

**XV300**



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### **Original Operating Instructions**

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Subject to alteration.



**DANGER!**

Hazardous voltage!

---

## Before commencing the installation

- Installation, electrotechnical expertise
- Disconnect the power supply of the device.
- Ensure that devices cannot be accidentally re-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.).

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## 0. About this documentation

### 0.1 List of revisions

## 0. About this documentation

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

This 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 its operating system or application software.

→ Section "Further reading", page 87

Please send any comments, recommendations, or suggestions regarding this document to: [AfterSalesEGBonn@eaton.com](mailto:AfterSalesEGBonn@eaton.com)

### 0.1 List of revisions

The following significant amendments have been introduced since previous issues:

<b>Publication date</b>	<b>page</b>	<b>Keyword</b>	<b>New</b>	<b>Modification</b>	<b>Deleted</b>
07/2015		New edition	x		
09/2015		ATEX authorization, XV-313advanced edition	x		
12/2015		Information for UL and battery added	x		



## 0.2 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.

The information in this document is required in order to be able to use the XV300 safely and effectively.

This manual describes all the lifecycle stages for the XV300: transportation, installation, commissioning, operation, maintenance, storage, and disposal.

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



### CAUTION



Installation, electrotechnical expertise



### 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 full document.

## 0.3 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 per-

## **0. About this documentation**

### **0.3 Legal Disclaimer**

sonnel and/or the XV300 is used improperly. Eaton assumes no liability for any damages resulting from cases such as these.

## 0.4 Device designations and abbreviations

The following general terms are used throughout this manual:

<b>Short designation</b>	<b>Explanation</b>
XV300	Product family with function code
HMI panel	Product 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 "Nameplate", page 23.

## 0. About this documentation

### 0.5 Writing conventions


#### 0.5 Writing conventions


Table 1: Format conventions used throughout this manual


<b>Award</b>	<b>Description</b>
<b>Bold text</b>	Used for all graphical user interface elements
Monospaced	Used for all elements at the file level
Font format code	
<code>Text</code>	Used for the button labels
<i>Menu path\submenu\...vitem</i>	Path information for software windows and menu pages
<i>Menu/command</i>	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


#### 0.5.1 Hazard warnings

##### Danger! Risk of personal injury.

	<b>DANGER</b> Warns of hazardous situations that result in serious injury or death.
--	--

	<b>WARNING</b> Warns of the possibility of hazardous situations that could result in serious injury or even death.
---	---


	<b>DANGER!</b> Hazardous voltage!
---	--------------------------------------

	<b>CAUTION</b> Warns of the possibility of hazardous situations that can cause injury.
---	---

##### Property damage warning

<b>NOTICE</b> Warns about the possibility of material damage.
--

##### Prohibited use

	<b>Prohibited uses, actions, etc.</b> Explanation
---	--

### Bids

	<b>Bid</b> Explanation
---	---------------------------

### Notes



Indicates useful tips.




Indicates instructions to be followed



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


### 0.5.2 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

## 1. Description

### 1.1 Function

XV300 units can be used as both control and monitoring devices too with PLC functionality.

The HMI panel features 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 Touch Panels 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 set up in portrait mode
- XV-303 model for front mounting and XV-313 model for rear (panel) mounting
- Display sizes 7.0" and 10.1" both with a 1024 x 600 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) using the 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 a 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. Description

### 1.2 Intended use

### 1.2 Intended use

XV300 units 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 units 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 "General data ", page 75 in the appendix.



#### **Prohibited uses**

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 Windows Embedded Compact 7 pro operating system
- an industrial capacitive multitouch display, PCT
- an 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, etc.

#### 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 (panel) 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:

- Two widescreen display sizes: 7.0" or 10.1" 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
- SWD for an efficient use of SmartWire-DT<sup>®</sup> 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 side with plastic bezel  
XV-303-10-..



Figure 2: Service side with optional interfaces  
XV-303-10-CE2-A00-1C



Figure 3: Front side with plastic bezel  
XV-303-70-..



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

Table 3: Enclosure versions for rear (panel) mounting



Figure 5: Front side with aluminum mounting frame  
XV-313-10-..



Figure 6: Service side with optional interfaces  
XV-313-10-...

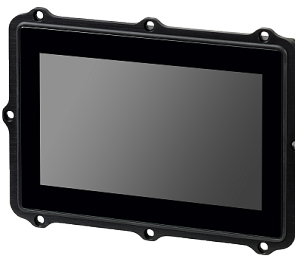


Figure 7: Front side with aluminum mounting frame  
XV-313-70-..

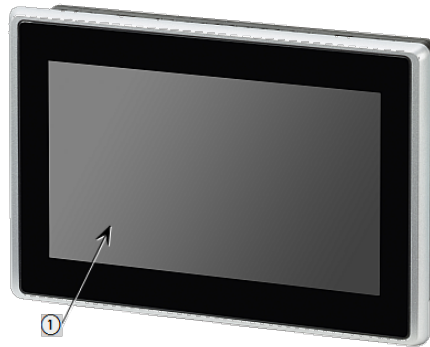


Figure 8: Service side with optional interfaces  
XV-313-70-...

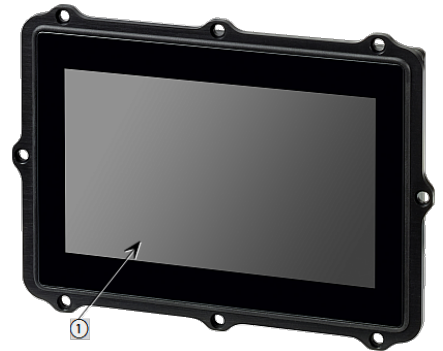
## 1.4 Operator control and display elements

### 1.4.1 Overview

#### Operator control and display elements



Front side with plastic bezel XV-303



Front side with aluminum mounting frame XV-313



Service side with optional interfaces XV-303



Service side with optional interfaces XV-313

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>① Display, touch sensor</li> <li>② SD card slot</li> <li>③ CTRL button</li> </ul> | <p>Display of HMI device<br/>Detects when the controls shown on the display are being actuated.<br/>Operation based on touch gestures.</p> <p>Slot for SD card</p> <p>The specific function depends on the software being used</p> |
|--|--|

## 1. Description

### 1.5 Interfaces to peripheral devices

#### 1.5 Interfaces to peripheral devices

The interfaces featured by your XV300 will depend on the XV version selected and cannot be modified.

The nameplate will indicate which specific interfaces are included with the unit.

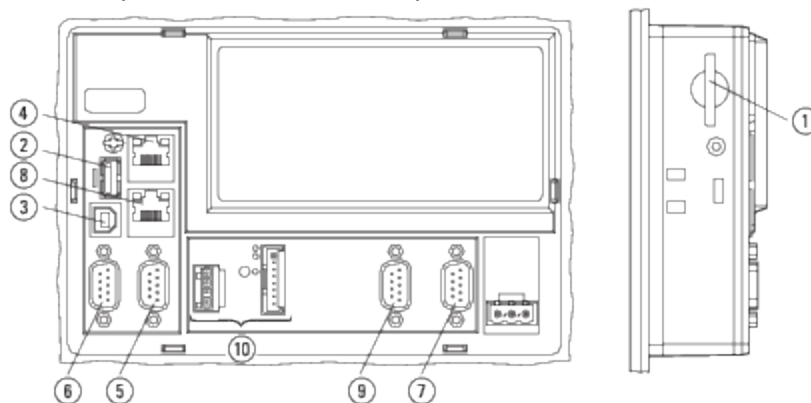


Figure 9: Interfaces

#### Interfaces on all HMI panels

	<b>interface</b>	<b>type</b>
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 interlocking
⑥	COM2	RS-485, not galvanically isolated, SUB-D plug 9-pole, UNC nuts for interlocking
⑦	CAN	CAN1, not galvanically isolated, SUB-D plug 9-pole, UNC nuts for interlocking

#### 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 Overview of available versions

Table 4: Front mounting versions with a 7.0" display

<b>Device version/part no.</b>	<b>Description</b>
XV-303-70-B00-...-..	HMI basis
XV-303-70-C00-...-..	HMI with 2nd Ethernet port
XV-303-70-B02-...-..	HMI with Profibus
XV-303-70-C02-...-..	HMI with 2nd Ethernet port and Profibus
XV-303-70-BE0-...-..	HMI-PLC with SmartWire-DT®
XV-303-70-CE0-...-..	HMI-PLC with 2nd Ethernet port and SmartWire-DT®
XV-303-70-BE2-...-..	HMI-PLC with SmartWire-DT® and Profibus
XV-303-70-CE2-...-..	HMI-PLC with 2nd Ethernet port, SmartWire-DT® and Profibus

Table 5: Versions: flush mounting 10.1" display

<b>Device version/part no.</b>	<b>Description</b>
XV-303-10-B00-...-..	HMI basis
XV-303-10-C00-...-..	HMI with 2nd Ethernet port
XV-303-10-B02-...-..	HMI with Profibus
XV-303-10-C02-...-..	HMI with 2nd Ethernet port and Profibus
XV-303-10-BE0-...-..	HMI-PLC with SmartWire-DT®
XV-303-10-CE0-...-..	HMI-PLC with 2nd Ethernet port and SmartWire-DT®
XV-303-10-BE2-...-..	HMI-PLC with SmartWire-DT® and Profibus
XV-303-10-CE2-...-..	HMI-PLC with 2nd Ethernet port, SmartWire-DT® and Profibus

Table 6: Rear (panel) mounting versions with a 7.0" display

<b>Device version/part no.</b>	<b>Description</b>
XV-313-70-B00-...-..	HMI basis

Table 7: Rear (panel) mounting versions with a 10.1" display

<b>Device version/part no.</b>	<b>Description</b>
XV-313-10-B00-...-..	HMI basis

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. Description

### 1.7 Accessories

### 1.7 Accessories

A variety of accessories are available for XV300 Touch Panels.

- SD card
- Accessories

**NOTICE**

Only use original accessories.



Order accessories through your supplier or through the Eaton online catalog [www.eaton.eu/ecat](http://www.eaton.eu/ecat)

for example

Article no.	Type
181638	MEMORY-SD-A2-S SD card with at least 1 GB
139807	MEMORY-SD-A1-S SD card with at least 256 MB
181585	LIC-PLC-A Licence Product Paper PLC
181637	ACCESSORIES-TP-10-KG holding brackets

## 1.8 Designation

### 1.8.1 Nameplate

The device has a nameplate on the rear of the unit..  
This rating-label includes the following information:

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



Figure 10: Example for a nameplate

### 1.8.2 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

## 2. Safety instructions

### 2.1 Basics

## 2. Safety instructions

### 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 instructions

### 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 for the XV300, including the installation instructions, can be found at the Eaton Download Center - Documentation page on the Internet.

 <http://www.eaton.eu/doc>



#### **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 full document.

#### 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, electrotechnical expertise



#### **Important!**

Dispose of recyclables as required by your local recycling regulations.

An XV300 panel which is 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 required ambient conditions must be met. → Section "General data", page 75
- Maintenance work must be carried out correctly.

Make sure to read the "Legal Disclaimer", page 9.

## **2. Safety instructions**

### **2.2 Mandatory requirements, personnel requirements**

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 (according to 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 Touch Panel, follow all instructions regarding how

## 2. Safety instructions

### 2.3 Device-specific hazards

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 XV300 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  $\geq 1.5 \text{ mm}^2$ , length  $\leq 350 \text{ mm}$
- The XV300 needs to be connected to the conductive structure in, e.g., the control panel using the central earth point (earthing screw). For trouble-free operation, this type of grounding is mandatory.



#### **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

## 2. Safety instructions

### 2.3 Device-specific hazards

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 Touch Panel 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 Touch Panel 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 Touch Panel 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 the XV300 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 or Nema 12 degree 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 where the device will be flush mounted:

$$2 \text{ mm (0.08")} \leq d \leq 5 \text{ mm (0.2")}$$



#### 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 Touch Panel unit are meant for maintenance work only.

## 2. Safety instructions

### 2.3 Device-specific hazards



#### 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, electrotechnical expertise



## 3. Installation

### 3.1 Prerequisites for the location of use

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

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

 **See also**

Label on the "Nameplate", page 23

The specifications in the appendix → Section "Technical data", page 70

#### 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.

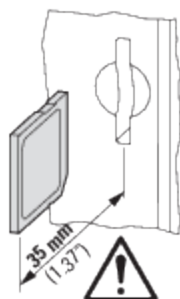


Figure 11: Space required to remove the SD card

#### 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 the XV300 unit from direct sunlight and other sources of UV radiation.

### 3. Installation

#### 3.1 Prerequisites for the location of use

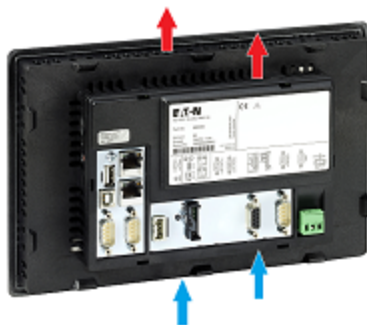
The environmental ambient conditions for operation must not exceed the specified values:

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)
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

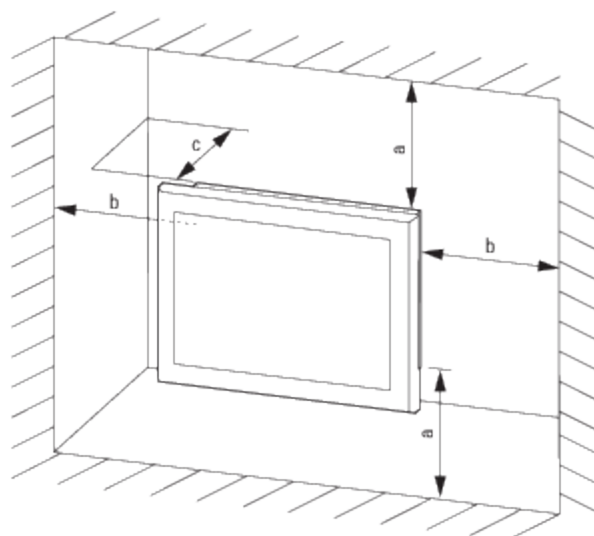


Figure 12: Cooling air circulation

Figure 13: Mounting distance

- Make sure that there will be enough volume for air changes inside the control panel, etc.  
The specified clearance around the HMI panel is:  $a, b, c \geq 30$  mm (1.18"),  $9\ 0^{\circ}\text{C}$  (32°F)  $\leq T \leq 50$  °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.  
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



**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.
- If no forced ventilation is being used, the device must not be mounted at an angle  $\alpha$  of more than  $\pm\alpha \leq 45^\circ$  relative to its fully vertical position.
- The enclosure material must be thick enough  
For front mounting:  $2 \text{ mm (0.08")} \leq d \leq 5 \text{ mm (0.2")}$ ,  
For rear (panel) mounting:  $d = 1.5 \text{ mm (0.059")} \pm 0.1 \text{ mm (0.004")}$   
Flatness  $\square \leq 0.5 \text{ mm (0.02")}$  at the mounting cutout with  $\surd Rz \leq 120$ ; IP 65  $\rightarrow$  DIN ISO 2768-2 (K)
- Recommended mounting cutout  
For front mounting:  
XV-303-70-...:  $e = 183 \text{ mm (7.20")} \pm 1 \text{ mm (0.04")}$ ,  $f = 122 \text{ mm (4.80")} \pm 1 \text{ mm (0.04")}$   
XV-303-10-...:  $e = 255.5 \text{ mm (10.06")} \pm 1 \text{ mm (0.04")}$ ,  $f = 160.5 \text{ mm (6.32")} \pm 1 \text{ mm (0.04")}$ ,  
For rear (panel) mounting:  
XV-313-70-...:  $e = 182.7 \text{ mm (7.193")} \pm 0.1 \text{ mm (0.004")}$ ,  $f = 126.8 \text{ mm (4.992")} \pm 0.1 \text{ mm (0.004")}$   
XV-313-10-...:  $e = 255.7 \text{ mm (10.07")} \pm 0.1 \text{ mm (0.004")}$ ,  $f = 165.8 \text{ mm (6.528")} \pm 0.1 \text{ mm (0.004")}$

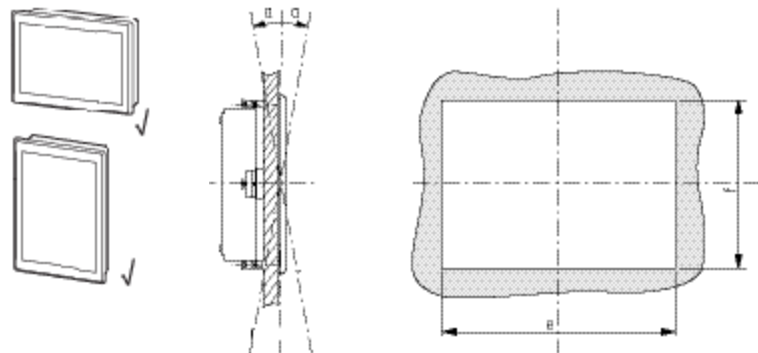


Figure 14: Mounting position

### 3. Installation

#### 3.1 Prerequisites for the location of use

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

###### Conditions for Underwriters Laboratories Inc. (UL) certification



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

Ambient Temperature 0 °C to 50 °C

Altitude up to 2000 m

Overvoltage Category II

Pollution degree 2

Supply voltage fluctuations up to -20%/+25% of the nominal voltage

Type rating Used in type 4X or type 12 enclosures, Indoor use only, dry locations only

Maximum Relative humidity 95% for temperatures up to 50 °C decreasing linearly to 50% relative humidity at 40 °C.

Means of protection Class III (SELV or PELV)

The panels shall be mounted in a suitable fire enclosure which shall be serving as a 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<sub>DC</sub>, rated operational current 2 A, trip type Z
- or a 2 A fuse.

### 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.
- ▶ 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.
- ▶ Check the package contents for visible transit damage.
- ▶ Use the information in 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 packaging contents for the XV300 include:

Table 8: Std. pack

Number of	Description
1 x	XV300 XV-303 or 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	IL048009ZU or IL048010ZU
6 x / 10 x	Holding bracket with set screw Internal hexagon M4x25 DIN 914 galvanized 6 x for XV-303-70-.. or 10 x for XV-303-10-..

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. Installation

### 3.3 Mounting

### 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 or Nema 12 degree 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 where the device will be flush mounted:  
 $2 \text{ mm (0.08")} \leq d \leq 5 \text{ mm (0.2")}$

#### 3.3.1 Fixing and sealing

- ▶ Make sure to check that the "Mounting", page 36 are being met.
- ▶ Make sure that the mounting cutout has the right size.
- ▶ Check the Polyurethane foam 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 mm 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!

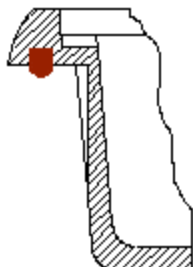
Together with the Polyurethane foam gasket, this holding bracket is the main element involved in achieving an IP65 (front) degree of protection.

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 Polyurethane foam 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*



Peripheral Polyurethane foam gasket along the entire edge  
 Material Raku-PUR 31-3117 black, dimensions 2mm x 3mm (0.0787" x 0.1181")

*Screw the set screws into the holding brackets*



Figure 15: Pre-installing the holding brackets  
 Internal hexagon M4x25 DIN 914 galvanized

*Insert the holding brackets into the enclosure*

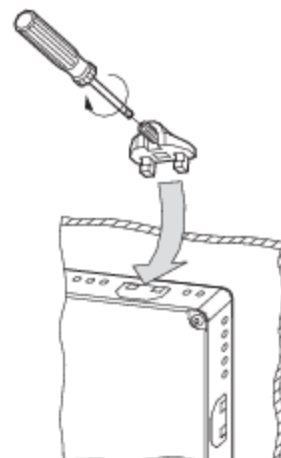


Figure 16: Mounting the XV-303

## 3. Installation

### 3.3 Mounting

- ▶ 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 with a torque of  $\leq 0.1 \text{ Nm}$  (0.86 lb-in).

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

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

- ▶ Make the required mounting cutout.
- ▶ Weld all the M4 x 12 weld studs onto the sheet as shown in the dimensional drawing for mounting

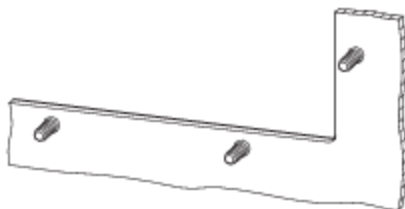


Figure 17: M4 x 12 weld studs onto the sheet

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

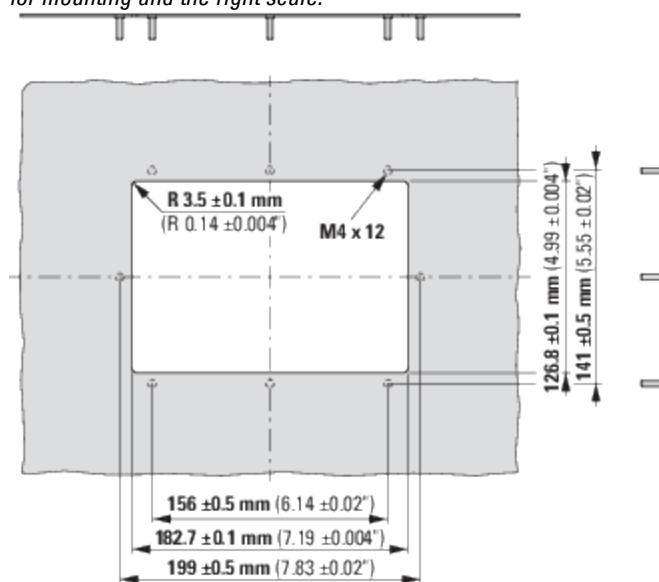


Figure 18: Dimensional drawing for mounting XV-313-70-..

### 3. Installation

#### 3.3 Mounting

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

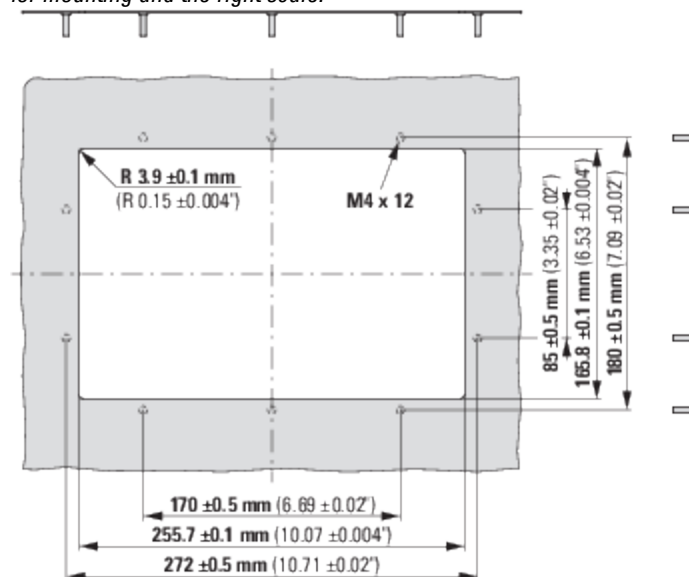


Figure 19: Dimensional drawing for mounting XV-313-10...

- ▶ 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.

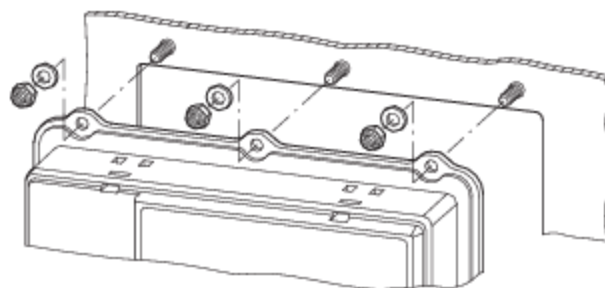


Figure 20: Mounting XV-313



### 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 XV300 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  $\geq 1.5 \text{ mm}^2$ , length  $\leq 350 \text{ mm}$

The XV300 needs to be connected to the conductive structure in, e.g., the control panel using the central earth point (earthing screw). For trouble-free operation, this type of grounding is mandatory.



#### CAUTION SHORT-CIRCUIT HAZARD

If the XV300 Touch Panel 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 Touch Panel 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 Touch Panel to direct thermal radiation from heating appliances.

#### Before connecting the power supply



#### CAUTION

24 VDC power supply for integrated DC-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.  
Observe 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 Touch Panel has an internal fuse and protection against polarity reversal.

The power supply for the XV300 Touch Panel is not galvanically isolated.

### 3. Installation

#### 3.4 Preparing the device for operation


The XV300 Touch Panel 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 under-voltage (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
fuse	Yes (fuse not accessible)
Potential isolation	no

Electrical current	7.0" display	10.1" display
$I_e$	$\leq 0.6$ A	$\leq 0,75$ A
$I_{TH}$	1.0 A <sup>2</sup> s	1.0 A <sup>2</sup> s

3.4.1 Functional earthing XV300



**CAUTION**  
**SAFELY DIVERTING ELECTRICAL INTERFERENCE CURRENTS**

HMI panel XV300 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  $\geq 1.5 \text{ mm}^2$ , length  $\leq 350 \text{ mm}$

The XV300 needs to be connected to the conductive structure in, e.g., the control panel using the central earth point (earthing screw). For trouble-free operation, this type of grounding is mandatory.

- ▶ 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 9: Functional earthing specifications

Functional earthing specifications	
Cross section	$\geq 1.5 \text{ mm}^2$ $\leq \text{AWG16}$
Earthing bolt	PZ2, M4 x 8
Ring-cable ferrule for M4	Internal diameter = 4.3 mm External diameter $\leq 8 \text{ mm}$
Cable length	$\leq 350 \text{ mm}$
Tightening moment	1.3 Nm (11.5 lb-in)

Functional earthing

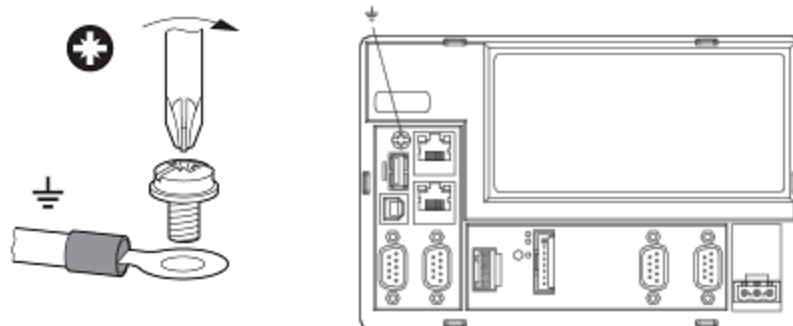


Figure 21: Screwing the functional earth conductor onto the enclosure

### 3. Installation

#### 3.4 Preparing the device for operation

##### 3.4.2 Power supply - electrical connection

Table 10: Configuration Plug connector MSTB 2.5/3-ST-5.08

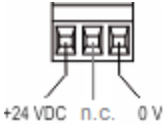
	Signal	Configuration
	+	Supply voltage + 24 VDC SELV (safety extra low voltage)/PELV (protective extra low voltage)
	n.c.	not assigned
	-	Supply voltage 0 V

Table 11: 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 <sup>2</sup> / max. 2.5 mm <sup>2</sup> (drain wire or conductor) min. AWG18 / max. AWG12
Tightening moment	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

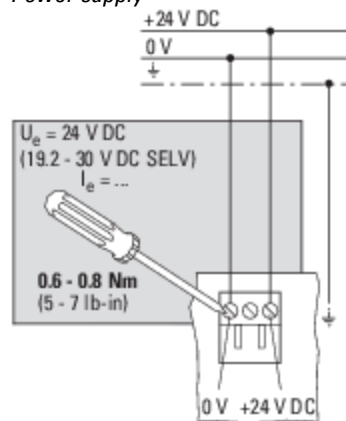


Figure 22: Connecting the screw terminals on the Plug connector MSTB 2.5/3-ST-5.08

##### Electrical connection

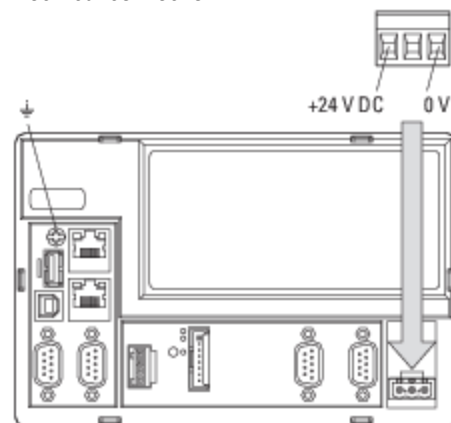


Figure 23: Power supplied through Plug connector MSTB 2.5/3-ST-5.08

### 3. Installation

#### 3.4 Preparing the device for operation


- ▶ 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<sub>DC</sub>.

## 4. Commissioning

### 4.1 Initial Commissioning

## 4. Commissioning

	<p><b>CAUTION</b> <b>SHORT-CIRCUIT HAZARD</b></p> <p>If the XV300 Touch Panel 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.</p> <p>Do not switch on the XV300 Touch Panel when it has condensation in or on it.</p> <p>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 Touch Panel to direct thermal radiation from heating appliances.</p>
---	---

- ▶ Apply an XV300 to the 24 VDC supply voltage unit

The XV300 unit will boot up.



The XV300 Touch Panel 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.



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

#### See also



System description Windows CE 7

MN050004EN



If the XV300 doesn't boot or an alarm occurs, follow the instructions → Section "Interferences", page 65.

## 5. External connections

With their ports, Eaton's XV300 Touch Panel 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 Touch Panel, follow all instructions regarding how to wire the corresponding port/interface.

All general Directives and standards must be complied with.

## 5. External connections

### 5.1 Layout of interfaces

#### 5.1 Layout of interfaces



Figure 24: 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 interlocking
⑥ COM2	RS-485, not galvanically isolated, SUB-D plug 9-pole, UNC nuts for interlocking
⑦ CAN	CAN1, not galvanically isolated, SUB-D plug 9-pole, UNC nuts for interlocking

#### 5.1.0.1 Optional interfaces



Figure 25: XV300 Touch Panel 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 <sup>®</sup>	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



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. External connections

### 5.3 USB interfaces

#### 5.3 USB interfaces

Eaton XV300 Touch Panels 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 Touch Panel 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 26: 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 27: 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 Touch Panel 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.

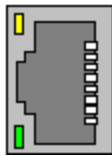


Figure 28: RJ-45 socket, 8-pole, 2 LEDs (CAT5e/6), LAN1, 10/100 Mbps



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. External connections

### 5.5 Serial interfaces for communication with PLCs or devices

#### 5.5 Serial interfaces for communication with PLCs or devices

##### 5.5.1 COM1 RS-232

The RS232- interface is not electrically isolated.


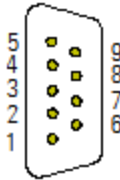
	<b>CAUTION</b>
	<b>NON-GALVANICALLY-ISOLATED INTERFACES</b>
	The XV300 may be damaged by potential differences.
▶	The GND terminals of all bus modules must be connected.
▶	Do not connect the connector to the XV300 or disconnect it without first de-energizing the system.

Table 12: Pin assignment COM1 RS-232, not galvanically isolated, SUB-D plug 9-pole, UNC nuts for interlocking

SUB-D plug	PIN	Signal	Description
<b>9-pole</b> 	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 maximum baud rate depends on the cable length

Table 13: RS-232 cable length based on baud rate

Cable length	Max. baud rate
2.5 m	115200 Bit/s
5 m	57600 Bit/s
10 m	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 Serial interfaces for communication with PLCs or devices

5.5.2 COM2 RS-485

The RS485- interface is not electrically isolated.


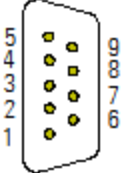
	<b>CAUTION</b>
	<b>NON-GALVANICALLY-ISOLATED INTERFACES</b>
	The XV300 may be damaged by potential differences.
	▶ The GND terminals of all bus modules must be connected.
	▶ Do not connect the connector to the XV300 or disconnect it without first de-energizing the system.

Table 14: Pin assignment COM2 RS-485, not galvanically isolated, SUB-D plug 9-pole, UNC nuts for interlocking

SUB-D plug	PIN	Signal	Description
<b>9-pole</b>  	1	n.c.	not assigned
	2	n.c.	not assigned
	3	B	Cable B
	4	n.c.	not assigned
	5	GND	Ground
	6	5 V	Output for external bus termination
	7	A	A cable
	8	n.c.	not assigned
	9	n.c.	not assigned
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.

Table 15: Specifications for RS-485 wiring

Rated cable impedance	120 Ohm
Permissible 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. External connections

### 5.5 Serial interfaces for communication with PLCs or devices

#### 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.

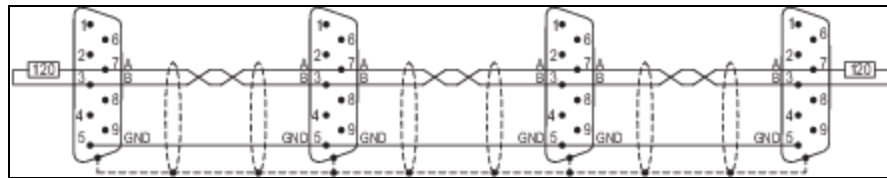


Figure 29: Bus segment with four nodes

5.6 CAN1 interface for the CANopen protocol, J1939 protocol, etc.

5.6 CAN1 interface for the CANopen protocol, J1939 protocol, etc.

The CAN1- interface is not electrically isolated.


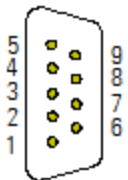
	<b>CAUTION</b>
	<b>NON-GALVANICALLY-ISOLATED INTERFACES</b>
	The XV300 may be damaged by potential differences.
	<ul style="list-style-type: none"> <li>▶ The GND terminals of all bus modules must be connected.</li> <li>▶ Do not connect the connector to the XV300 or disconnect it without first de-energizing the system.</li> </ul>

Table 16: 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	Description
<b>9-pole</b> 	1	n.c.	not assigned
	2	CAN-L	Bus line (dominant low)
	3	GND	Ground
	4	n.c.	not assigned
	5	n.c.	not assigned
	6	GND	Optional Ground
	7	CAN-H	Bus line (dominant high)
	8	n.c.	not assigned
	9	n.c.	not assigned



- nc: Pin 1, 4, 5, 8 and 9 must not be connected.
- Pin 3 (CAN-GND) and 6 (GND) are internally interconnected
- 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 17: Specifications for CAN wiring

Rated cable impedance		120 Ohm	
Permissible 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 <sup>2</sup>
		M 250	0.34 mm <sup>2</sup>
		500 m	0.75 mm <sup>2</sup>

## 5. External connections

### 5.6 CAN1 interface for the CANopen protocol, J1939 protocol, etc.

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



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.

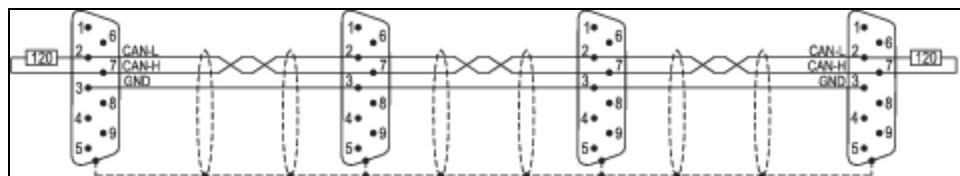


Figure 30: CAN bus segment with four nodes



## 5.7 Profibus interface

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


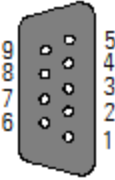
	<p><b>CAUTION</b> <b>NON-GALVANICALLY-ISOLATED INTERFACES</b></p> <p>The XV300 may be damaged by potential differences.</p> <ul style="list-style-type: none"> <li>▶ The GND terminals of all bus modules must be connected.</li> <li>▶ Do not connect the connector to the XV300 or disconnect it without first de-energizing the system.</li> </ul>
---	---

Table 18: Pin assignment for Profibus DP, not galvanically isolated, SUB-D socket 9-pole, UNC nuts for interlocking PROFIBUS interface

SUB-D socket	PIN	Signal	Description
<b>9-pole</b> 	1	n.c.	not assigned
	2	n.c.	not assigned
	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 assigned
	8	A	EIA RS 485 cable A
	9	n.c.	not assigned



n.c.: PIN 1, 2,7 and 9 must not be connected.



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

### 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) must be used.

Table 19: Specifications for Profibus wiring

Cable specifications			
Rated cable impedance			150 Ohm
Permissible impedance			135 ... 165 Ohm
Capacitance per unit length			< 30 pF/m
Loop resistance			< 100 Ohm/km
Core cross-section			≥ 0.34 mm <sup>2</sup> (22 AWG)
The maximum 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
		400 m	500 kBit/s
		1000 m	187.5 kBit/s
		1200 m	≤ 93.75 kBit/s



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

## 5. External connections

### 5.7 Profibus interface

#### 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 signal 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).

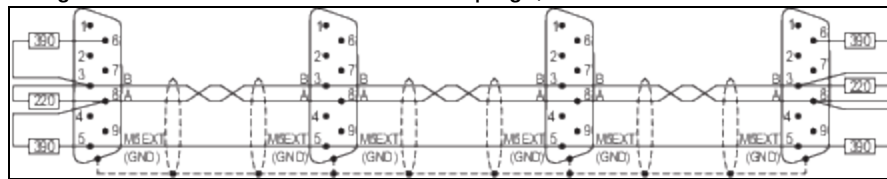


Figure 31: Profibus bus segment with four nodes



- 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 station.
- Operation without correct termination of the Profibus network can cause transfer errors.

## 5. External connections


### 5.8 XV300 Touch Panel as a SmartWire-DT® coordinator

#### 5.8 XV300 Touch Panel as a SmartWire-DT® coordinator


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

 SmartWire-DT® Module Manual MN05006002Z

Using the XSOFTE-CODESYS-2 programming tool and the PLC runtime system for XV300 with Windows CE7.

 User Manual MN048015ZU  
XSOFTE-CODESYS 2, PLC programming XV300

#### 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 32: SmartWire-DT® power connector

## 5. External connections

### 5.8 XV300 Touch Panel as a SmartWire-DT® coordinator

#### Conditions for Underwriters Laboratories Inc. (UL) certification

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<sub>DC</sub>, rated operational current 2 A, trip type Z
- or a 2 A fuse.

#### 5.8.1.1 SWD power supply voltages

The following power supplies 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.

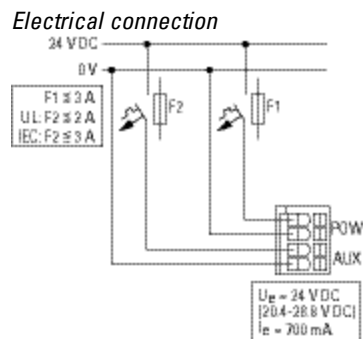



Figure 33: WAGO plug connector (view from wiring side)

Table 20: Pin assignment WAGO plug connector

Plug connector	PIN	Signal	Description
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 Touch Panel as a SmartWire-DT® coordinator

Table 21: Wiring the plug connector

	Description/Value
Terminal type:	spring-cage terminal
Cross section	0.2 - 1.5 mm <sup>2</sup> (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 22: 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 SmartWire-DT modules and the switchgear, as well as control wires for assigning addresses.

Table 23: Pin assignment for SmartWire-DT ribbon cable interface (pin header, 8-pin)

Plug connector	PIN	Signal	Configuration
8-pole  	1	+24 V DC	Contactors control voltage
	2	Chassis ground	Contactors 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

## 5. External connections

### 5.8 XV300 Touch Panel as a SmartWire-DT® coordinator

#### 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.

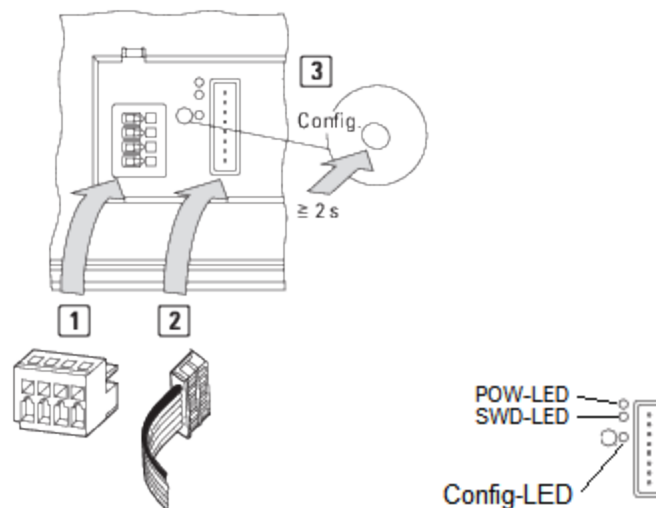


Figure 34: Commissioning SmartWire-DT® sequence

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.

## 5. External connections

### 5.8 XV300 Touch Panel as a SmartWire-DT® coordinator

- ▶ Load the PLC project onto the XV300 Touch Panel.

#### Configuration tests

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 24: 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	<ul style="list-style-type: none"> <li>• Short-circuit on the 15 V DC power supply.</li> <li>• No SmartWire-DT® module found.</li> </ul>
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	<ul style="list-style-type: none"> <li>• The physical configuration of the SmartWire-DT® network is compared with the target configuration.</li> <li>• The SmartWire-DT® modules are addressed.</li> </ul>
Green continuous light	<ul style="list-style-type: none"> <li>• The modules found in the SmartWire-DT® network match the target configuration.</li> <li>• The SmartWire-DT® network is ready for data exchange.</li> </ul>

## 5. External connections

### 5.8 XV300 Touch Panel as a SmartWire-DT® coordinator

Table 25: 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.

<b>Health</b>	<b>Description</b>
off	<ul style="list-style-type: none"><li>• No project configuration present.</li><li>• Incorrect target configuration (see LED SWD).</li></ul>
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. Interferences

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

<b>Fault</b>	<b>Cause</b>	<b>Remedy</b>
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 $\geq 1.5$ mm <sup>2</sup> , length $\leq 350$ 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

## 7. Maintenance

### 7.1 Cleaning and maintenance

The XV300 units 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 buffer time when de-energized, provided the corresponding ambient conditions and temperature are adhered, to: approx. 10 years at 25° C (77°F).

## 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 the XV300 unit from direct sunlight and other sources of UV radiation.



#### CAUTION SHORT-CIRCUIT HAZARD

If the XV300 Touch Panel 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 Touch Panel 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 Touch Panel to direct thermal radiation from heating appliances.

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

The ambient air temperature during operation must not exceed the maximum limit value:

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)
	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.

## 7. Maintenance

### 7.3 Storage, transport and disposal

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

#### 7.3.2 Disposal

	<p><b>EXPLOSION HAZARD</b> <b>LITHIUM BATTERY</b></p> <p>The lithium battery inside the XV300 may explode if handled incorrectly.</p> <p>▶ Dispose of the XV300 unit professionally.</p>
---	--



#### 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 26: Materials used XV300

Assembly part		Material characteristic
display	XV-303	Anti-glare toughened glass in plastic bezel
	XV-313	Anti-glare toughened glass without bezel
Housing		plastic material black
Battery		Lithium
		BR-2330/GNU, 3V, 255 mAh,
		Battery weight (g): 3,7
		SVHC Substance: 1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)
		Substance weight (%): 2-4

#### Materials used in the packaging

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

## Appendix

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## Appendix

### 8.1 Technical data

## 8.1 Technical data

### 8.1.1 Dimension and weight specifications

#### XV-303-70-.. Front mounting

#### 7.0" Display

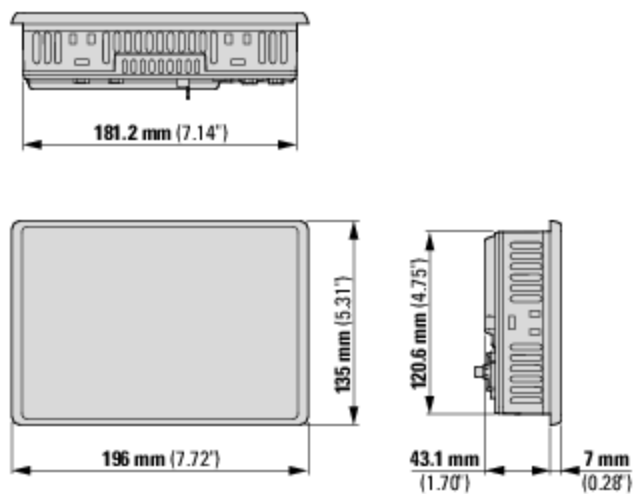


Figure 35: Dimensions for 7.0" front mounting devices in mm (inches)

width x height x depth (without connectors)	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**

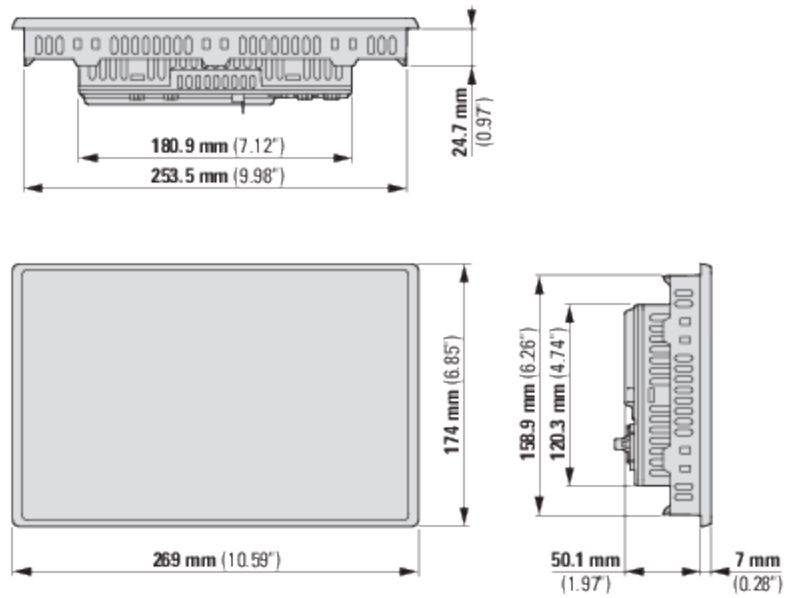


Figure 36: Dimensions for 10.1" front mounting devices in mm (inches)

Width x height x depth (without connectors)	269 mm x 174 mm x 58 mm (10.59" x 6.85" x 2.28")
Weight	1.13 kg (2.49 lbs)

**Appendix**  
**8.1 Technical data**

**Rear (panel) mounting XV-313-70-..**  
**7.0" Display**

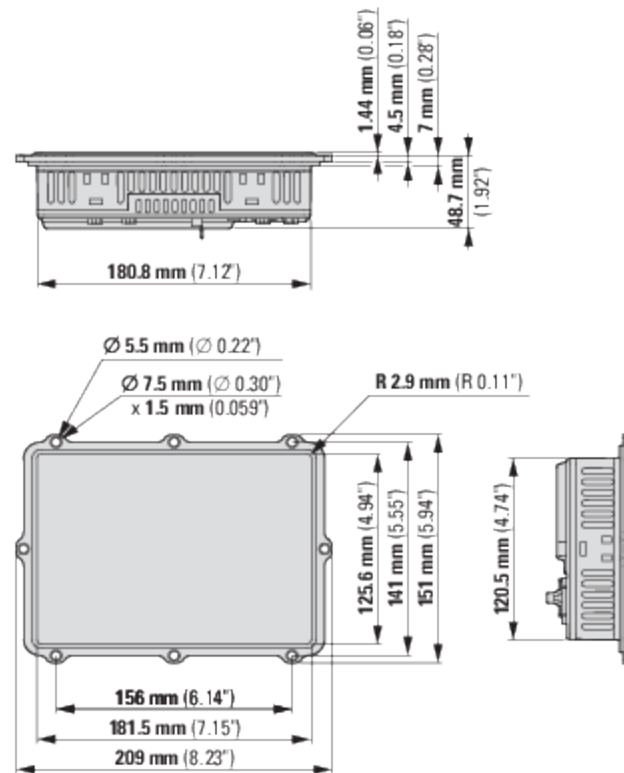


Figure 37: Dimensions for 7.0" rear (panel) mounting devices in mm (inches)

Width x height x depth without connectors	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 XV-313-10-..

10.1" Display

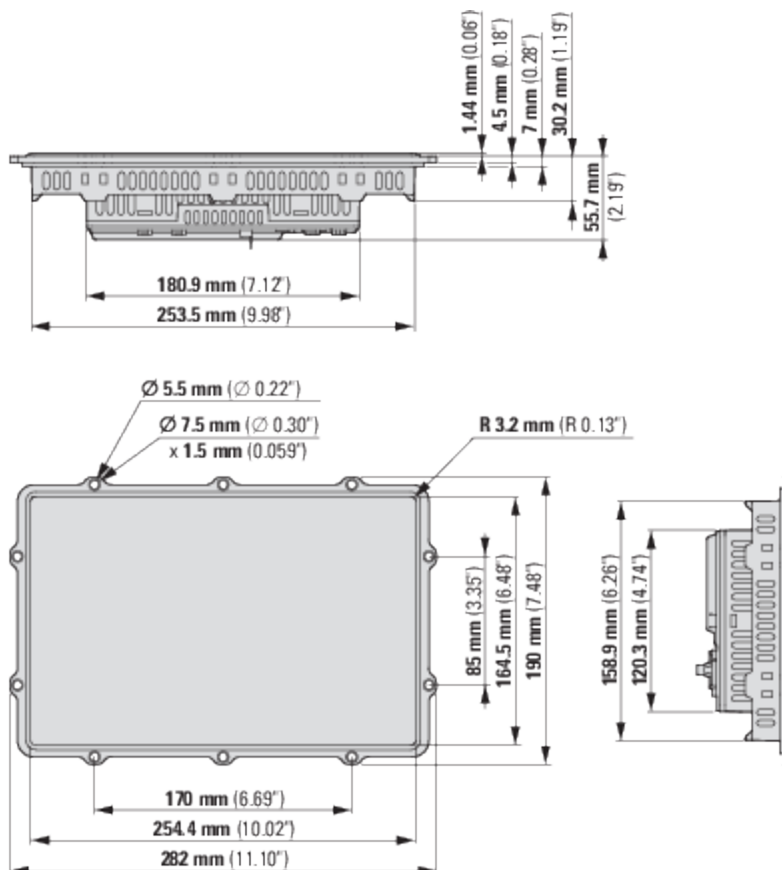


Figure 38: Dimensions for 10.1" rear (panel) mounting devices in mm (inches)

Width x height x depth  
without connectors  
Weight

282 mm x 190 mm x 58 mm (11.10" x 7.48" x 2.28")

1.21 kg (2.67 lbs)

## Appendix 8.1 Technical data

### 8.1.1.1 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.*

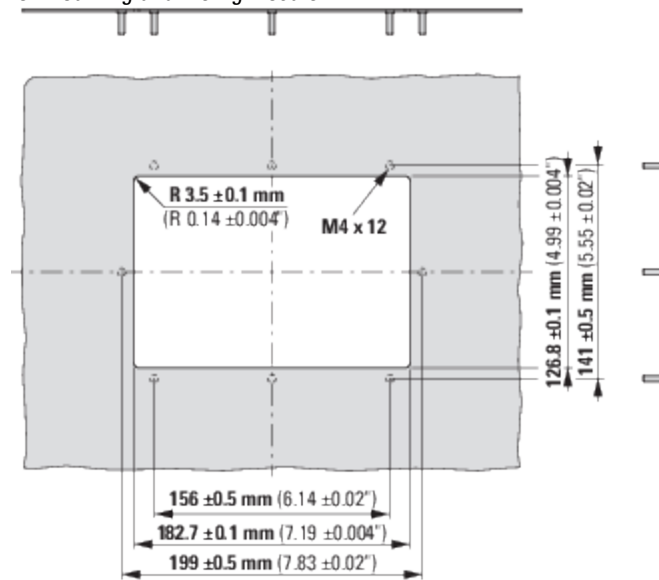


Figure 39: Installation panel for XV-313-70..

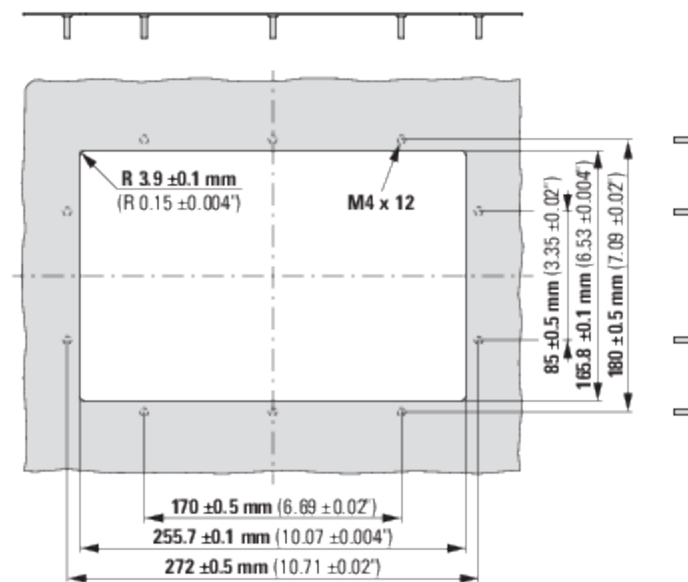


Figure 40: Installation panel for XV-313-10..

### 8.1.2 General data

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

<b>General</b>	
Housing Material	Plastic black
Front type	
	XV-303 Anti-glare toughened glass in plastic bezel
	XV-313 Anti-glare toughened glass without bezel
Degree of protection	IP65 (front), IP20 (on rear)
<b>Operation</b>	
Technology	Projected Capacitive Touch (PCT)
Touch sensor	Multi-touch 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 real-time clock	
	Battery (service life) Zero maintenance
	Backup (time at zero voltage) approx. 10 years at 25° C (77°F)
Operating System	Windows Embedded Compact 7 pro
<b>Display</b>	
Display - Type	Color display, TFT, anti-glare
Resolution	WSVGA   1024 x 600 pixels
Screen diagonal	
	XV-303-70-..., XV-313-70-.. 7.0" widescreen
	XV-303-10-..., XV-313-10-.. 10.1" widescreen
Visible screen area	
	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
Colors	16 mil.
Contrast ratio (Normally)	
	XV-303-70-...,XV-313-70-.. normally 850:1
	XV-303-10-..., XV-313-10-.. normally 500:1
Brightness	Normally 400 cd/m2
Backlight	LED   dimmable via software
Lifespan of backlight	Normally 50,000 h at 25 °C

## Appendix

### 8.1 Technical data

#### 8.1.3 Port and interface specifications

##### 8.1.3.1 Front mounting

##### 10.1" display

Table 27: 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...
<b>Quantity</b>				
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	–	–	–	–
<b>Type</b>				
Ethernet	10/100 Mbps			
USB Host	USB 2.0, not galvanically isolated			
1 x 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	–	–	–	–

**7.0" display**

Table 28: 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-...
<b>Quantity</b>				
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	–	–	–	–
<b>Type</b>				
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	–	–	–	–

## Appendix

### 8.1 Technical data

#### 8.1.3.2 Front mounting with SmartWire-DT® connection

##### 10.1" display

Table 29: 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-...
<b>Quantity</b>				
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
<b>Type</b>				
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

**7.0" display**

Table 30: Communication ports and interfaces for front mounting XV-303-70-... with SmartWire-DT® connection

<b>Type</b>	<b>XV-303-70- BE0-...</b>	<b>XV-303-70- CE0-...</b>	<b>XV-303-70- BE2-...</b>	<b>XV-303-70- CE2-...</b>
<b>Quantity</b>				
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
<b>Type</b>				
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

## Appendix

### 8.1 Technical data

#### 8.1.3.3 Rear (panel) mounting

##### 10.1" display

Table 31: Communication ports and interfaces for rear (panel) mounting XV-313-10-..

Type	XV-313-10-B00-...
Quantity	
Ethernet	1
RS-232	1
RS-485	1
CAN	1
USB host 2.0	1
USB device 2.0	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	–



**7.0" display**

Table 32: Communication ports and interfaces for rear (panel) mounting XV-313-70-..

<b>Type</b>	<b>XV-313-70-B00-...</b>
<b>Quantity</b>	
Ethernet	1
RS-232	1
RS-485	1
CAN	1
USB host 2.0	1
USB device 2.0	1
Profibus	–
SmartWire-DT	–
<b>Type</b>	
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	–

## Appendix

### 8.1 Technical data

#### 8.1.4 Information on the power supply

The following specifications apply to all XV300 units.

<b>power supply</b>	
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 under-voltage (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
fuse	Yes (fuse not accessible)
Potential isolation	no

<b>Electrical current</b>	<b>7.0" display</b>	<b>10.1" display</b>
$I_e$	$\leq 0.6$ A	$\leq 0,75$ A
$I_{TH}$	1.0 A <sup>2</sup> s	1.0 A <sup>2</sup> s

Applies only to XV-3.3-...-E-...-.. XV300 units with aSmartWire-DT<sup>®</sup> connection.

<b>Supply voltage <math>U_{Aux}</math></b>	
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
	<b>Notes</b> If contactors with a total current consumption > 3 A (for acceptance by UL: 2A) are connected, a power feeder module EU5C-SWD-PF1 or EU5C-SWD-PF2 has to be used.
Short-circuit strength	no, external protection necessary with fuse FAZ Z3
Potential isolation	no
Heat dissipation	Normally 1.0 W
Rated operating voltage of 24-V <sub>DC</sub> modules	Normally $U_{Aux} - 0.2$ V

<b>SmartWire-DT<sup>®</sup> supply voltage <math>U_{Pow}</math></b>	
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 display	LED

## Appendix

### 8.1 Technical data

<b>SmartWire-DT® interface</b>	
Potential isolation between U <sub>Pow</sub> and 15 V SmartWire-DT supply voltage	no
Rated operating voltage U <sub>e</sub>	14.5 V ± 3 % (14.0 ... 15.0 V <sub>DC</sub> )
max. current	0.7 A
	<b>Notes</b> 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 strength	yes
Module type	SWD master, coordinator
Number of SWD stations	Max. 99
Baud Rate	125 kBd   250 kBd
Address setting	Automatic
status display	SWD master LED: green   Configurations LED: red
Connections	Plug, 8-pole
plug connector	Blade terminal SWD4-8MF2

### 8.1.5 Approvals and declarations

The following specifications apply to all XV300 units.

<b>Approvals and declarations</b>		
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.	
Explosion protection	II 3D Ex tc IIIC T70°C IP6x: Zone 22, Category 3D <ul style="list-style-type: none"> <li>• IP5x for devices of the group IIIB (non-conductive dust)</li> <li>• IP6x for devices of the group IIIC (conductive dust)</li> </ul> For front mounting mandatory according to specifications built-in fastening material -XV-303-70-...: each 6 x Holding bracket with set screw -XV-303-10-...: each 10 x Holding bracket with set screw For rear (panel) mounting mandatory according to specifications screwed at all attachment positions. -XV-313-70-...: each 8 x -XV-313-10-...: each 10 x	
<b>Applied standards and directives</b>		
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 (in relation to 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»
Safety		
	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 34
Product standards		
	DIN EN 60898-1:2006-03	Electrical accessories - Circuit-breakers for over-current protection for household and similar installations
	EN 50178	Electronic equipment for use in power installations
	IEC/EN 61131-2	Programmable controllers: Equipment requirements and tests
Mechanical shock resistance	IEC/EN 60068-2-27	15g /11ms
Vibration	IEC/EN 60068-2-6	Displacement amplitude: 5–9 Hz: 3.5 mm; 9–60 Hz: 0.15 mm Acceleration amplitude: 60–150 Hz: 2 g

## Appendix

### 8.1 Technical data

Applied standards and directives		
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 33: 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	± 0 – +50 °C (+32 – +122 °F)
Storage / Transport	-20 – + 60 °C (-4 – +140 °F)
Relative humidity	Relative humidity 10 - 95 %
Condensation	non-condensing

## 8.2 Further reading



### Hardware

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

 Instruction leaflet XV-303	IL048009Z
 Instruction leaflet XV-313	IL048010Z

### Software





For more information, please refer to the following manuals:

 GALILEO 10	MN048018
 System description Windows CE 7	MN050004



### Communication

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 explain what needs to be taken into account and configured:

 Networks in Brief	MN05010009Z
 SmartWire-DT® The System Manual	MN05006002Z
 SmartWire-DT® Module Manual	MN05006001Z
 User Manual XSOFT-CODESYS 2, PLC programming XV300	MN048015ZU

### SmartWire-DT®

 SmartWire-DT® The System Manual	MN05006002Z
 SmartWire-DT® Module Manual	MN05006001Z

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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>

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# Glossary

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## IR

Infrared

## PLC

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

---

\*

## \*.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 (pre-setting).

**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](http://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, sub-networks, 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

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## **U**

### **UNC**

Unified Coarse Thread

### **User**

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

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## **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.

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