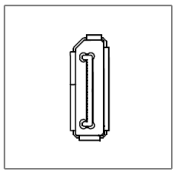
Serial Connector (Titanium)



	RS-232		RS-422		RS-485	
PIN	Function	Description	Function	Description	Function	Description
1	DCD	Data Carrier Detect	TX-	Transmitter Differential Pair -	DATA-	Data Differential Pair A
2	RX	Receive Data	TX+	Transmitter Differential Pair +	DATA+	Data Differential Pair B
3	TX	Transmit Data	RX+	Receiver Differential Pair +	--	--
4	DTR	Data Transmit Ready	RX-	Receiver Differential Pair -	--	--
5	GND	Ground	GND	Ground	GND	Ground
6	DSR	Data Set Ready	--	--	--	--
7	RTS	Ready To Send	--	--	--	--
8	CTS	Clear To Send	--	--	--	--
9	RI	Ring Indicator	--	--	--	--

Table 7: Pinout Serial Connector Titanium

Display Port

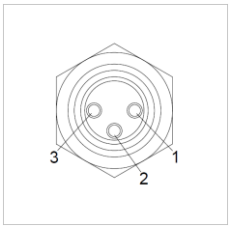


PIN	Function	Description
1	DP data 0+	DP data 0+
2	GND	Ground
3	DP data0-	DP data0-
4	DP data1+	DP data1+
5	GND	Ground
6	DP data1-	DP data1-
7	DP data2+	DP data2+
8	GND	Ground
9	DP data2-	DP data2-
10	DP data3+	DP data3+
11	GND	Ground
12	DP data3-	DP data3-
13	CONFIG1 CAD	Cable adapter recognized
14	CONFIG2	Ground (Pull-Down)
15	AUX_CH+	Additional device +
16	GND	Ground
17	AUX_CH-	Additional device -
18	HPD	Hot Plug recognized
19	GND	Ground
20	DP_PWR 3,3V	Power Supply DP

Table 8: Pinout Display Port

Display Port 1.1 is also known as "Dual-Mode Display Port" and "Display Port++". This allows compatibility with DVI and HDMI.

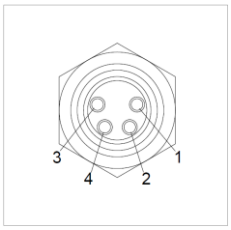
M8 3-pin male connector



PIN	Function	Description
1	24 V (max. 4 A)	24 V (maximum 4 ampere)
2	--	--
3	GND	Ground

Table 9: Pinout M8 3-pin male connector

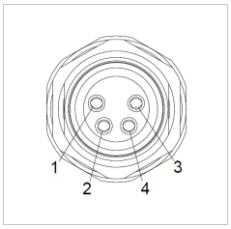
M8 4-pin male connector



PIN	Function	Description
1	24 V (max. 4 A)	24 V (maximum 4 ampere)
2	CAN_H	CAN High
3	GND	Ground
4	CAN_L	CAN Low

Table 10: Pinout M8 4-pin male connector

M8 4-pin female connector



PIN	Function	Description
1	24 V (max. 2.5 A)	24 V (maximum 2.5 ampere)
2	CAN_H	CAN High
3	GND	Ground
4	CAN_L	CAN Low

Table 11: Pinout M8 4-pin female connector

4 Mounting

This chapter describes all the steps for assembly. The following warnings are safety instructions that must be applied throughout the assembly chapter and in every other life cycle of the device.

NOTICE	
	**Power Supply** Disturbance of the proper operation ➢ The device must be operated with protective low voltage (< 28.8 VDC).

⚠ WARNING	
	**Dropping a device** Injuries and bruises to the legs and / or feet ➢ Wear safety shoes

Note for the installation site

This device is not designed for outdoor use.

Make sure that the ambient temperature and humidity are within the ranges which are specified under Environmental Conditions.

Do not install the device directly in the sunlight.

Make sure that the device is installed so that is accessible for the operator.

Installation instructions

Check the package contents for any visible damage and for completeness.

In case of damage, do not install the device and contact the Christ Service.

4.1 Torque

All screws must be tightened with the following torques.

Screw	Torque
M3	1.0 Nm
M4	2.3 Nm

4.2 Mounting

Step 1:

Completely unscrew all four nuts on the back of the device.

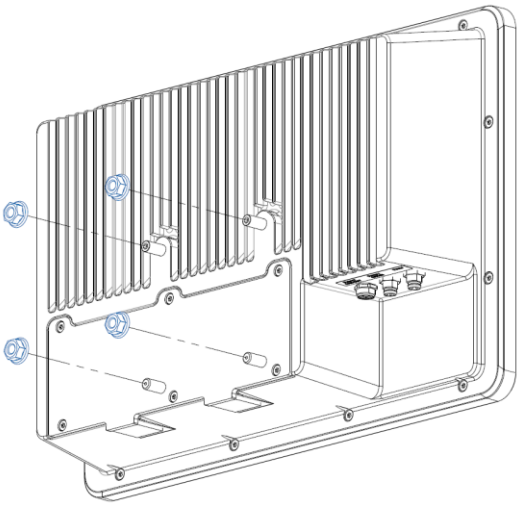


Illustration 5: Mounting

Step 2:

Push the threaded bolts through an assembly jig.

Step 3:

Screw all four nuts back onto the threaded bolts. The tightening torque is determined by the customer.

4.2.1 Dismounting the cover plate

The cover plate can only be dismounted if it is not blocked.

Step 1:

Loosen all six screws marked in blue on the back of the device and store them together with the serrated lock washer.

Step 2:

Remove cover plate.

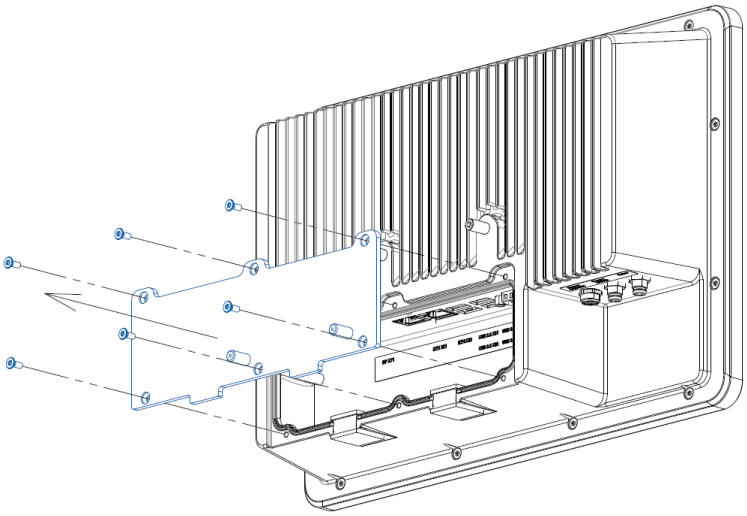


Illustration 6: Dismounting the cover plate

4.2.2 Mounting the cover plate

Step 1:

Attach cover plate.

Step 2:

Screw on all six screws marked in blue together with the serrated lock washers.

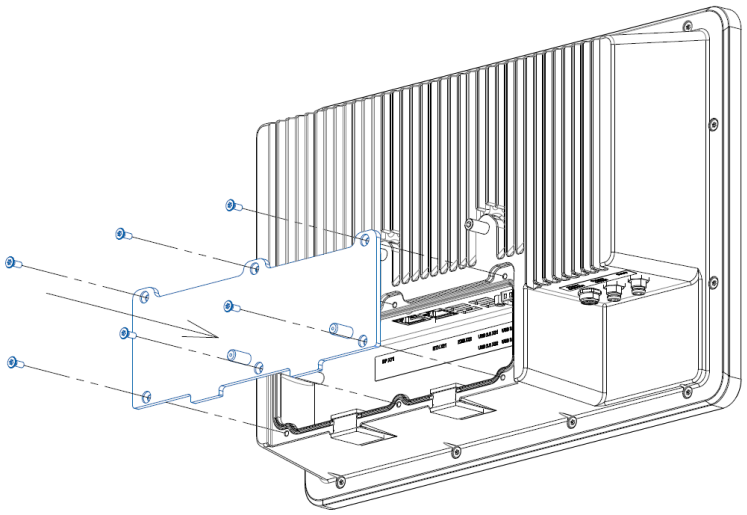


Illustration 7: Mounting the cover plate

4.2.3 Replacing the cable grommets

Suitable cable grommets can be found on the icotek homepage: https://www.ico-tek.com/en/products/cable-grommets/qt

If additional cables are routed out of the enclosure from the concealed interfaces, the cable grommets must be removed and replaced with suitable cable grommets for the corresponding cable diameters. The enclosure is designed for cable grommets from the manufacturer icotek.

To replace the cable grommets, they can be removed from the recess and pushed in.

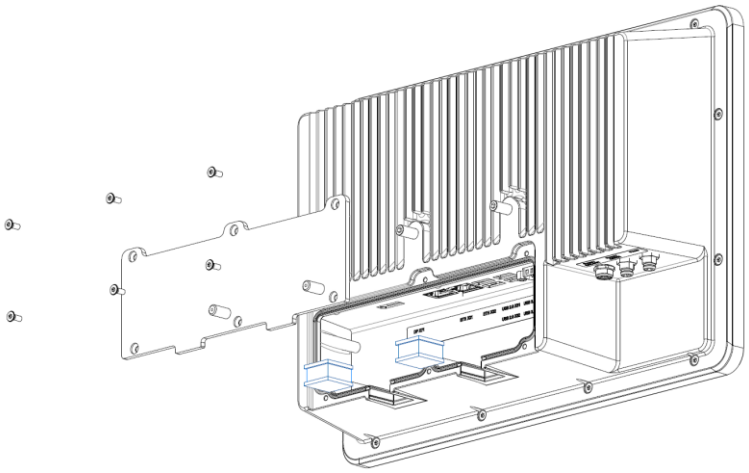


Illustration 8: Replacing the cable grommets

The flat surface of the cable grommets must face the front of the device!

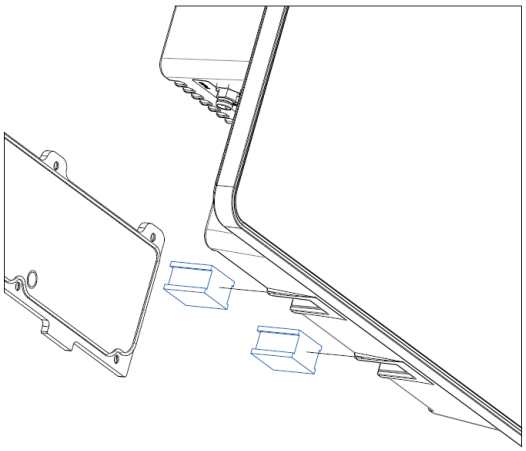


Illustration 9: Alignment of the cable grommets

5 Commissioning

To put the device into operation, connect the power supply to the unit.

The device starts.

Further steps for commissioning are not necessary.

5.1 Function of the power button

If the device has a power button, it behaves according to the following standard.

When the device is plugged into the power supply, the device boots up without having to press the power button.

If the power button is pressed while the device is running, the device shuts down.

If the power button is pressed while the device is not running, the device starts up. The power supply must be present at the device.

Notice:

A different behaviour may occur if the device does not have the standard configuration.

5.2 Unusual situations

Under certain circumstances, the unit may behave in an unusual way. These are listed below.

5.2.1 Sluggish touch behavior

Description of error:

The touch´s functionality is affected. The touch only triggers irregularly and behaves sluggishly.

Description:

This behavior can be caused by the power supply unit if there is no conductive connection between the PE of the primary side and the GND of the secondary side.

Solution:

A power supply unit must be used with a conductive connection between the PE of the primary side and the GND of the secondary side.

6 Software

The Software chapter describes settings and functions that may be required to use the device.

6.1 BIOS Basic Settings

AMI BIOS ROM has built-in settings program that allows users to make basic settings. This information is stored in a battery supported CMOS RAM, so it remains stored even when there is no power supply.

Accessing the BIOS works by pressing the "Del" key several times while the device is booting.

The following tabs in the BIOS enable various settings.

Main	Set date
Advanced	Make advanced BIOS settings like: COM, ACPI, etc.
Chipset	SATA and RST configuration
Security	Set administrator password
Boot	Set Boot Option
Save & Exit	Save the settings made and initiate a restart. (Also possible with the F4 key on the keyboard)

Table 12: BIOS

Pressing F3 and confirming the query "Load Optimized Defaults?" with "Yes" restores the delivery state.

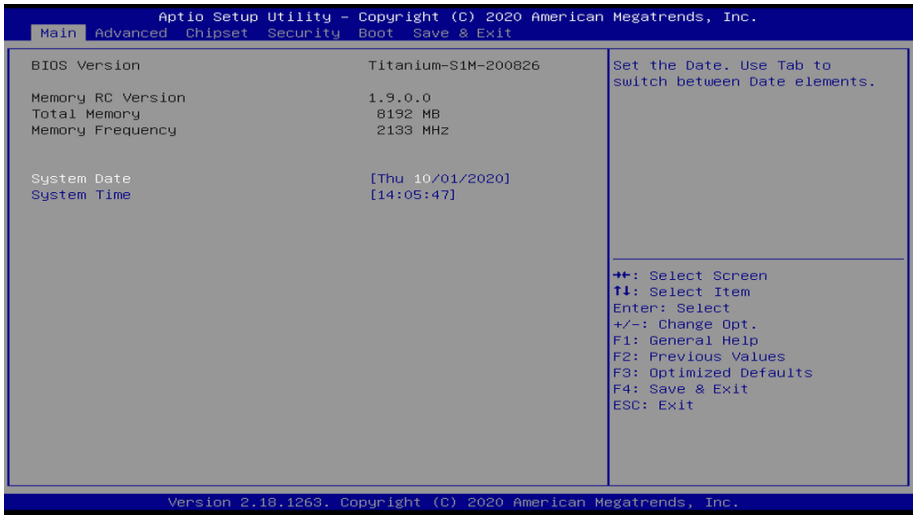


Illustration 10: BIOS

6.1.1 BIOS Default Settings

The BIOS is password protected. Please note that the keyboard layout for entering the BIOS password is English. The BIOS password is case sensitive and must be entered in the same way.

The following default settings are already made in the BIOS.

LVDS Configuration

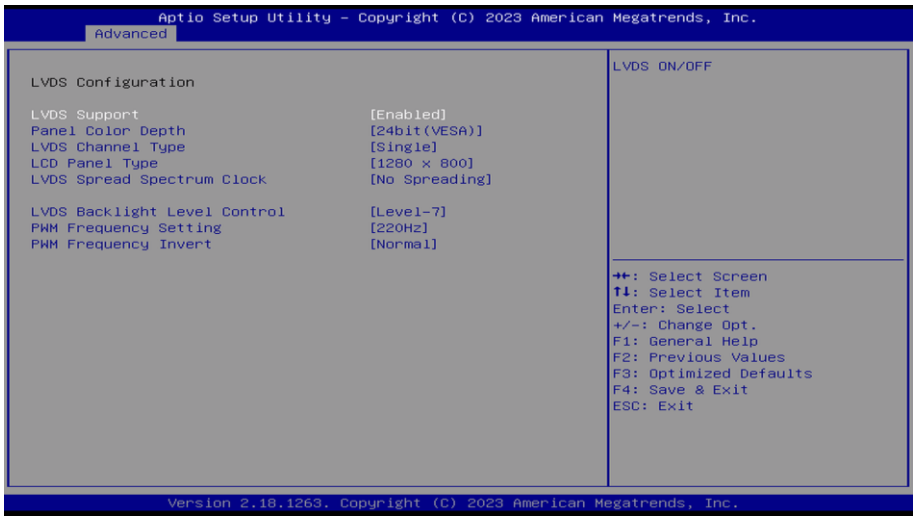


Illustration 11: BIOS LVDS Configuration

Setting Attempt Secure Boot

Secure Boot is activated in this BIOS. This means that only signed images can be started.

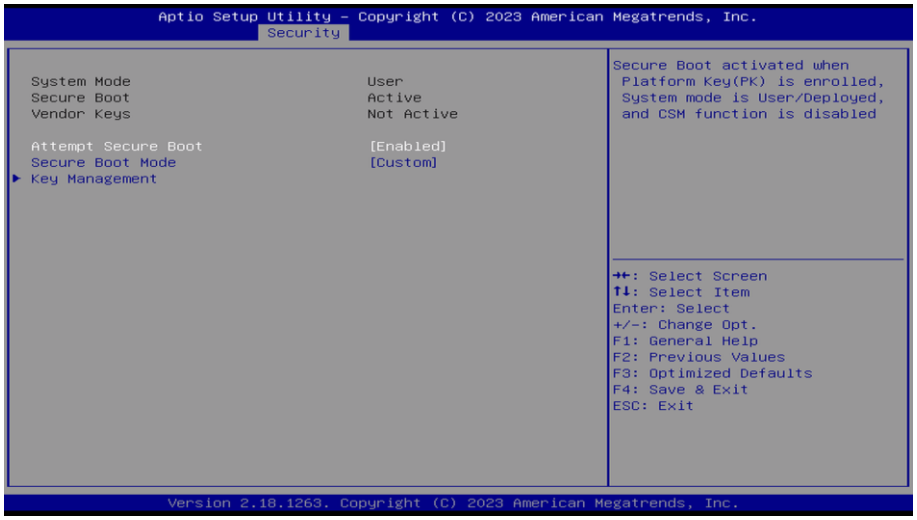


Illustration 12: BIOS Attempt Secure Boot

Installed Keys for the Secure Boot

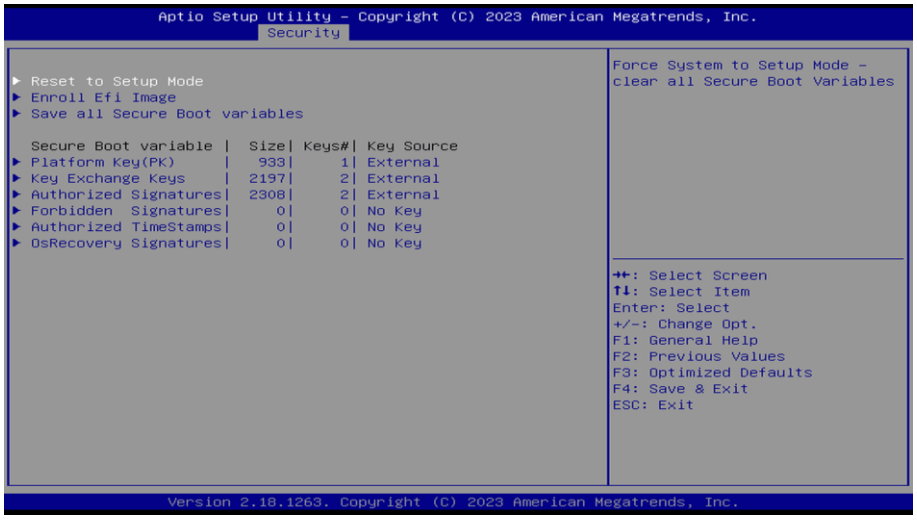


Illustration 13: BIOS Keys for the Secure Boot

Settings in the Boot tab

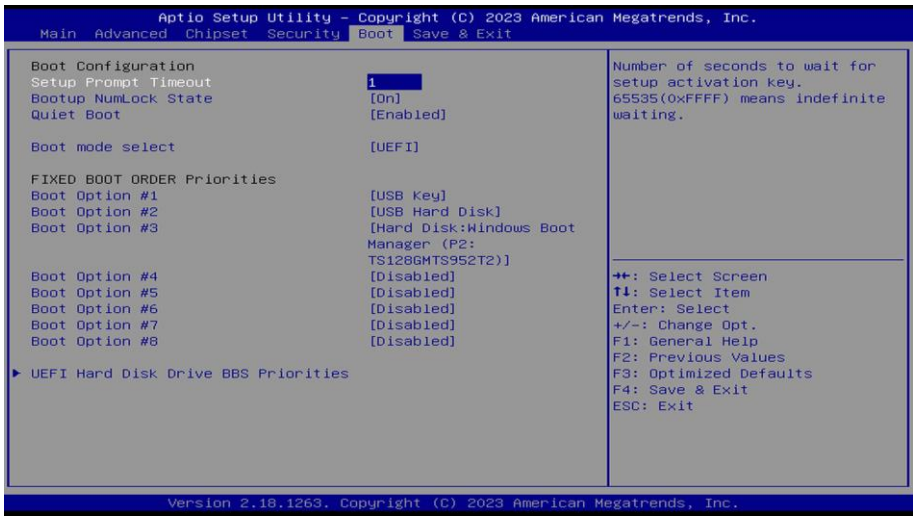


Illustration 14: BIOS Boot

6.1.2 Set Boot Priority

If you want to boot from a USB device, the following settings must be made in the BIOS:

1. Select "Boot" tab
2. Select "Boot mode select" "UEFI"
3. Open the "Boot Option #1" by pressing the "Enter" key
4. Select USB device with "Enter"
5. Save with keystroke "F4" (confirmation with "Yes")

6.2 BIOS Update

6.2.1 Preparation

Copy the AMI BIOS update files to a USB stick

You can obtain the required files from Christ Electronic Systems. These are the same for Argon and Titanium.

- efi
- flash.nsh
- fparts.txt
- Fpt.efi
- Titanium-200826a-S1M.bin (This .bin is only an example, the file can also be named differently)

6.2.2 Perform Update

Note: Attempt Secure Boot is [Enabled]. This must be set to [Disabled] before the BIOS update can be performed.

Insert the bootable USB stick with the required files into the unit.

Set the USB stick to Hard Disk Boot Priority in the BIOS. You can read about the procedure under Boot Priority.

The EFI Update Script is automatically detected on the USB stick and starts the update process.

Further procedure

- Confirm the question: "Enter 'q' to quit, any other key to continue:" with Enter

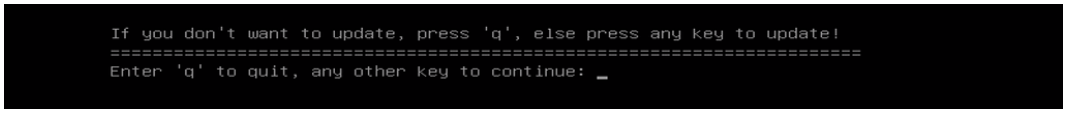


Illustration 15: BIOS Update

- The update is executed
- The message "FPT Operation Successful" indicates successful completion

Illustration 16: BIOS Update successful

- Disconnect the power supply
- Restore the power supply and enter the BIOS again (do not reboot)
- Press the F3 key to confirm the question "Load Optimized Defaults" with "Yes"
- Press the F4 key to save and exit

6.3 Redo Backup and Recovery

The instructions for Christ Redo Backup and Recovery can be found in the Download section of the Christ website: Downloads

7 Maintenance

The following chapter describes maintenance measures that can be performed by a qualified end user.

NOTICE	
	**Damage to the seals, damage to the housing** Loss of IP protection class ➢ There must be no permanent exposure to substances containing large amounts of oils or fats.

7.1 Cleaning

⚠ DANGER	
	**Triggering unintended functions** Loss of control of the plant / machine / device ➢ The unit may only be cleaned when it is switched off or unplugged.

To clean the device, use a soft cloth moistened with detergent solution or screen cleaner.

The cleaning agent must not be applied directly to the device. Under no circumstances may aggressive solvents, chemicals or scouring agents be used.

7.2 Maintenance

7.2.1 Replacing the battery

NOTICE	
	**The electronic components can be damaged by touching them** Malfunction occur ➢ ESD protection must be observed. Do not touch any electronic components unnecessarily.

Note: Within the warranty period, the battery may only be replaced by Christ Electronic Systems GmbH.

Note: Christ Electronic Systems GmbH will not bear any costs if the unit is damaged druing battery replacement.

Description	CR2450
Capacity	610 mAh
Connector	Molex 51021-02

Loosen all 12 countersunk screws M3 x 6 and store them.

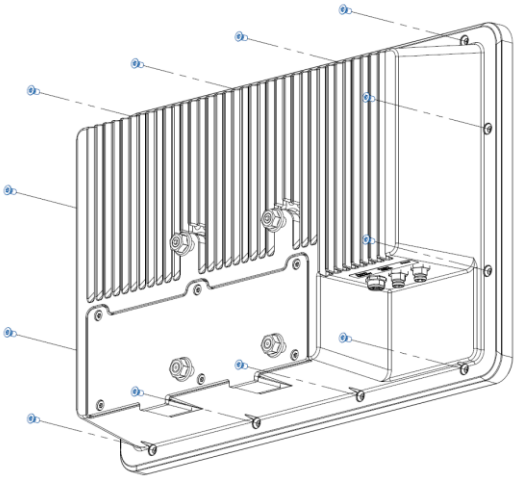


Illustration 17: Loosen screws of the front unit

Remove the front unit. Do not disconnect any cables.

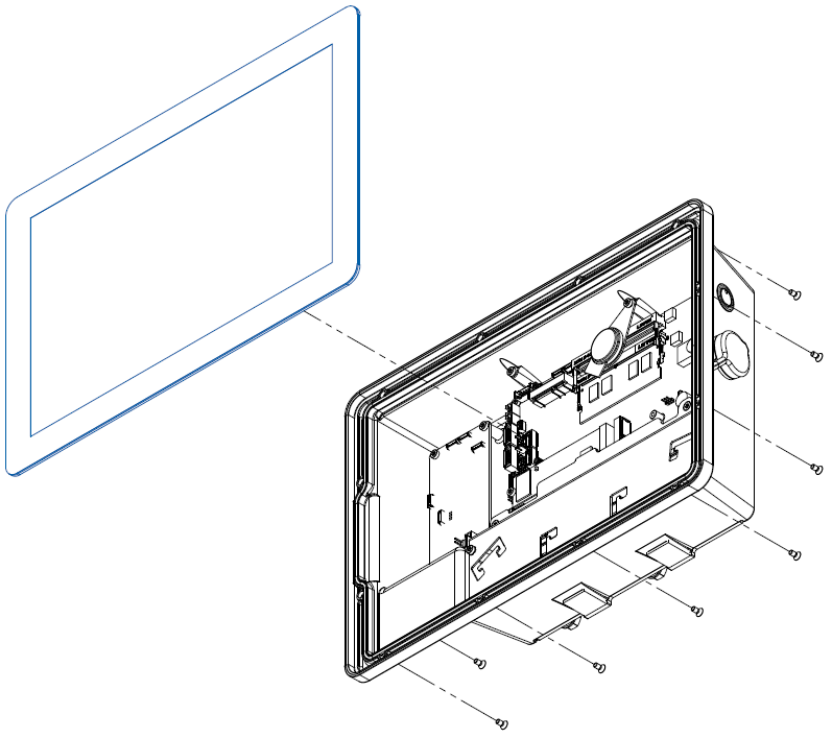


Illustration 18: Remove the front unit

Disconnect the battery.

Loosen the cylinder screw M3 x 6 and remove the battery.

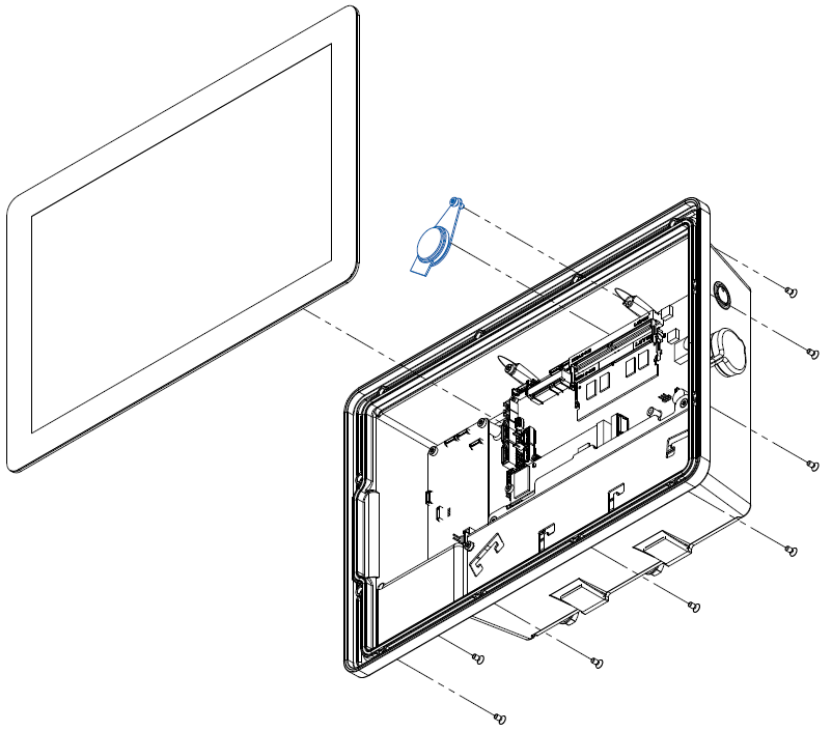


Illustration 19: Replace battery

Insert the new battery and screw it back on with the previously loosened screw.
Replace the front unit and fasten it again with the 12 stored screws.
Note: Observe the instructions for the disposal of batteries.

8 Technical Data

This chapter summarizes the technical data.

8.1 Mechanical Specifications

Housing	Aluminium
Weight	ca. 2.7 kg
Dimensions	312 mm x 214 mm x 70 mm
Mounting	VESA MIS-D, 75
Cooling	Passive

Table 13: Mechanical Specifications

8.2 Electrical Specifications

Supply Voltage	19.2 VDC ... 28.8 VDC
Power Consumption	see table Power Consumption
Inrush Current (load-independent)	max. 70A for 80 µs (Used power supply: FSP060-DAAN3)
External Power Supply	SELV
Earthing	Functional Earthing (Cable cross-section has to be identical to the supply lines)
Battery Lifetime	4 years (constantly turned off)

Table 14: Electrical Specifications

8.3 Power Consumption

Display Size	Power Consumption
12.1"	bis 45 W

Table 15: Power Consumption

NOTICE

Specifications are maximum values

Peripheral devices are considered (e.g. 1 x USB 2.0 equals 2,5 W)

➢ Provide sufficient power

8.4 Environmental Conditions

Ambient Temperature	0 ~ 50 °C
Storage Temperature	-30 ~ 70 °C
Humidity	5 ~ 80 % (not condensing)
Protection Class	IP65 (IP54 rear)
Cooling	Natural Air Convection

Table 16: Environmental Conditions

NOTICE

Insufficient air supply to the device

Overheating

➢ Never cover the device completely or operate it in a small, unventilated housing

8.5 Temperature test

The values for ambient temperature and humidity were determined under worst-case conditions. The maximum workload of the system was achieved by the BurnInTest from PassMark Software Pty Ltd.

The test ran under 100 % utilisation of:

- CPU
- RAM
- 2D and 3D Graphic (x86 only)
- Brightness of the display

9 Standards and Approvals

The device meets the following requirements.

9.1 CE Marking

The device has been tested in accordance with the applicable EU directives and the associated harmonized standards.

9.2 UKCA Marking

The device has been tested in accordance with the applicable United Kingdom directives and the associated harmonized standards.

9.3 RoHS

The device complies with the requirement of the EU Directive RoHS 2011/65/EU.

9.4 Electromagnetic Compatibility

Emitted Interference	EN55032 Klasse B
Immunity of supply line DC	± 1 kV according to IEC 61000-4-4; EFT
Immunity of signal lines	± 1 kV according to IEC 61000-4-4; EFT
ESD	± 4 kV Contact discharge according to EN61000-4-2 ± 8 kV Air discharge according to EN 61000-4-2
Immunity of conducted emission	10 V 150 kHz – 80 MHz, 80% AM according to IEC 61000-4-6
Immunity of high-frequency radiation	10 V/m 80 MHz – 1 GHz, 80% AM according to IEC 61000-4-3 3 V/m 1,4 GHz – 6 GHz, 80% AM according to IEC 61000-4-3

Table 17: Electromagnetic Compatibility

The device complies with the requirements of the EU Electromagnetic Compatibility Directive 2014/30/EU with the harmonized standards listed below:

EN 55032: 2015 Class B	Electromagnetic compatibility of multimedia equipment - Emission Requirements
EN 55035: 2017	Electromagnetic compatibility of multimedia equipment - Immunity requirements

9.5 FCC Approval

The device meets the requirements of FCC for approval in the USA and Canada. This has been tested and confirmed by SGS.

FCC (Federal Communications Commission)

The device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause any harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operations.

Changes or modifications not expressly approved by the party responsible for compliance could void theuser's authority to operate the equipment.

Note: This equipment has been tested and found comply with the limits of Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equiment in a resident area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Name Plate

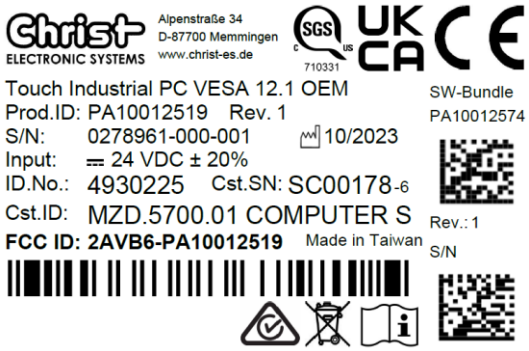


Illustration 20: Name Plate

9.6 Environmentally Appropriate Disposal

The device must not be disposed of with domestic waste.

The appliance complies with the requirement of the EU Directive WEEE 2012/19/EU, which is symbolised by the symbol with the crossed-out dustbin.

In order to enable environmentally friendly recycling, the various materials must be separated from one another.

Disposal must be carried out in accordance with the applicable legal regulations.

Component parts	Disposal
Enclosure	Metal Recycling
Electronic	Electronics Recycling
Paper / cardboard packaging	Paper / Cardboard boxes Recycling
Plastic packing materials	Plastics Recycling

Disposal of electrical devices

Electrical devices and electric replacement parts must not be disposed of with household waste at the end of their service life. Ask your local authority for information on how to proceed. Christ electrical devices meet the requirements of the WEEE Directive 2012/19/EU.

Electrical and electronic appliances are collected separately, which enables old appliances to be reused or recycled, and their materials to be reused. This is intended to prevent any hazardous materials that may be contained in the appliances from damaging the environment and health during disposal.

Electrical devices can be returned to the manufacturer at the end of their service life or can be recycled or repaired if this makes ecological sense.

Disposal of batteries:

Batteries must not be disposed of with household waste at the end of their service life. Ask your local authority for information on how to proceed. Batteries used at Christ meet the requirements of the Regulation (EU) 2023/1542.

Batteries are collected separately, which enables the batteries or their materials to be recycled. This is intended to prevent any hazardous materials that may be contained in the appliances from damaging the environment and health during disposal. Please refer to the disassembly instructions for information on removing batteries. There are free collection points for returning batteries in your area.

When disposing of batteries, avoid shorting the contact surfaces.

10 Technical Support

You can send the device to us without prior notice. All you need to do is fill out the repair cover letter and enclose it with the touch panel or IPC so that the service department can start the repair quickly.When the device arrives, it goes through a defined process that clearly documents all processes and makes the respective status traceable. As soon as your panel or IPC is registered in our system, you will receive a confirmation of receipt so that you can also get a precise overview.

Technical Support can be contacted as follows:

Service, Repair and Technical Support
Phone: +49 8331 8371-500
Fax: +49 8331 8371-497
E-Mail: service@christ-es.de

Or directly via the Homepage.
Christ Service

10.1 Device Seal

A device seal is affixed to every Christ device in order to prove whether the device has been opened by a third party. In case of a defect, please do not open the device, but contact our service department. They will discuss the further procedure with you.
Opening the device will void the warranty.

Index of Illustration

Index of Tables