

Magelis Small Panels

HMI STO User Manual

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

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Safety Information



Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book



At a Glance

Document Scope

This manual describes how to use the Magelis HMI STO 5•• panels.

Validity Note

This documentation is valid for Vijeo Designer version 6.1 SP2 or later.

Product Related Information

 WARNING
UNINTENDED EQUIPMENT OPERATION The application of this product requires expertise in the design and programming of control systems. Only persons with such expertise should be allowed to program, install, alter, and apply this product. Follow all local and national safety codes and standards. Failure to follow these instructions can result in death, serious injury, or equipment damage.

Part I

HMI STO 5•• Panels

Overview

This part describes how to use HMI STO 5•• Panels.

What Is in This Part?

This part contains the following chapters:

Chapter	Chapter Name	Page
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Chapter 1

HMI STO 5•• Panels

Overview

This chapter describes the HMI STO 5•• Panels and connectable devices.

What Is in This Chapter?

This chapter contains the following topics:

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HMI STO 5•• Series of Panels

Introduction

The following presents the HMI STO 5•• series of HMI (Human Machine Interface) products. These products have an operating voltage of 24 Vdc. The products offered in this series have various features and benefits listed below:

- Screen size
- Screen resolution
- Screen technology and color
- Communication ports

Part Numbers

The following table describes the different HMI STO 5•• products:

Part number	Screen size	Pixel resolution	Mono/Color	Screen technology	Serial port	Ethernet port
HMI STO 501 HMI STO 511	8.9 cm (3.4 in.)	200 x 80	Monochrome with Green/ Orange/ Red backlight	STN	Yes	No
HMI STO 512	8.9 cm (3.4 in.)	200 x 80	Monochrome with White/ Pink/ Red backlight	STN	Yes	No
HMI STO 531	8.9 cm (3.4 in.)	200 x 80	Monochrome with Green/ Orange/ Red backlight	STN	No	Yes
HMI STO 532	8.9 cm (3.4 in.)	200 x 80	Monochrome with White/ Pink/ Red backlight	STN	No	Yes

STN: scan twisted neumatic, also known as passive matrix.

NOTE: The HMI STO 501 is not supported in SoMachine.

Critical Systems, Detected Alarms and Handling Requirements

Critical detected alarm indicators and system functions require independent and redundant protection hardware and/or mechanical interlocks.

If the unit for any reason becomes inoperative (for example, an inoperative backlight) it may be difficult or impossible to identify a function. Functions that may present a hazard if not immediately executed, such as emergency stop, must be provided independently of the unit. The design of the control system must take into account an inoperative unit (backlight) and that the operator is unable to control the machine or respond to detected errors using the unit.

When the power is cycled, wait at least 10 seconds before restoring the power to the HMI unit. Switching the power OFF and ON quickly can damage the unit.

WARNING

LOSS OF CONTROL

- Consider the potential failure modes of control paths in the machine control system design, such as:
 - The possibility of backlight failure,
 - Unanticipated link transmission delays or failures,
 - The operator being unable to control the machine,
 - The operator making errors in the control of the machine.
- Provide a means to achieve a safe state during and after a path failure for critical control functions such as emergency stop and overtravel stop.
- Provide separate or redundant control paths for critical control functions.
- Test individually and thoroughly each implementation of the HMI STO 5•• for correct operation before service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

WARNING

UNINTENDED EQUIPMENT OPERATION

- Do not use the unit as the only means of control for critical system functions such as motor start/stop or power control.
- Do not use the unit as the only notification device for critical alarms, such as device overheating or overcurrent.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Handling the LCD Panel

The following characteristics are specific to the LCD unit and are considered normal behavior:

- LCD screen may show unevenness in the brightness of certain images or may appear different when seen from outside the specified viewing angle. Extended shadows, or crosstalk may also appear on the sides of screen images.
- LCD screen pixels may contain black and white colored spots and color display may seem to have changed over time.
- When the same image is displayed on the screen for a long period, an after-image may appear when the image is changed. If this happens, turn off the unit, wait 10 seconds and then restart it.

NOTE: Change the screen image periodically and do not display the same image for a long period of time.

CAUTION

SERIOUS EYE AND SKIN INJURY

The liquid present in the LCD panel contains an irritant:

- Avoid direct skin contact with the liquid.
- Wear gloves when you handle a broken or leaking unit.
- Do not use sharp objects or tools in the vicinity of the LCD touch panel.
- Handle the LCD panel carefully to prevent puncture, bursting, or cracking of the panel material.

If the panel is damaged and any liquid comes in contact with your skin, immediately rinse the area with running water for at least 15 minutes.

If the liquid gets in your eyes, immediately rinse your eyes with running water for at least 15 minutes and consult a doctor.

Failure to follow these instructions can result in injury or equipment damage.

Using Touch Panel Correctly

WARNING

UNINTENDED EQUIPMENT OPERATION

- Operate the HMI STO 5•• touch panel with only one finger.
- Do not activate two or more points of the touch panel simultaneously.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

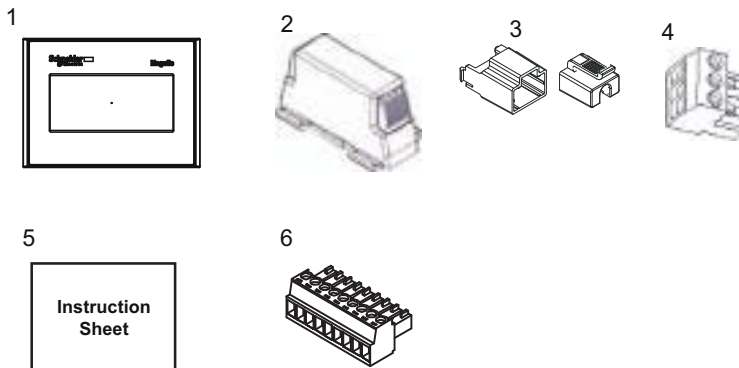
Use only one finger to select an object on the touch panel.

If the touch panel receives pressure at two or more points at the same time, an unintended object could be selected.

HMI STO 5•• Package Contents

Package Contents

Verify all items listed here are present in your package:



- 1 HMI (Human Machine Interface) unit
- 2 Spring Clip x 2
- 3 USB Standard Type A Cable Holder
- 4 Power Supply Terminal Block
- 5 Instruction sheet
- 6 COM 9-pin interface connector. Only for HMI STO 501.

Revision

You can identify the product version (PV), revision level (RL) and the software version (SV) from the unit product label.

Accessories

Optional Accessories for Main Unit

Product Number	Product Name
HMI ZS60	Set of 5 Screen Protective Sheets

Optional Accessories for Maintenance

Product Number	Product Name
HMI ZSCLP1	USB Holder for Type A Port
XBT Z3002	Spring Clips
HMI ZS50	Installation Gasket
HMI ZSCLP3	Mini-B USB Holder

Optional Accessories for Peripherals

Product Number	Product Name
BMX XCA USB H018	Mini-B USB <-> PC download cable
HMI ZSUSBB	USB Front Cable (MiniB)
HMI ZURS	USB-232C Converter Cable
HMI ZSPWO	Set of 5 Power Connectors

Serial Interface Items for HMI STO 51•

Product Number	Description
XBT Z9780 (2.5 m/8.20 ft) XBT Z9782 (10 m/32.80 ft)	Connects COM1 to Premium, Micro or Twido PLC.
XBT Z9980 (2.5 m/8.20 ft) XBT Z9982 (10 m/32.80 ft)	Connects COM1 to Modicon M340.
VW3A8306	Connects COM1 to TSXSCA62 Y-junction box.
VW3A8306R10	Connects COM1 to ATV Drives, to Hub LU9GC3 or to Fieldbus Tap TWDXCAT3RJ, TWDXCAISO.
XBT ZG939	Cable adapter COM1, RJ45.

Product Number	Description
XBT Z968 XBT Z9680 XBT Z9681	Connects COM1 port with XBTZ adapter to Premium, Micro, Twido PLC.
XBT Z9710	Connects COM1 port with XBTZ adapter to Quantum PLC.
XBT Z9711	Connects COM1 port with XBTZ adapter to Momentum PLC.
XBT Z908	Connects COM1 port with XBTZ adapter to derivation box TSXSCA62.
XBT Z938	Connects COM1 port with XBTZ adapter to ATV drives or to Hub LU9GC3 or to Fieldbus Tap TWDXCAT3RJ, TWDXCAISO.
XBT Z918	Connects COM1 port with XBTZ adapter to Premium SCY.
XBT Z988	Connects COM1 port with XBTZ adapter to Advantys STB. Use XBTZG939.
XBT Z9733	Connects COM1 to Rockwell DF1 Logix PLC.
XBT Z9734	Connects COM1 to Rockwell DH485 Logix PLC.
XBT Z9743	Connects COM1 to Omron PLC Sysmac Link series.
XBT Z9730 XBT Z9731	Connects COM1 with XBT Z adapter to Rockwell DF1 PLC.
XBT Z9732	Connects COM1 with XBT Z adapter to Rockwell DH485 PLC.
XBT Z9740	Connects COM1 with XBT Z adapter to Omron PLC Sysmac Link series.

Serial Interface Items for HMI STO 501

Product Number	Description
SR2CBL09	Connects COM1 with Zelio Logic Smart Relay.

USB Interface Items

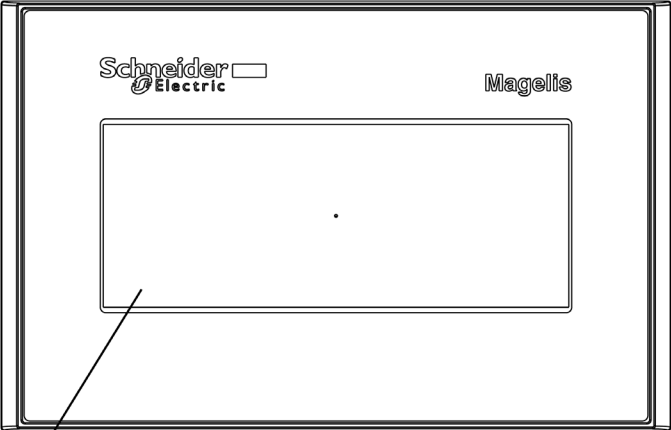
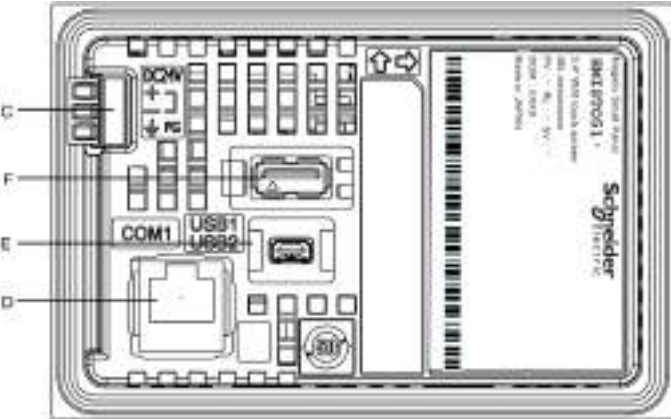
Product Number	Description
XBT ZG935	Connects the panel to a personal computer. Transfers screen data and user program.
XBT ZGUSB	Extends a USB host interface on a cabinet with waterproofing.
BMX XCAUSB018	Connects the panel to: <ul style="list-style-type: none">• a personal computer for transferring screen data and user programs• the USB terminal port of a PLC (Modicon M340)
HMI ZSUSBB	Extends a USB device interface on a cabinet with waterproofing.
HMI ZURS	Connects the panel to a serial printer.

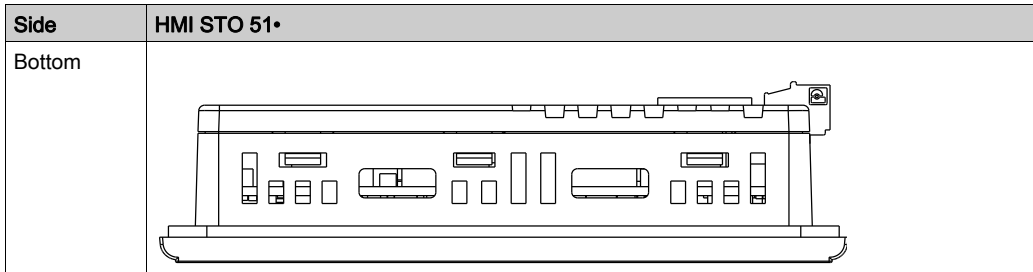
Software

Product name	Description
Vijeo Designer	Software installed on a PC for creating HMI unit project data.

Parts Identification and Functions

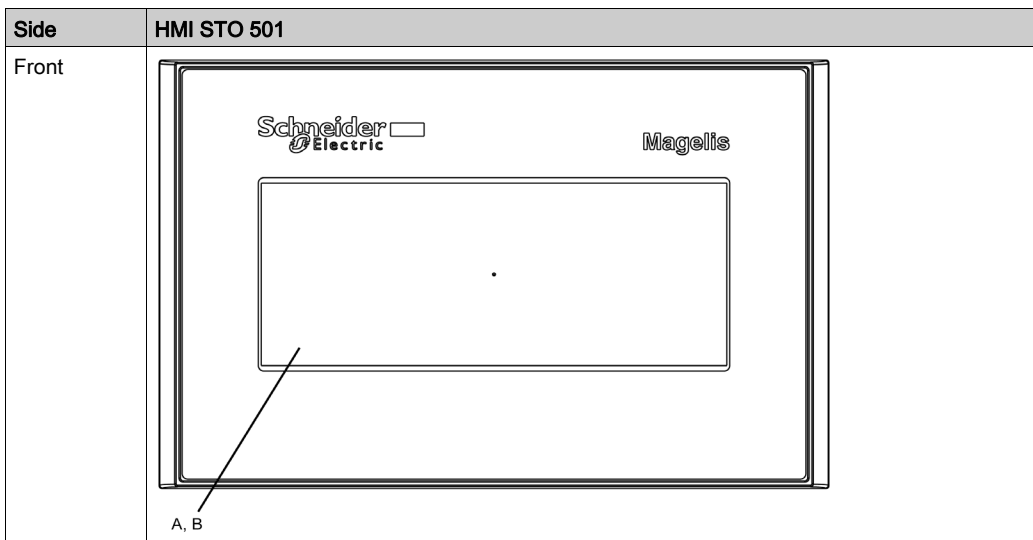
HMI STO 51•

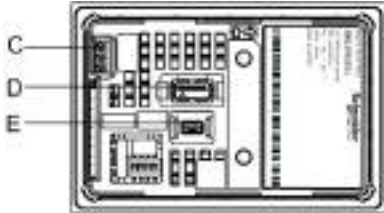
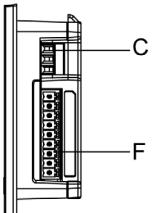
Side	HMI STO 51•
Front	 <p>A, B</p>
Rear	 <p>C</p> <p>F</p> <p>E</p> <p>D</p>



Part	Description
A	Display: displays user created screens and remote equipment variables.
B	Touch panel: performs screen change operations and sends data to the host (PLC).
C	Power input Terminal block: connects the power input and ground wires to the unit.
D	Serial Interface (host Interface 8 pin RJ45): connects a RS-232C or RS-485 (serial) cable (from the host/PLC) to the unit (COM1 port).
E	Mini-B USB port connector: connects the data transfer PC cable to the unit (USB2 port).
F	Standard A USB port connector: connects the data transfer cable or memory stick to the unit (USB1 port).

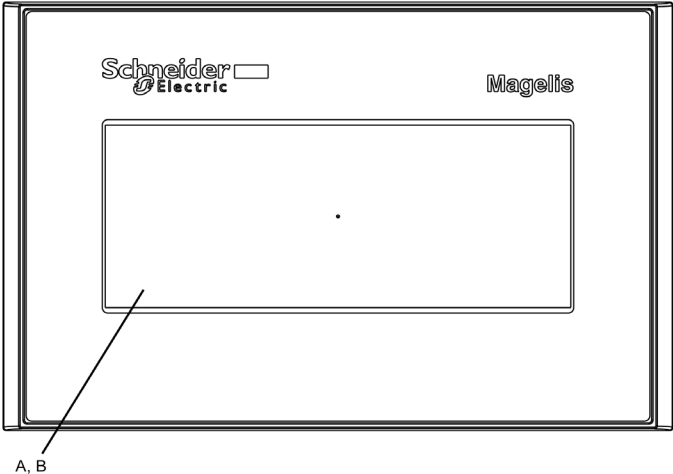
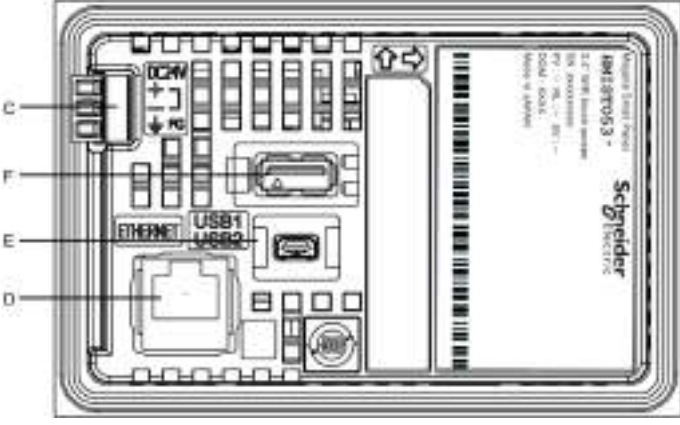
HMI STO 501

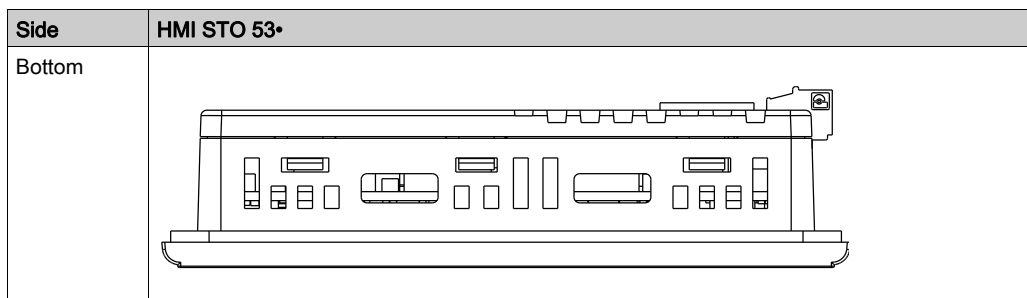


Side	HMI STO 501
Rear	
Right side	

Part	Description
A	Display
B	Touch panel
C	Power connector
D	<p>USB (Type A) interface (USB1) Complies with USB 2.0 Uses a TYPE-A connector Power supply voltage is 5 Vdc \pm 5%. The maximum communication distance is 5 m (16,40 ft).</p> <p>NOTE: If connecting a bar code reader to the product, supply power from an external source (such as a self-powered hub). If you supply power from the product, it may reset itself because it cannot supply enough power.</p>
E	<p>USB (Mini-B) interface (USB2) Conforms to USB2.0 (Mini-B) x 1. Cable length is 5 m (16,40 ft) or less.</p>
F	<p>Serial Interface (COM1) RS-232C Type: 9-pin terminal block.</p>

HMI STO 53•

Side	HMI STO 53•
Front	 <p>A, B</p>
Rear	



Part	Description
A	Display: displays user created screens and remote equipment variables.
B	Touch panel: performs screen change operations and sends data to the host (PLC).
C	Power input Terminal block: connects the power input and ground wires to the unit.
D	Ethernet Interface: connects an Ethernet cable (from the host/PLC) to the unit.
E	Mini-B USB port connector: connects the data transfer PC cable to the unit (USB2 port).
F	Standard A USB port connector: connects the data transfer cable or memory stick to the unit (USB1 port).

Certifications and Standards

Introduction

Schneider Electric submitted these products for independent testing and qualification by third-party listing agencies. These agencies have certified these products as meeting the following standards.

Agency Certifications for HMI STO 5•• Units

HMI STO 5•• units are certified by Underwriters Laboratory according to:

- UL 508 and CSA C22.2 n°142 for Industrial Control Equipment.
- ANSI/ISA - 12.12.01 and CSA C22.2 n°213 (for Electrical Equipment for Use in Class I, Division 2 Hazardous Locations) certifications are ongoing, please refer to product label.

ATEX certification by INERIS is ongoing, please refer to product label.

The HMI STO 5•• units are designed to comply to merchant navy rules.

For detailed information, contact your local distributor or see catalog & marking on the product.

Hazardous Substances

HMI STO 5•• units are designed for compliance with:

- WEEE, Directive 2002/96/EC
- RoHS, Directive 2002/95/EC
- RoHS China, Standard SJ/T 11363-2006
- REACH: Regulation N°1907/2006 on the Registration, Evaluation, Authorisation of Chemicals

UL Conditions of Acceptability and Handling Cautions for HMI STO 5•• Units

The HMI STO 5•• units are suitable for use in hazardous locations in accordance with Class I, Division 2 standards, refer to markings. All relevant local, state, and regional codes must be followed.

CE Label

The HMI STO 5•• units comply with IEC61131-2 to conform to the following Directive for applying the CE label:

- 2004/108/EC EMC Directive.

WARNING

RISK OF EXPLOSION IN HAZARDOUS LOCATIONS

- Verify that the power, input and output (I/O) wiring are in accordance with Class I, Division 2 wiring methods.
- Do not substitute components that may impair compliance to Class I, Division 2.
- Do not connect or disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
- Securely lock externally connected units and each interface before turning on the power supply.
- The USB2 connector is for temporary connection only during maintenance and setup of the device. Do not use, connect, or disconnect USB2 cable unless area is known to be non-hazardous.
- Potential electrostatic charging hazard: wipe the front panel of the terminal with a damp cloth before turning ON.
- Use an insulated stylus to activate the touchscreen.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

For HMI STO 501 and HMI STO 51•, interfaces are: COM1 and USB1.

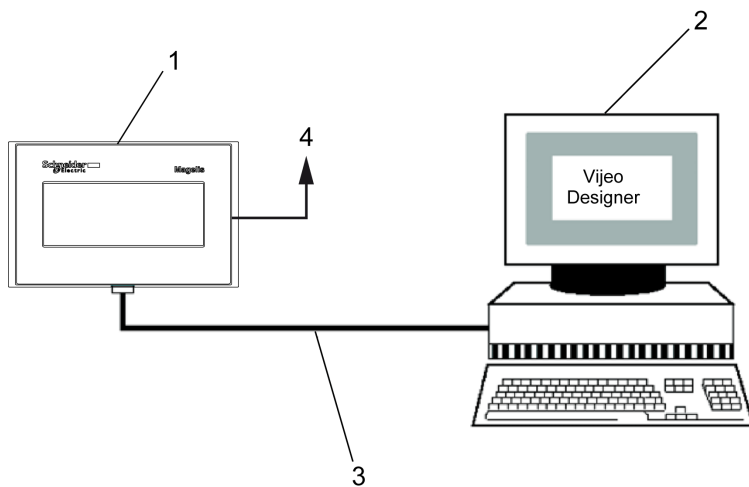
For HMI HMI STO 53•, interfaces are: ETHERNET and USB1.

System Design

Introduction

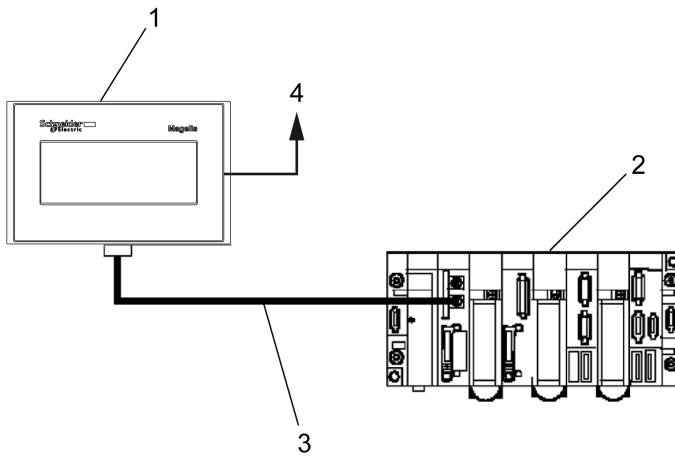
The following diagrams represent the main selection of equipment connectable to the units.

HMI STO 5•• Edit Mode Peripherals



- 1 HMI STO 5••
- 2 Personal computer
- 3 USB transfer cable
- 4 To Ethernet network, available only for HMI STO 53•

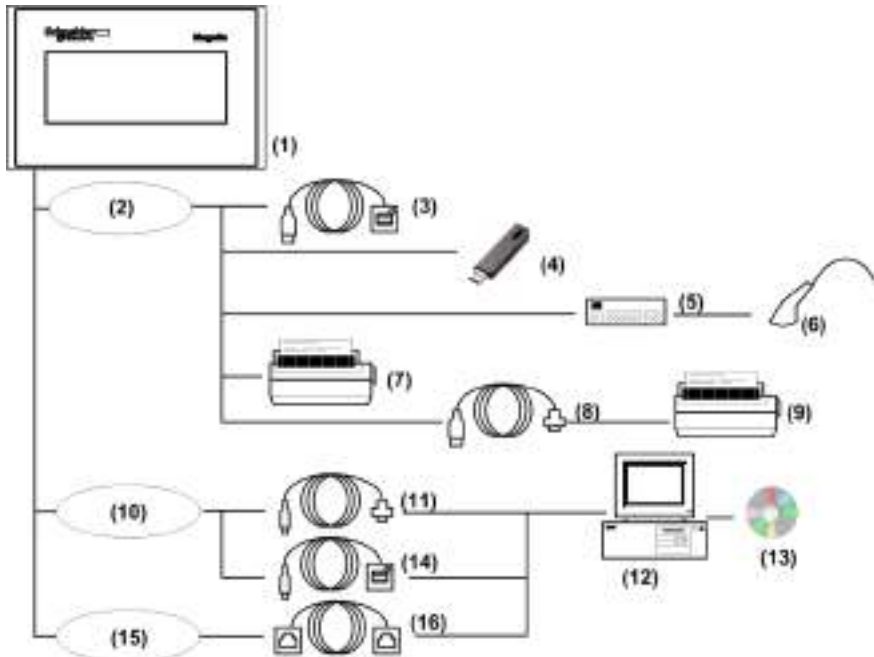
HMI STO 5•• Run Mode Peripherals



- 1 HMI STO 5••
- 2 PLC
- 3 Serial interface cable, available only for HMI STO 501 or HMI STO 51•
- 4 To Ethernet network, available only for HMI STO 53•

Connecting Magelis HMI STO 5•• units to an external device

The following diagrams represent the main selection of equipment connectable to the HMI STO 5•• units.



- 1 HMI STO 5••
- 2 USB HOST interface (TYPE-A)
- 3 USB Front Cable (A) 1 m (3.28 ft) **XBT ZGUSB**
- 4 USB Memory
- 5 USB HUB (Self Power Only)
- 6 Barcode Reader
- 7 USB Printer
- 8 USB-232C Converter Cable 0.5 m (1.64 ft) **HMI ZURS**
- 9 Serial Printer
- 10 USB DEVICE interface (TYPE-MiniB)
- 11 Download Cable **BMX XCA USB H018**
- 12 PC
- 13 Vijeo-Designer
- 14 USB Front Cable **HMI ZSUSBB**
- 15 Ethernet interface
- 16 Ethernet Cable, available only for HMI STO 53•

Chapter 2

Specifications

Overview

This chapter presents the HMI STO 5•• specifications.

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
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2.2	Functional Specifications	33
2.3	Interface Specifications	37
2.4	Dimensions	42

Section 2.1

General Specifications

General Specifications

Electrical Specifications

The following table shows the electrical specifications of HMI STO 5••:

Rated Input Voltage	Input Voltage Limits	Acceptable Voltage Drop	Power Consumption	In-Rush Current	Voltage endurance between power terminal and frame ground (FG)	Insulation Resistance between power terminal and FG
24 Vdc	19.2...28.8 Vdc	≤ 3 ms	≤ 5 W	≤ 30 A	1000 Vac 20 mA for 1 minute	10 MΩ or higher at 500 Vdc

Environmental Specifications

The following table shows the environmental specifications of HMI STO 5••:

	Specification	Value
Physical Environment	Ambient operating temperature (cabinet interior and panel face)	0...+50 °C (32...122 °F)
	Storage temperature	-20...+60 °C (-4...140 °F)
	Operating humidity	10...90 %RH (Non-condensing, wet bulb temperature 39 °C (102.2 °F) or less)
	Storage humidity	10...90 %RH (Non-condensing, wet bulb temperature 39 °C (102.2 °F) or less)
	Air purity (dust)	≤ 0.1 mg/m ³ (10 ⁻⁷ oz/ft ³) (non-conductive levels)
	Pollution degree	Pollution degree 2
	Corrosive gases	Free of corrosive gases
	Atmospheric endurance	800...1,114 hPa (2000 m (6,561 ft) or lower)

	Specification	Value
Mechanical Environment	Vibration immunity (operating)	IEC 61131-2 1gn 5...150Hz (max. 3.5 mm (0.13 in.))
	Protection (front panel)	IP 65 - (IEC 60529) Enclosure type, 4X indoor use with spring clips
	Protection structure	Type 4X indoor, installed on a panel (flat surface)
	Protection (rear panel)	IP 20 - (IEC 60529)
	Shock immunity (operating)	IEC 61131-2 15gn 11 ms
	Marine application IACS E10	0.7 gn 3...100 Hz (max.1 mm (0.04 in.))
Electrical Environment	Noise immunity	Noise voltage: 1000 Vp-p Pulse width: 1 µs Rising time: 1 ns
	High Energy Surges	1 kV CM, 0.5 kV DM on DC power supply 1 kV CM on shielded cables
	Electrical fast transient burst	2 kV CM, 2 kV DM on DC power supply. 1 kV on shielded cables
	Radiated radio frequency electromagnetic field	10 V/m / 80 MHz to 2.7GHz Sinus amplitude modulated 80 % 1 kHz + Internal clock frequency
	Electrostatic Discharge Immunity	EN 61000-4-2 Level 3 6 kV direct contact 8 kV air contact
CM Common Mode DM Differential Mode		

Structural Specifications

The following table shows the structural specifications of HMI STO 5••:

ITEM		Catalog Specifications
Installation requirement	Grounding	D type grounding (SG-FG connected)
	Protection structure	UL50 TYPE4X/13 (1) (for the front surface when installed on a flat surface of a type 4X (Indoor Use only) or type 13 Enclosure): <ul style="list-style-type: none"> ● Type: all-in-one ● Installation: panel mounted
	Cooling method	Natural air circulation
	Weight	0.2 kg or less (main unit only)
	External dimensions (W x H x D)	117 x 78 x 28 mm (4.60 x 3.07 x 1.10 in.)
	Panel cut size (W x H)	105 × 66 mm (4.13 × 2.59 in.) (2)
Color	Front bezel: dark gray Rear bezel: light gray	
Material	PC/PBT	
(1): Only when using spring-clips (2): Dimension tolerance +1/-0 mm (+0.039/-0 in.), R3 or less Installation panel thickness: from 1.5 to 6.0 mm (0.059 to 0.236 in.).		

Section 2.2

Functional Specifications

Overview

This section presents the HMI STO 5•• functional specifications of the display, memory and interfaces.

What Is in This Section?

This section contains the following topics:

Topic	Page
Display	34
Memory, Clock, and Touch Panel	36

Display

Display Specifications

The following table shows the display specifications of HMI STO 5••:

Items	HMI STO 5•1	HMI STO 5•2
Type	Monochrome LCD	
Resolution (pixels)	200 x 80	
Active display Area (W x H)	79.985 x 31.985 mm (3.149 x 1.259 in.)	
Colors	16 levels of gray Text blinking	
Backlight	LED backlight: green/orange/red	LED backlight: white/pink/red
	Life cycle: hours before dimmed to 50% brightness. Environment temperature = 25°C (77°F):	
	<ul style="list-style-type: none"> ● White: 50,000 hours ● Green: 50,000 hours ● Red: 10,000 hours 	
	Non exchangeable	
	LED ON / OFF control, adjustable screensaver activation time When the backlight is OFF, 12.8% of power consumption is saved	
Contrast adjustment	8 levels of adjustment available via touch panel in the configuration menu.	
Brightness adjustment	16 levels of adjustment available via touch pane in the Configuration menu.	
Brightness	<ul style="list-style-type: none"> ● White LED: 360 cd/m² (33 cd/ft²) max. ● Green LED: 290 cd/m² (27 cd/ft²) max. ● Red LED: 70 cd/m² (7 cd/ft²) max. 	
View angle	<ul style="list-style-type: none"> ● 40 degrees: left, right ● 30 degrees: up ● 20 degrees: down (test cond: contrast ratio > 2)	
System embedded language character sets	ASCII: (Code page 850) alphanumeric (including european characters), Chinese: (GB2312-80 codes) simplified chinese fonts, Japanese: ANK 158, Kanji: 6,962 (JIS Standards 1 & 2) (including 607 non-kanji characters), Korean: (KSC5601 - 1992 codes) hangul fonts, Taiwanese: (Big 5 codes) traditional chinese fonts,	

Items	HMI STO 5•1	HMI STO 5•2
Character sizes	8 x 8, 8 x 16, 16 x 16 and 32 x 32 pixels fonts NOTE: The display font differs depending on the language or the size selected.	
Font sizes	Width can be expanded 1 to 8 times. Height can be expanded 1/2 and 1 to 8 times.	
8 x 8 pixels	25 characters per row x 10 rows	
8 x 16 pixels	25 characters per row x 5 rows	
16 x 16 pixels	12 characters per row x 5 rows	
32 x 32 pixels	6 characters per row x 2 rows	

Memory, Clock, and Touch Panel

Memory

The following table shows the memory specifications of HMI STO 5••:

Items	Specification
Application flash	16 MB
Data backup in flash	128 KB
Application run DRAM	32 MB

Memory Back-up Management in Flash

Detected alarms data are saved:

- automatically every hour in the back-up memory.
- upon user request through Vijeo Designer application design.

Clock

Variations in operating conditions can cause a clock shift from -380 to +90 seconds per month.

Touch Panel

The following table shows the touch panel specifications of HMI STO 5••:

Items	Specification
Type	Analog resistance film type (Metal Tab, Golden Plated)
Positioning Accuracy	2.0 % or lower
Response Time (Scan time)	36 ms or lower
Lifetime	1 million touches or more

Section 2.3

Interface Specifications

Overview

This section presents the interface specifications of the HMI STO 5•• units.

What Is in This Section?

This section contains the following topics:

Topic	Page
Interface Specifications	38
Specifications of Serial Interface COM1	40

Interface Specifications

Serial Interface COM1

The following table describes the serial interface COM1 of HMI STO 51• units:

Interface	Description
Serial interface COM1 RJ45	
Asynchronous Transmission	RS-232C / RS-485
Data Length	7 or 8 bits
Stop Bit	1 or 2 bits
Parity	None, odd or even
Data Transmission Speed	2,400 to 115,200 bps
Max. Transmission Distance	RS-232C 15 m (49.21 ft) / RS-485 1200 m (3,937 ft) at 100 kbps

The following table describes the serial interface COM1 of HMI STO 501 unit:

Interface	Description
Serial interface COM1 9-pin connector	
Asynchronous Transmission	RS-232C
Data Length	7 or 8 bits
Stop Bit	1 or 2 bits
Parity	None, odd or even
Data Transmission Speed	2,400 to 115,200 bps
Max. Transmission Distance	RS-232C 15 m (49.21 ft)

USB1 Interface and Memory Card (USB peripherals)

The following table describes the USB1 Interface and Memory Card of HMI STO 5•• units:

Interface	Description	
HOST Interface		
Transmission Speed	High speed	480 Mbps
	Full speed	12 Mbps
	Low speed	1.5 Mbps
Max. Transmission Distance	5 m (16.40 ft) at 12 Mbps	
Connector	USB Type-A V2.0	

USB2 Interface and Memory Card (application download)

The following table describes the USB2 Interface and Memory Card of HMI STO 5** units:

Interface		Description
Device Interface		
Transmission Speed	High speed	480 Mbps
	Full speed	12 Mbps
	Low speed	1.5 Mbps
Max. Transmission Distance		5 m (16.40 ft) at 12 Mbps
Connector		USB Type-MiniB V2.0

Ethernet Interface

The HMI STO 53• comes equipped with an **IEEE802.3** compliant Ethernet interface. This Ethernet port **10BASE-T/100BASE-TX** is used either for application download or Ethernet communication.

The following table describes the LED colors and status for the Ethernet connector of HMI STO 53• units:

LED	Contents
Green 1	Link state
Green 2	Activity

Specifications of Serial Interface COM1

Introduction

This interface is used to connect the HMI STO 5•• to remote equipment via an RS-232C or RS-485 cable. The connector used is a RJ45-8 pin type connector.

When using a long PLC cable to connect the unit, a difference of electric potential can be observed between the cable and the unit, even if both are connected to ground.

The serial port is not isolated. The SG (signal ground) and the FG (frame ground) terminals are connected inside the unit.

NOTE: When setting up RS-485 communication, the cable diagram for some equipment may require polarization on the terminal side. This terminal does not require any special setting as it handles polarization automatically.

DANGER

ELECTRIC SHOCK

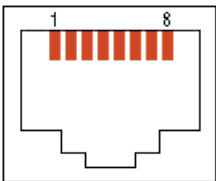
When using the SG terminal to connect an external device to the unit:

- Verify that a short-circuit loop is not created when you set up the system.
- Connect the #8 SG terminal to remote equipment when the host (PLC) unit is not isolated. Connect the #8 SG terminal to a known reliable ground connection to reduce the risk of damaging the RS-232C/RS-485 circuit.

Failure to follow these instructions will result in death or serious injury.

Serial Interface COM1

The following table describes the RJ45-8 pin connector on the HMI STO 5•• units:

Pin Connection	Pin	Signal Name	Direction	Meaning
	1	RXD	Input	Receive Data (RS-232C)
	2	TXD	Output	Send Data (RS-232C)
	3	Not connected	-	-
	4	D1	Output/Input	Transfer Data (RS-485)
	5	D0	Output/Input	Transfer Data (RS-485)
	6	RTS	Output	Request To Send
	7	Not connected	-	-
	8	SG	-	Signal Ground

RS-232C Type

The following table describes the 9-pin COM interface connector on the HMI STO 5••:

RS-232C			
Label	Signal Name	Direction	Meaning
CI	CI(RI)	Input	Called status display
CD	CD	Input	Carrier detect
CS	CS(CTS)	Input	Send possible
RS	RS(RTC)	Output	Request to send
SG	SG	-	Signal ground
DR	DR(DSR)	Input	Data set ready
ER	ER(DTR)	Output	Data terminal ready
RD	RD(RXD)	Input	Receive data
SD	SD(TXD)	Output	Send data

Any excessive weight or stress on communication cables may cause a disconnection and unintended equipment operation.

CAUTION

LOSS OF COMMUNICATION

When using HMI STO 5••:

- All connections to the communication ports on the bottom and sides of the unit must not put excessive stress on the ports.
- Securely attach communication cables to the panel or cabinet.
- Use only RJ45 cables with a locking tab in good condition.

Failure to follow these instructions can result in injury or equipment damage.

Section 2.4

Dimensions

Overview

This section presents the dimensions of HMI STO 5•• units.

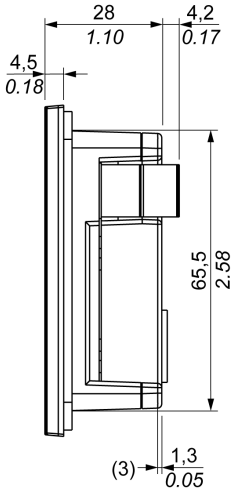
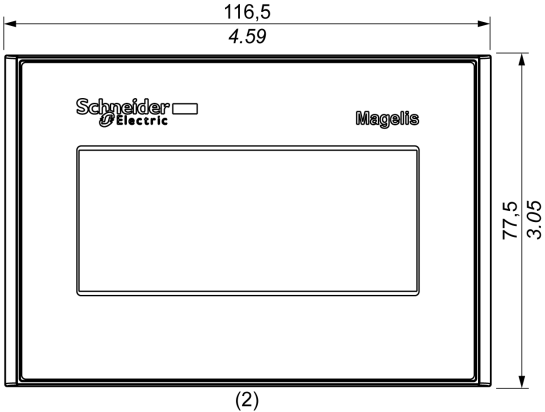
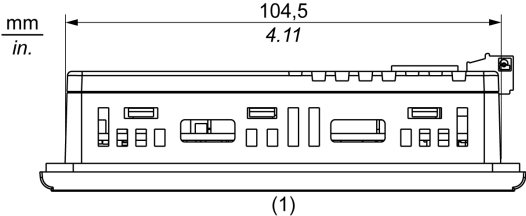
What Is in This Section?

This section contains the following topics:

Topic	Page
HMI STO 5•• Dimensions	43
Panel Cut-Out Dimensions	46
Installation Fasteners	47

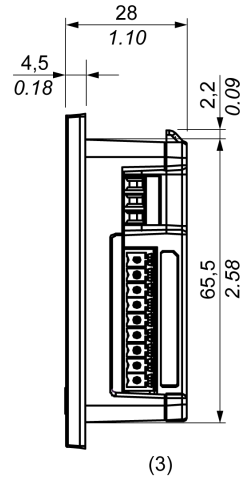
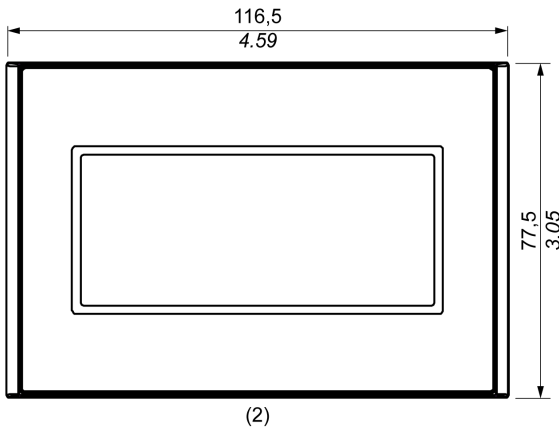
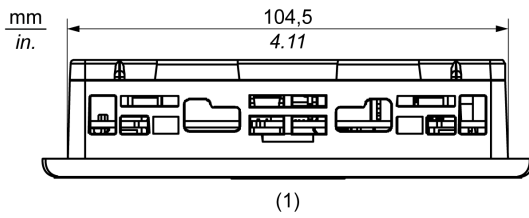
HMI STO 5•• Dimensions

HMI STO 51•/53• Dimensions



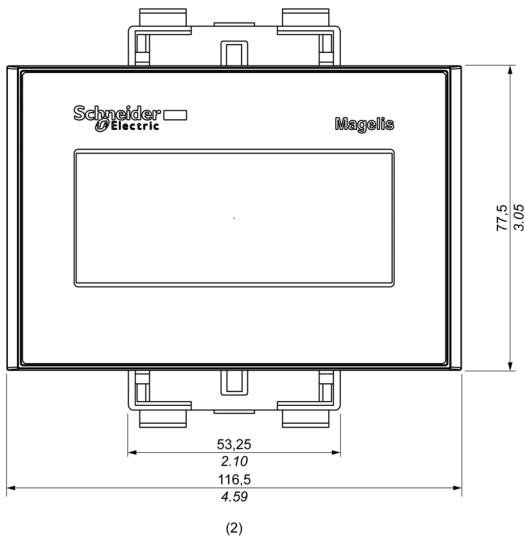
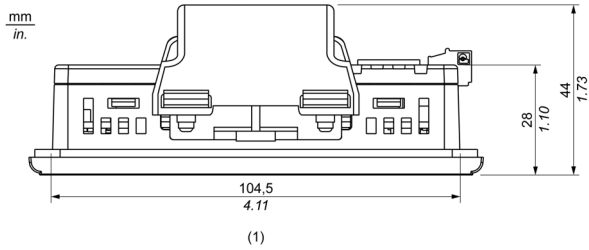
- (1) Top
- (2) Front
- (3) Right Side

HMI STO 501 Dimensions



- (1) Top
- (2) Front
- (3) Right Side

Dimensions with Spring Clips

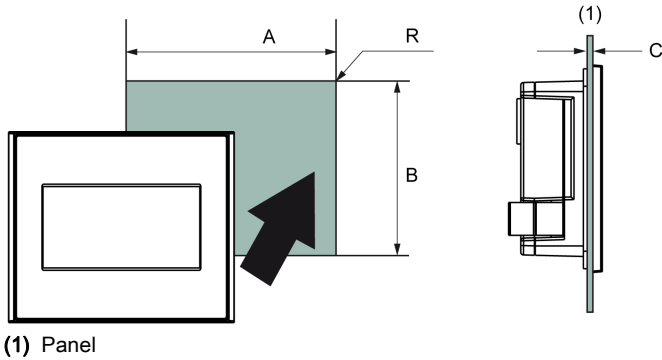


- (1) Top
- (2) Front

Panel Cut-Out Dimensions

Inserting a HMI STO 5••

Create a panel cut-out and insert the unit into the panel from the front. The following illustration shows the panel cut-out for a HMI STO 5•• units:

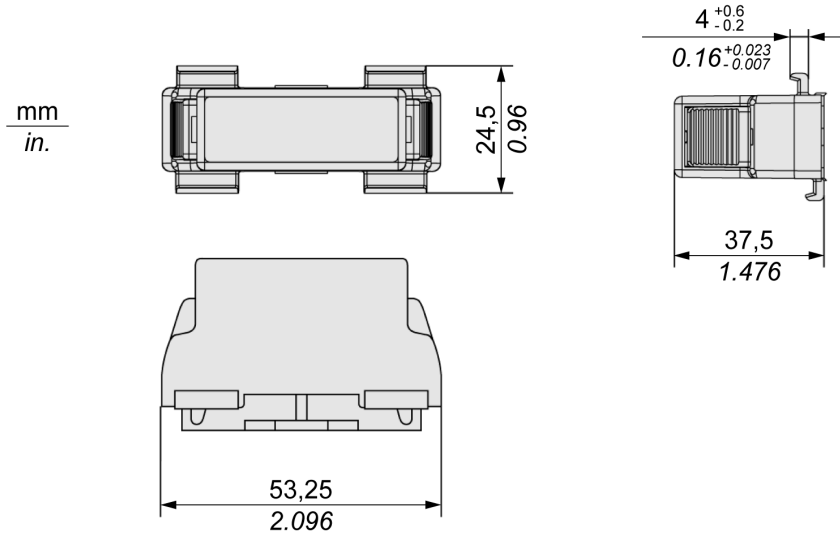


Dimensions

Unit	A (mm)	A (in.)	B (mm)	B (in.)	C Spring Clips	R
HMI STO 5••	+1 105 -0	+0.04 4.13 -0	+1 66 -0	+0.04 2.59 -0	1.5...6.0 mm (0.059...0.236 in.)	2.0...3.0 mm (0.078...0.118 in.)

Installation Fasteners

Spring Clip Dimensions



Chapter 3

Installation and Wiring

Overview

This chapter describes the installation procedures and the wiring principles for HMI STO 5••.

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
3.1	Installation	50
3.2	Wiring Principles	56
3.3	USB Port	64
3.4	Ethernet Cable Connector	79

Section 3.1

Installation

Installation Procedures

Introduction

Before installing the unit into a cabinet or panel, read the instructions below.

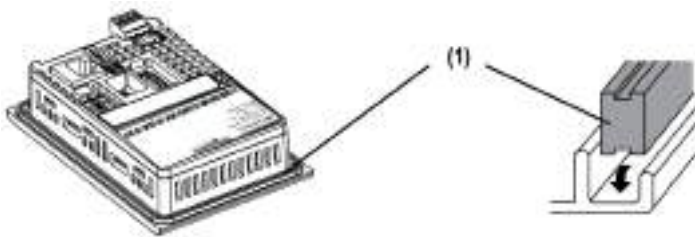
The installation gasket and installation fasteners (screw installation fasteners or spring clips) are required when installing the unit.

Mount the terminal in an enclosure that provides a clean, dry, robust, and controlled environment (IP65 enclosure).

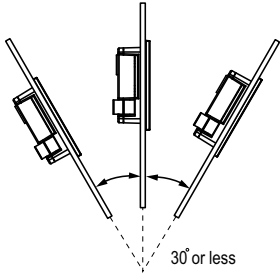
NOTE: An old gasket can lose its dust and drip resistance. Changing the gasket once a year or when scratches or dirt becomes visible is recommended.

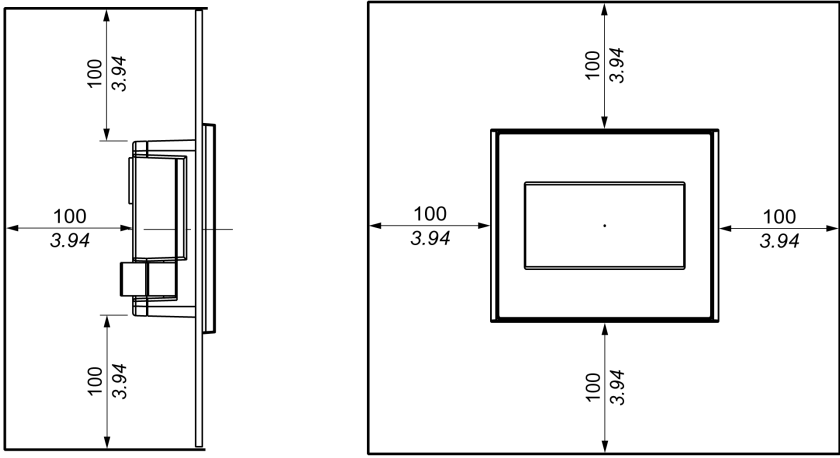
Gasket Setup Requirements

The gasket maintains the protection ratings (IP65) of the unit and prevents vibrations.

Step	Action
1	Before installing the unit into a cabinet or panel, check that the gasket is securely attached to the unit.
2	Insert the joint only in the straight sections of the groove at the bottom of the product. Inserting the joint incorrectly can rip the installation gasket.
3	For a sufficient level of moisture resistance, verify that the gasket is inserted into the panel bottom face as shown in the following illustration:  (1) Gasket

Panel Setup Procedure

Step	Action
1	Check that the surface of the panel or the cabinet is flat, in good condition and has no jagged edges. Metal reinforcing strips may be attached to the inside of the panel, near the panel cut-out, to increase the rigidity of the panel.
2	The panel thickness should be between 1.6 mm (0.06 in.) and 6 mm (0.23 in.).
3	Verify that the ambient operation temperature and humidity are within their specified ranges. (When installing the unit in a cabinet or enclosure, the ambient operation temperature is the cabinet or enclosure internal temperature.)
4	Verify that the heat from the surrounding equipment does not cause the unit to exceed its standard operating temperature.
5	<p>When installing the unit in a slanted panel, the panel face must not incline more than 30°, the ambient temperature must not exceed 40 °C (104 °F):</p>  <p>If necessary, use forced air cooling (fan, A/C) to ensure that the ambient operating temperature is 40 °C (104 °F) or below.</p>
6	When installing the unit vertically, position the unit so that the power plug is also vertical.
7	When installing the unit in enclosure type 4 compliant environment, use only the installation fasteners supplied with the unit.

Step	Action
8	<p>For easier maintenance, operation and improved ventilation, install the unit at least 100 mm (3.94 in.) away from adjacent structures and other equipment:</p> <p><u>mm</u> <i>in.</i></p> 

Installation with Spring Clips

CAUTION

SPRING LOADED MECHANISM

Do not release the spring clip mechanism near your face.

Failure to follow these instructions can result in injury or equipment damage.

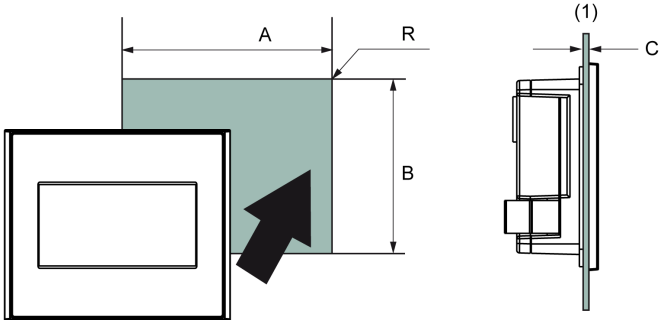
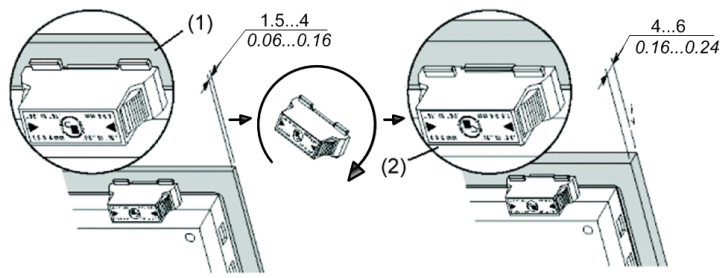
CAUTION

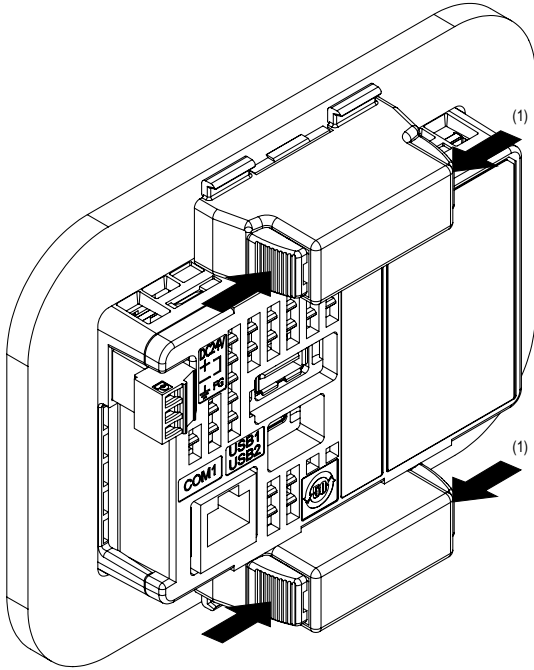
TERMINAL UNSTEADY WHEN UNSECURED

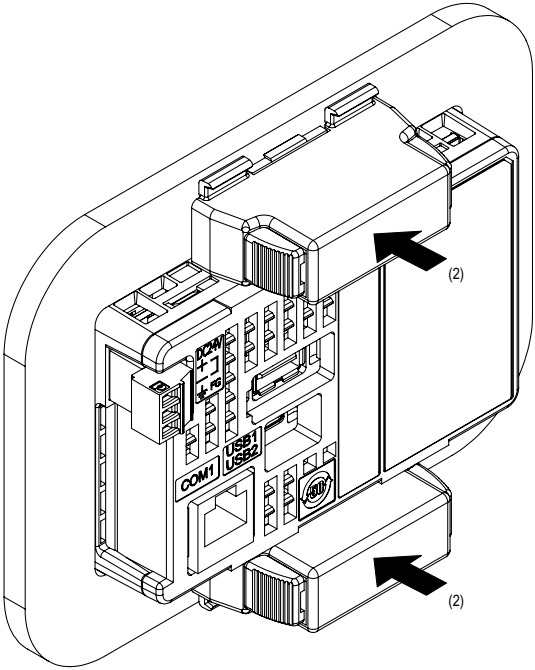
Stabilize the terminal in the panel cut-out while you are installing or removing the spring clips.

Failure to follow these instructions can result in injury or equipment damage.

Use the following procedure to install a unit:

Step	Action
1	Place the unit on a clean and level surface with the display panel facing downward.
2	Check that the unit's installation gasket (<i>see page 50</i>) is seated securely into the gasket's groove, which runs around the perimeter of the panel's frame.
3	Create the correct sized opening required to install the unit, using the Panel Cut-out Dimensions (<i>see page 46</i>)
4	<p>Insert the unit into the panel cut-out:</p>  <p>(1) Panel A 105 mm (4.13 in.) B 66 mm (2.59 in.) C From 1.5 to 6.0 mm (0.059 to 0.236 in.) R From 2.0 to 3.0 mm (0.078 to 0.118 in.)</p> <p>See Panel Cut-out Dimensions (<i>see page 46</i>).</p>
5	<p>Adjust the spring clips for the panel thickness by turning it over:</p> <ul style="list-style-type: none"> • 1.5 mm (0.059 in.) ≤ panel thickness ≤ 4 mm (0.157 in.) (position 1), • 4 mm (0.157 in.) ≤ panel thickness ≤ 6 mm (0.236 in.) (position 2). <p>$\frac{\text{mm}}{\text{in.}}$</p>  <p>(1) Position 1 (2) Position 2</p>

Step	Action
6	<p data-bbox="322 203 1214 251">Lock the spring clips by pressing simultaneously on the top and the bottom of the clip with two fingers.</p>  <p data-bbox="322 941 425 966">(1) CLICK</p>

Step	Action
7	<p data-bbox="353 203 1248 251">To remove the spring clips, unlock the spring clips by pressing the back of the clip until a click is heard:</p>  <p data-bbox="353 941 466 966">(2) CLACK</p>

Section 3.2

Wiring Principles

Overview

This section presents HMI STO 5•• wiring principles.

What Is in This Section?

This section contains the following topics:

Topic	Page
Connecting the Power Cord	57
Connecting the Power Supply	60
Grounding	62

Connecting the Power Cord

Introduction

Follow these instructions when supplying power to the unit:

- When the frame ground (FG) terminal is connected, verify the wire is grounded. Not grounding the unit can result in excessive Electromagnetic Interference (EMI). Grounding is required to meet EMC level immunity.
- The shield ground (SG) and FG terminals are connected internally in the unit.
- Remove power before wiring to the power terminals of the unit.
- The unit uses only 24 VDC power. Using any other level of power can damage both the power supply and the unit.
- Since the unit is not equipped with a power switch, connect a power switch to the unit's power supply.
- Ground the FG terminal.

Power Cord Preparation

Before using your power cord verify the ground wire is the same gauge or heavier than the power wires.

⚠ WARNING

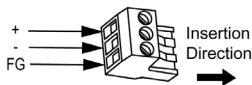
SHORT CIRCUITS, FIRE, OR UNINTENDED EQUIPMENT OPERATION

Use a power cord that meets the following requirements:

- Uses copper solid or stranded wires.
- Use D25CE/AZ5CE cable ends to avoid short circuits.
- Uses wires that are 0.2 to 1.5 mm² (24 - 16 AWG).
- Uses wires with a temperature rating of 75°C (167°F).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

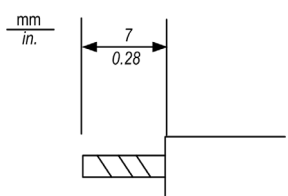
Power Plug Illustration



Connection	Wire
+	24 V
-	0 V
FG	Grounded terminal connected to the unit chassis.

How to connect the Power Cord

The following table explains how to connect the power plug:

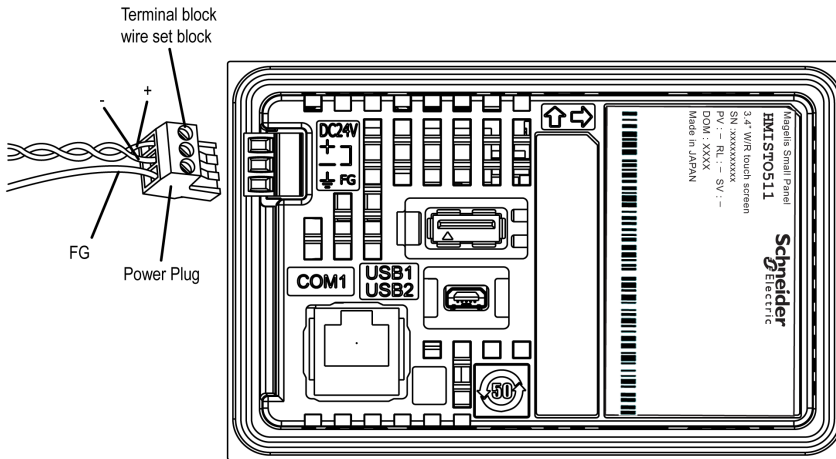
Step	Action
1	Check the rated voltage, and remove the sticker on the power connector that reads 24 Vdc
2	Remove the power cord from the power supply.
3	Remove the power plug from unit.
4	Remove 7 mm (0.28 in.) of the vinyl cover of each of the power cord's wires. 
5	If using stranded wire, twist the ends. Tinning the ends with solder reduces risk of fraying and enhances electrical transfer.
6	Connect the wires to the power plug by using flat-blade screwdriver (Size 0.4 x 2.5 mm (0.015 to 0.098 in.)).
7	Torque the mounting screws: 0.22 to 0.25 Nm (1.95 to 2.2 lb-in).
8	Replace the power plug to the power connector.

NOTE:

- Do not solder the wire directly to the power receptable pin.
- The power supply cord must meet the specification shown above. Twist the power cords together, up to the power plug, for EMC cancellation. (See illustration as shown below).

Power Connection

The following illustration displays a connection of the power cord:



Connecting the Power Supply

Precautions

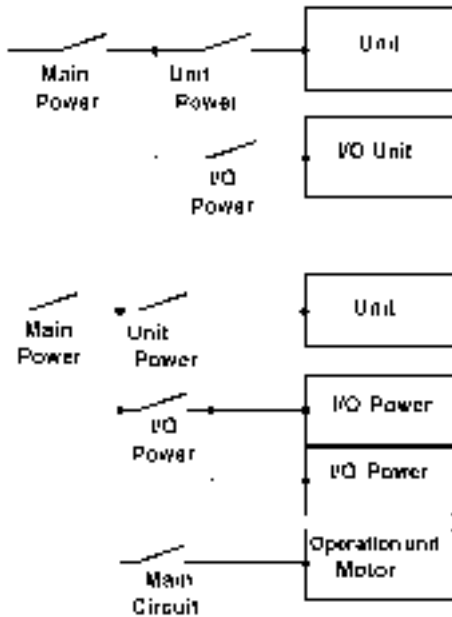
- Connect the power cord to the power connector on the side of the unit using the power plug.
- Use a regulated power supply with a Class 2 power supply between the line and the ground.
- Do not bundle the power supply cord with, or keep close to, main circuit lines (high voltage, high current), or input/output signal lines.
- Connect a lightning surge absorber to handle power surges.

Excessive stress on the power connection or attempting to install a unit with the power cables connected may disconnect or cause damage to the power connections. This can cause short circuits, fire or unintended equipment operation.

 WARNING
SHORT CIRCUITS, FIRE, OR UNINTENDED EQUIPMENT OPERATION
<ul style="list-style-type: none">● Securely attach power cables to the panel or cabinet.● Use the designated torque to tighten the unit terminal block screws.● Install and fasten unit on installation panel or cabinet prior to connecting Power Supply and Communication lines.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Power Supply Connections

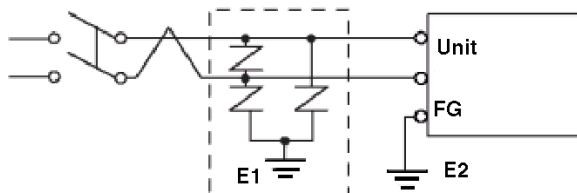
For ease of maintenance, use the following optional connection diagram to set up your power supply connections.



NOTE:

- Ground the surge absorber (E1) separately from the unit (E2).
- Select a surge absorber that has a maximum circuit voltage greater than the peak voltage of the power supply.

The following diagram displays a lightning surge absorber connection:



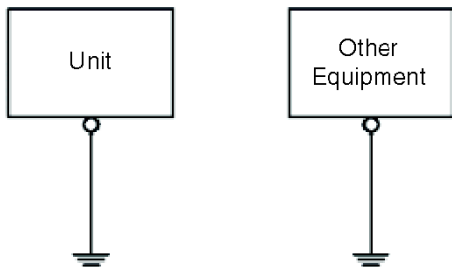
Grounding

Introduction

Take the following precautions for grounding the unit.

Exclusive Grounding

Connect the frame ground (FG) terminal on the power plug to an exclusive ground.



Grounding Procedure

Step	Action
1	Check that the grounding resistance is less than 100 Ω .
2	Create the connection point as close to the unit as possible, and make the wire as short as possible. When using a long grounding wire, replace the thin wire with a thicker wire, and place it in a duct.

Common Grounding

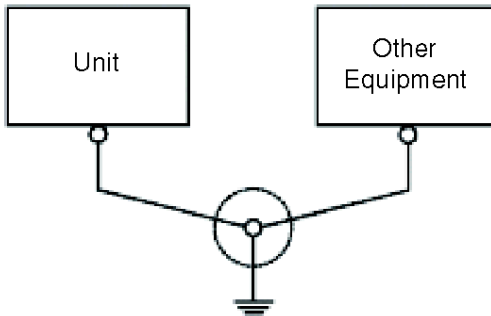
Precautions:

Electromagnetic Interference (EMI) can be created if the devices are improperly grounded. Electromagnetic Interference (EMI) can cause loss of communication.

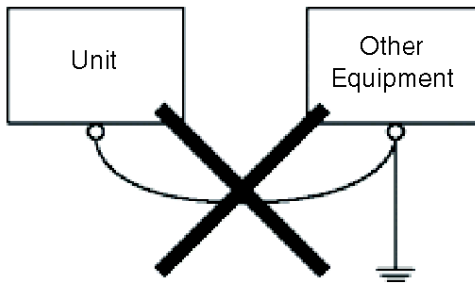
Do not use common grounding, except for the authorized configuration described below.

If exclusive grounding is not possible, use a common connection point.

Correct grounding



Incorrect grounding



Section 3.3

USB Port

Overview

This section presents the USB port.

What Is in This Section?

This section contains the following topics:

Topic	Page
Important Considerations When Using the USB Port	65
USB Data Transfer Cable (BMX XCA USB H018) - USB Driver Installation	66
USB Standard A	68
USB Mini-B	75

Important Considerations When Using the USB Port

Introduction

Data transfer cable (BMX XCA USB H018) can be attached to the USB port to allow data transfer from the computer to the unit.

WARNING

RISK OF EXPLOSION IN HAZARDOUS LOCATIONS

In hazardous locations as described in UL1604 and ANSI/ISA - 12.12.01:

- confirm that the USB cable has been attached with the USB cable clamp before using the USB host interface.
- remove power before attaching or detaching any connector(s) to or from the unit.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTICE

UNINTENDED EQUIPEMENT OPERATION

Do not use the 4.5 m USB cable BMX XCA USB H045.

Failure to follow these instructions can result in equipment damage.

USB Data Transfer Cable (BMX XCA USB H018) - USB Driver Installation

Important information

Follow the procedure described below to avoid damage to the cable connector or the unit:

- Do not connect the USB data transfer cable until told to do so in the instructions.
- Insert the connector at the correct angle when connecting the USB data transfer cable to the PC or to the unit.
- Hold the connector, not the cable itself when disconnecting the cable.
- Use the port designated during installation. If the cable is unplugged from the port designated during installation and connected to a different port, the OS (Operating System) will not recognize the new port.
- Restart the PC and quit all resident applications before re-installing the software if the installation does not complete successfully.

NOTE: Vijeo Designer must be installed before installing the USB driver.

Installation Procedure

Step	Action
1	Insert the Vijeo Designer Installation CR-ROM into your CR-ROM drive. The Setup window for Vijeo Designer opens automatically. If not, at the Windows Start menu, click Run and type x:\install.exe (where x is your CR-ROM drive name).
2	In the install menu, select USB Driver .
3	Select the driver you want to install from the window that appears. For the BMX XCA USB H018 USB cable, select Install USB driver for....
4	A popup window appears stating the installation of the driver was successful.
5	Connect the USB cable to the computer. Windows automatically detects the cable and states that the device is ready to use.

Post-Installation Check

Perform the following check after installation:

Step	Action
1	On the target machine, verify the USB cable is physically connected to the USB port.
2	On the PC, verify the USB cable is physically connected to the USB port.
3	On the desktop, right-click My Computer and click Properties .
4	In System Properties dialog box, select Hardware tab, and then click Device Manager .
5	In Device Manager , the USB link cable (BMX XCA USB H018) is displayed below the USB controller.

Troubleshooting

Detected problem/Symptom	Solution
The USB cable is not recognized.	Connect the cable correctly, or restart your PC. Also, when connecting a USB hub, connect it directly to your PC USB port.
Overcurrent occurred.	
The Plug and Play is not functioning correctly.	
You are unable to use the USB cable after connecting it to a USB hub.	The power supplied from the hub may be insufficient. Verify the hub is self-powered. Connect the cable directly to the PC USB port.
After installation, a ? is displayed when you try to confirm the cable's status via the Device Manager.	The driver has not been installed correctly. Uninstall the driver and re-install it.

Uninstalling the USB Driver

Step	Action
1	Click the USB device icon Stop USB link cable in the Windows task tray and then click Stop USB link cable (BMX XCA USB H018) for Windows 2000, or Safely remove USB link cable (BMX XCA USB H018) for Windows XP.
2	When the Safe To Remove Hardware message box appears, remove the USB download cable.
3	Click OK to close the message box.

USB Standard A

Introduction

When using a USB device, you can attach a USB holder to the USB interface on the side of the unit to prevent the USB cable from being disconnected.

 WARNING
--

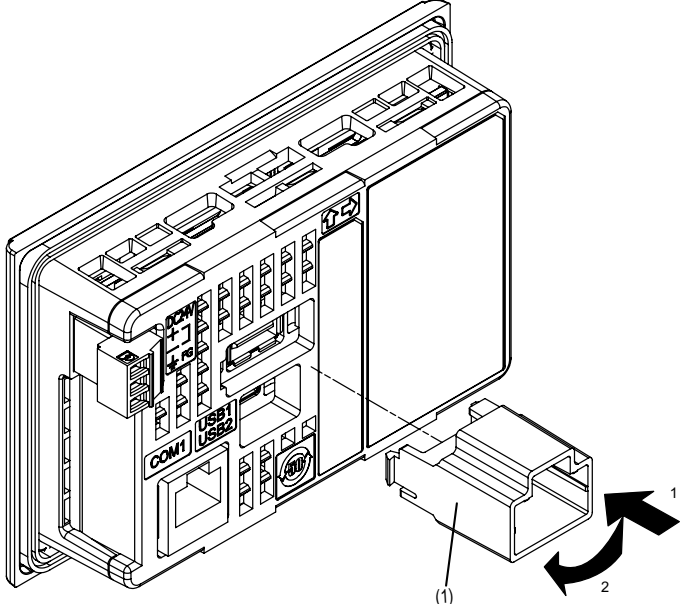
RISK OF EXPLOSION IN HAZARDOUS LOCATIONS

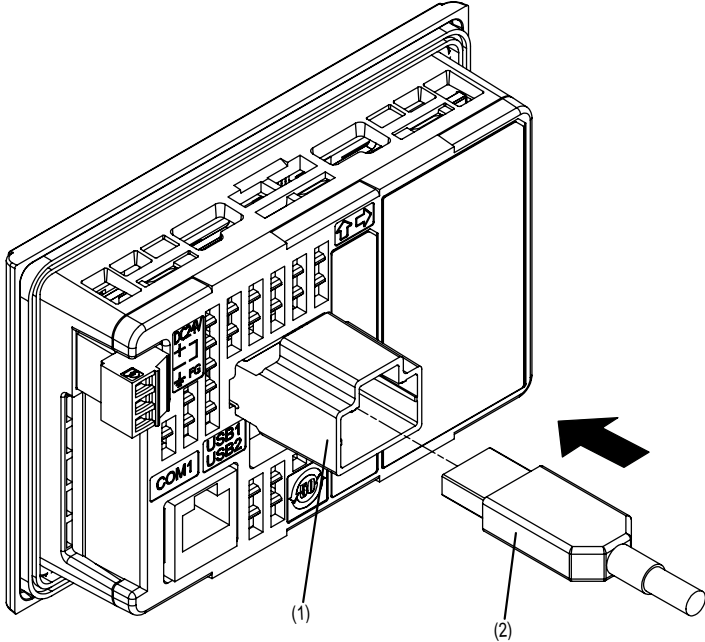
In hazardous locations as described in ANSI/ISA - 12.12.01:

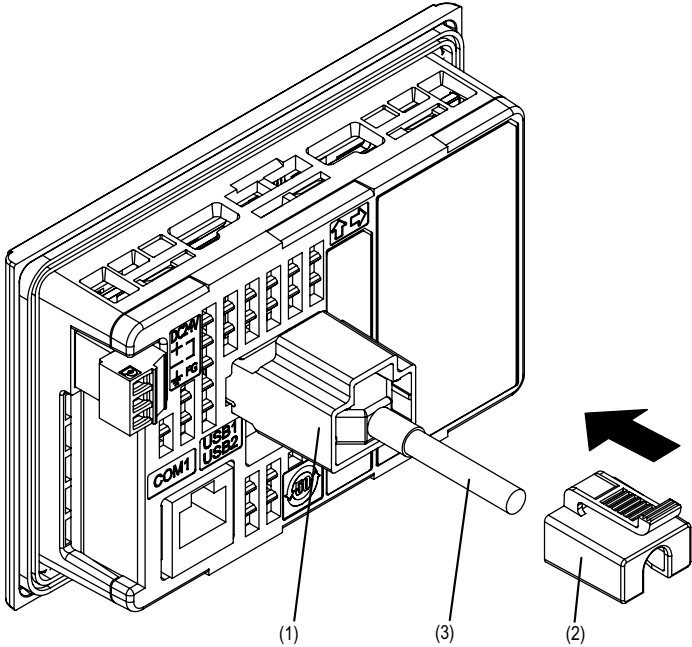
- | |
|---|
| <ul style="list-style-type: none">● confirm that the USB cable has been attached with the USB cable clamp before using the USB host interface.● remove power before attaching or detaching any connector(s) to or from the unit. |
|---|

Failure to follow these instructions can result in death, serious injury, or equipment damage.

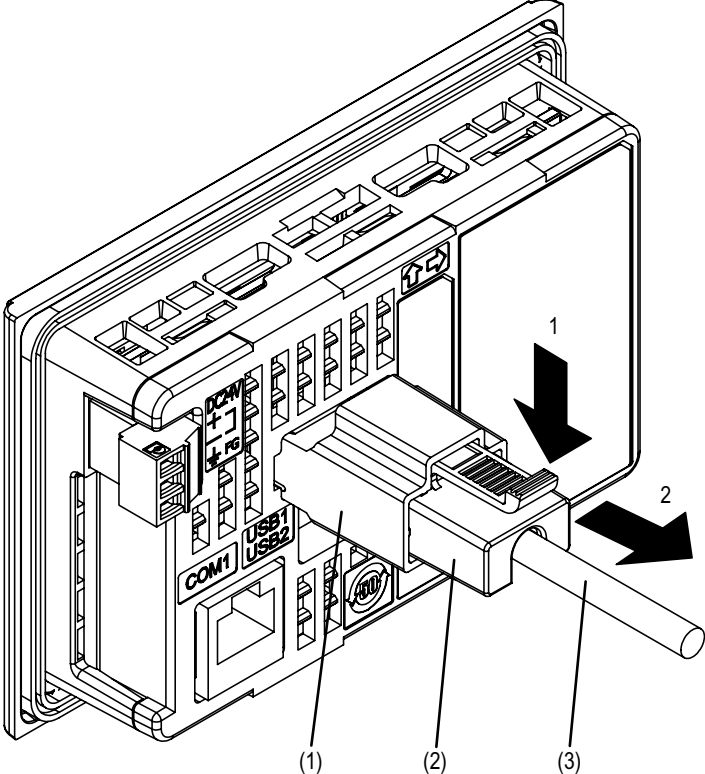
Attaching the USB Holder

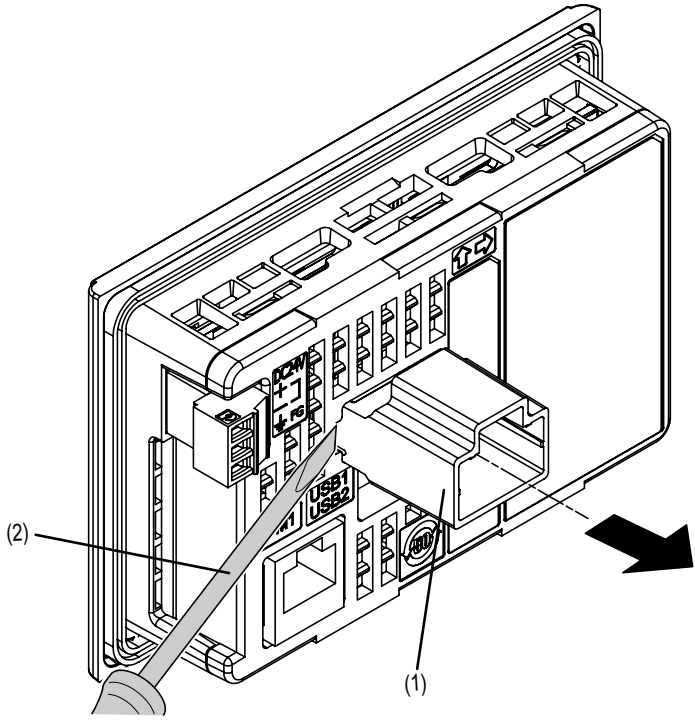
Step	Action
1	<p data-bbox="374 256 1249 332">Attach the USB holder to the USB Host Interface on the main unit. Hook the upper pick of the USB holder to the attachment hole of the main unit and insert the lower pick as shown below to affix the USB holder.</p>  <p data-bbox="374 966 528 990">(1) USB holder</p>

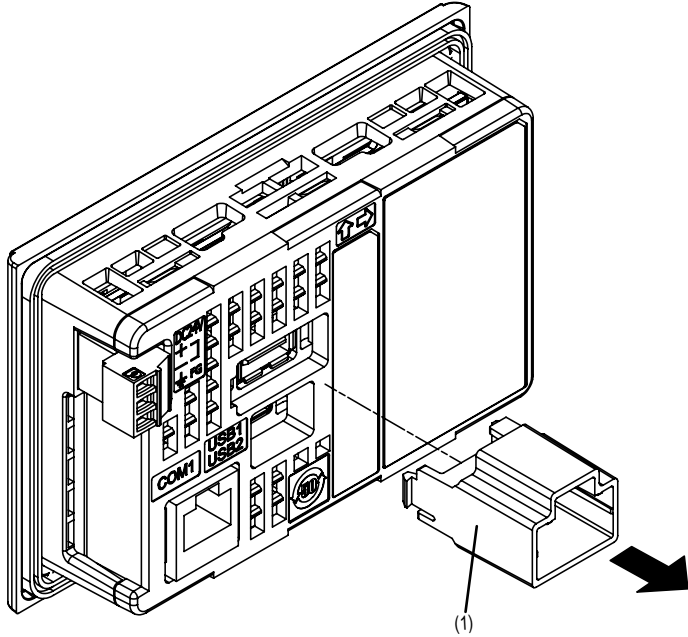
Step	Action
2	<p data-bbox="344 203 806 228">Insert the USB cable into the USB host interface.</p>  <p data-bbox="344 889 495 945">(1) USB holder (2) USB cable</p>

Step	Action
3	<p data-bbox="375 201 1238 250">Attach the USB cover to fix the USB cable in place. Insert the USB cover into the tab of the USB holder.</p>  <p data-bbox="375 922 526 995">(1) USB holder (2) USB cover (3) USB cable</p>

Removing the USB Holder

Step	Action
1	<p data-bbox="344 256 1016 280">Push down the tab of the USB holder and then remove the USB cover.</p>  <p data-bbox="344 1084 495 1161">(1) USB holder (2) USB cover (3) USB cable</p>
2	<p data-bbox="344 1177 843 1201">Remove the USB cable from the USB host interface.</p>

Step	Action
3	<p data-bbox="375 201 1204 224">Insert a screwdriver into the slot as shown in the following illustration, pry up the holder.</p>  <p data-bbox="375 961 765 1008">(1) USB holder (2) screwdriver less than 6 mm (0.23 in.)</p>

Step	Action
4	Remove the holder.  <p data-bbox="343 885 493 914">(1) USB holder</p>

USB Mini-B

Introduction

When using a USB device, you can attach a USB holder to the USB interface on the side of the unit to prevent the USB cable from being disconnected.

 WARNING
--

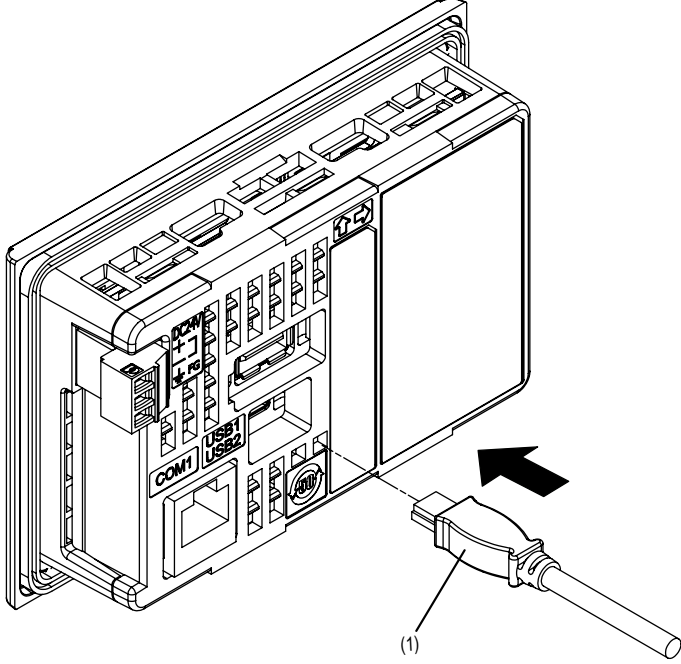
RISK OF EXPLOSION IN HAZARDOUS LOCATIONS

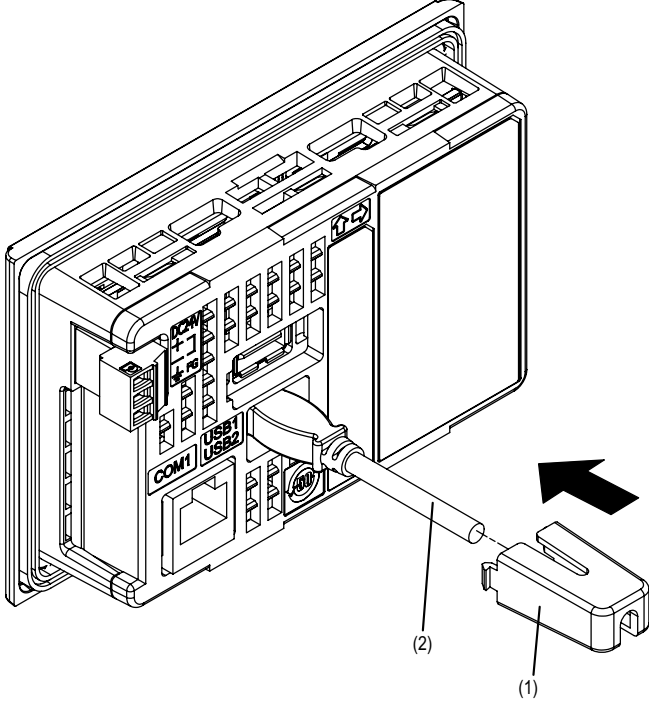
In hazardous locations as described in ANSI/ISA - 12.12.01:

- | |
|---|
| <ul style="list-style-type: none">● confirm that the USB cable has been attached with the USB cable clamp before using the USB host interface.● remove power before attaching or detaching any connector(s) to or from the unit. |
|---|

Failure to follow these instructions can result in death, serious injury, or equipment damage.

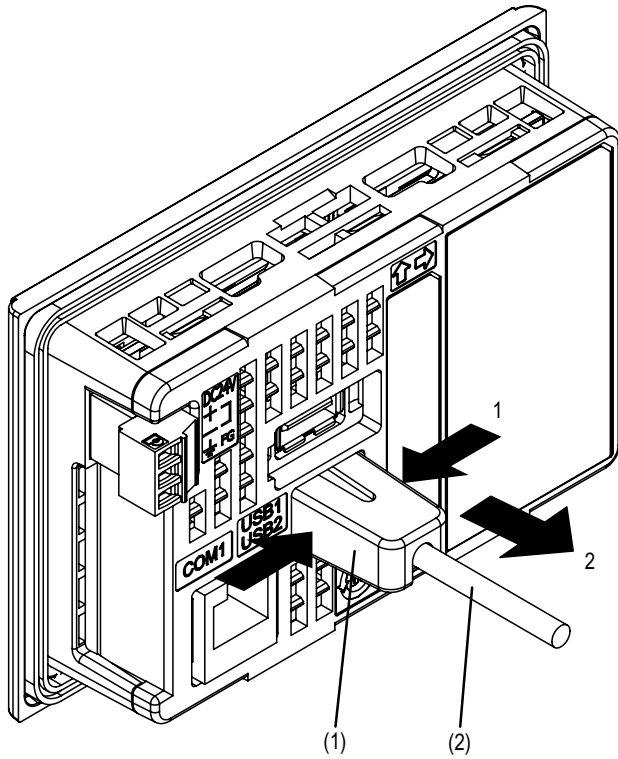
Attaching the USB Holder

Step	Action
1	<p data-bbox="345 256 806 279">Insert the USB cable into the USB host interface.</p>  <p data-bbox="345 954 482 977">(1) USB cable</p>

Step	Action
2	<p data-bbox="375 201 1196 224">Attach the USB holder to fix the USB cable in place. Insert the USB holder into the tab.</p>  <p data-bbox="375 954 526 1000">(1) USB holder (2) USB cable</p>

Removing the USB Holder

Squeeze the tab of the USB holder and then remove the USB holder.



- (1) USB holder
- (2) USB cable

Section 3.4

Ethernet Cable Connector

Presentation

Introduction

The HMI STO 53• comes equipped with an **IEEE802.3** compliant Ethernet interface, that transmits and receives data at 10 Mbps or 100 Mbps.

Installation

NOTE: Ethernet networks must be installed by a trained and qualified person.

1:1 connections must be made with a hub or a switch. It is possible to use the 1:1 connection with a cross cable depending on the connected PCs and network cards.

Part II

Settings

Overview

This part describes the settings available on the target machine as well as how to debug the unit.

What Is in This Part?

This part contains the following chapters:

Chapter	Chapter Name	Page
4	Configuring the Unit	83
5	Troubleshooting	97
6	Maintenance	101

Chapter 4

Configuring the Unit

Overview

This chapter presents the settings on the HMI STO 5•• units.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Types of Configuration	84
Offline Settings	85
System Settings	89
Diagnostics Settings	94

Types of Configuration

Introduction

You can use the **Configuration** menu to configure the unit.

Depending on how you use your HMI STO 5••, you can display the **Configuration** menu using three different methods:

- Use an action
- Touch the top-left corner of the panel when powering up
- Touch two corners of the panel successively while the application is running

You can select which methods your application uses in the Vijeo Designer editor's Target properties.

Calling Up the Settings Menu

Step	Action
1	<p>Set up any combination of the following methods for displaying the Configuration menu.</p> <ul style="list-style-type: none">● Action: Create a switch and add the Configuration System Operation. See the Vijeo Designer online help for more information on creating a switch.● Top-Left Corner: In Target properties, set To Configuration to either Top Left Corner or Top Left/2 Corner.● Touch two corners successively: In Target properties, set To Configuration to either 2 Corner or Top Left/2 Corner. <p>If you set To Configuration to None and do not create a switch to display the Settings menu, then there is no way to configure the unit at runtime.</p>
2	Connect the power supply.
3	<p>Depending on what you set up in Step 1, you can display the Configuration menu using one of the following methods:</p> <ul style="list-style-type: none">● Action: Touch the switch set up with the Configuration system operation.● Top-Left Corner: Touch the top-left corner of the screen within ten seconds after the unit begins starting up.● Touch two corners successively: Touch successively the top left corner then the bottom right corner within half a second. The touch area is 50 dots by 50 dots. <p>Vijeo Designer Runtime restarts and displays the Settings menu.</p>
4	The Configuration menu contains: Offline , System , Diagnostics and To Run Mode . Click either tab to display its settings.

Offline Settings

Introduction

The offline settings cannot be changed while a user application is running.

Changing the Buzzer Settings

Step	Action
1	In the Configuration menu, press the Offline button, the following message appears: Are you sure you want to restart the system?
2	Press the OK button to restart the system, or the Cancel button to return to the Configuration menu.
3	Press the Touch Buzzer button.
4	Press the desired buzzer mode. The factory setting is Pressing Touch Object . <ul style="list-style-type: none">● None: Selecting this will turn the buzzer off.● Pressing Touch Object: The buzzer will only sound when a Touch Object is pressed.
5	Press the OK button to validate your configuration or the Cancel button to return to the Offline menu.

Changing Backlight Control

Step	Action
1	In the Configuration menu, press the Offline button, the following message appears: Are you sure you want to restart the system?
2	Press the OK button to restart the system, or the Cancel button to return to the Configuration menu.
3	Press the Backlight button.
4	In the Backlight control, define the backlight operations. Wait : To extend the life of the backlight, you can set up the unit so that it turns off the backlight when the panel is inactive (idle) for the defined period of time, (Idle means the unit panel has not been pressed). The factory setting for this item is off.
5	Press the right arrow button to view the next control.
6	Allow touch actions when backlight is off : This setting defines whether the press panel is enabled or disabled when a backlight burnout is detected. When this feature is cleared and the backlight burns out, press inputs are ignored to prevent operation detected errors. The factory setting for this item is off.
7	Press the OK button to validate your configuration or the Cancel button to return to the Backlight control.

NOTE: To turn the **Backlight** off automatically after a specified period of time, uncheck the **Wait** checkbox.

Self Test

There are three self tests:

- Characters pattern,
- Display pattern,
- Touch panel.

The characters pattern self test checks the characters in each font set available on the unit. Use this test when characters (usually 2-byte characters) do not display properly.

Step	Action
1	In the Configuration menu, press the Offline button, the following message appears: Are you sure you want to restart the system?
2	Press the OK button to restart the system, or the Cancel button to return to the Configuration menu.
3	Press the right arrow button.
4	Press the Self Test button.
5	In the Self Test control press the Char. Pattern button:
6	Press the desired font button: Ok appears if there is no detected error. NG appears if there is a detected error. Only Japanese, Korean, Traditional Chinese fonts are available in the current screen.
7	Press the right arrow button to check Simplified Chinese and ASCII fonts, or Return button to the Self Test control.
8	Press the Return button to return to the Offline menu or the right arrow button to view the next Self Test control screen.

The display pattern self test checks your LCD screen with some graphical patterns of test.

Step	Action
1	In the Configuration menu, press the Offline button, the following message appears: Are you sure you want to restart the system?
2	Press the OK button to restart the system, or the Cancel button to return to the Configuration menu.
3	Press the right arrow button.
4	Press the Self Test button.
5	In the Self Test control press the Disp. Pattern button.
6	Press the Return button to return to the Offline menu or the right arrow button to view the next Self Test control screen.

The touch panel self test checks the touch panel cells. Each cell highlights when it is pressed during the test.

Step	Action
1	In the Configuration menu, press the Offline button, the following message appears: Are you sure you want to restart the system?
2	Press the OK button to restart the system, or the Cancel button to return to the Configuration menu.
3	Press the right arrow button.
4	Press the Self Test button.
5	Press the right arrow button.
6	Press the Touch Panel button to check the touch panel cells. Each cell highlights when it is pressed during the test.
7	Press the Return button to return to the Offline menu, or the left arrow button to view the previous Self Test control screen.

Driver Configuration

Step	Action
1	In the Configuration menu, press the Offline button, the following message appears: Are you sure you want to restart the system?
2	Press the OK button to restart the system, or the Cancel button to return to the Configuration menu.
3	Press the right arrow button.
4	Press the IO Manager button.
5	In the IO Manager control, press the Driver Config button.
6	In the Driver Config control: Select Driver: press the up/down arrow to select the desired driver.
7	Press the right arrow button to set the parameters of the selected driver.
8	Press the OK button to validate your configuration or the Cancel button to return to the IO Manager menu.

Equipment Configuration

Step	Action
1	In the Configuration menu, press the Offline button, the following message appears: Are you sure you want to restart the system?
2	Press the OK button to restart the system, or the Cancel button to return to the Configuration menu.
3	Press the right arrow button.
4	Press the IO Manager button.
5	In the IO Manager control, press the Equipment Config button.
6	In the Equipment Config control: Select Equipment: press the up/down arrow to select the desired equipment.
7	Press the right arrow button to set the parameters of the selected equipment.
8	Press the OK button to validate your configuration or the Cancel button to return to the IO Manager menu.

System Settings

Introduction

You can change system settings while the user application is still running.

Selecting a Language

The following table describes how to select the language used for the Settings menu, the run-time messages and user application.

Step	Action
1	In the Configuration menu, press the System button.
2	Press the Language Selection button.
3	Press the up/down arrows to select the desired system language, then validate by pressing the Enter button.
4	Press the right arrow button to configure the next language parameter.
5	Press the up/down arrows to select the desired user application language, then validate by pressing the Enter button.
6	Press the right arrow button to configure the next language parameter.
7	Press the up/down arrows to select the desired keyboard language, then validate by pressing the Enter button.
8	Press the OK button to validate your configuration or the Cancel button to return to the System menu.

NOTE: The languages available in the language settings are defined in the Vijeo Designer editor.

Changing the Date/Time

Step	Action
1	In the Configuration menu, press the System button.
2	Press the Date/Time button.
3	Press any of the Year , Month or Day fields and a data entry keypad will display. Use this keypad to define the selected date setting.
4	Press the right arrow button to configure the next language parameter.
5	Press any of the Hour , Minutes or Seconds fields and a data entry keypad will display. Use this keypad to define the selected time setting.
6	Press the right arrow button to configure the next language parameter.
7	Check the Auto. adjust clock for daylight saving time box to choose adjusting clock for daylight saving time changes automatically.

Step	Action
8	Press the right arrow button to configure the next language parameter.
9	In Time Zone press the up/down arrows to select the desired time zone.
10	Press the right arrow button to configure the next language parameter.
11	In DST type press the up/down arrows to select the desired daylight saving time type: <ul style="list-style-type: none"> ● Date: the DST is added or subtracted on the exact date chosen. ● Rule: the DST is added or subtracted on a specific weekday in the month.
12	Press the right arrow button to configure the next language parameter.
13	Press the DST amount field and a data entry keypad will display. Use this keypad to define the desired daylight saving time amount.
14	Press the OK button to validate your configuration, the Cancel button to return to the System menu or the right arrow button to configure the parameters of daylight saving time by Date (<i>see page 90</i>) or by Rule (<i>see page 91</i>).

Daylight Saving Time Setting by Date

If **Date** is selected in the step 11 on the Changing the Date/Time (*see page 89*) follow this procedure to set the daylight saving time parameters:

Step	Action
1	Follow the procedure of Changing the Date/Time (<i>see page 89</i>) till step 14 then press the right button.
2	In Date to add time press the up/down arrows to select the desired month and press the right field to display the keypad to define the desired day to add time.
3	Press the right arrow button to configure the next parameter.
4	In Hour to add time press any of the fields to display the keypad and define the hour to add time.
5	Press the right arrow button to configure the next parameter.
6	In Date to subtract time press the up/down arrows to select the desired month and press the right field to display the keypad to define the desired day to subtract time.
7	Press the right arrow button to configure the next parameter.
8	In Hour to subtract time press any of the fields to display the keypad and define the hour to subtract time.
9	Press the OK button to validate your configuration or the Cancel button to return to the System menu.

Daylight Saving Time Setting by Rule

If **Rule** is selected in the step 11 on the Changing the Date/Time (*see page 89*) follow this procedure to set the daylight saving time parameters:

Step	Action
1	Follow the procedure of Changing the Date/Time (<i>see page 89</i>) till step 14 then press the right button.
2	In Month to add time press the up/down arrows to select the desired month to add time.
3	Press the right arrow button to configure the next parameter.
4	In Day to add time press the up/down arrows to select the desired the day to add time.
5	Press the right arrow button to configure the next parameter.
6	In Hour to add time press any of the fields to display the keypad and define the hour to add time.
7	Press the right arrow button to configure the next parameter.
8	In Month to subtract time press the up/down arrows to select the desired month to subtract time.
9	Press the right arrow button to configure the next parameter.
10	In Day to subtract time press the up/down arrows to select the desired day to subtract time.
11	Press the right arrow button to configure the next parameter.
12	In Hour to subtract time press any of the fields to display the keypad and define the hour to subtract time.
13	Press the OK button to validate your configuration or the Cancel button to return to the System menu.

Forcing a Restart

Step	Action
1	In the Configuration menu, press the System button.
2	Press the right arrow button.
3	Press the Restart button, the following message appears: Are you sure you want to restart the system?
4	Press the Restart button to restart the unit or the Cancel button to return to System menu.

Stylus

Step	Action
1	In the Configuration menu, press the System button.
2	Press the right arrow button.
3	Press the Stylus button.
4	Press the center of the cross several times to complete calibration of the screen.

Displaying Version Information

Step	Action
1	In the Configuration menu, press the System button.
2	Press the right arrow button twice.
3	Press the Info / Version . Runtime Version : the version number of the runtime
4	Press the right arrow button to view the next information.
5	Version Vijeo-Designer : the version number of the Vijeo-Designer.
6	Press the right arrow button to view the next information.
7	Build Number : the version number of the build number of the editor that was used to design the user application.
8	Press the Return button to return to the System menu or the left arrow button to view the previous information.

Displaying Memory Statistics

Step	Action
1	In the Configuration menu, press the System button.
2	Press the right arrow button twice.
3	Press the Memory button.
4	Main Memory describes the amount of memory currently being used by the application.
5	Press the right arrow button to view the next information.
6	Main Flash indicates the amount of internal memory (flash memory) required to store the runtime system files and the user application.
7	Press the Return button to return to the System menu or the left arrow button to view the previous information.

Brightness/Contrast Control

Step	Action
1	In the Configuration menu, press the System button.
2	Press the right arrow button three times.
3	Press the Brightness button.
4	Brightness level: press the up/down arrows to adjust the brightness.
5	Press the right arrow button to configure the next parameter.
6	Contrast level: press the up/down arrows to adjust the contrast. Reducing the brightness and contrast could increase the life span of the backlight.
7	Press the OK button to validate your configuration or the Cancel button to return to the System menu.

Option

In some projects and in some environments, inverting could make the application more visible and reduce eye-strain for the operator working with the target machine.

Step	Action
1	In the Configuration menu, press the System button.
2	Press the right arrow button three times.
3	Press the Option button.
4	Select Invert to reverse the black and white colors on the screen.
5	Press the OK button to validate your configuration or the Cancel button to return to the System menu.

Diagnostics Settings

Introduction

The HMI STO 5•• units are equipped with a number of diagnostic features that can be used to check the systems and the interfaces for any detected problems.

Variables

Use the **Variable** menu to check that the application is running correctly. The following table describes how to get to **Variable** menu:

Step	Action
1	In the Configuration menu, press the Diagnostics button.
2	Press the Variable button.
3	Select Equipment : press the up/down arrow to select the equipment whose variables you want to test.
4	In the Variable menu, press the Start button, the following message appears: Warning: Entering the Variable Test screen pauses communication with all equipment. Continue?
5	Press the OK button to restart the system, or the Cancel button to return to the Variable menu.
6	If the Start is pressed, the test reads the value for each variable associated with the selected equipment. If there is a detected error in the equipment or a time-out, the event log displays a message with the name of the corresponding variable.
7	After you complete testing variables from one equipment, you can continue testing variables for other equipment connected to the target machine.
8	Alternatively, you can test all equipment at once by selecting Test All in the Select Equipment drop-down list.
9	Press the Return button to return to the Diagnostics menu.

Statistics

Use the **Statistics** menu to check the connection between equipment. The following table describes how to get to **Statistics** menu:

Step	Action
1	In the Configuration menu, press the Diagnostics button.
2	Press the Statistics button. NOTE: When you write any value to this system control word, press the Rollover button to: <ul style="list-style-type: none">● Copy the values in the current statistic variables to the previous statistic variables.● Reset current statistic variables to zero.

Step	Action
3	In Show Stats for : press the up/down arrow to select the equipment whose variables you want to show statistics for.
4	Press the right arrow button to view the next display.
5	Press the Start button to start the test.
6	Press the right arrow button to view the next display.
7	Total Good : the total number of received variables without detected error.
8	Press the right arrow button to view the next display.
9	Total Bad : the total number of detected errors of all types.
10	Press the right arrow button to view the next display.
11	Total Count : Total Good + Total Bad.
12	Press the right arrow button to view the next display.
13	No Reply : no reply was received in response to the request.
14	Press the right arrow button to view the next display.
15	Chksum Fail : received a request or response*1 with an incorrect checksum.
16	Press the right arrow button to view the next display.
17	Wrong Addr. : received a request or response*1 with an incorrect address.
18	Press the right arrow button to view the next display.
19	Error Resp. : received a detected error response from the equipment.
20	Press the right arrow button to view the next display.
21	Inv. Resp. : received a response that contained a protocol detected error.
22	Press the right arrow button to view the next display.
23	Init. Fail : initializing communications with the equipment unsuccessful.
24	Press the right arrow button to view the next display.
25	Write Fail : writing a new value to the equipment unsuccessful.
26	Press the right arrow button to view the next display.
27	Intrn Error : internal driver detected error indicates improper driver configuration or driver detected problem.
28	Press the right arrow button to view the next display.
29	Xmit Fail : transmitting a request or response unsuccessful.
30	Press the right arrow button to view the next display.
31	Unsupp. Req. : received a request for an unsupported service.
32	Press the right arrow button to view the next display.
33	Inv. Request : received a request that contained a protocol detected error.
34	Press the Return to return to the Diagnostics menu or the left arrow button to view the previous display.

Chapter 5

Troubleshooting

Overview

This chapter describes how to find and resolve detected problems with the HMI STO 5•• units.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Troubleshooting Checklists	98
Self Test List	100

Troubleshooting Checklists

Introduction

When there is a detected problem, go through the checklist and follow the instructions given.

Here are the main detected problems that may occur when using HMI STO 5•• units.

- Panel display is blank,
- Connected equipment cannot be used,
- Panel does not respond or responds very slowly,
- Panel beeps when powered on,
- Cannot change the date or time.

NOTE: Contact your local Schneider Electric vendor or your local distributor.

Panel Display is Blank

If the unit display is blank, perform the following check steps:

Step	Check/Operation	Solution
1	Are all Vijeo Designer screens downloaded?	You may have to download the screens again.
2	Is the Initial Panel ID set up correctly in Vijeo Designer?	Enter the Initial Panel ID in the Vijeo Designer editor and download again.
3	Is the unit using the correct rated voltage?	Verify the power supply connections and levels.
4	Is the power supply off or disconnected?	Follow the instructions in this manual for reconnecting the power supply.

Connected Equipment Cannot be Used

If the unit does not communicate with connected equipment, perform the following check steps:

Step	Check/Operation	Solution
1	Is the power supply off or disconnected?	Verify the power supply connections and levels.
2	Do the Driver and Equipment settings in Vijeo Designer match the actual equipment you are trying to communicate with?	In the Vijeo Designer editor Navigator window's Project tab, expand the I/O Manager node to enter the correct configuration settings for the Driver and Equipment nodes.
3	Is the communication cable connected correctly?	Refer to the associated protocol manual for information about cable diagrams.
4	Is the detected problem resolved?	If none of the previous steps fixed the communication detected problem, then verify the hardware.

Unit does not respond when pressed

If the unit is either not responding when pressed or if its response time is very slow, perform the following check steps:

Step	Check/Operation	Solution
1	Disconnect all the cables except the power cable.	-
2	In the Settings menu, press the Offline tab and then press the Self Test icon. Run the Touch Panel test.	If the test is unsuccessful, there is a detected problem with the hardware.
3	If touch response is slow, does it happen on a specific panel?	If the panel displays the values of a large number of equipment variables, you may want to redesign the panel and separate the variables into different panels and download again.
4	If touch response is slow, the target CPU may be very busy communicating with external equipment.	To resolve this detected problem, try each of the following in the Vijeo Designer editor and download again. <ul style="list-style-type: none">● If you are using serial communication, verify the communication speed between the target and equipment is optimized.● In the equipment or scan group properties, reduce the Scan Rate to Slow. This will reduce the frequency of variable updates to 1000 ms.● If you use many equipment variables in application scripts, you may want to change the script to a panel script so that the variables are active only when the information is necessary. If none of the above works, then you may have to reduce the number of external variables in the project. If none of the proposed options work, contact your Schneider Electric Technical Support for optimizing your project.

Target beeps when powered ON

A continuous beep from the target means that system files are corrupted. To resolve this detected problem, go to the Vijeo Designer Start menu and run Recovery on the target machine.

Self Test List

Introduction

The HMI STO 5•• units are equipped with a number of diagnostic features that can be used to check the systems and the interfaces for any detected problems.

Self Test

From the **Settings** menu, press the **Offline** button and then the **Self Test** icon. **Self Test** menu appears. See the Vijeo Designer online help for information on accessing the **Offline** button.

Self Tests

The following tests can be accessed from the **Self Test** menu.

Test	Description
Char. Pattern	Checks the characters in each font set available on the unit. Use this test when characters (usually 2-byte characters) are not displayed properly. OK appears if there is no detected error; NG appears if there is a detected error.
Disp. Pattern	Use this test when your drawings are not displayed properly.
Touch Panel	Tests the touch panel cells. Each cell highlights when it is pressed during the test.

Chapter 6

Maintenance

Overview

This chapter explains how to maintain your HMI STO 5•• units.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Regular Cleaning	102
Periodic Check Points	103

Regular Cleaning

Cleaning the display

NOTICE

EQUIPMENT DAMAGE

- Power off the unit before cleaning it.
- Do not use hard or pointed objects to operate the touch panel, since it can damage the panel surface.
- Do not use paint thinner, organic solvents, or a strong acid compound to clean the unit.

Failure to follow these instructions can result in equipment damage.

Cleaning the Gasket

With the gasket in place, the unit meets IP65 rating.

Change the gasket at least once a year, or as soon as scratches or dirt become visible.

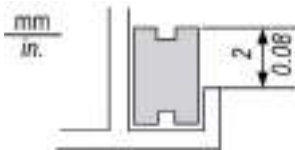
During normal maintenance and reinstallation, check the gasket for dirt and scratches.

Inserting the Gasket

The gasket must be inserted correctly into the groove to comply with IP65.

The upper surface of the gasket should protrude approximately 2 mm (0.08 in.) out from the groove. Verify that the gasket is correctly inserted before installing the unit into a panel.

NOTE: Verify the gasket seam is inserted into the straight bottom section of the groove. Inserting it into a corner may lead to eventual tearing.



Periodic Check Points

Operation Environment

Refer to the Environmental Specifications.

Electrical Specifications

The input voltage must be within 20.4 to 28.8 Vdc.

Related Items

- Are all power cords and cables connected properly? Are there any loose cables?
- Are all mounting brackets holding the unit securely?
- Are there scratches or traces of dirt on the installation gasket?



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