XV300

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Imprint

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Original Operating Instructions

is the German-language edition of this document

DANGER!

Dangerous Electrical Voltage!

Before commencing the installation

- Installation, electrotechnical expertise
- Disconnect the power supply of the device.
- Ensure that devices cannot be accidentally ret-riggered
- Verify isolation from the supply
- Ground and short-circuit.
- Cover or enclose neighbouring units that are live.
- 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 potential equalizing. 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 cause malfunction and dangerous operation.
- 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 cause restart.
- Built-in devices for enclosures or cabinets must only be run and operated in an installed state, desk-top devices or portable devices only when the housing is closed.

- Measures should be taken to ensure the proper restart of programs interrupted after a voltage dip or failure. This should not cause 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.).

Table of Content

0.1 About this documentation

This Manual contains all the information you will need in order to use the XV300 safely and effectively.

The Manual XV300 manual is considered an integral part of the devices 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 assumes you have electrical engineering knowledge and skills.

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

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

📕 Manual XV300   MN048017EN

The latest version of this documentation, as well as additional references, is available for download on the Internet. → Section "Further reading", page 104

🌐 http://www.eaton.eu/doc

Please send any comments, recommendations, or suggestions regarding this document to: AfterSalesEGBonn@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
07/2015		New edition			
09/2015		ATEX accreditation,	✓		
		XV-313 Expansions	✓		
12/2015		Information on UL and battery added	✓		
08/2016		Information on the shipping classification	✓		
04/2017		XV-313 expansions	✓		
		XV-303-15-.. added			
06/2017	41	Information on gasket corrected and specified	✓	✓	
04/2019		new version XV-313-..-...-A11-.. implemented	✓		

0.1 About this documentation

0.1.2 Target group

This Manual is intended for electricians and electrical engineers, as well as for the people who will be in charge of performing the electrical installation and people who will be using the XV300 as an operating and monitoring device or as an integrated operating and control device in their own applications.

	CAUTION Installation requires qualified electrician

	Follow the safety instructions for the XV300! The section on safety instructions must be read and understood by everyone who will be working with the HMI panel before the actual work is performed.

	WARNING **Incomplete operator manual copies** Working with individual pages taken out from the operator manual may lead to bodily injury and property damage due to missing safety information. ▶ Always work with the current and complete documentation.

XV300 04/19 MN048017EN www.eaton.eu

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 XV300 before reading and understanding this manual.

It is assumed that the user of this manual is thoroughly familiar with the information found in the manuals for incorporating the XV300 into automation processes.

Hazards posed by the XV300 cannot be eliminated if the safety instructions are not observed – especially if the XV300 is commissioned and maintained by unqualified personnel and/or the XV300 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:

Brief description	Explanation
XV300	Product family with function code
HMI panel	Family
XV300	Used to refer to all the devices in the product family
XV-303	Used to refer to all front mounting devices as a group
XV-313	Used to refer to all rear (panel) mounting devices as a group
SmartWire-DT	SmartWire-DT

For the exact designation for your XV300, please refer to the→ "Indication label", page 24.

0.1.5 Writing conventions

Table 1: Format conventions used throughout this manual

Award	Description
Bold text	Used for all graphical user interface elements
Monospaced Font format code	Used for all elements at the file level
Text	Used for the button labels
Menu path\submenu\...\item	Path information for software windows and menu pages
Menu/command	Used for commands found in the menu bar's menus
<name>	Angle brackets are used to indicate variable values that you must replace with your own values

0.1 About this documentation

0.1.5.1 Hazard warnings

Danger! Risk of personal injury.

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.

GEFAHR!

Gefährliche elektrische Spannung!

CAUTION

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

Property damage warning

ACHTUNG
warnt vor möglichen Sachschäden.

Prohibited use

Prohibited uses, actions, etc.

Explanation

Bids

Bid

Explanation

Notes

  Weist auf nützliche Tipps hin.

▶ Indicates instructions to be followed

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

0.1.5.2 Documents with additional information

Manuals, for example. These will be listed with the corresponding title and Eaton number after the icon.

 Publication title   For identifying the Eaton publication code

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

 Destination Address

1. Description

1.1 Function

XV300 can be used as control and monitoring devices featuring PLC functionalities.

HMI panel feature an industrial high-resolution display with capacitive multi-touch technology. This, combined with a highly precise and intuitive gesture-based user interface, enables operators to start working right away. Their unmatched system performance with a powerful graphics processing unit powers a state-of-the-art user interface.

With their compact and sleek design – featuring a heavy-duty, flat, anti-glare glass panel – XV300 multi touch display are ideal for industrial applications in harsh environments.

1.1.1 Features

- Sleek design with capacitive multi-touch technology (PCT)
- Heavy-duty, anti-glare tempered glass; easy to clean
- Requires very little space; can also be used in portrait mode
- XV-303 model for front mounting and XV-313 model for rear (panel) mounting
- Display sizes 7.0" and 10.1" with a 1024 x 600 Pixel resolution,
  Display size 15.6" with a 1366 x 768 Pixel resolution
- Powerful CPU: 800 MHz ARM Cortex-A9
- 1 GB internal memory and 128 kB non-volatile data memory
- The unit's memory can be expanded with SD cards (accessories)
  SD card slot for SD / SDHC memory cards
- Windows Embedded Compact 7 operating system
- Comprehensive basic configuration with integrated interfaces

1.1.2 Options

- additional integrated interfaces:
  e.g.: 2. Ethernet, 1x Profibus and /or 1x SmartWire-DT

1.1.3 Notes

1.1.3.1 SmartWire-DT

XV-3.3-..-.E.-...-..,

Units featuring the optional SmartWire-DT interface can be used as SmartWire-DT coordinators for Lean Automation.

> SmartWire-DT can prove to be invaluable when implementing Lean Automation concept, which, as part of the company's Lean Solution approach, offers several significant advantages.
> More specifically, SmartWire-DT integrates the I/O level directly into the switchgear being used, enabling a PLC to use SmartWire-DT to directly access digital and analog data from control circuit devices all the way to circuit-breakers.
> This eliminates the need for a separate gateway and I/O layer. reducing the number of components and engineering work and enabling users to create flexible, yet streamlined automation solutions.
> Eaton calls this concept "Lean Automation" and uses it to provide users in the machine building and plant engineering industries with unparalleled freedom so that they can design creative and profitable solutions.

1.1.3.2 XN300

The ultra-compact XN300 modular slice card I/O system, which features a plug-in connection system, complements the XV series with application-oriented functions that are ideal for optimized system solutions.

1.2 Use as intended

XV300 are primarily intended for use in machine and system building applications.

They are intended exclusively for monitoring, operating, and controlling machines and systems.

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

The XV300 multi touch display are approved for use in closed spaces.

Bid
The HMI panel must be used only in locations for which the XV300 is approved. Make sure to read and follow the information and labels on the nameplate for the HMI panel, 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).

1.3 Device models - versions and part nos.

1.3.1 Basic features

All XV are equipped with:

- the operating system Windows Embedded Compact 7 pro

- an industrial capacitive multitouch display, PCT

- a SD/SDHC memory card slot.

Every HMI panel comes with the following integrated interfaces as standard:

- One Ethernet port (10/100 Mbit/s) for use as a communication or field bus interface
- One USB 2.0 host port for memory and other accessories, full power (500 mA)
- One USB device 2.0,
- One standard RS-232 (COM1) port for communicating with PLCs or devices
- One standard RS-485 (COM2) port for communicating with PLCs or devices
- One standard CAN interface for the CANopen protocol, J1939 protocol

1.3.2 Device variants

One of the main differences between the various device models is the specific mounting method that must be used when installing the devices in an enclosure.

- Front mounting, in which the device is inserted into the enclosure from the front
- Rear mounting, which provides a flush alignment with the enclosure's surface

1.3.3 Optional features

The following individual options are available in order to ensure that the unit will best meet the needs of the application at hand:

- Three widescreen display sizes: 7.0", 10.1"or 15.6" widescreen
- Device bundles with visualization software and/or control software licenses.

Additional integrated interfaces

- Second Ethernet port (10/100 Mbit/s) for use as a communication interface
- PROFIBUS-DP, universal field bus interface for all typical protocols
- SmartWire-DT for an efficient use of SmartWire-DT technology and its comprehensive features

1. Description
1.3 Device models - versions and part nos.

Table 2: Enclosure versions for front mounting

Figure 1: Front with plastic frame

XV-303-10-..

Figure 2:
Service side with optional interfaces

XV-303-10-CE2-A00-1C

Figure 3: Front with plastic frame
XV-303-70-..

Figure 4: Service side with optional interfaces
XV-303-70-CE2-A00-1C

Figure 5: Front side with aluminum frame
XV-303-15-..

Figure 6: Service side with optional interfaces
XV-303-15-C00-A00-1C

Table 3: Enclosure versions for rear (panel) mounting

Figure 7: Front side with aluminum mounting frame
XV-313-10-..

Figure 8: Service side with optional interfaces
XV-313-10-...
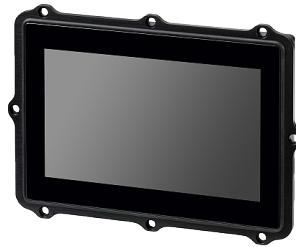
Figure 9: Front side with aluminum mounting frame
XV-313-70-..

Figure 10: Service side with optional interfaces
XV-313-70-...

1.4 Operating and Indication elements

1.4.1 Overview

Operator control and display elements
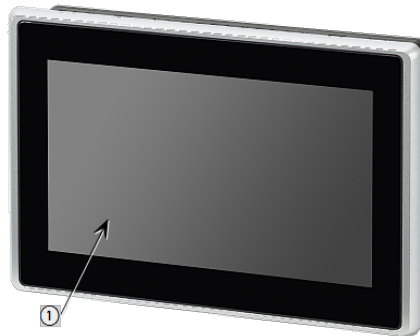
Front XV-303
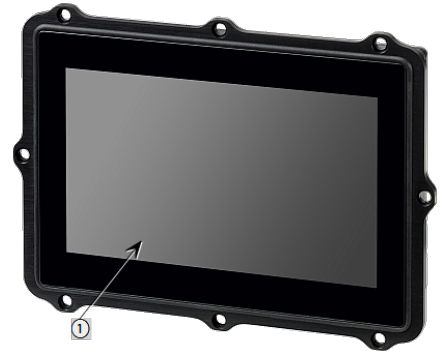
Front XV-313

Service side with optional interfaces XV-303

Service side with optional interfaces XV-313

①	Display, Touch sensor	Display of HMI device Detects when the controls shown on the display are being actuated. Operation based on touch gestures.
②	SD card slot	Slot for SD card
③	CTRL button	The specific function depends on the software being used

1.5 Interfaces to peripheral devices

The interfaces featured by your XV300 will depend on theXV version selected and can-not be modified.

The nameplate will indicate which specific interfaces are included with the unit.
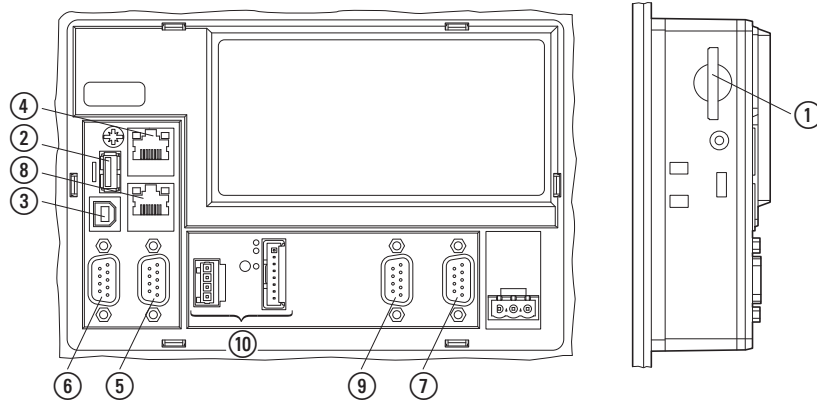
Figure 11: Interfaces

Basic interfaces (all XV300 models come with these interfaces)

	interface	type
①	SD card slot	SDSC or SDHC conforming to the SDA 2.0 specification
②	USB Host	USB 2.0, not galvanically isolated, plug type A, Full power (500 mA)
③	USB device	USB 2.0, not galvanically isolated, plug type B
④	Ethernet 1	RJ-45 socket, 8-pole, 2 LEDs (CAT5e/6), LAN1, 10/100 Mbps
⑤	COM1	RS-232, not galvanically isolated, SUB-D plug 9-pole, UNC nuts for inter-locking
⑥	COM2	RS-485, not galvanically isolated, SUB-D plug 9-pole, UNC nuts for inter-locking
⑦	CAN	CAN1, not galvanically isolated, SUB-D plug 9-pole, UNC nuts for inter-locking

Optional interfaces

⑧	Ethernet 2	RJ-45 socket, 8-pole, 2 LEDs (CAT5e/6), LAN1, 10/100 Mbps
⑨	Profibus	Profibus DP, not galvanically isolated, SUB-D socket 9-pole, UNC nuts for interlocking
⑩	SmartWire-DT	4-pin WAGO connector (article no. 734-104) and 8-pole ribbon cable plug

1.6 How to interpret the Part number

The available types and versions are found in the part number in code format.

You can find the part number on your XV300 multi touch display's nameplate.

Table 4: Part number

XV - 3.. - .. - ... - ... - ..

| | Type | Display size | Interfaces | Version | Visualization software |

Table 5: Type

3..

303	Front mounting
313	Rear (panel) mounting

Table 6: Display size

..

70	7.0" screen diagonal
10	10.1" screen diagonal
15	15.6" screen diagonal

Table 7: Interfaces

..

B00	Base (1xEthernet, 1xRS232, 1xRS485, 1xCAN, 1x USB host, 1xUSB device1xSD card slot)
C00	Base + 2. Ethernet
B02	Base + 1xProfibus
C02	Base + 2. Ethernet + 1x Profibus
BE0	Base + SmartWire-DT
CE0	Base + SmartWire-DT + 2. Ethernet
BE2	Base + SmartWire-DT + 1xProfibus
CE2	Base + SmartWire-DT+ 2. Ethernet + 1xProfibus

Table 8: Version

...

A00	Standard version, implementation XV-313 Sheet metal thickness of the mounting surround d = 1.5 mm (0.059") ± 0.1mm (0.004")
A11	implementation XV-313 Sheet metal thickness of the mounting surround d = 2 mm (0.08") ± 0.1mm (0.004")

Table 9: Bundles with visualization software

..

1B	WEC7P, PLC function can be added later on, runtime license for GALILEO visualization software

..

1C	WEC7P, integrated PLC function, runtime licenses for GALILEO visualization software and XSoft CoDeSys 2/3
1D	WEC7P, PLC function can be added later on, runtime license for Visual Designer visualization software
1E	WEC7P, integrated PLC function, runtime licenses for Visual Designer visualization software and XSoft CoDeSys 2/3

XV300 devices are available with various bundle options that include visualization software licenses and/or control software licenses. For more information, or to order, contact your supplier or
use the Eaton online catalog.
Enter "XV300" into the search box and the catalog will take you directly to the corresponding product group in the Automation, Control and Visualization section.

🌐 http://www.eaton.eu/ecat

1.7 Accessory devices

A variety of accessories are available for XV300 multi touch displays.

- SD card
- Accessories

> *NOTICE*
> Only use original accessories.

➡ Order accessories through your supplier or through the Eaton online catalog www.eaton.eu/ecat

e.g.

article no.	Type
181638	MEMORY-SD-A2-S SD memory card with min. 1 GB
139807	MEMORY-SD-A1-S SD memory card with min. 256 MB
181585	LIC-PLC-A license product certificate PLC
181637	ACCESSORIES-TP-10-KG brackets for XV-303-70-../XV-303-10-..

1.8 Indication label

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

- Manufacturer
- Part number
- Part No.
- Version
- Date of manufacture
- Required power supply
- Serial-No.
- Type approval and certification marks and information
- Layout of ports/interfaces and controls

Figure 12: Example for a nameplate

1.9 Support

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

- Part No.
- Serial No.

1.10 Conditions for Underwriters Laboratories Inc. (UL) listing

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

Ambient temperature 0°C to 50°C

Mounting height up to 2000 m

Overvoltage category II

Degree of pollution 2

Permissible voltage range 20%/+25% of rated operating voltage

Type rating

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

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

Suitable power supply for class III (SELV or PELV)

The devices must be installed in a suitable fire protection enclosure that provides protection against the spread of fire.

The torque used to tighten the screw terminals on the plug-in connection for the supply voltage must not exceed 0.6 ... 0.8 Nm (5 ... 7 lb-in).

Required only for XV-3.3-..-.E.-...-..XV300 units with a SmartWire-DT connection.

The SmartWire-DT master interface's U_{Aux} supply voltage must be externally protected against overcurrent and short-circuits with the following:

- Miniature circuit-breaker 24 V_{DC}, rated operational current 2 A, trip type Z
- or a 2 A fuse.

1.11 Marine approvals

Obtained type approvals

XV300 multi touch display 7.0" and 10.1" have been granted the required by Det Norsk Veritas / Germanischer Lloyd (DNV GL)

- DNVGL-CG-0339 type approval, November 2015 edition,
  "Environmental test specification for electrical, electronic and programmable equipment and systems"
  Certificate No.: TAA00000NC

Location classes

temperature	B - Ambient temperature: 0°C to +55°C
Humidity	B - Relative humidity up to 100 % at all relevant temperatures.
Vibration	A - Bulkheads, beams, deck, bridge, acceleration amplitude: 0.7 g
emc	A* - All locations except bridge and open deck B* - All locations (including bridge and open deck)
Input	Required protection according to DNV-GL Rules shall be provided upon installation on board

* Filters / Ferrites maybe required to fulfil. See installation restrictions

Installation restrictions

1. Install and commission referring to manuals.
2. Screened communication cables improve EMC behavior
3. PE connection of communication cables improve EMC behavior (e.g. earth-connection kit: EATON ZB4-102-KS1)

Location class	interface	Installation
EMC B	Power supply	Place interference filter
EMC A		No additional installations

Please refer to the following as well → Section "Conditions for Marine approvals", page 40

2. Safety regulations

2.1 Basics

The device has 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 the device unless it is in perfect technical condition. Make sure to always operate it as specified in this document and for the intended purpose.

	Follow the safety instructions for the XV300!
	The section on safety instructions must be read and understood by everyone who will be working with the HMI panel before the actual work is performed.

NOTICE
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.

2.2.3 Device documentation

This manual is considered an integral part of the XV300 and must always be readily available in the device's close proximity so that users have access to it.

2. Safety regulations
2.2 Mandatory requirements, personnel requirements

Make sure that every person who will be working with the XV300, regardless of the life-cycle stage involved, has read and understood the relevant parts of the documentation for the XV300.

Additional parts of the documentation and information for the XV300, including the installation instructions, can be found at the Eaton Download Center - Documentation and at the product pages on the Internet

🌐 http://www.eaton.eu/doc

🌐 http://www.eaton.eu/xv300

⚠	**WARNING** **Incomplete operator manual copies** Working with individual pages taken out from the operator manual may lead to bodily injury and property damage due to missing safety information. ▶ Always work with the current and complete documentation.

2.2.4 Installation, maintenance, and disposal

Make sure that the XV300 is connected, installed, serviced, and disposed of professionally and in line with all relevant standards and safety rules.

⚠	**CAUTION** Installation requires qualified electrician

❗	**Important!** Dispose of recyclables as required by your local recycling regulations.

HMI panel XV300 no longer being used must be professionally disposed of as per local standards or returned to the manufacturer or relevant sales department.

2.2.5 Prerequisites for proper operation

In order for the device to be able to meet the contractually stipulated terms, the following must be observed:

- Only qualified personnel should be allowed to work with the XV300.
- The personnel working with the XV300 must have read the manual and must follow all the instructions in it.

- The ambient conditions stated must be observed.
- Maintenance work must be carried out correctly.

→ Make sure to read the → "Legal Disclaimer", page 11.

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 XV300
- Alterations, changes, and repairs to the XV300

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
Zone 22 hazardous areas (as defined in the ATEX Directive)

▶ Make sure that the device is not exposed to dangerous impacts and other types of dangerous mechanical shock.

▶ Do not operate the device in hazardous (classified) locations unless it is mounted correctly.

▶ De-energize the device before disconnecting plug connections.

EXPLOSION HAZARD
LITHIUM BATTERY

The lithium battery inside the XV300 may explode if handled incorrectly.

▶ Dispose of the XV300 unit professionally.

CAUTION
DESTRUCTION

The XV300 should only be opened by the manufacturer or by an authorized center. Operate the XV300 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 HMI panel (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 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 XV300 multi touch display, follow all instructions regarding how to wire the corresponding port/interface.
All general Directives and standards must be complied with.

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 specified in the technical data.

CAUTION
SAFELY DIVERTING ELECTRICAL INTERFERENCE CURRENTS

HMI panel XV300The 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 $\geqq$ 1.5 mm², length $\leqq$ 350 mm

The XV300 needs to be connected to the conductive structure in, e.g., the control panel using the central earth point (earthing screw). 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 XV300 may be damaged by potential differences.

▶ The GND terminals of all bus modules must be connected.

▶ Do not connect the connector to the XV300 or disconnect it without first de-energizing the system.

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 XV300 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 XV300 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 XV300 multi touch display 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 XV300 multi touch display when it has condensation in or on it.
If the XV300 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 XV300 multi touch display 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 XV300 unit's lifespan. Protect theXV300 unit from direct sunlight and other sources of UV radiation.

CAUTION
POINTY, SHARP OBJECTS AND CORROSIVE LIQUIDS
When cleaning the XV300:

- 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 XV300 unit (short-circuit hazard) and that the XV300 unit is not damaged in any way.

CAUTION
INSTALLATION CUT-OUT
The mounting cutout 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, Nema 4x and Nema 12 degrees of protection will only be ensured if there is sufficient stiffness, the device is properly mounted using the original fixing material, and the gasket has a proper seat

- Minimum sheet thickness of control panel panel where the device will be flush mounted:
  XV-303-70-.., XV-303-10-..
  2 mm (0.08") ≦ d ≦ 5 mm (0.2")
  XV-303-15-..
  1.5 mm (0.06") ≦ d ≦ 4 mm (0.16")

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 ports (USB host and USB device) on the XV300 multi touch display unit are meant for maintenance work only.

WARNING
The device should only be run with safety extra-low voltage (functional extra-low voltage with protective separation).
The power transformer must meet all applicable standards.

CAUTION
FORCES ON THE ETHERNET INTERFACE
Communications may be affected, and the connection's mechanical components may be damaged, if the Ethernet 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

XV300 units are products designed for use in industrial environments as defined in ICE/EN 6100-6-4. 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

3.1 Prerequisites for the Area of application

The XV300 must be used exclusively in locations for which HMI panel has been approved/certified.

A 24 VDC supply voltage must be ensured as per the specifications.

See also Label on the → "Indication label", page 24
as well as the specifications in the appendix → Section "Technical data", page 80

3.1.1 Installation position

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

- If you will be using the HMI panel in a hazardous (explosive) location, make sure it is not exposed to any dangerous impacts or other types of dangerous mechanical shock.
- The controls and connectors on the XV device's service side must remain accessible even after the device has been installed.

→ The SD card slot is located on the side of the XV300.
Make sure to take the space required to remove the SD card into account.
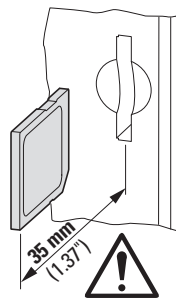

Figure 13: Space required to remove the SD card

3.1.1.1 Temperatures

Make sure that the HMI panel does not overheat.

Do not expose the HMI panel to direct sunlight or other sources of heat.
The minimum clearance to components emitting heat, such as transformers under heavy loads, is 15 cm.
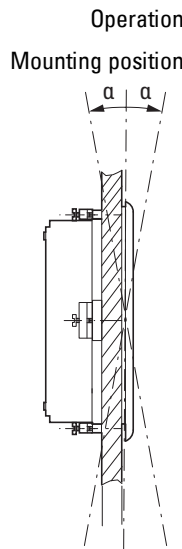
> **CAUTION**
> **UV LIGHT**
> Plastics will become brittle when exposed to UV light. This artificial aging will reduce the XV300 unit's lifespan. Protect theXV300 unit from direct sunlight and other sources of UV radiation.

3. Installation
3.1 Prerequisites for the Area of application

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

Ambient climatic conditions	
Air pressure (in operation)	795 - 1080 hPa
	max. 2000 m a. NHN (standard elevation zero)
Temperature	
Operation	$\pm\,0 - +50\ °C\ (+32 - +122\ °F)$
Mounting position	XV-303-10-…, XV-303-70-... $\alpha \leqq \pm\,45°,\ T \leqq 50\ °C\ (122\ °F)$ XV-303-15-.E.-…, XV-303-15-.02-.. $\alpha \leqq \pm\,10°,\ T \leqq 50\ °C\ (122\ °F)$ XV-303-15-.00-... $\alpha \leqq \pm\,10°,\ T \leqq 50\ °C\ (122\ °F)$ $\alpha \leqq \pm\,45°,\ T \leqq 45\ °C\ (113\ °F)$ Inclination from vertical: $\alpha \leqq \pm\,45°$ at operating temperature $\leqq 45°C$ possible (if using natural convection)
Storage / Transport	$-20 - +60\ °C\ (-4 - +140\ °F)$
Relative humidity	Relative humidity 10 - 95 %
Condensation	non-condensing

3.1.1.2 Aeration and de-aeration

- Do not block the ventilation openings when mounting the device:
  They are designed to allow air to circulate in order to cool the HMI panel.
- The device uses natural convection-based passive cooling, i.e., it does not use fans.

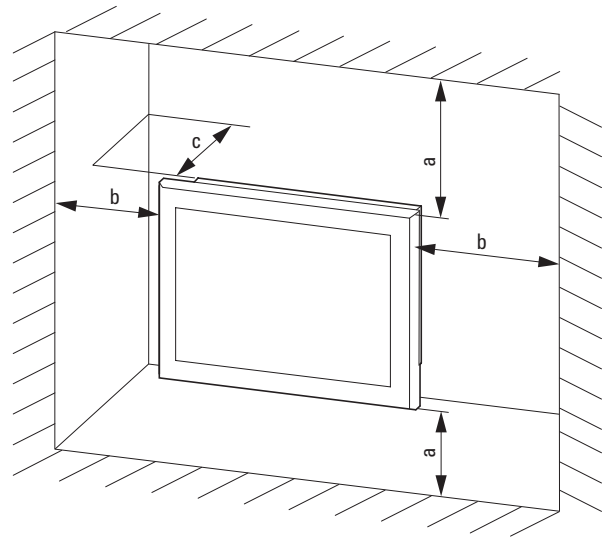*Ventilation diagram*   *Clear Zone*

Figure 14: Cooling air   Figure 15: Mounting distance
circulation

- Make sure that there will be enough volume for air changes inside the control panel, etc.
  The specified clearance around the XV300 is: a, b, c ≧ 30 mm (1.18"), ϑ 0°C (32°F) ≦ T ≦ 50 °C (122°F)

- If you will be installing the XV300 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: ϑ 0°C (32°F) ≦ T ≦ 50°C (122°F)
  The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the XV300 as necessary for design verification in accordance with IEC EN 61439

XV-303-15-..

An inclination angle α greater than 10° is only permissible for certain XV-303-15-… device models and only at a reduced max. ambient temperature of 45 °C.
For XV-303-15-CE.-…, XV-303-15-C02-.., the inclination angle l α is limited to α ≦ ±10° in general.

3.1.1.3 Criteria for the Installation position

The XV300 are intended to be flush mounted in control cabinets, control panels, or control consoles.

- XV300 units can be installed in landscape or portrait mode.
  If you are using your XV300 unit with an SD card, do not install it with the SD slot facing downwards, as the SD card may fall out otherwise.

3. Installation
3.1 Prerequisites for the Area of application

- If no forced ventilation is being used, the device must not be mounted at an angle α of more than $\pm\alpha \leqq 45°$.
  An inclination angle α greater than 10° is only permissible for certain XV-303-15-… device models and only at a reduced max. ambient temperature of 45 °C.
  For XV-303-15-CE.-…, XV-303-15-C02-.., the inclination angle l α is limited to $\alpha \leqq \pm 10°$ in general.
- The enclosure material must be thick enough
  XV-303-10-.., XV-303-70-..
  for front mounting 2 mm (0.08") $\leqq$ d $\leqq$ 5 mm (0.2"),
  XV-313-10-.., XV-313-70-..

  for rear (panel) mounting XV-313-..-…-A00-..d = 1.5 mm (0.059") $\pm$ 0.1mm (0.004"),
  XV-313-..-…-A11-.. d = 2 mm (0.08") $\pm$ 0.1mm (0.004")
  XV-303-15-..
  for front mounting 1.5 mm (0.06") $\leqq$ d $\leqq$ 4 mm (0.16")

  as well as flatness $\square \leqq$ 0.5 mm (0.02") am Einbauausschnitt bei $\sqrt{\ }$ Rz $\leqq$ 120; IP 65
  $\longrightarrow$ DIN ISO 2768-2 (K)
- Recommended mounting cutout
  for front mounting
  XV-303-70-..:e = 183 mm (7.20") $\pm$ 1 mm (0.04"), f = 122 mm (4.80") $\pm$ 1 mm (0.04")
  XV-303-10-..: e = 255.5 mm (10.06") $\pm$ 1 mm (0.04"), f = 160.5 mm (6.32") $\pm$ 1 mm (0.04"),
  XV-303-15-..:e = 388 mm (1x6") $\pm$ 0.5 mm (0.02"), f = 239 mm (x2") $\pm$ 0,5 mm (0.02")
  for rear (panel) mounting
  XV-313-70-..: e = 182.7 mm (7.193") $\pm$ 0.1 mm (0.004"), f = 126.8 mm (4.992") $\pm$ 0.1 mm (0.004")
  XV-313-10-..: e = 255.7 mm (10.07") $\pm$ 0.1 mm (0.004"), f = 165.8 mm (6.528") $\pm$ 0.1 mm (0.004")
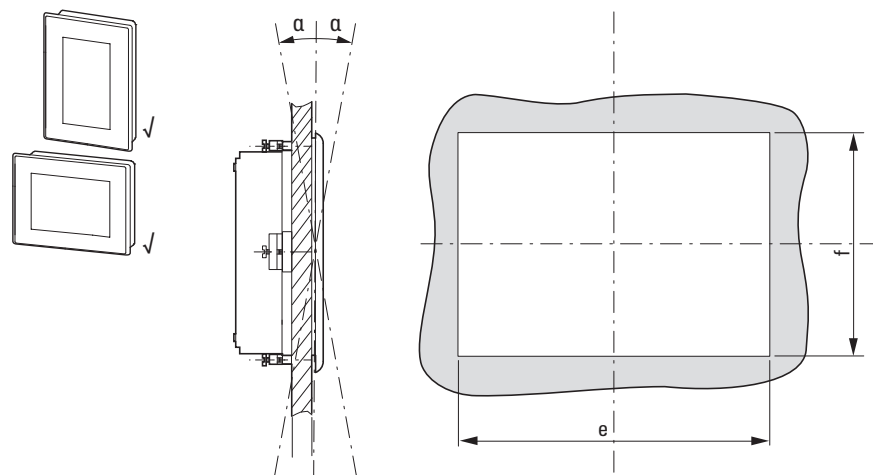
Figure 16: Mounting position

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

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

Ambient temperature 0°C to 50°C

Mounting height up to 2000 m

Overvoltage category II

Degree of pollution 2

Permissible voltage range 20%/+25% of rated operating voltage

Type rating

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

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

Suitable power supply for class III (SELV or PELV)

The devices must be installed in a suitable fire protection enclosure that provides protection against the spread of fire.

The torque used to tighten the screw terminals on the plug-in connection for the supply voltage must not exceed 0.6 … 0.8 Nm (5 … 7 lb-in).

Required only for XV-3.3-..-.E.-…-..XV300 units with a SmartWire-DT connection.

The SmartWire-DT master interface's U_{Aux} supply voltage must be externally protected against overcurrent and short-circuits with the following:

- Miniature circuit-breaker 24 V_{DC}, rated operational current 2 A, trip type Z
- or a 2 A fuse.

3. Installation
3.1 Prerequisites for the Area of application

3.1.3 Conditions for Marine approvals

The following DNV GL rules for shipping classification in accordance with DNVGL-CG-0339 type approvals must be observed:

1. Complete and proper installation and commissioning in accordance with DNV GL rules and Eaton requirements and specifications.
2. Installation of radio interference suppression filters for the 24 V DC supply.

3.1.3.1 Radio interference suppression filter for the 24 V DC supply

Additional interference filters must be installed for the power supply in order to adhere to the EMC B provisions.

▶   Integrate a radio interference suppression filter into the wiring.

Depending on the output, the following filters can be used:

• XT-FIL-1 suppression filter for 24-V-DC supply up to 2.2 A (Eaton article no. 285316)

Or

• XT-FIL-2 suppression filter for 24-V-DC supply up to 12 A (Eaton article no. 118980)
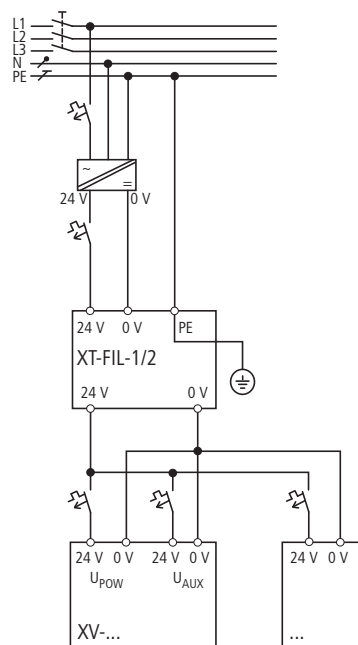

Figure 17: Engineering example for integration of radio interference suppression filters

Earthing is ensured either by using

• the filter's integrated contact fields onto a grounded metal plate

or using

- a separate line to the filer's PE connection.

Depending on the current consumption or configuration, several filters may be used as well.

3.2 Unpacking and checking the equipment supplied

▶ Check the HMI panel's 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 Installation instructions IL048009ZU or IL048010ZU 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 HMI panel.
Make sure to also keep the documents enclosed with the device and/or to give them to the end customer.

The XV300 package includes:

Table 10: Std. pack

Number	Description
1 x	XV300 XV-303or XV-313
1 x	Plug connector MSTB 2.5/3-ST-5.08
1 x	Plug connector WAGO 734-104 Required only for XV-3.3-..-.E.-...-..XV300 units with a SmartWire-DT connection.
1 x	Installation instructions IL048009ZU or IL048010ZU
6 x / 10 x /12 x	Holding bracket with set screw Internal hexagon M4x25 DIN 914 galvanized 6 x for XV-303-70-.., 10 x for XV-303-10-.., or 12 x for XV-303-15-..

The XV300 is sturdily built, but the components inside it are sensitive to excessively strong vibrations and/or mechanical shock.

Accordingly, make sure to protect the XV300 from mechanical loads that exceed the scope of the unit's intended use.

The XV300 should only be transported in its original packaging after being packed properly.

3.3 Mounting

> *NOTICE*
> Arrange for a professional technician to mount the device.

> ⚠️ **CAUTION**
> **INSTALLATION CUT-OUT**
> The mounting cutout 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, Nema 4x and Nema 12 degrees of protection will only be ensured if there is sufficient stiffness, the device is properly mounted using the original fixing material, and the gasket has a proper seat
>
> - Minimum sheet thickness of control panel panel where the device will be flush mounted:
>   XV-303-70-.., XV-303-10-..
>   2 mm (0.08") $\leqq$ d $\leqq$ 5 mm (0.2")
>   XV-303-15-..
>   1.5 mm (0.06") $\leqq$ d $\leqq$ 4 mm (0.16")

3.3.1 Fixing and Sealing

► Make sure to check that the installation position criteria are being met. → page 37
► Make sure that the mounting cutout has the right size.
► Check the gasket for damage and make sure it is resting correctly inside the enclosure groove.

Missing parts or damage

If you notice anything wrong, please contact your distributor or
Eaton Service +49 (0) 180 5 223822 (de,en)

3.3.2 Front mounting XV-303

Securing the panel with Holding bracket with set screw

List of tools:

- 2.0 m Allen key
- PZ2 Pozidriv screwdriver
- Torque wrench with Newton meter scale

The required holding brackets are included in the right amount as accessories with the HMI panel. All the included holding brackets need to be installed!

Together with the gasket, this holding bracket is the main element involved in achieving an IP65 (front) degree of protection.

The purpose of the holding brackets is to secure the XV300 onto a control panel, etc.
To this end, the brackets must be hooked into the enclosure sideways and screwed against the control panel door, etc.
Make sure to position the holding brackets in such a way that they will push against the center of the peripheral gasket.

▶ Pre-install the holding brackets using the set screws.

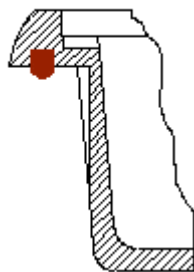*Check that the gasket is in its correct position and pre-install the holding brackets*

Figure 18: Peripheral gasket along the entire edge

XV-303-70-..and XV-303-10-..: foam rubber round cord, material NBR/PVC black, closed outer skin, diameter 3 mm (0.12")
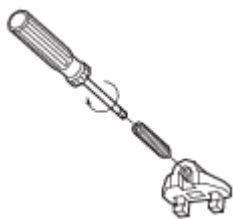XV-303-15-..: Polyurethane foam gasket, material Raku-PUR 31-3117 black, dimensions 2mm x 3mm (0.0787" x 0.1181")
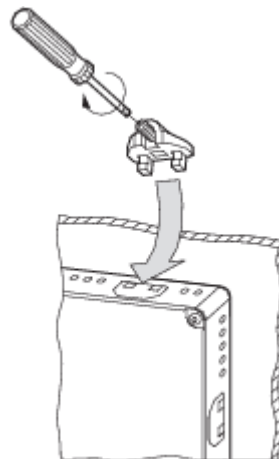
XV-303-70-.., XV-303-10-..

Pre-installing the holding brackets
Screw the set screwsInternal hexagon M4x25
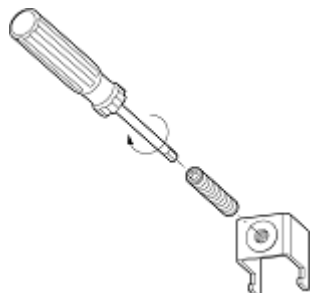*DIN 914 galvanized into the holding brackets*
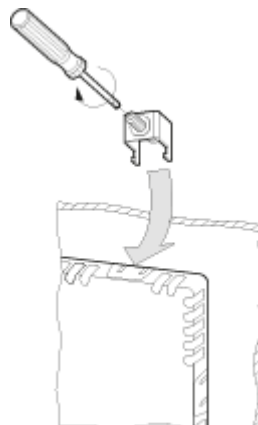
Insert the holding brackets into the enclosure

XV-303-15-..

Figure 19: Pre-installing the holding brackets
Screw the set screwsInternal hexagon M4x25
DIN 914 galvanized into the holding brackets

Figure 20: Installing the holding brackets

▶ 1. Insert the XV-303 into the mounting cutout.

▶ 2. Insert a holding bracket into the corresponding enclosure opening and tighten the set screw until it comes into contact with the surface of the control panel, etc.

▶ 3. Repeat on the opposite side.

▶ 4. Follow steps 3 and 4 to insert the next holding bracket at a 90° angle to the last one you inserted.

▶ 5. Repeat steps 3 and 4 until all holding brackets are installed.

▶ 6. Check that the Polyurethane foam gasket is in its correct, centered position all around and adjust it if necessary.

▶ 7. Tighten the set screws in a criss-cross sequence:
XV-303-70-.., XV-303-10-.. with a torque of ≦ 0.1 Nm (0.86 lb-in)
XV-303-15-.. with a torque of 0.6 … 0.8 Nm (5 … 7 lb-in)

3.3.3 Rear (panel) mounting Rear (panel) mounting XV-313

This mounting method is intended for use with sheet metal with a wall thickness of d = 1.5 mm (0.059") ± 0.1mm (0.004") (including any coatings on the sheet metal)

Version

A00　　Standard version,
　　　　Sheet metal thickness of the mounting surround d = 1.5 mm (0.059") ± 0.1mm (0.004")

A11　　Sheet metal thickness of the mounting surround d = 2 mm (0.08") ± 0.1mm (0.004")

▶　Make the required mounting cutout.

▶　Weld all the M4 x 12 weld studs onto the sheet as shown in the dimensional drawing for mounting
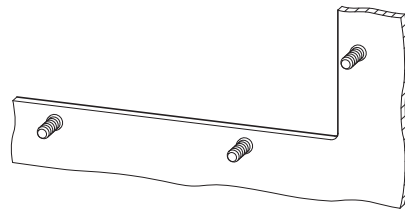

Figure 21: M4 x 12 weld studs on sheet

Not a true-to-scale template! If necessary, make your own template based on the dimensional drawing for mounting and the right scale.
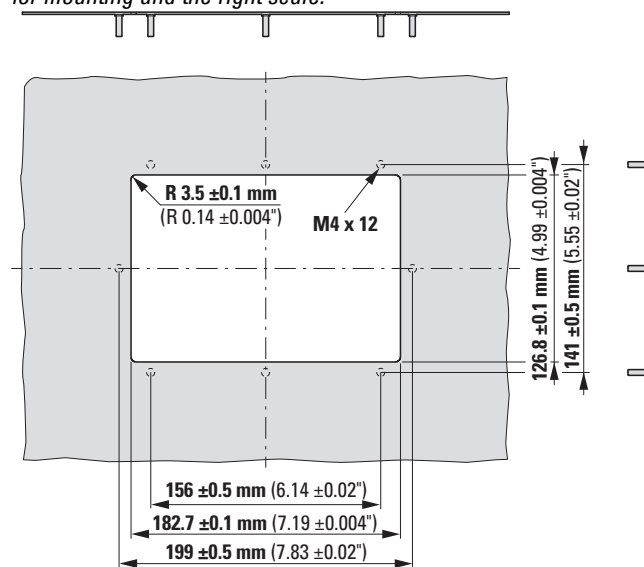

Figure 22: Dimensional drawing for mounting XV-313-70-..

Not a true-to-scale template! If necessary, make your own template based on the dimensional drawing for mounting and the right scale.
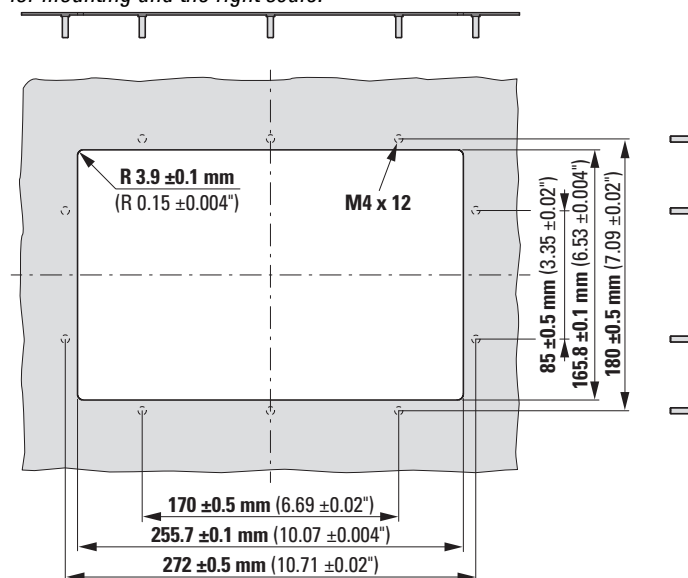

Figure 23: Dimensional drawing for mountingXV-313-10-..

▶ 1. Carefully insert the XV-313 into the mounting cutout from behind.

▶ 2. Center the XV-313 in the mounting cutout.

▶ 3. Use washers and M4 nuts to fasten the XV-313 to all the weld studs on the sheet in such a way that there is zero clearance
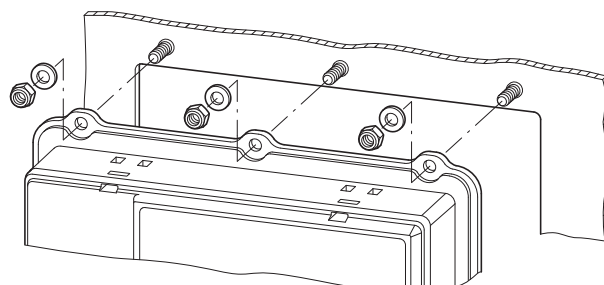

Figure 24: Mounting XV-313

3.4 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 specified in the technical data.

	CAUTION **SAFELY DIVERTING ELECTRICAL INTERFERENCE CURRENTS**
⚠	HMI panel XV300The 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 $\geq$ 1.5 mm², length $\leq$ 350 mm The XV300 needs to be connected to the conductive structure in, e.g., the control panel using the central earth point (earthing screw). This method of earthing is mandatory required for proper function.

	CAUTION **SHORT-CIRCUIT HAZARD**
⚠	If the XV300 multi touch display 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 XV300 multi touch display when it has condensation in or on it. If the XV300 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 XV300 multi touch display to direct thermal radiation from heating appliances.

Before connecting the power supply

> **CAUTION**
> 24 VDC power supply for integrated AC-to-DC converter.
> The voltage being applied must meet the requirements for safety extra-low voltages (SELV) set forth in IEC 60950 and the requirements for protected extra-low voltages (PELV) set forth in ICE/UL 61010-2-201.
> Pay attention to the polarity.

> *NOTICE*
> Arrange for an electrician to install the Plug connector MSTB 2.5/3-ST-5.08 and connect the power supply.

The XV300 multi touch display has an internal fuse and protection against polarity reversal.

The power supply for the XV300 multi touch display is not galvanically isolated.

The XV300 multi touch display requires a rated operating voltage of 24 VDC from an AC-to-DC converter with safe isolation (SELV/PELV).

Power supply	
rated operating voltage	+ 24 VDC SELV (safety extra low voltage)/PELV (protective extra low voltage)
Permissible voltage range	Effective: 19.2-30.0 V DC (rated operating voltage -20%/+25%)
	Absolute with ripple: 18.0-31.2 V DC
	Battery powered: 18.0-31.2 V DC (rated operating voltage -25%/+30%); 35 V DC for a duration of < 100 ms
Voltage dips	Ability to accommodate brief voltage dips $\leq$ 10 ms from rated operating voltage (24 V DC), $\leq$ 5 ms from undervoltage (19.2 V DC)
Power consumption XV-303-70-.., XV-313-70-..	max. 14.4 W Current consumption at 24 V DC: 11.9 W for basic device + 2.5 W for USB module
XV-303-10-.., XV-313-10-..	max. 18 W Current consumption at 24 V DC: 15.5 W for basic device + 2.5 W for USB module
XV-303-15-..	max. 21,6 W Current consumption at 24 V DC: 19,1 W for basic device + 2,5 W for USB module
fuse	Yes (fuse not accessible)
Potential isolation	No

Electrical current		7.0" display	10.1" display	15.6" display
	Ie	0.6 A	$\leq$0.75 A	$\leq$ 0.9 A
	I_{TH}	1.0 A²s	1.0 A²s	1.0 A²s

3.4.1 Functional earthing XV300

> ⚠ **CAUTION**
>
> **SAFELY DIVERTING ELECTRICAL INTERFERENCE CURRENTS**
>
> HMI panel XV300The 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 $\geqq 1.5$ mm², length $\leqq 350$ mm
>
> The XV300 needs to be connected to the conductive structure in, e.g., the control panel using the central earth point (earthing screw). This method of earthing is mandatory required for proper function.

▶ Assemble and terminate the functional earth conductor in advance.

▶ Unscrew the earthing screw on the enclosure.

▶ Put the earthing connection cable's eyelet in position.

▶ Use a torque of 1.3 Nm (11.5 lb-in) to tighten the earthing screw on the enclosure.

Table 11: specification Functional earthing

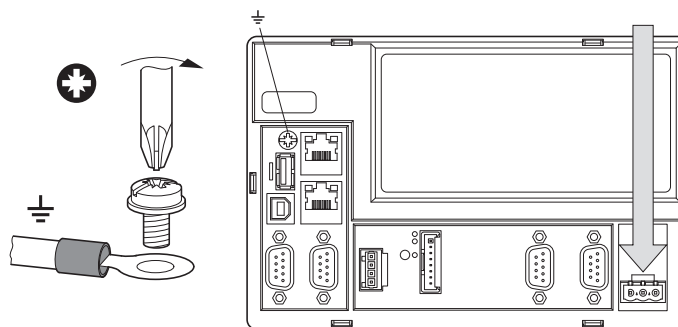| Functional earthing specifications	
Cross section	$\geqq 1.5$ mm^2
	$\leqq$ AWG16
Earthing bolt	PZ2, M4 x 8
Ring-cable ferrule for M4	Internal diameter = 4.3 mm External diameter $\leqq$ 8 mm
Cable length	$\leqq$ 350 mm
tightening torque	1.3 Nm (11.5 lb-in)

Functional earthing

Figure 25: Screwing the functional earth conductor onto the enclosure

3.4.2 Power supply - electrical connection

Table 12: Configuration Plug connector MSTB 2.5/3-ST-5.08

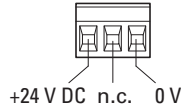|	signal	Configuration
	+	Supply voltage + 24 VDC SELV (safety extra low voltage)/PELV (protective extra low voltage)
+24 V DC n.c. 0 V	n.c.	not used
	–	Supply voltage 0 V

Table 13: Specifications for connection to 24 VDC supply voltage

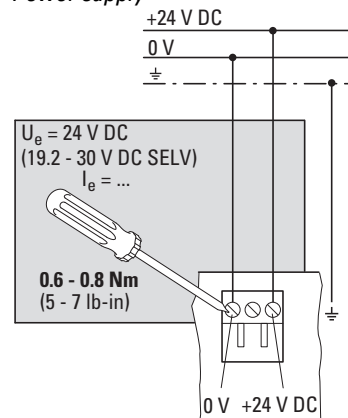| Specifications for connection to 24 VDC supply voltage	
Copper conductor	60° / 70°C
Cross section	min. 0.75 mm^2 / max. 2.5 mm^2 (drain wire or conductor)
	min. AWG18 / max. AWG12
tightening torque	0.6 ... 0.8 Nm (5 ... 7 lb-in) for the screws on the Plug connector MSTB 2.5/3-ST-5.08
Strip length	7 mm

Power supply

Figure 26: Connecting the screw terminals on the Plug connector MSTB 2.5/3-ST-5.08
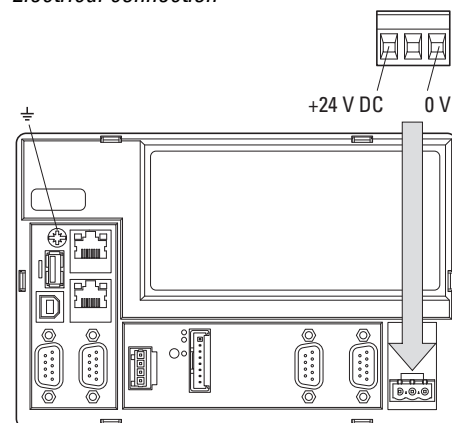
Electrical connection

Figure 27: Power supplied through Plug connector MSTB 2.5/3-ST-5.08

▶ Use the Plug connector MSTB 2.5/3-ST-5.08 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.

▶ Connect the power supply cable to a 24 VDC supply voltage that meets the requirements for safety extra-low voltages (SELV) set forth in IEC 60950 and – in connection with the UL listing – the requirements for a low-voltage source set forth in UL 61010-2-201.

The XV300 is now ready to run on 24 V_{DC}.

4. Commissioning

> ⚠ **CAUTION**
> **SHORT-CIRCUIT HAZARD**
> If the XV300 multi touch display 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 XV300 multi touch display when it has condensation in or on it.
> If the XV300 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 XV300 multi touch display to direct thermal radiation from heating appliances.

▶ Apply an XV300 to the 24 VDC supply voltage unit

The XV300 unit will boot up.

> ➜ The XV300 multi touch display does not come with any runtime software for visualization or PLCs installed.
> The corresponding software packages can be used to install the required runtime software on the XV300 unit.

4.1 Initial Commissioning

Carry out the following steps once:

▶ Configure the XV300 unit's system settings as necessary.
▶ Install the required software packages.

4.2 Running the XV300

Once the XV300 has been initially commissioned, it will run whenever it is connected to the supply voltage.

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

> ➜ The Reducing the level of brightness will increase the backlight's lifespan.

Siehe auch

📄 System description Windows CE 7   mn050004en

If the XV300 doesn't boot or an alarm occurs, follow the instructions → Section "Faults", page 74.

5. External connections

With their interfaces, Eaton's XV300 multi touch displays make it possible to connect a variety of peripheral devices and components.

> **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 XV300 multi touch display, follow all instructions regarding how to wire the corresponding port/interface.
> All general Directives and standards must be complied with.

5.1 Layout of interfaces

Figure 28: Interfaces included on all HMI panels

	interface	type
①	SD card slot	SDSC or SDHC conforming to the SDA 2.0 specification
②	USB Host	USB 2.0, not galvanically isolated, plug type A, Full power (500 mA)
③	USB device	USB 2.0, not galvanically isolated, plug type B
④	Ethernet 1	RJ-45 socket, 8-pole, 2 LEDs (CAT5e/6), LAN1, 10/100 Mbps
⑤	COM1	RS-232, not galvanically isolated, SUB-D plug 9-pole, UNC nuts for inter-locking
⑥	COM2	RS-485, not galvanically isolated, SUB-D plug 9-pole, UNC nuts for inter-locking
⑦	CAN	CAN1, not galvanically isolated, SUB-D plug 9-pole, UNC nuts for inter-locking

5.1.0.1 Optional Interfaces

Figure 29: XV300 multi touch display with all optional features

⑧	Ethernet 2	RJ-45 socket, 8-pole, 2 LEDs (CAT5e/6), LAN1, 10/100 Mbps
⑨	Profibus	Profibus DP, not galvanically isolated, SUB-D socket 9-pole, UNC nuts for interlocking
⑩	SmartWire-DT	4-pin WAGO connector (article no. 734-104) and 8-pole ribbon cable plug

5.2 SD card

The slot for the SD card is on the side of the XV300 unit.

> ⚠️ **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 XV300 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 XV300 is de-energized.
> ► Before switching off the device, make sure that there are no programs writing to the SD card.

Inserting the SD card

ℹ️

SD cards cannot be inserted the wrong way around.
Do not use force when inserting the card.

► 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.

5.3 USB interfaces

Eaton XV300 multi touch displays feature ports that can be used to connect USB peripheral devices supported by the XV300's hardware and operating system.

> **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 ports (USB host and USB device) on the XV300 multi touch display unit are meant for maintenance work only.

→ Only use standard USB cables with a shield.
Max. cable length: 5 m.

5.3.1 USB Host

Figure 30: USB 2.0, not galvanically isolated, plug type A, Full power (500 mA)

5.3.2 USB device

The USB device interface supports USB 2.0.

Figure 31: USB 2.0, not galvanically isolated, plug type B

5.4 Ethernet 1, Ethernet 2

The Ethernet 1 port on the XV300 can be used as a communication interface or as a real-time field bus interface.

The Ethernet 2 port on the XV300 multi touch display XV-3.3-..-C..-...-.. can only be used as a communication interface without real-time requirements.

The Ethernet controllers support transfer rates of 10 Mbit/s and 100 Mbit/s.
When the green LED lights up, this means that there is a LINK, i.e., that an active network is connected and has been detected.
When the yellow LED flashes, this means that data is being transferred.

Figure 32: RJ-45 socket, 8-pole, 2 LEDs (CAT5e/6), LAN1, 10/100 Mbps

For the network, use shielded twisted-pair (STP) cables only.
For connecting:
The XV300 to a device:

- Use a crossover cable.

The XV300 to a hub/switch:

- Use a patch cable (1:1).

Max. cable length: 100 m.

CAUTION
FORCES ON THE ETHERNET INTERFACE
Communications may be affected, and the connection's mechanical components may be damaged, if the Ethernet 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.

To commission the communication between the XV300 and the device, follow the description for the connected device.

5.5 Serial interfaces for communication with PLCs or devices

5.5.1 COM1 RS-232
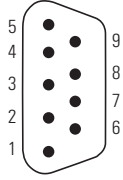
The RS232- interface is not electrically isolated.

> ⚠ **CAUTION**
> **NON-GALVANICALLY-ISOLATED INTERFACES**
> The XV300 may be damaged by potential differences.
>
> ▶ The GND terminals of all bus modules must be connected.
> ▶ Do not connect the connector to the XV300 or disconnect it without first de-energizing the system.

Table 14: Pin assignment COM1 RS-232, not galvanically isolated, SUB-D plug 9-pole, UNC nuts for interlocking

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

5.5.1.1 Wiring

- Shielded cables must be used.
- The maximal baud rate depends on the cable length

Table 15: RS-232 cable length based on baud rate

Lead Length	Max. baud rate
2.5 m	115200 Bit/s
5 meters	57600 Bit/s
10 metres	38400 Bit/s
15 m	19200 Bit/s
30 m	9600 Bit/s

➡ When preparing connections, ensure that the cable shield has a low impedance connection with the connector housing.

5.5.2 COM2 RS-485

The RS485- interface is not electrically isolated.

> ⚠ **CAUTION**
> **NON-GALVANICALLY-ISOLATED INTERFACES**
> The XV300 may be damaged by potential differences.
>
> ▶ The GND terminals of all bus modules must be connected.
> ▶ Do not connect the connector to the XV300 or disconnect it without first de-energizing the system.

Table 16: Pin assignment COM2 RS-485, not galvanically isolated, SUB-D plug 9-pole, UNC nuts for interlocking

SUB-D plug	PIN	signal	Meaning
9 pole	1	n.c.	not used
	2	n.c.	not used
	3	B	Line B
	4	n.c.	not used
	5	GND	Ground
	6	5 V	Output for external bus termination
	7	A	A cable
	8	n.c.	not used
	9	n.c.	not used
	Plug housings	GND	Functional earthing

→ n.c.: PIN 1, 2, 4, 8 and 9 must not be connected.

→ PIN 6 (5 V) must not be used as a power supply for external devices.

5.5.2.1 Wiring

- Screened twisted-pair cables must be used.

- The maximal baud rate depends on the cable length

Table 17: Specifications for RS-485 wiring

Rated surge impedance	120 Ohm
Permissible surge impedance	108 … 132 Ohm
Max. cable length	1200 m
Possible baud rates	9600 Bit/s
	19200 Bit/s
	38400 Bit/s
	57600 Bit/s
	115200 Bit/s

→ When preparing connections, ensure that the cable shield has a low impedance connection with the connector housing.

5.5.2.2 RS-485 topology

- A bus segment can interconnect up to 32 slaves.
- Several bus segments can be connected using repeaters (bi-directional amplifiers).

> The use of repeaters enables the maximum cable length to be increased.
> For more details, please consult the documentation provided by manufacturer.

A bus segment must be provided with cable termination (120 Ohm) at both ends.

These terminals must be connected in the plug directly between pin 3 and 7.

> The bus segment must be terminated at both ends.
> No more than two terminations must be provided for each bus segment.
> Operation without correct cable termination can cause transfer errors.
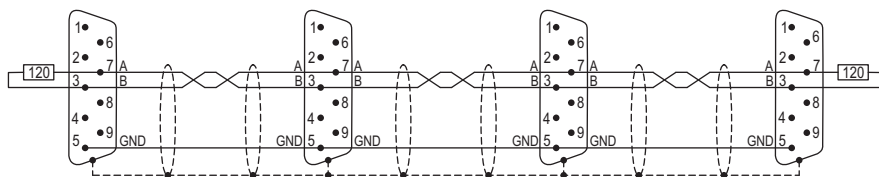
Figure 33: Bus segment with four nodes

5.6 CAN1 interface for protocols CANopen and J1939

The CAN1- interface is not electrically isolated.

> ⚠ **CAUTION**
> **NON-GALVANICALLY-ISOLATED INTERFACES**
> The XV300 may be damaged by potential differences.
>
> ▶ The GND terminals of all bus modules must be connected.
> ▶ Do not connect the connector to the XV300 or disconnect it without first de-energizing the system.

Table 18: PIN assignment for CAN interface as specified in CiA) CAN1, not galvanically isolated, SUB-D plug 9-pole, UNC nuts for interlocking

SUB-D plug	PIN	signal	Meaning
9 pole	1	n.c.	not used
	2	CAN-L	Bus line (dominant low)
	3	GND	Ground
	4	n.c.	not used
	5	n.c.	not used
	6	GND	Optional Ground
	7	CAN-H	Bus line (dominant high)
	8	n.c.	not used
	9	n.c.	not used

➜
- nc: PIN 1, 4, 5, 8 and 9 must not be connected.
- PIN 3 (CAN-GND) and 6 (GND) are internally inter-connected.
- The power supply of the CAN bus drivers is implemented internally.
- A power supply for third party devices is not provided on the CAN connector.

5.6.0.1 Wiring

- Screened twisted-pair cables must be used.

Table 19: Specifications for CAN wiring

Rated surge impedance			120 Ohm
Permissible surge impedance			108 … 132 Ohm
Capacitance per unit length			< 60 pF/m
Core cross-section	With a max. cable length of	100 m	$0.25\ mm^2$
		250 m	$0.34\ mm^2$
		500 m	$0.75\ mm^2$

The maximal baud rate depends on the cable length			
Possible baud rates	With a max. cable length of	25 m	1000 kBit/s (= default settings)
		50 m	800 kBit/s (= default settings)
		100 m	500 kBit/s (= default settings)
		M 250	250 kBit/s (= default settings)
		500 m	125 kbit/s
		500 m	100 kBit/s (can be set through software)
		1000 m	50 kBit/s (= default settings)
		2500 m	20 kBit/s (= default settings)
		5000 m	10 kBit/s (= default settings)

→ When preparing connections, ensure that the cable shield has a low impedance connection with the connector housing.

5.6.0.2 CAN-Bus-topology

- A bus segment can interconnect up to 32 slaves.
- Several bus segments can be connected using repeaters (bi-directional amplifiers).

→ The use of repeaters enables the maximum cable length to be increased.
Repeaters can also be used for galvanic isolation. For more details, please consult the documentation for repeaters provided by manufacturer.
Make sure to follow the recommendations provided by CiA (CAN in Automation)
at http://www.can-cia.org.

A bus segment must be provided with cable termination (120 Ohm) at both ends.

These terminals must be connected in the plug directly between pin 2 and 7.

→ The bus segment must be terminated at both ends.
No more than two terminations must be provided for each bus segment.
Operation without correct cable termination can cause transfer errors.
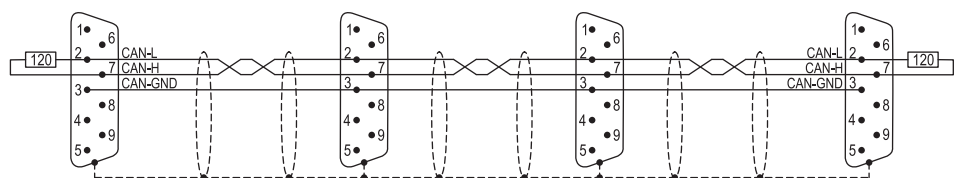
Figure 34: CAN bus segment with four nodes

5.7 PROFIBUS interface

The Profibus-DP-- interface is not electrically isolated.

> **CAUTION**
> **NON-GALVANICALLY-ISOLATED INTERFACES**
> The XV300 may be damaged by potential differences.
>
> ▶ The GND terminals of all bus modules must be connected.
> ▶ Do not connect the connector to the XV300 or disconnect it without first de-energizing the system.

Table 20: Pin assignment for Profibus DP, not galvanically isolated, SUB-D socket 9-pole, UNC nuts for interlocking PROFIBUS interface

SUB-D socket 9 pole	PIN	signal	Meaning
	1	n.c.	not used
	2	n.c.	not used
	3	B	EIA RS 485 cable B
	4	RTSAS	Output for controlling a repeater
	5	M5EXT (GND)	Output 0 V for external termination (Ground)
	6	P5EXT	Output 5 V for external termination
	7	n.c.	not used
	8	A	EIA RS 485 cable A
	9	n.c.	not used

→ PIN 6 (5 V) must not be used as a power supply for external devices.
nc: PIN 1, 2, 7 and 9 must not be connected.

5.7.0.1 Wiring

- Screened twisted-pair cables must be used.

- Cable type A (as specified in Profibus standards IEC/EN 61158 and IEC/EN 61784)

Table 21: Specifications for Profibus wiring

Cable specifications			
Rated surge impedance			150 Ohm
Permissible surge impedance			135 … 165 Ohm
Capacitance per unit length			< 30 pF/m
Loop resistance			< 100 Ohm/km
Core cross-section			$\geq 0.34\ mm^2$ (22 AWG)
The maximal baud rate depends on the cable length			
Possible baud rates	With a max. cable length of	100 m	12000 kBit/s (12MBit/s)
		200 m	1500 kBit/s (= default settings)
		400 m	500 kBit/s (= default settings)
		1000 m	187.5 kBit/s (= default settings)
		1200 m	$\leq$ 93.75 kBit/s

→ When preparing connections, ensure that the cable shield has a low impedance connection with the connector housing.

5.7.0.2 Profibus topology

- A bus segment can interconnect up to 32 slaves.
- Several bus segments can be connected using repeaters (bi-directional amplifiers).

> The use of repeaters enables the maximum cable length to be increased.
> For more details, please consult the documentation for repeaters provided by manufacturer.

Only use bus connector plugs specified for use with PROFIBUS networks.
These plugs combine both bus cables on a node and ensure that the cable shield has a low-impedance connection to the node's shield reference potential.

In addition, these bus connector plugs include a PROFIBUS-specific cable termination that can be activated if necessary.

A bus segment must be provided with cable termination at both ends. This termination is passive, but is fed from the node. It ensures a defined quiescent state on the bus if no bus station is sending. These bus terminations are preferably implemented externally in the connector housing as per the PROFIBUS standard (and can be implemented using the aforementioned bus connector plugs).
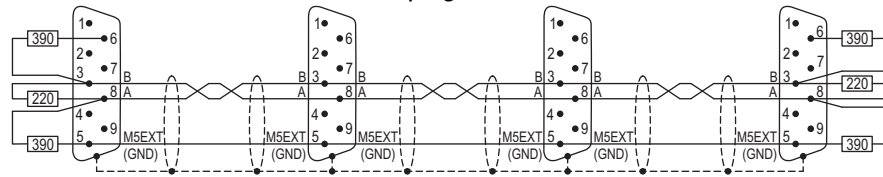
Figure 35: Profibus bus segment with four nodes

> - The bus segment must be terminated at both ends.
> - No more than two terminations must be provided for each bus segment.
> - At least one of the two terminations must be fed by the bus user.
> - Operation without correct termination of the Profibus network can cause transmission errors.

5.8 XV300 multi touch display as SmartWire-DT coordinator

Applies only to XV300 SmartWire-DT units with a XV-3.3-..-.E.-...-.. connection.

In addition to the information in this document, you will also need the information in the following documents in order to set up a SmartWire-DT network and install and operate it using the SmartWire-DT master:

System description, engineering, installation, commissioning, and diagnostics for a SWD network

SmartWire-DT The System Manual   MN05006002Z

Setup, engineering, installation, etc. for the individual SWD modules

Manual for SmartWire-DT IP20 modules   MN05006001Z

Manual for SmartWire-DT IP67 modules   MN120006

5.8.1 SmartWire-DT powered via POW/AUX

The POW/AUX- interface is not electrically isolated.

> ⚠ **CAUTION**
> **NON-GALVANICALLY-ISOLATED INTERFACES**
> The XV300 may be damaged by potential differences.
> ▶ The GND terminals of all bus modules must be connected.
> ▶ Do not connect the connector to the XV300 or disconnect it without first de-energizing the system.

Electrical connection

Power supply SmartWire-DT
POW/AUX
Figure 36: SmartWire-DT power connector

Conditions for Underwriters Laboratories Inc. (UL) certification

Underwriters
Laboratories

The SmartWire-DT master interface's U_{Aux} supply voltage must be externally protected against overcurrent and short-circuits with the following:

- Miniature circuit-breaker 24 V_{DC}, rated operational current 2 A, trip type Z
- or a 2 A fuse.

5.8.1.1 SWD power supply voltages

The following supply voltages are required for a SmartWire-DT network:

- POW supply voltage:
  The device supply voltage for the electronics in the downstream SmartWire-DT modules (15 V DC) is generated using the 24 V DC supply voltage applied at the POW terminal.
- AUX supply voltage:
  If there are any contactors or motor starters in the SmartWire-DT topology, a 24 V DC AUX voltage must be additionally supplied as a control voltage for the contactor coils.

POW/AUX power supply interface

The Plug connector WAGO 734-104 plug connector is included with the device.

Electrical connection
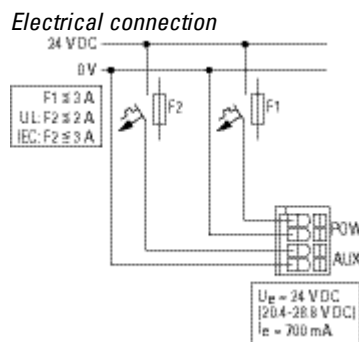
Figure 37: WAGO plug connector (view from wiring side)

Table 22: Pin assignment WAGO plug connector

Plug connector	PIN	signal	Meaning
4-Pole	1	+24 V DC POW	Supply voltage U_{POW} +24 V DC
	2	0 V POW	Supply voltage U_{POW} 0 V
	3	+24 V DC AUX	Supply voltage U_{AUX} +24 V DC
	4	0 V AUX	Supply voltage U_{AUX} +0 V

Observe the following when assembling and terminating the wiring for the plug connector:

5. External connections
5.8 XV300 multi touch display as SmartWire-DT coordinator

Table 23: Wiring the plug connector

	Description/Value
Terminal type:	spring-cage terminal
Cross section	0.2 - 1.5 mm^2 (connectable conductor, solid)
	AWG24 - AWG16
Strip length	6 -7 mm

A miniature circuit-breaker or a fuse must be used to provide U_{AUX} with external over-current and short-circuit protection.

Table 24: Overcurrent and short-circuit protective device standards

Standard	Overcurrent and short-circuit protective device
DIN VDE 0641, part 11 and EC/EN 60898	Miniature circuit-breaker 24 V DC, rated operational current 3 A, trip type Z fuse 3 A, Utilization category gL/gG
UL 61010-2-201	Miniature circuit-breaker 24 V DC, rated operational current 2 A, trip type Z fuse 2 A

5.8.2 SmartWire-DT interface

The SmartWire-DT- interface is not electrically isolated.

> **CAUTION**
> **NON-GALVANICALLY-ISOLATED INTERFACES**
> The XV300 may be damaged by potential differences.
>
> ▶ The GND terminals of all bus modules must be connected.
> ▶ Do not connect the connector to the XV300 or disconnect it without first de-energizing the system.

SmartWire-DT uses an eight-conductor ribbon cable in control panels. In addition to communication wires, this ribbon cable carries the power supply for the SWD modules, the switchgear, as well as control wires for assigning addresses.

Table 25: Pin assignment for SmartWire-DT ribbon cable interface (pin header, 8-pin)

Plug connector	PIN	signal	Configuration
8 Poles	1	+24 V DC	Contactor control voltage
	2	Chassis ground	Contactor control voltage
	3	GND	for device supply voltage and data cable
	4	Data B	Data cable B
	5	Data A	Data cable A
	6	GND	for device supply voltage and data (Data A, Data B)
	7	SEL	Select cable for automatic addressing of the SWD slaves
	8	+15 V DC	Device supply voltage
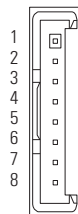
Wiring

- When connecting the SmartWire-DT network to the SmartWire-DT interface, make sure to only use the following ribbon cables:
SWD4-100LF8-24 with the corresponding SWD4-8MF2 blade terminals OR
SWD4-(3/5/10)F8-24-2S (prefabricated cable)

5.8.2.1 Commissioning the SmartWire-DT network

The following requirements must be met before switching on the network after initial commissioning, replacement, or modifying the SmartWire-DT configuration:

- All SWD modules must be connected to each other via SmartWire-DT cables.
- The SmartWire-DT network must be connected to the SmartWire-DT interface.
- The power supply for the device and for SmartWire-DT must be on and connected.
- The SmartWire-DT master's POW LED must be lit up with a solid light.
- The status LEDs of the connected SWD modules must be flashing or showing a solid light.
- There must be a PLC project in which the SmartWire-DT master is configured (project configuration).
- The PLC runtime system must be installed on the device.
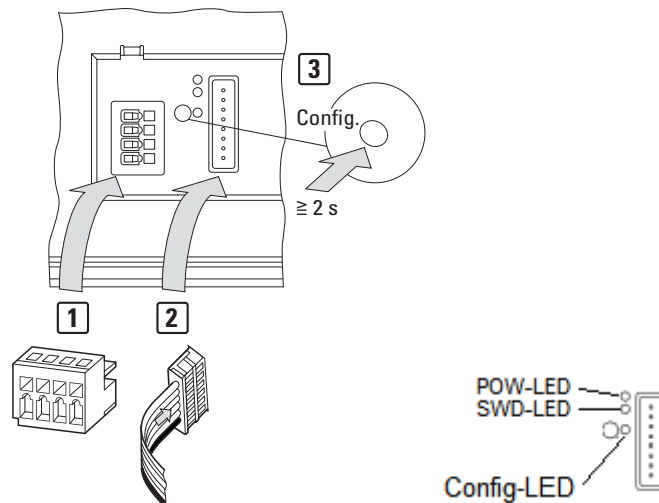
Figure 38: Commissioning SmartWire-DT sequence

Perform the following instructions :

▶   Press and hold down the Config button for at least 2 seconds.

The SmartWire-DT master interface's SWD LED will start flashing with an orange light.
The status LEDs of the connected SWD modules will start flashing.
The SmartWire-DT master interface's SWD LED will start flashing with a green light.
All SWD modules are addressed.

The SmartWire-DT network's physical configuration will be stored in the HMI panel's non-volatile memory as the target configuration.
The SmartWire-DT master interface's SWD LED will show a solid green light.

▶   Load the PLC project onto the XV300 multi touch display.

Configuration check

The configurations are compared every time the power supply is switched on.

- The modules that are actually on the network will be compared with the target configuration stored on the device:
  If the SmartWire-DT network's physical configuration matches the target configuration, the SmartWire-DT network will be ready to start transferring data.
- The target configuration stored in the device will be compared with the project configuration defined in the PLC:
  If the target configuration matches the project configuration, the Config LED will light up with a solid green light.

Table 26: SWD-LED

SWD-LED

Indicates whether the physical configuration of the SWD network matches the target configuration stored in the XV300.

status	Description
off	No target configuration present
Red continuous light	• Short-circuit on the 15 V DC power supply. • No SmartWire-DT module found.
Red flashing	The modules found in the SmartWire-DT network do not match the target configuration. A SmartWire-DT module configured as necessary is missing.
Flashing with an orange light	The SmartWire-DT network's physical configuration is being imported and stored as a new target configuration in the device.
GREEN flashing	• The physical configuration of the SmartWire-DT network is compared with the target configuration. • The SmartWire-DT modules are addressed.
Green continuous light	• The modules found in the SmartWire-DT network match the target configuration. • The SmartWire-DT network is ready for data exchange.

Table 27: Config-LED

Config-LED

Indicates whether the SWD master project configuration defined in the PLC matches the SWD network target configuration stored in the XV300.

status	Description
off	• No project configuration present. • Incorrect target configuration (see LED SWD).

Config-LED

Red continuous light	The project configuration and the stored target configuration are not compatible with each other.
GREEN flashing	The project configuration is compatible with the stored target configuration.
Green continuous light	The project configuration matches the stored target configuration

6. Faults

This section provides troubleshooting information for your XV300 in case it does not behave as expected.

Fault	Cause	Remedy
XV300 will not boot up	No 24 VDC supply voltage	Check the input wiring. Switch on XV300
The display stays or turns dark.	The backlight is deactivated.	Switch the backlight on; please refer to the Windows Embedded Compact 7 pro system description or to the corresponding function in the visualization software.
The Capacitive multi-touch technology (PCT) is not responding or is responding incorrectly when used.	The functional earthing has not been connected properly.	The XV300 needs to be connected to the conductive structure in, e.g., the control panel using the central earth point (earthing screw). Ground connection characteristics: Wire cross-sectional area ≥ 1.5 mm², length ≤ 350 mm
	The touch is not calibrated correctly.	Switch on XV300 Calibrate the touch functionality; please refer to the Windows Embedded Compact 7 pro system description
	The touch is disabled.	Switch on XV300 Enable the touch functionality; please refer to the Windows Embedded Compact 7 pro system description

7. Maintenance

7.1 Cleaning and maintenance

The XV300 are maintenance-free.

However, the following work may need to be carried out:

- Cleaning the Capacitive multi-touch technology (PCT) when soiled.
- Recalibrating the Capacitive multi-touch technology (PCT) if it stops responding correctly to touch.

7.1.1 Capacitive multi-touch technology (PCT)

When soiled:

> **CAUTION**
> **POINTY, SHARP OBJECTS AND CORROSIVE LIQUIDS**
> When cleaning the XV300:
>
> - 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 XV300 unit (short-circuit hazard) and that the XV300 unit is not damaged in any way.

▶ Clean the Capacitive multi-touch technology (PCT) with a clean, soft, damp cloth.

7.1.2 Battery

The internal battery used to back up the real-time clock is maintenance-free and is sized for a backup time of approx. 10 years at 25° C (77°F) when de-energized, provided the corresponding ambient conditions are met.

7.2 Repairs

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

> **CAUTION**
> **DESTRUCTION**
> The XV300 should only be opened by the manufacturer or by an authorized center. Operate the XV300 until only with the enclosure fully closed and sealed.

Use the original packaging to ship the device.

7.3 Storage, transport and disposal

7.3.1 Storage and transport

> ⚠ **CAUTION**
> **UV LIGHT**
> Plastics will become brittle when exposed to UV light. This artificial aging will reduce the XV300 unit's lifespan. Protect theXV300 unit from direct sunlight and other sources of UV radiation.

> ⚠ **CAUTION**
> **SHORT-CIRCUIT HAZARD**
> If the XV300 multi touch display 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 XV300 multi touch display when it has condensation in or on it.
> If the XV300 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 XV300 multi touch display to direct thermal radiation from heating appliances.

The ambient conditions must be met when transporting and storing the XV300.

The ambient air temperature for storage and transportation must not exceed the maximum specified limit:

Ambient climatic conditions

Air pressure (in operation)	795 - 1080 hPa
	max. 2000 m a. NHN (standard elevation zero)
Temperature	
Operation	± 0 – +50 °C (+32 – +122 °F)
Mounting position	XV-303-10-…, XV-303-70-…
	α ≦ ± 45°, T ≦ 50 °C (122 °F)
	XV-303-15-.E.-…, XV-303-15-.02-..
	α ≦ ± 10°, T ≦ 50 °C (122 °F)
	XV-303-15-.00-…
	α ≦ ± 10°, T ≦ 50 °C (122 °F)
	α ≦ ± 45°, T ≦ 45 °C (113 °F)
	Inclination from vertical: α ≦ ± 45° at operating temperature ≦ 45°C possible (if using natural convection)
Storage / Transport	-20 – + 60 °C (-4 – +140 °F)
Relative humidity	Relative humidity 10 - 95 %
Condensation	non-condensing

→ 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 HMI panel, do not switch on the device until it is completely dry.

Use the original packaging to ship the device.

The XV300 is sturdily built, but the components inside it are sensitive to excessively strong vibrations and/or mechanical shock.

Accordingly, make sure to protect the XV300 from mechanical loads that exceed the scope of the unit's intended use.

The XV300 should only be transported in its original packaging after being packed properly.

7.3.2 Disposal

⚠ **EXPLOSION HAZARD**
LITHIUM BATTERY
The lithium battery inside the XV300 may explode if handled incorrectly.

> ► Dispose of the XV300 unit professionally.

Important!

Dispose of recyclables as required by your local recycling regulations.

XV300 no longer being used must be professionally disposed of as per local standards or returned to the manufacturer or relevant sales department.

Table 28: Materials used XV300

Assembly part		Material characteristic
display	XV-303	Anti-glare toughened glass in plastic frame
	XV-303-15-..	Anti-glare toughened glass in aluminium frame
	XV-313	Anti-glare toughened glass without frame, Front side with aluminum mounting frame
Enclosure material		Insulated material black
Battery	Panasonic	Lithium BR-2330/GNU, 3V, 255 mAh, Weight (g): 3.7 SVHC Substance: Ethylenglycoldimethylether Substance weight (%): 2-4

Materials used in the packaging

Packaging	Material characteristic
External packaging	Cardboard
Inner packaging	Cardboard Plastic bag: polyethylene (PE)

Appendix

A.1 Technical data

A.1.1 Data Sheets

The current specifications for the device can be found in the corresponding data sheet at www.eaton.eu/ecat.

A.1.2 Specifications: Dimensions and Weight

XV-303-70-.. Front mounting

7.0" display
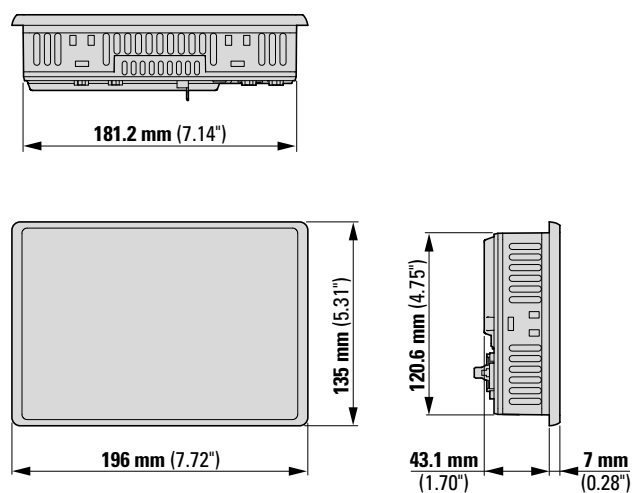
Figure 39: Dimensions 7.0" front mounting devices in mm (inches)

Width x Height x Depth (without plug)	196 mm x 135 mm x 51 mm (7.72" x 5.31" x 2.01")
Weight	0.74 kg (1.63 lbs)

XV-303-10-.. Front mounting

10.1" display
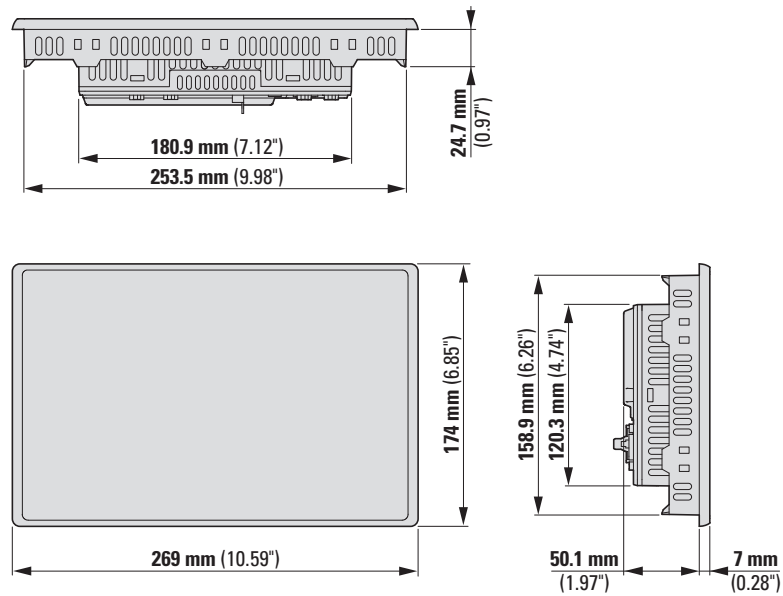
Figure 40: Dimensions 10.1" front mounting devices in mm (inches)

Width x Height x Depth (without plug)	269 mm x 174 mm x 58 mm (10.59" x 6,85" x 2.28")
Weight	1.13 kg (2.49 lbs)

XV-303-15-.. Front mounting

15.6" display
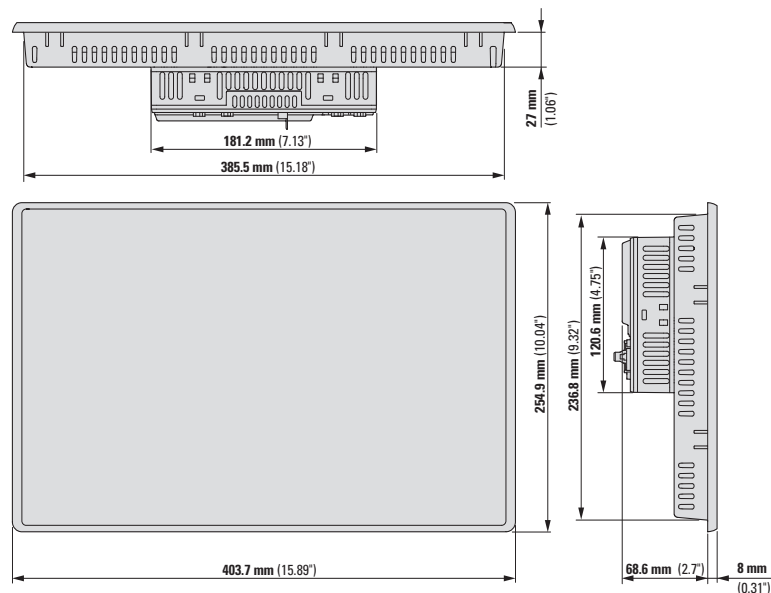
Figure 41: Dimensions 15.6" front mounting devices in mm (inches)

Width x Height x Depth (without plug)	404 mm x 255 mm x 76 mm (15.9" x 10.04" x 2.99")
Weight	3.,9 kg (8,50 lbs)

Rear (panel) mounting

7.0" display XV-313-..-…-A00-..

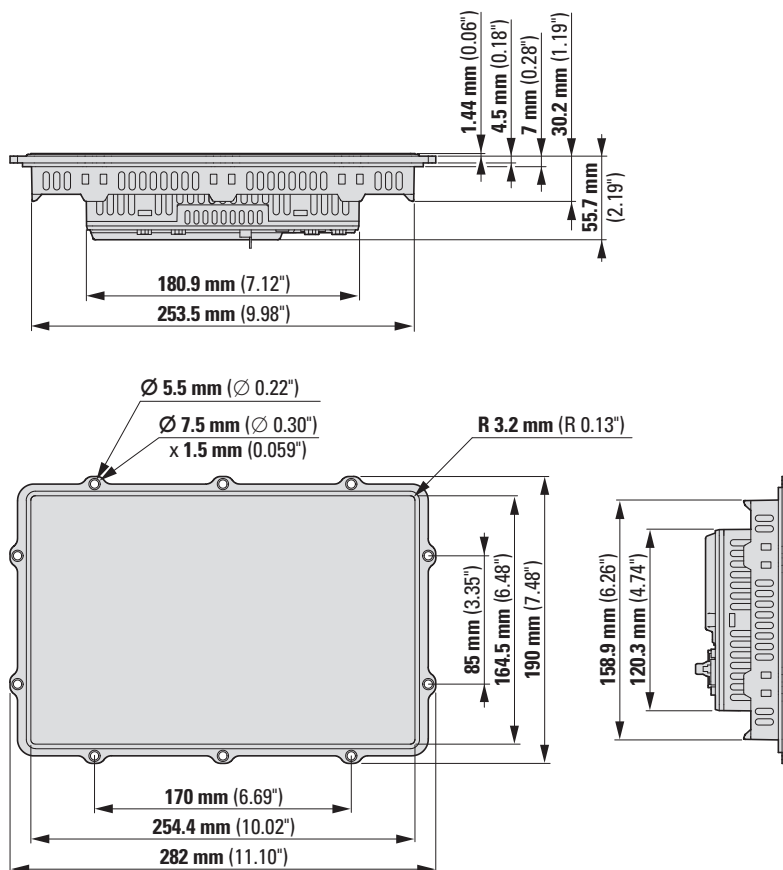Sheet metal thickness of the mounting surround d = 1.5 mm (0.059") ± 0.1mm (0.004")
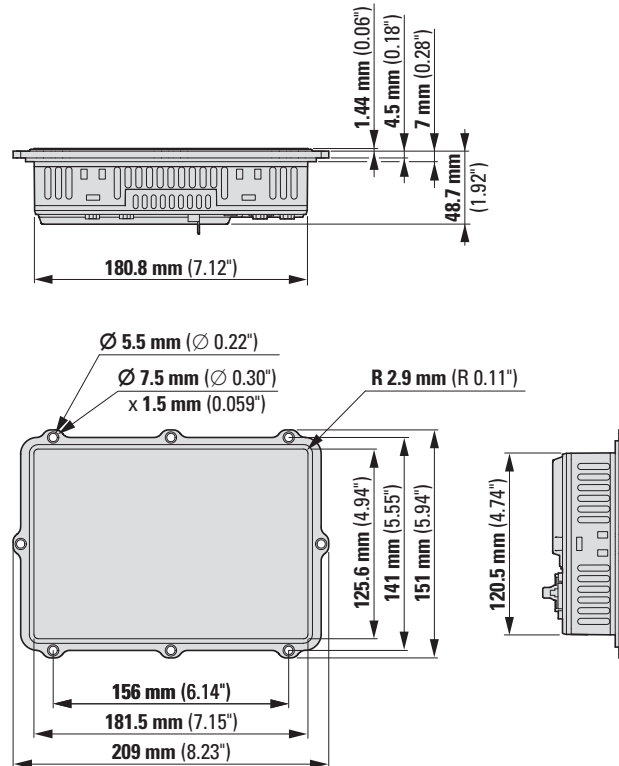
Figure 42: Dimensions 7.0" rear (panel) mounting devices in mm (inches) XV-313-..-…-A00-..

7.0" display XV-313-..-...-A11-..
Sheet metal thickness of the mounting surround d = 2 mm (0.08") ± 0.1mm (0.004")

Figure 43: Dimensions 7.0" rear (panel) mounting devices in mm (inches) XV-313-..-...-A11-..

Width x Height x Depth (without plug)	209 mm x 151 mm x 51 mm (8.23" x 5.94" x 2.01")
Weight	0.8 kg (1.76 lbs)

Rear (panel) mounting

10.1" display XV-313-..-...-A00-..
Sheet metal thickness of the mounting surround d = 1.5 mm (0.059") ± 0.1 mm (0.004")

Figure 44: Dimensions 10.1" rear (panel) mounting devices in mm (inches) XV-313-..-...-A00-..

10.1" display XV-313-..-...-A11-..
Sheet metal thickness of the mounting surround d = 2 mm (0.08") ± 0.1mm (0.004")

Figure 45: Dimensions 10.1" rear (panel) mounting devices in mm (inches) XV-313-..-...-A11-..

Width x Height x Depth (without plug)	282 mm x 190 mm x 58 mm (11.10" x 7.48" x 2.28")
Weight	1.21 kg (2.67 lbs)

A.1.2.1 Mounting surrounds for rear (panel) mounting

Not a true-to-scale template! If necessary, make your own template based on the dimensional drawing for mounting and the right scale.

R 3.5 ±0.1 mm
(R 0.14 ±0.004")

M4 x 12

126.8 ±0.1 mm (4.99 ±0.004")
141 ±0.5 mm (5.55 ±0.02")

156 ±0.5 mm (6.14 ±0.02")
182.7 ±0.1 mm (7.19 ±0.004")
199 ±0.5 mm (7.83 ±0.02")
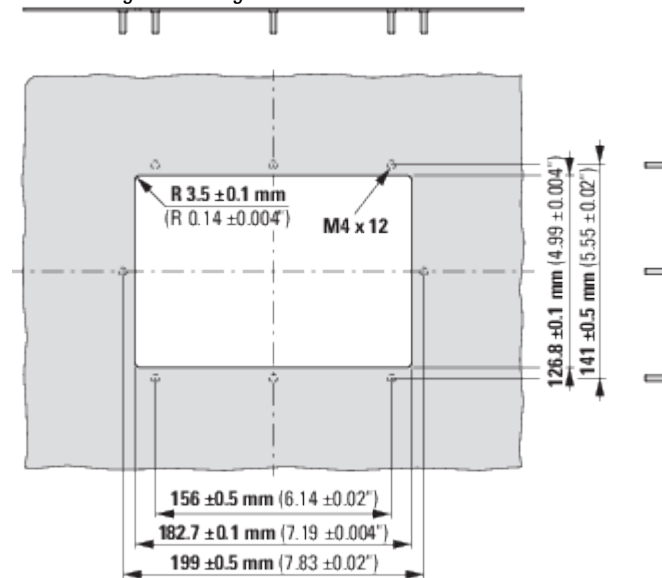
Figure 46: Installation panel for XV-313-70-..

R 3.9 ±0.1 mm
(R 0.15 ±0.004")

M4 x 12

85 ±0.5 mm (3.35 ±0.02")
165.8 ±0.1 mm (6.53 ±0.004")
180 ±0.5 mm (7.09 ±0.02")

170 ±0.5 mm (6.69 ±0.02")
255.7 ±0.1 mm (10.07 ±0.004")
272 ±0.5 mm (10.71 ±0.02")
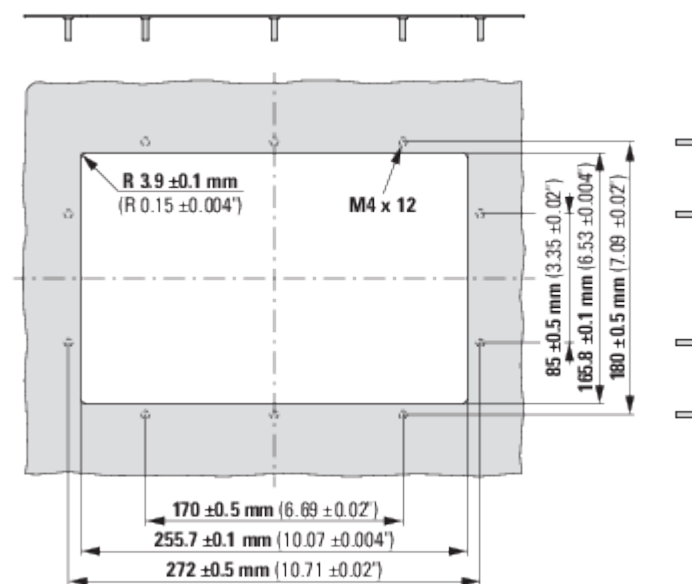
Figure 47: Installation panel for XV-313-10-..

A.1.3 General data

The following specifications apply to all XV300 units or to the specified part nos. where applicable.

General

body material	Insulated material black
Front type	

	XV-303-70-.., XV-303-10-..	Anti-glare tempered glass in plastic frame
	XV-303-15-..	Anti-glare tempered glass in aluminum frame
	XV-313	Anti-glare tempered glass without frame

Degree of protection	IP65 (front), IP20 (on rear)
	NEMA 4X, NEMA 12 (according to NEMA 250-2003)

Operation

Technology	Projected Capacitive Touch (PCT)
Touch sensor	Multi touch panel
System	

	Processor	ARM Cortex-A9 800 MHz
	Internal memory	512 MB RAM, 1GB SLC, 128kB Retain

SD card slots	One SDSC or SDHC conforming to the SDA 2.0 specification – use genuine accessories only!
Cooling	Fanless CPU and system cooling, natural convection-based passive cooling
Back-up of the real-time clock	

	Battery (service life)	Non-maintained
	Backup (time at zero voltage)	approx. 10 years at 25° C (77°F)

Operating System	Windows Embedded Compact 7 pro

display

Display - Type	Color display, TFT, anti-glare
Number of colors	≈ 16.7 mill. (color depth 24 bit)
resolution	

	XV-303-70-.., XV-313-70-.., XV-303-10-..,XV-313-10-..	WSVGA	1024 x 600 pixels
	XV-303-15-..	WXGA	1366 x 768 pixels

Screen diagonal	

	XV-303-70-.., XV-313-70-..	7.0" widescreen
	XV-303-10-.., XV-313-10-..	10.1" widescreen
	XV-303-15-..	15.6" widescreen

Visible screen area	

display		
	XV-303-70-.., XV-313-70-..	153.6 mm x 90.0 mm
	XV-303-10-.., XV-313-10-..	222.72 mm x 125.28 mm
	XV-303-15-..	344.23 mm x 193.54 mm
Contrast ratio (Normally)		
	XV-303-70-..,XV-313-70-..	normally 850:1
	XV-303-10-.., XV-313-10-.., XV-303-15-..	normally 500:1
Brightness		Normally 400 cd/m2
Backlight		LED dimmable via software
Lifespan of backlight		Normally 50000 h at 25 °C

A.1.4 Specifications: Interfaces

A.1.4.1 Front mounting

7.0" display

Table 29: Communication ports and interfaces for front mounting XV-303-70-...

Type	XV-303-70-B00-...	XV-303-70-C00-...	XV-303-70-B02-...	XV-303-70-C02-...
Quantity				
Ethernet	1	2	1	2
RS-232	1	1	1	1
RS-485	1	1	1	1
CAN	1	1	1	1
USB host 2.0	1	1	1	1
USB device 2.0	1	1	1	1
Profibus	–	–	1	1
SmartWire-DT	–	–	–	–
Type				
Ethernet	10/100 Mbps			
USB Host	USB 2.0, not galvanically isolated			
USB device	USB 2.0, not galvanically isolated			
RS-232	not galvanically isolated, SUB-D plug, 9-pole, UNC			
RS-485	not galvanically isolated, SUB-D plug, 9-pole, UNC			
CAN	not galvanically isolated, SUB-D plug, 9-pole, UNC			
Profibus DP	–	–	not galvanically isolated, D-Sub bus 9-pole, UNC	
SmartWire-DT master	–	–	–	–

10.1" display

Table 30: Communication ports and interfaces for front mounting XV-303-10-...

Type	XV-303-10-B00-...	XV-303-10-C00-...	XV-303-10-B02-...	XV-303-10-C02...
Quantity				
Ethernet	1	2	1	2
RS-232	1	1	1	1
RS-485	1	1	1	1
CAN	1	1	1	1
USB host 2.0	1	1	1	1
USB device 2.0	1	1	1	1
Profibus	–	–	1	1
SmartWire-DT	–	–	–	–
Type				
Ethernet	10/100 Mbps			
USB Host	USB 2.0, not galvanically isolated			
USB device	USB 2.0, not galvanically isolated			
RS-232	not galvanically isolated, SUB-D plug, 9-pole, UNC			
RS-485	not galvanically isolated, SUB-D plug, 9-pole, UNC			
CAN	not galvanically isolated, SUB-D plug, 9-pole, UNC			
Profibus DP	–	–	not galvanically isolated, D-Sub bus 9-pole, UNC	
SmartWire-DT master	–	–	–	–

15.6" display

Table 31: Communication ports and interfaces for front mounting XV-303-15-...

Type	XV-303-15-B00-...	XV-303-15-C00-...	XV-303-15-B02-...	XV-303-15-C02...
Quantity				
Ethernet	1	2	1	2
RS-232	1	1	1	1
RS-485	1	1	1	1
CAN	1	1	1	1
USB host 2.0	1	1	1	1
USB device 2.0	1	1	1	1
Profibus	–	–	1	1
SmartWire-DT	–	–	–	–
Type				
Ethernet	10/100 Mbps			
USB Host	USB 2.0, not galvanically isolated			
USB device	USB 2.0, not galvanically isolated			
RS-232	not galvanically isolated, SUB-D plug, 9-pole, UNC			
RS-485	not galvanically isolated, SUB-D plug, 9-pole, UNC			
CAN	not galvanically isolated, SUB-D plug, 9-pole, UNC			
Profibus DP	–	–	not galvanically isolated, D-Sub bus 9-pole, UNC	
SmartWire-DT master	–	–	–	–

A.1.4.2 Front mounting with SmartWire-DT connection

7.0" display

Table 32: Communication ports and interfaces for front mounting XV-303-70-.. with SmartWire-DT connection

Type	XV-303-70-BE0-…	XV-303-70-CE0-…	XV-303-70-BE2-…	XV-303-70-CE2-…
Quantity				
Ethernet	1	2	1	2
RS-232	1	1	1	1
RS-485	1	1	1	1
CAN	1	1	1	1
USB host 2.0	1	1	1	1
USB device 2.0	1	1	1	1
Profibus	–	–	1	1
SmartWire-DT	1	1	1	1
Type				
Ethernet	10/100 Mbps			
USB Host	USB 2.0, not galvanically isolated			
USB device	USB 2.0, not galvanically isolated			
RS-232	not galvanically isolated, SUB-D plug, 9-pole, UNC			
RS-485	not galvanically isolated, SUB-D plug, 9-pole, UNC			
CAN	not galvanically isolated, SUB-D plug, 9-pole, UNC			
Profibus DP	–	–	not galvanically isolated, D-Sub bus 9-pole, UNC	
SmartWire-DT master	Yes	Yes	Yes	Yes

10.1" display

Table 33: Communication ports and interfaces for front mounting XV-303-10-.. with SmartWire-DT connection

Type	XV-303-10-BE0-...	XV-303-10-CE0-...	XV-303-10-BE2-...	XV-303-10-CE2-...
Quantity				
Ethernet	1	2	1	2
RS-232	1	1	1	1
RS-485	1	1	1	1
CAN	1	1	1	1
USB host 2.0	1	1	1	1
USB device 2.0	1	1	1	1
Profibus	–	–	1	1
SmartWire-DT	1	1	1	1
Type				
Ethernet	10/100 Mbps			
USB Host	USB 2.0, not galvanically isolated			
USB device	USB 2.0, not galvanically isolated			
RS-232	not galvanically isolated, SUB-D plug, 9-pole, UNC			
RS-485	not galvanically isolated, SUB-D plug, 9-pole, UNC			
CAN	not galvanically isolated, SUB-D plug, 9-pole, UNC			
Profibus DP	–	–	not galvanically isolated, D-Sub bus 9-pole, UNC	
SmartWire-DT master	Yes	Yes	Yes	Yes

15.6" display

Table 34: Communication ports and interfaces for front mounting XV-303-15-.. with SmartWire-DT connection

Type	XV-303-15-BE0-...	XV-303-15-CE0-...	XV-303-15-BE2-...	XV-303-15-CE2-...
Quantity				
Ethernet	1	2	1	2
RS-232	1	1	1	1
RS-485	1	1	1	1
CAN	1	1	1	1
USB host 2.0	1	1	1	1
USB device 2.0	1	1	1	1
Profibus	–	–	1	1
SmartWire-DT	1	1	1	1
Type				
Ethernet	10/100 Mbps			
USB Host	USB 2.0, not galvanically isolated			
USB device	USB 2.0, not galvanically isolated			
RS-232	not galvanically isolated, SUB-D plug, 9-pole, UNC			
RS-485	not galvanically isolated, SUB-D plug, 9-pole, UNC			
CAN	not galvanically isolated, SUB-D plug, 9-pole, UNC			
Profibus DP	–	–	not galvanically isolated, D-Sub bus 9-pole, UNC	
SmartWire-DT master	Yes	Yes	Yes	Yes

A.1.4.3 Rear (panel) mounting

7.0" display

Table 35: Communication ports and interfaces for rear (panel) mounting XV-313-70-..

Type	XV-313-70-B00-...	XV-313-70-C00-...
Quantity		
Ethernet	1	2
RS-232	1	1
RS-485	1	1
CAN	1	1
USB host 2.0	1	1
USB device 2.0	1	1
Profibus	–	–
SmartWire-DT	–	–
Type		
Ethernet	10/100 Mbps	
USB Host	USB 2.0, not galvanically isolated	
USB device	USB 2.0, not galvanically isolated	
RS-232	not galvanically isolated, SUB-D plug, 9-pole, UNC	
RS-485	not galvanically isolated, SUB-D plug, 9-pole, UNC	
CAN	not galvanically isolated, SUB-D plug, 9-pole, UNC	
Profibus DP	–	
SmartWire-DT master	–	

10.1" display

Table 36: Communication ports and interfaces for rear (panel) mounting XV-313-10-..

Type	XV-313-10-B00-...	XV-313-10-C00-...
Quantity		
Ethernet	1	2
RS-232	1	1
RS-485	1	1
CAN	1	1
USB host 2.0	1	1
USB device 2.0	1	1
Profibus	–	–
SmartWire-DT	–	–
Type		
Ethernet	10/100 Mbps	
USB Host	USB 2.0, not galvanically isolated	
USB device	USB 2.0, not galvanically isolated	
RS-232	not galvanically isolated, SUB-D plug, 9-pole, UNC	
RS-485	not galvanically isolated, SUB-D plug, 9-pole, UNC	
CAN	not galvanically isolated, SUB-D plug, 9-pole, UNC	
Profibus DP	–	
SmartWire-DT master	–	

A.1.4.4 Rear (panel) mounting with SmartWire-DT connection

7.0" display

Table 37: Communication ports and interfaces for rear (panel) mounting XV-313-70-.. with SmartWire-DT connection

Type	XV-313-70-CE0-...
Quantity	
Ethernet	2
RS-232	1
RS-485	1
CAN	1
USB host 2.0	1
USB device 2.0	1
Profibus	–
SmartWire-DT	1
Type	
Ethernet	10/100 Mbps
USB Host	USB 2.0, not galvanically isolated
USB device	USB 2.0, not galvanically isolated
RS-232	not galvanically isolated, SUB-D plug, 9-pole, UNC
RS-485	not galvanically isolated, SUB-D plug, 9-pole, UNC
CAN	not galvanically isolated, SUB-D plug, 9-pole, UNC
Profibus DP	–
SmartWire-DT master	Yes

10.1" display

Table 38: Communication ports and interfaces for rear (panel) mounting XV-313-10-.. with SmartWire-DT connection

Type	XV-313-10-CE0-...
Quantity	
Ethernet	2
RS-232	1
RS-485	1
CAN	1
USB host 2.0	1
USB device 2.0	1
Profibus	–
SmartWire-DT	1
Type	
Ethernet	10/100 Mbps
USB Host	USB 2.0, not galvanically isolated
USB device	USB 2.0, not galvanically isolated
RS-232	not galvanically isolated, SUB-D plug, 9-pole, UNC
RS-485	not galvanically isolated, SUB-D plug, 9-pole, UNC
CAN	not galvanically isolated, SUB-D plug, 9-pole, UNC
Profibus DP	–
SmartWire-DT master	Yes

A.1.5 Information on the power supply

The following specifications apply to all XV300 units.

Power supply	
rated operating voltage	+ 24 VDC SELV (safety extra low voltage)/PELV (protective extra low voltage)
Permissible voltage range	Effective: 19.2-30.0 V DC (rated operating voltage -20%/+25%)
	Absolute with ripple: 18.0-31.2 V DC
	Battery powered: 18.0-31.2 V DC (rated operating voltage -25%/+30%); 35 V DC for a duration of < 100 ms
Voltage dips	Ability to accommodate brief voltage dips ≤ 10 ms from rated operating voltage (24 V DC), ≤ 5 ms from undervoltage (19.2 V DC)
Power consumption XV-303-70-.., XV-313-70-..	max. 14.4 W Current consumption at 24 V DC: 11.9 W for basic device + 2.5 W for USB module
XV-303-10-.., XV-313-10-..	max. 18 W Current consumption at 24 V DC: 15.5 W for basic device + 2.5 W for USB module
XV-303-15-..	max. 21,6 W Current consumption at 24 V DC: 19,1 W for basic device + 2,5 W for USB module
fuse	Yes (fuse not accessible)
Potential isolation	No

Electrical current		7.0" display	10.1" display	15.6" display
	I_e	0.6 A	≦0.75 A	≦ 0.9 A
	I_{TH}	1.0 A²s	1.0 A²s	1.0 A²s

Applies only to XV300 units with a XV-3.3-..-.E.-...-.. SmartWire-DT connection.

Supply voltage U_{Aux}

Rated operating voltage	24 V DC Effective: 20.4-28.8 V DC (rated operating voltage -15/+20%)
Residual ripple of input voltage	max. 5%
Protection against polarity reversal	Yes
max. current	max. 3A
Notes	If contactors with a total current consumption > 3 A (for acceptance by UL: 2 A)are connected, a power feeder module EU5C-SWD-PF1 or EU5C-SWD-PF2 has to be used.
Short-circuit rating	No, external protection using FAZ Z3 is required
Potential isolation	No
Heat dissipation	Normally 1.0 W
Rated operating voltage of 24-V-$_{DC}$ modules	Normally U_{Aux} - 0.2 V

SmartWire-DT supply voltage U_{POw}

Specifications for connection to supply voltage	24 V DC Effective: 20.4-28.8 V DC (rated operating voltage -15/+20%)
Residual ripple of input voltage	max. 5%
Protection against polarity reversal	Yes
rated operational current	max. 0.7 A
Overload proof	Yes
Inrush current and length	12.5 A/6 ms
Heat dissipation at 24 V DC	1.0 W
Bridging voltage dips	10 ms
Repetition rate	1s
Status indication	LED

SmartWire-DT interface

Potential isolation between U_{POw} and 15 V SmartWire-DT supply voltage	No
Rated operating voltage Ue	14.5 V ± 3 % (14.0 ...15.0 V_{DC})
max. current	0.7 A
Notes	If SWD modules with a total power consumption > 0.7 A are connected, a power feeder module EU5C-SWD-PF2 has to be used.
Short-circuit rating	Yes
Module type	SWD master, coordinator
Number of SWD stations	Max. 99
Baud Rate	125 kBd | 250 kBd
Address setting	Automatic
Status indication	SWD master LED: green | Configurations LED: red
porting	Plug, 8-pole
Plug connectors	Blade terminal SWD4-8MF2

A.1.6 Approvals and declarations

The following specifications apply to all XV300 units.

Approvals and Declarations	
cUL	UL 61010-2-201, UL File No. E205091
CE	XV300 units comply with all applicable European Union (EU) Directives and feature the CE marking.
NEMA	XV300 devices comply with the applicable guidelines in North America
explosion safety	II 3D Ex tc IIIC T70°C IP6x: zone 22, category 3D • IP5x for group IIIB devices (nonconductive dust) • IP6x for group IIIC devices (conductive dust) For front mounting: fixing material that must be installed as specified without fail -XV-303-70-..: on each 6 x Holding bracket with set screw -XV-303-10-..: Ten (10) Holding bracket with set screw -XV-303-15-..: Twelve (12) Holding bracket with set screw For rear (wall) mounting: fastened as specified at all mounting points without fail. -XV-313-70-..: on each 8 x -XV-313-10-..: on each 10 x
Marine approval (shipping classification)	Type approval for the XV300 7.0" and 10.1" – provided that a radio interference suppression filter for the device is installed in the wiring DNVGL-CG-0039, from 11/2015 DNV GL Type Approval Certificate No: TAA00000NC

Applied Standards and Policies List		
EMC (relevant for CE)		2004/108/EEC 2014/30/EU
	IEC/EN 61000-6-2	Interference immunity for industrial environments
	IEC/EN 61000-6-4	Emitted interference for industrial environments
Explosion protection (relevant for CE)		ATEX directive 94/9/EG 2014/34/EG
	IEC/EN 60079-0	Explosive atmospheres: Equipment - General requirements
	IEC/EN 60079-31	Explosive atmospheres: Equipment dust ignition protection by enclosure "t"
Security		
	IEC/EN 60950	Safety of Information Technology Equipment
	UL 61010-2-201	Industrial Control Equipment → Section "Technical conditions for acceptance by Underwriters Laboratories Inc. (UL)", page 39
	DIN EN 60529	Degrees of protection provided by enclosures
	NEMA 250-2003	Enclosures for electrical equipment (1000 Volts maximum)
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 logic controllers: Equipment requirements and tests

Applied Standards and Policies List

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 60068-2-31	
RoHS	Directive 2011/65/EG	conform
Climatic proofing	Cold to IEC 60068-2-1	
	Damp heat as per EN 60068-2-3	
	Dry heat to IEC60068-2-2	

Table 39: Overcurrent and short-circuit protective device standards

Standard	Overcurrent and short-circuit protective device
DIN VDE 0641, part 11 and EC/EN 60898	Miniature circuit-breaker 24 V DC, rated operational current 3 A, trip type Z fuse 3 A, Utilization category gL/gG
UL 61010-2-201	Miniature circuit-breaker 24 V DC, rated operational current 2 A, trip type Z fuse 2 A

Ambient climatic conditions

Air pressure (in operation)	795 - 1080 hPa
	max. 2000 m a. NHN (standard elevation zero)
Temperature	
Operation	$\pm 0 - +50\ °C\ (+32 - +122\ °F)$
Mounting position	XV-303-10-…, XV-303-70-… $\alpha \leqq \pm 45°$, T ≦ 50 °C (122 °F) XV-303-15-.E.-…, XV-303-15-.02-.. $\alpha \leqq \pm 10°$, T ≦ 50 °C (122 °F) XV-303-15-.00-… $\alpha \leqq \pm 10°$, T ≦ 50 °C (122 °F) $\alpha \leqq \pm 45°$, T ≦ 45 °C (113 °F) Inclination from vertical: $\alpha \leqq \pm 45°$ at operating temperature ≦ 45°C possible (if using natural convection)
Storage / Transport	-20 – + 60 °C (-4 – +140 °F)
Relative humidity	Relative humidity 10 - 95 %
Condensation	non-condensing

A.2 Further reading

Hardware

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

📄 XV-303-70-…, XV-303-10-… installation instructions   IL048009Z

📄 XV-313-70-…, XV-313-10-… installation instructions   IL048010Z

Software

For more information, please refer to the following manuals:

📄 GALILEO 10   mn048018en

📄 System description Windows CE 7   mn050004en

Communications

HMI panels are able to communicate with a variety of PLCs. In order to integrate your XV300 into your system, additional settings will need to be configured as appropriate for the PLC being used.
The following documents, together with other documentation, explain what needs to be taken into account and configured:

📄 Networks in Brief   MN05010009Z

📄 XSOFT-CODESYS 2,   MN048015ZU
XV300 PLC programming user manual

📄 XSOFT-CODESYS 3,   MN048008ZU
PLC programming user manual

SmartWire-DT

📄 SmartWire-DT The System Manual   MN05006002Z

📄 Manual for SmartWire-DT IP20 modules   MN05006001Z

📄 Manual for SmartWire-DT IP67 modules   MN120006

Download Center,Eaton Online Catalog

Enter "XV300" into the search box and the catalog will take you directly to the corresponding product group in the Automation, Control and Visualization section.

🌐 http://www.eaton.eu/doc

🌐 http://www.eaton.eu/ecat

Product information

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

http://www.eaton.eu/xv300

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XV300 04/19 MN048017EN www.eaton.eu

List of figures

List of tables

Glossary

IR
Infrared

PLC
Programmable logic controller The controller or peripheral that is connected to the HMI.

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*

*.bmp
Pixel-based file format for two-dimensional raster graphics

*.csv
Comma-Separated Values (Character-Separated Values) Data format for text

*.DLL
Dynamic link library

*.jpg
Pixel-based file format for the JPEG (Joint Photographics Expert Group) image file format The JPEG format does not support transparency

*.png
PNG (Portable Network Graphics) image file format for graphics and video software, The PNG file format supports transparency with its alpha channel

*.prj
File format used by GALILEO project files

*.tiff
Vector-based image file format for graphics and video software, The TIFF format supports transparency, as well as images using 8-bit channels (grayscale, RGB, CMYK, etc.)

*.zip
ZIP file format used to compress and archive files

A

Address reference
The term "address reference" refers to the data packet's start address.

Alpha channel
Transparency information for PNG images Used to specify the degree of transparency for each pixel

Application
Short for "application software," a computer program that performs a function useful to the user.

B

Background Image
Image that fills up the entire screen

Bitmap
Image file in the BMP raster graphics image file format.

Boot
Booting up, starting (up) - automatic process that takes place after the device is switched on, and in which a simple program in ROM memory starts a more complex program.

C

CBA
Communication Board Adapter

CF-card
CompactFlash card

CIS

Card Information Structure

Client

The term "client" refers to an application that requests specific services from a server.

Color model

All colors must be described in a manner that can be processed. All computer systems work with binary data, i.e., with numbers. Color models that describe all the colors that can be generated by a device and that are based on the specific device's color elements are referred to as "device-dependent."

Comboard Loader

Loading program integrated into GRS and used to update modules with loadable firmware.

Command sequence

Path information List of the commands that the device operator must tap in succession in order to get to the location described; for example: Start\Project Overview\Variables folder.

Communication

The transfer of data between the panel and the PLC, controller, or peripheral connected to it.

Communication Board Adapter

In WinGRS, this adapter is the runtime license.

CompactFlash card

CompactFlash (CF) is an interface standard for non-volatile, rewritable data memory in the form of CF cards, which are used with Eaton touch panels. Data written to these cards is stored in a non-volatile manner that does not require any additional (secondary) power.

Compilation

The process of transforming project data to an executable user interface program for the specific panel model / to a GRS-specific data structure

Compile

The process of transforming project data to an executable user interface program for the specific panel model / to a GRS-specific data structure

Control data block

Together with the status data block, the control data block is used to monitor and display the status of data transfers between the HMI and PLC.

CTRL button

D

Data packet

The term "data packet" refers to a variable, array, or structure that has been addressed in Galileo. These data packets are always transmitted to the PLC as a unit.

Data Set Ready

The transmitter is ready to send data.

Data synchronization

Routine used to ensure that all the modules connected to the HMI have the same data (presetting).

Data Terminal Ready

The receiver is ready to receive data.

Depending on device

All colors must be described in a manner that can be processed. All computer systems work with binary data, i.e., with numbers. Color models that describe all the colors that can be generated by a device and that are based on the specific device's color elements are referred to as "device-dependent."

DHCP (used to obtain an IP address automatically)

You can enable this setting if you do not want to configure every single individual computer

within a network, provided there is a DHCP server on the network. When this setting is enabled, the computer will get information such as an IP address, subnet mask, gateway, and DNS from the DHCP server. In most cases, the router used on a network will also feature a DHCP server.

DNS (Domain Name Server)

When you enter an address such as www.intel.com into a browser or FTP client, your computer will first need to ask a server for the IP address behind the name in order to actually be able to reach the address. The server that provides this information is known as a "domain name server." Every single Internet provider provides this service, and most providers have a secondary DNS in case their primary DNS fails. DNS records are the IP addresses for these servers.

DSR

Data Set Ready

DTR

Data Terminal Ready

Dynamic Control

Elements (objects and tools) that display a change based on an action on the HMI or a change in the data on the PLC (e.g., button, value display or input field, error window, etc.).

E

Eaton

Eaton is a power management company that provides energy-efficient solutions that help our customers effectively manage electrical, hydraulic, and mechanical power. A global technology leader, Eaton acquired Cooper Industries plc in 2012. The 2012 revenue of the combined companies was $21.8 billion on a pro forma basis. Eaton has approximately 102,000 employees and sells products to customers in more than 175 countries. For more information, please visit www.eaton.com.

Eaton Automation

The integration in the Eaton group has led to the formation of a new business unit offering power distribution and automation solutions from a single source. Solutions aimed at both the panel building and the mechanical engineering. Eaton Automation offers HMI, PLC, HMI/PLC, Remote IO and SmartWire-DT in the field of industrial automation. Industrial automation is complemented by industrial switchgear from Eaton with contactors, motor-protective circuit-breakers, frequency inverters, soft starters, control circuit devices and circuit-breakers. The product range is designed for machine and panel building solutions. We cater for the demands of our international customers with our systematic product conformity to UL/CSA, CCC and IEC standards. We are present on a global level just like our customers with sales subsidiaries in more than 150 countries and development centres in Asia, America and Europe.

Eaton Electrical

Eaton's electrical business is a global leader in power distribution, power quality, control and industrial automation, power monitoring, and energy management products and services. Eaton's global electrical product lines, including Cutler-Hammer®, Moeller®, Powerware®, Holec®, MEM®, and Santak® provide customer-driven solutions to serve the power system needs of the data center, industrial, institutional, government, utility, commercial, residential, and OEM markets worldwide.

Error texts

Texts shown in the error window in projects. These texts can consist of several lines.

Error variable

Variable with the Error or Error Array data type. When this variable has a value of "1", this means that there is an error.

F

FAT

File Allocation Table

File Allocation Table

FATs are used to define filesystems.

Firewall

Firewalls are used to prevent outside attempts to access IP addresses on a private network. In other words, they are used to protect internal data. When configured correctly, they can also be used to set up rules or lists that prevent specific URLs from being requested, e.g., when they are in violation of company policy. A firewall's main task is to use the information in a packet (the source and destination IP addresses, as well as the port) to decide whether the packet should be rejected or allowed to pass. This also prevents packets not meant for the network from subjecting the network to an unnecessary load, as well as packets meant for the private network from reaching the Internet.

Flash

Non-volatile memory on CompactFlash card or SD card.

FTP

File Transfer Protocol

G

GALILEO OPEN

GALILEO OPEN is a PC-based visualization program consisting of the Galileo Runtime System (WinGRS) and a communication module.

GALILEO Project Inspector (GPI)

Program for testing GALILEO projects directly on a PC. With a few exceptions, all of the HMI's functions can be tested and tried out on a PC.

GALILEO Runtime System (GRS

The term "GRS PLC runtime system" refers to the GRSW sequential programs on HMI devices. These programs interpret (compile) the data structure generated by the GALILEO code generation program. GRS2 for Windows CE devices with an x86 processor. The corresponding panel must have a parallel port and a PCMCIA card. GRSW3 for all Windows CE devices with ARM processors.

Gateway

Gateway When two computers on different networks want to communicate with each other, the networks need to be connected with a router. For example, surfing on the Internet requires for packets to be routed from the Internet to the network and vice versa. By using a subnet mask, a computer can know whether the receiver can be found on its network or whether it is located outside of it. If it is located outside the network, the computer will send a packet to the router specified with the gateway IP address.

GPI

Galileo Project Inspector

GRS

Short for "Galileo Runtime System"

GRS2

The term "GRS PLC runtime system" refers to the GRSW sequential programs on HMI devices. These programs interpret (compile) the data structure generated by the GALILEO code generation program. GRS2 for Windows CE devices with an x86 processor. The corresponding panel must have a parallel port and a PCMCIA card. GRSW3 for all Windows CE devices with ARM processors.

GRSW3)

The term "GRS PLC runtime system" refers to the GRSW sequential programs on HMI devices. These programs interpret (compile) the data structure generated by the GALILEO code generation program. GRS2 for Windows CE devices with an x86 processor. The corresponding panel must have a parallel port and a PCMCIA card. GRSW3 for all Windows CE devices with ARM processors.

H

Help texts

Texts shown in the help windows in a project. These texts can consist of several lines.

History

Events stored as a result of error and warning changes.

HMI (MMI)

Human Machine Interface An operating terminal on which the project is installed as a user interface.

HSB model

Hue/Saturation/Brightness color model

I

IL

Instruction leaflet

Internal Storage

Internal touch panel memory

IP Address

IP addresses are 32 bits (4 bytes) long and are used to uniquely identify networks, subnetworks, and individual computers that work with the TCP/IP protocol. A distinction is drawn between private address spaces for local networks (intranet) and public addresses (Internet).

L

Language file

Each project can be translated into a maximum of 100 languages. Each translation will need to be stored in its own file, which is referred to as a "language file."

Log file

Log file used to store the actions carried out by the application program's users in a traceable manner.

M

MDI

Multi Document Interface

MN

Manual - Operation manual

Monitor view

View on the HMI that contains the objects configured in GALILEO (e.g., controls, indicators, function keys, etc.).

Monospaced fonts

Fonts with a fixed width for all characters

Multi Document Interface

Feature making it possible to open multiple documents (screens, views) simultaneously in a Windows application (GALILEO)

O

Object

Static or dynamic element used for engineering purposes. Static objects are located in the view's background and do not change at runtime. In contrast, dynamic objects are located in the view's foreground, and their appearance can change as a result of data changes.

OOPM

Object-oriented programming and modeling

Operating system

A group of programs that control and manage the processes in a computer and its connected devices.

P

PCMCIA

Personal Computer Memory Card International Association (PCMCIA)

PCT

Projected capacitive touch

Peer to Peer (P2P)

Peer-to-peer is a term used for computers that are connected to each other in an architecture in which both computers can assume the role of server and client.

PELV (protective extra low voltage)

Protective low voltage that provides protection against electric shock. It refers to how machines are electrically installed – one side of the circuit or a point on the PELV circuit's power source needs to be connected to the protective bonding circuit.

Personal computer

A personal computer is made up of a central processing unit, RAM, external data storage devices, an operating system, and application programs, and is connected to peripheral devices (monitor, printer). PCs can be stationary or portable.

Personal Computer Memory Card International Association (PCMCIA)

PCMCIA Card, also known as PC Card, is a standard for the expansion cards for portable computers used in Eaton touch panels. PCMCIA cards are energy-efficient and support hot plugging, i.e., they can be replaced during ongoing operation. Plug and play is supported thanks to the fact that all the properties required in order

to automatically configure the driver are stored on the card's CIS.

PLC

Programmable logic controller The controller or peripheral that is connected to the HMI.

Polling

Cyclical reading of the PLC's addressed variables

Port

Ports can be seen as virtual mailboxes for data packets. A computer can communicate with other computers on 65,536 different ports.

Project

File containing all the screens with configured objects and their assignments so that they can be loaded onto the HMI as a view unit

Project languages

Project languages The texts in a project can be simultaneously stored in more than one language on the HMI. However, only one of these languages can be displayed on the MMI at any one time. Special functions can be used to switch to a different language. For a more detailed description of these special functions, please refer to the GALILEO program.

Projected capacitive touch

A display designed for high precision, user friendliness, and durability. It is designed to bring the controls that have now become prevalent in consumer electronics to machines, with advantages such as a gesture-based user interface, two-finger multi-touch depending on the application software being used, intuitive operation that enables operators to start working right away, and the fact that no calibration is required

R

Recipe entry

Refers to a collection of values stored under a definable name in a recipe object. Multiple recipe entries are combined into a general management structure. Recipe entries can be edited in the *.TAB file. The file's name will be the same as the recipe object's name. The name of each entry will be in the second column of each row. A maximum of 1,000 entries can be managed in each recipe object.

Recipe Management

Refers to a collection of recipe entries. The values for the corresponding variables can be stored on the panel using a specific name.

Recipe Object

Refers to a collection of recipe entries. The values for the corresponding variables can be stored on the panel using a specific name.

Register

Subpages in a dialog box or object

RGB model

Red/Green/Blue color model

Ribbon

Menu ribbon that can be expanded and collapsed and that provides the various available commands

ROM (read-only memory)

Non-volatile read-only memory

Router

Routers are devices used to forward ("route") requests from a network to the Internet (or to another network). Routers provide a measure of security for private networks, as nodes outside of the network will be unable to determine which specific computer requested the data. This is because all the computers on the private network will appear under the same IP address on the Internet.

Runtime

General designation for the GALILEO Runtime System

Runtime code

The compiled project used by GRS.

Runtime data

Data generated by the GRS during ongoing operation.

Runtime software

General designation for the GALILEO Runtime System

RxD

Receive cable for received data

S

SD card

Secure Digital memory cards are non-volatile, rewritable flash data storage devices that are used with Eaton touch panels and are commonly referred to as SD cards. Data written to these cards is stored in a non-volatile manner that does not require any additional (secondary) power.

SD card slot

SELV (safety extra low voltage)

Circuit in which no dangerous voltage occurs even in the event of a single fault.

Server:

The term "server" is usually used to refer to computers that provide services on a network. Admittedly, however, this definition is not very precise. More specifically, servers are applications on a computer that are responsible for providing or processing data. In fact, every computer can provide such services. Servers are

not active in and of themselves. They wait until they are addressed by a client, after which they perform the corresponding tasks. Each server application provides its service on the network via a specific port.

Show System Info

Special function that can be used to show a window with current system data in GRS

Shutdown

Special function that can be used to exit GRS

Slot

Refers to a slot for a communication module in the HMI

Source project

The project currently open in GALILEO.

Standard texts

Texts that can be used in a general manner throughout a project, e.g., titles, button labels, etc. These texts can consist of several lines.

Start screen

The start screen that appears when the program starts on the HMI (device). The start screen needs to be defined as one of the standard screens in the project organization structure for each GALILEO project.

Static Control

An element (objects and tools such as lines, circles, rectangles, images, text, etc.) that does not change while the HMI is running.

Status bar

The status bar is located at the bottom of the program window. It is used to show whether the editing mode is in "overwrite" or "insert" mode, etc. In addition to the standard information shown by Windows, the currently selected text number will also be shown.

Status Data Block

Together with the control data block, the status data block is used to monitor and display the status of data transfers between the HMI and PLC.

Stroke

A hub is a device used to connect various network devices together. Hubs broadcast all data to all connected devices (devices connected with a patch cable).

Subnet mask

A subnet mask is an IP address "filter." It has the same syntax as an IP address. This mask defines which computers can transfer data between themselves within a network. This also means that subnet masks define the maximum size of the corresponding subnetworks.

Supply voltage

Switch

Switches are networking devices that are more advanced than hubs. One of the main features that sets them apart from the latter is the fact that they are more "intelligent" and forward data packets much more efficiently by sending them only to the devices that need to receive them. Multiple data packets can pass through a switch at the same time. Among other things, this means that switches have a significantly higher total bandwidth (throughput) than hubs. Moreover, switches learn which stations are connected to which ports, meaning that additional data transfers will not result in any ports being subjected to unnecessary loads, i.e., that data will only be forwarded to the port connected to the intended destination. With the exception of their higher price, switches are superior to hubs in every way.

System character set

Font type and size used to output system messages.

System error message

These error messages are system-specific and are generated by GRS. The two basic types are error messages and information messages. Errors will be shown in a superimposed red window, while information messages will be shown in a green window. Fatal errors will cause the program to crash.

System History

For each system message, it is possible to define whether it should be stored with the corresponding date and time.

System port

Serial interface on touch panel.

T

Tag

Defined data point on the HMI or PLC Addresses are used to link the PLC's and HMI's data points.

Toolbar

The toolbar provides all important functions so that they can be accessed directly. All the buttons in a toolbar can also be found as menu options in the menu.

Touch bezel

Connects IR elements to the touch controller

Touch Controller

Takes care of signal processing and evaluates all IR elements.

Touch filter

The plastic bezel behind which the IR elements are located.

Touch panel

An HMI that enables users to intervene directly in the process by touching the objects on the screen.

Touch zone

A rectangular area on the panel that can be custom-defined and that will respond to touch

Transfer parameters

Baud rate, data bit, start bit, stop bit, and parity

TxD

Transmit cable for transmitted data

U

UNC

Unified Coarse Thread

User

Operator using the device on which the user interface created with Galileo is running.

W

Widescreen

Widescreen format

Windows

Dialog boxes, prompts, etc. that open while the application is running and remain on the current program page Synonyms: dialogue box, dialog These windows are shown by the application in various situations in order to obtain specific input or confirmations from the user. Dialog boxes expect input from the user, while prompts are shown to get the user's confirmation for specific messages.

Windows CE Image

Operating system for Windows CE devices

Windows Embedded Compact 7 pro

A component-based, multi-functional real-time operating system designed to meet the needs of even the most demanding industrial applications. The operating system will unpack itself into the device's RAM memory every time the device is started, making it possible to de-energize the device without the need for a UPS or

other similar precautions. As the successor to WinCE 6, Windows Embedded Compact 7 features a large selection of standard technologies, communication servers/clients, and web services. • Fast boot time • Multi-touch support (two-finger) • Long-term availability

WinGRS

Runtime system that can be run in Windows, but that requires an appropriate communication module as a license in order to be fully executable.

WINS

Windows Internet Name Service, Name resolution service within Microsoft networks. In order for this service to be used, there must be a WINS server. If there is no WINS server, names will be resolved using broadcasts and other mechanisms. A fixed name can be assigned to an IP address in WINS so that a computer will continue to be recognized even if its IP address changes.

Eaton's electrical business is a global leader with expertise in power distribution and circuit protection; backup power protection; control and automation; lighting and security; structural solutions and wiring devices; solutions for harsh and hazardous environments; and engineering services. Eaton develops innovations that not only provide energy for the important things across industries worldwide, but also help customers tackle the most critical electrical power management challenges out there.

The Eaton Corporation is a diversified power management company with 2017 sales of 20.4 billion dollars. We provide energy-efficient solutions that help our customers effectively manage electrical, hydraulic, and mechanical power more efficiently, safely, and sustainably. Eaton is dedicated to improving people's quality of life and the environment through the use of power management technologies and services. Eaton has approximately 96,000 employees and sells products to customers in more than 175 countries. For more information, please visit Eaton.com.

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