

SIEMENS

SITRANS L

Controllers SITRANS LT500 with ultrasonic transducer inputs

Compact Operating Instructions




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7ML60.. (SITRANS LT500 with ultrasonic transducer inputs)

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

 DANGER
indicates that death or severe personal injury will result if proper precautions are not taken.
 WARNING
indicates that death or severe personal injury may result if proper precautions are not taken.
 CAUTION
indicates that minor personal injury can result if proper precautions are not taken.
NOTICE
indicates that property damage can result if proper precautions are not taken.


If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

 WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens Aktiengesellschaft. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Getting started

Use this chapter as a quick reference. It provides links to the steps required for startup.

Before you begin, read the following safety information:

- General safety information (Page 11)
- Basic safety information: Installing/mounting (Page 15)
- Basic safety information: Connecting (Page 28)
- Basic safety information: Commissioning (Page 48)

Procedure

1. Install/mount the device.
Installing/mounting (Page 15)
 2. Connect the device.
Connecting (Page 28)
 3. Power up the device.
Device startup (Page 50)
 4. Commission the device via quick commissioning wizard:
Quick commissioning: Level/Space/Distance (Page 57)
Quick commissioning: Volume (Page 63)
Quick commissioning: Volume flow (Page 71)
 5. Setup pumps (if applicable).
Pump control (Page 82)
 6. Configure basic control relays (if applicable).
Basic control (Page 88)
 7. Configure alarms (if applicable).
Alarms (Page 91)
 8. Configure totalizers and samplers (if applicable) referencing the respective parameters.
- Startup is complete.

Introduction

2.1 Purpose of this documentation

These instructions are a brief summary of important features, functions and safety information, and contain all information required for safe use of the device. Read the instructions carefully prior to installation and commissioning. In order to use the device correctly, first review its principle of operation.

The instructions are aimed at persons who install and commission the device.

To realize optimum performance from the device, read the complete operating instructions.

2.2 Designated use

Use the device in accordance with the information on the nameplate and in the Technical specifications (Page 102).

2.3 Industrial use note

NOTICE
Use in a domestic environment
This Class A Group 1 equipment is intended for use in industrial areas. In a domestic environment this device may cause radio interference.

2.4 Product compatibility

The following table describes compatibility between document edition, device revision, engineering system and associated Electronic Device Description (EDD).

Service channel

Manual edition	Remarks	Device revision	Compatible version of device integration package	
02/2024	First edition	Service channel FW: 1.00.00 HW: 1.00.00 Device revision 0	SIMATIC PDM V9.2 SITRANS DTM V4.3	EDD: 1.00.04 or later EDD: 1.00.04 or later

2.5 Checking the consignment

Modbus RTU

Manual edition	Remarks	Device revision	Compatible version of device integration package	
02/2024	First edition	Modbus RTU	Not applicable	Not applicable

HART

Manual edition	Remarks	Device revision	Compatible version of device integration package	
02/2024	First edition	HART	Not applicable	Not applicable

PROFIBUS PA

Manual edition	Remarks	Device revision	Compatible version of device integration package	
02/2024	First edition	PROFIBUS PA GSD: si0281de.gse	Not applicable	Not applicable

PROFIBUS DP

Manual edition	Remarks	Device revision	Compatible version of device integration package	
02/2024	First edition	PROFIBUS DP GSD: si0281df.gse	Not applicable	Not applicable

PROFINET

Manual edition	Remarks	Device revision	Compatible version of device integration package	
02/2024	First edition	PROFINET GSDML: gsdml-v2.35-sitrans_lt500-0b10-20230501.xml	Not applicable	Not applicable

2.5 Checking the consignment

Check the device packaging for damage. Inform your supplier of any damage. Retain the damaged parts for clarification.

Check the scope of delivery by comparing the shipping documents with your order for correctness and completeness.

Do not take damaged or incomplete devices into operation under any circumstances.

Special conditions for storage and transportation of device listed in Section "Technical specifications (Page 102)".

2.6 Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that may be implemented, please visit

<https://www.siemens.com/industrialsecurity>.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under

<https://www.siemens.com/cert>.

NOTICE
Unauthorized product information or software
Use only authorized Siemens websites when accessing any product information or software, including firmware updates, device integration files (EDD, for example), as well as other product documentation. Using unauthorized product information or software could result in a security incident, such as breach of confidentiality, or loss of integrity and availability of the system.
For more information, see Product documentation and support (Page 111).

2.7 Transportation and storage

To guarantee sufficient protection during transport and storage, observe the following:

- Keep the original packaging for subsequent transportation.
- Devices/replacement parts should be returned in their original packaging.
- If the original packaging is no longer available, ensure that all shipments are properly packaged to provide sufficient protection during transport. Siemens cannot assume liability for any costs associated with transportation damages.

NOTICE
Insufficient protection during storage
The packaging only provides limited protection against moisture and infiltration.
<ul style="list-style-type: none">• Provide additional packaging as necessary.

Special conditions for storage and transportation of the device are listed in Technical specifications (Page 102).

2.8 Notes on warranty

The contents of this manual shall not become part of or modify any prior or existing agreement, commitment or legal relationship. The sales contract contains all obligations on the part of Siemens as well as the complete and solely applicable warranty conditions. Any statements regarding device versions described in the manual do not create new warranties or modify the existing warranty.

The content reflects the technical status at the time of publishing. Siemens reserves the right to make technical changes in the course of further development.




Safety notes

3.1 Preconditions for use

This device left the factory in good working condition. In order to maintain this status and to ensure safe operation of the device, observe these instructions and all the specifications relevant to safety.

Observe the information and symbols on the device. Do not remove any information or symbols from the device. Always keep the information and symbols in a completely legible state.

3.1.1 Warning symbols on the device

Symbol	Explanation
	Consult operating instructions
	Electrostatic sensitive device
	Dispose of in an environmentally safe manner, and according to local regulations.

3.1.2 Laws and directives

Observe the safety rules, provisions and laws applicable in your country during connection, assembly and operation. These include, for example:

- National Electrical Code (NEC - NFPA 70) (USA)
- Canadian Electrical Code (CEC Part I) (Canada)

3.1 Preconditions for use

The product described in this document is in conformity with the relevant harmonization legislation, and its amendments, of the European Union.

Electromagnetic compatibility directive EMC 2014/30/EU	Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to electromagnetic compatibility
Low voltage directive LVD 2014/35/EU	Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits
Radio equipment directive RED 2014/53/EU	Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC
Restriction of hazardous substances directive RoHS 2011/65/EU	Directive of the European Parliament and the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment

The applicable directives can be found in the EU declaration of conformity of the specific device.

See also Certificates (<http://www.siemens.com/processinstrumentation/certificates>).

The product described in this document is in conformity with the relevant harmonization legislation, and its amendments, of the United Kingdom. The applicable regulations can be found in the UKCA declaration of conformity of the specific device.

See also Certificates (<http://www.siemens.com/processinstrumentation/certificates>).

3.1.3 FCC conformity

US Installations only: Federal Communications Commission (FCC) rules

Note

Void user authority

Changes or modifications not expressly approved by Siemens could void the user's authority to operate the equipment.

Note

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.


This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference to radio communications, in which case the user will be required to correct the interference at his own expense.

3.1.3.1 CE and UKCA Electromagnetic Compatibility (EMC) Conformity

This equipment has been tested and found to comply with the following EMC Standards:

EMC Standard	
FCC, CFR 47, Part 15 Subpart B	Class A, Unintentional radiators
CISPR 11 / KS C 9811	Class A, Group 1, Industrial, scientific and medical equipment
KS C 9811:2019	Class A, Industrial, scientific and medical equipment (ISM) - Radio-frequency disturbance characteristics - Limits and methods of measurement
IEC/EN 61326-1	Table 2, Electrical Equipment for Measurement, Control and Laboratory Use – EMC Requirements, Part 1: General Requirements for equipment intended to be used in an industrial electromagnetic environment.
KS C 9610-6-2	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments

3.1.4 Improper device modifications

 WARNING
<p>Improper device modifications</p> <p>Risk to personnel, system, and environment can result from modifications to the device, particularly in hazardous areas.</p> <ul style="list-style-type: none"> Only carry out modifications that are described in the instructions for the device. Failure to observe this requirement cancels the manufacturer's warranty and the product approvals. Do not operate the device after unauthorized modifications.

3.2 Requirements for special applications

Due to the large number of possible applications, each detail of the described device versions for each possible scenario during commissioning, operation, maintenance or operation in systems cannot be considered in the instructions. If you need additional information not covered by these instructions, contact your local Siemens office or company representative.

Note

Operation under special ambient conditions

We highly recommend that you contact your Siemens representative or our application department before you operate the device under special ambient conditions as can be encountered in nuclear power plants or when the device is used for research and development purposes.

3.3 Use in hazardous areas

Qualified personnel for hazardous area applications

Persons who install, connect, commission, operate, and service the device in a hazardous area must have the following specific qualifications:

- They are authorized, trained or instructed in operating and maintaining devices and systems according to the safety regulations for electrical circuits, high pressures, aggressive, and hazardous media.
- They are authorized, trained, or instructed in carrying out work on electrical circuits for hazardous systems.
- They are trained or instructed in maintenance and use of appropriate safety equipment according to the pertinent safety regulations.

WARNING


Use in hazardous area


Risk of explosion.

- Only use equipment that is approved for use in the intended hazardous area and labeled accordingly.
- Do not use devices that have been operated outside the conditions specified for hazardous areas. If you have used the device outside the conditions for hazardous areas, make all Ex markings unrecognizable on the nameplate.

Installing/mounting

4.1 Basic safety notes

 WARNING
<p>Improper installation</p> <p>Risk to personnel, system and environment can result from improper installation.</p> <ul style="list-style-type: none"> • Installation shall only be performed by qualified personnel and in accordance with local governing regulations.

 CAUTION
<p>Damage from electrostatic discharge (ESD)</p> <p>Some components in the device (such as communication cards, or memory cards) are sensitive to electrostatic discharge and could be damaged. Be sure to handle such components in a manner that avoids any potential damage due to ESD.</p>

4.1.1 Installation location requirements

NOTICE
<p>Direct sunlight</p> <p>Damage to device.</p> <p>The device can overheat or materials become brittle due to UV exposure.</p> <ul style="list-style-type: none"> • Protect the device from direct sunlight. • Make sure that the maximum permissible ambient temperature is not exceeded. Refer to the information in Technical specifications (Page 102).

NOTICE
<p>Strong vibrations</p> <p>Damage to device.</p> <ul style="list-style-type: none"> • In installations with strong vibrations, mount the device in a low vibration environment.

4.1.2 Proper mounting

NOTICE
Incorrect mounting The device can be damaged, destroyed, or its functionality impaired through improper mounting. <ul style="list-style-type: none">• Before installing ensure there is no visible damage to the device.• Make sure that process connectors are clean, and suitable gaskets and glands are used.• Mount the device using suitable tools. Refer to the information in Technical specifications (Page 102).

4.2 Installing/mounting the device

4.2.1 General installation notes

Requirements of installation

- Install device display window at shoulder level, unless most interaction is through a SCADA system.
- Provide easy access to local buttons.
- Minimize cable length requirements.
- Ensure mounting surface is free from vibration.
- Provide sufficient room to swing device lid open with clear access.
- Provide a place for a laptop computer for on-site configuration (optional, as laptop not required for configuration).

Things to avoid

- Exposure to direct sunlight. (Provide a sun shield to avoid direct sunlight.)
- Proximity to high voltage/current runs, contactors, SCR or variable frequency motor speed controllers.

Note

Improper device support

Regardless of the mounting surface used, it **must** be able to support four times the weight of the device or damage to the device may occur.

- Mount directly to wall or to electrical cabinet back panel with mounting screws: M4 (#6).
-

Note**Incorrect torque**

Ensure torque is set properly or damage to the device may occur.

- Tighten lid screws to 0.7 to 0.9 Nm (6 to 8 lb-inch).
- Tighten remote lid screws to 1.1 Nm (10 lb-inch).
- Tighten terminal screws in wiring compartment to 0.56 to 0.79 Nm (5 to 7 lb-inch).

4.2.2 Drilling cable entry holes

Cable entry holes can be ordered pre-drilled, or they can be drilled by the customer per the following procedure.

Condition

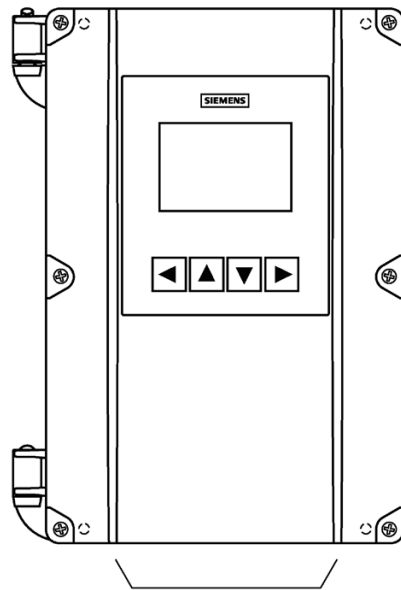
- The following have been reviewed: Basic safety notes (Page 15), and General installation notes (Page 16).
- This procedure (if applicable) must be completed prior to mounting the device.

Procedure **CAUTION****Damage from electrostatic discharge (ESD)**

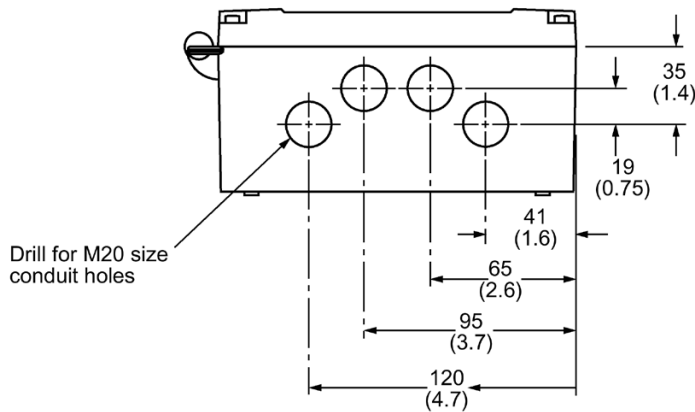
Some components in the device (such as communication cards, or memory cards) are sensitive to electrostatic discharge and could be damaged. Be sure to handle such components in a manner that avoids any potential damage due to ESD.

1. Remove the lid from the device by undoing its six lid screws and lifting it off its hinges.
2. Disconnect the display cable by pressing the locking tab and pulling straight out.
3. Remove the four screws holding the plastic cover and motherboard to the enclosure.
4. Remove the plastic cover by pulling it straight out.
5. Remove the motherboard from the enclosure by pulling the board straight out.
6. Drill the required cable entry holes. Ensure conduit holes do not interfere with the lower areas on the terminal block, circuit board, or communication card. See illustration below.
7. Reinstall the motherboard and plastic cover; secure them with the mounting screws.
8. Reconnect the display cable.
9. Reattach the lid onto the hinges.
10. Follow the applicable procedure to mount the device on wall or panel.

4.2 Installing/mounting the device



Suitable location for conduit entries. See recommended pattern below



Dimensions in mm (inch)

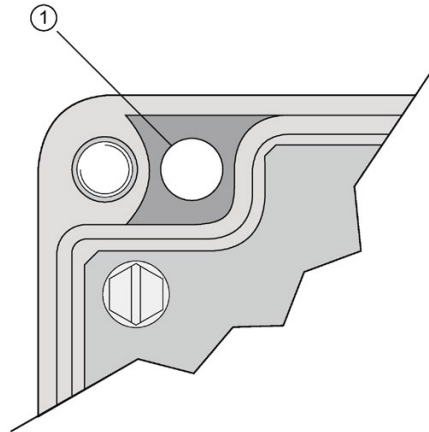
4.2.3 Wall mounting

Condition

- The following have been reviewed: Basic safety notes (Page 15), and General installation notes (Page 16).
- The correct number of cable entry holes (for this installation) are available; device was ordered with pre-drilled cable entry holes, or customer has completed procedure Drilling cable entry holes (Page 17).

Procedure

1. Unscrew the lid (six screws) and open it to reveal the mounting holes.
2. Mark and drill four holes in the mounting surface for the four screws (customer supplied).



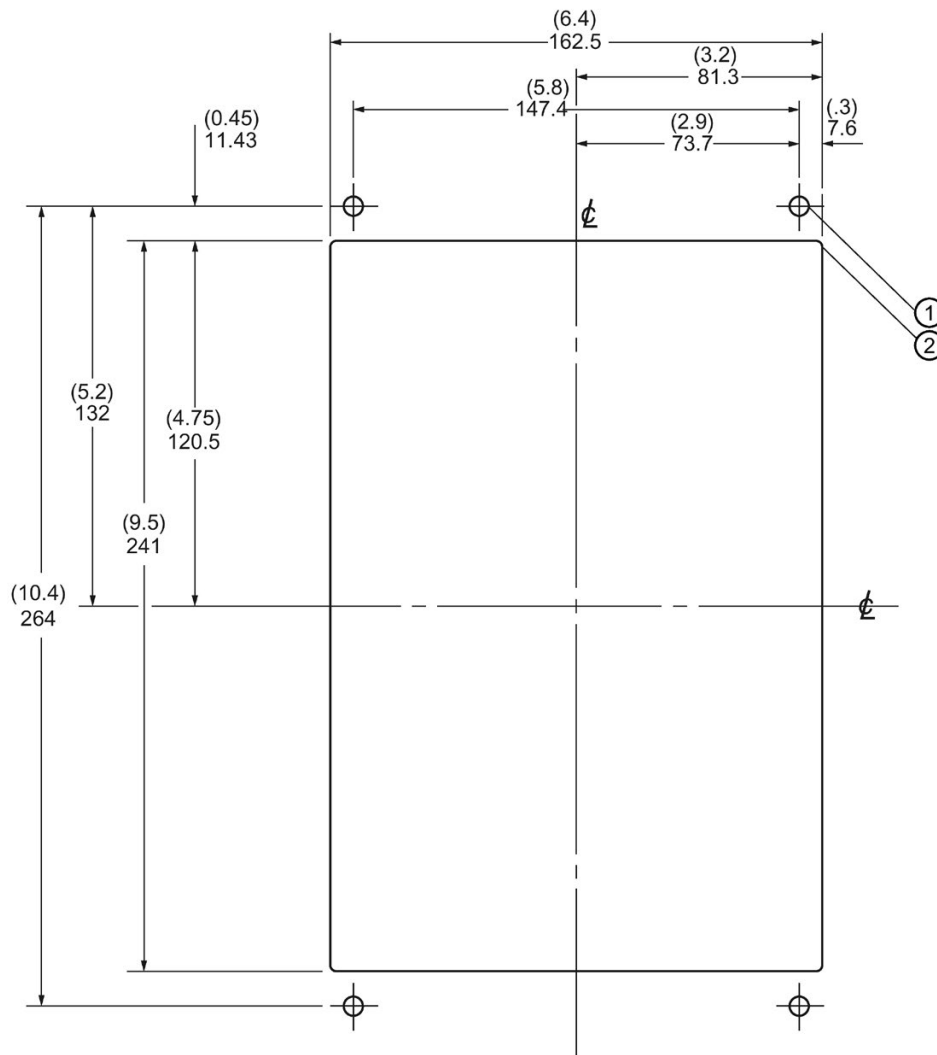
① Mounting screw holes

3. Fasten with a long screwdriver.
4. Add conduit or cable glands if applicable to application and wire as required:
 - Attach the conduit to the gland before connecting the gland to the enclosure.
 - Unscrew the glands and attach them loosely to the enclosure. Use only approved suitable-sized glands for watertight applications.
 - Thread the cables through the conduit/glands.
To avoid interference, ensure that the power cable is kept separated from the signal cables, and then wire the cables to the terminal blocks.
 - Tighten the glands to form a good seal.
5. Screw the lid in place noting recommended torque values.

4.2.4 Panel mounting

Panel cutout dimensions

Installing the panel mount device requires making a cutout in the panel. The dimensions for the cutout are provided in the illustration below. A full size cutout template is provided with the device or may be downloaded from Siemens Industry Online Support (SIOS) (<https://support.industry.siemens.com>).



Dimensions in mm (inch)

- ① 6.3 mm diameter (0.25 inch)
- ② Min. rad. (type)

Note

Cutout template (printed to scale) shipped with panel mount option.

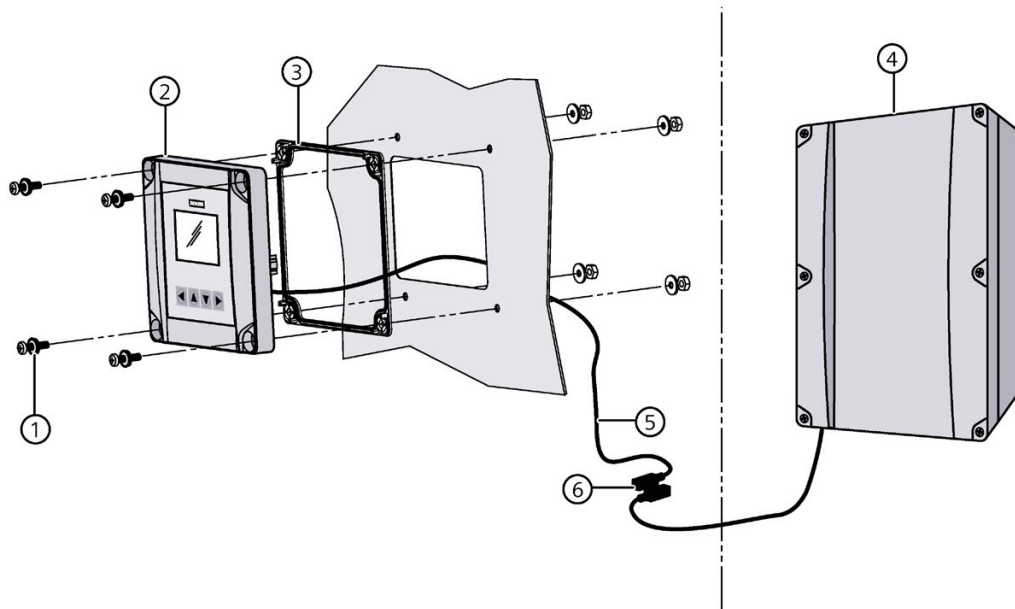
Condition

- The following have been reviewed: Basic safety notes (Page 15), and General installation notes (Page 16).
- The correct number of cable entry holes (for this installation) are available; device was ordered with pre-drilled cable entry holes, or customer has completed procedure Drilling cable entry holes (Page 17).

Procedure

1. Select a place for the device and fasten the template onto the panel (use tape or tacks).
2. Drill the four fastener holes.
3. Make the cutout using the appropriate tools.
4. Place the device into the panel and insert hexagonal fasteners through bevel slots and pre-drilled panel holes.
5. Fasten with wingnuts and hand tighten. (Use tape to hold the hexagonal heads in slots while attaching the wingnuts.)
6. Add conduit or cable glands if applicable to application and wire as required:
 - Unscrew the lid (six screws).
 - Attach the conduit to the gland before connecting the gland to the enclosure.
 - Unscrew the glands and attach them loosely to the enclosure. Use only approved suitable-sized glands for watertight applications.
 - Thread the cables through the conduit/glands.
To avoid interference, ensure that the power cable is kept separated from the signal cables, and then wire the cables to the terminal blocks.
 - Tighten the glands to form a good seal.
 - Screw the lid in place noting recommended torque values.

4.2.5 Remote panel mounting



- ① Four panel mount fasteners provided
- ② Remote display lid
- ③ Gasket
- ④ LT500 with blank lid
- ⑤ Extension cable
- ⑥ Connection between two extension cables

4.2.6 Mounting the remote lid

Note

Remote mounted lid can be mounted up to 5 m from the device using two optional cable extensions (each 2.5 m in length). For instructions on how to connect an extension cable, see Remote mounted lid with extension cable (Page 24).

1. Using the template provided, cut out the necessary hole for the remote display lid. Place the gasket inside the lid, aligning the mounting holes. Align the back of the remote display lid with the panel hole cutout. Mark and drill four holes in the mounting surface for the four screws (provided).
2. Fasten with a screwdriver and wrench.

Note

Recommended torque on fastening screws for good seal:

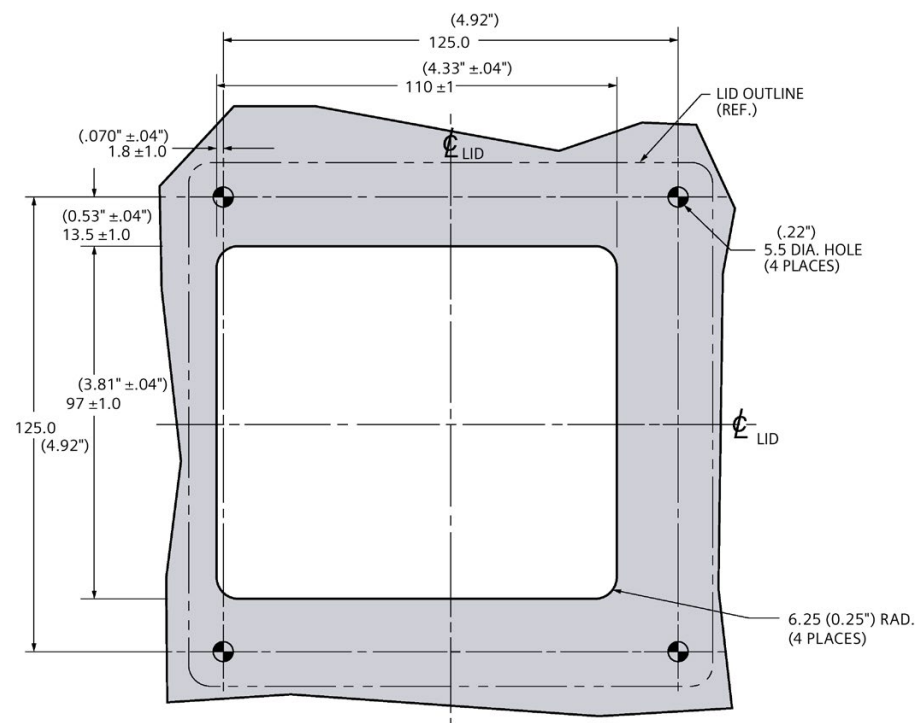
- 1.1 Nm (10 lb-inch)

Note

- Recommended mounting: mount to panel, up to 5 m from the device. If alternate mounting surface is used, it MUST be able to support four times the weight of the device.
- Fasteners included: M5 screw, seal washer, M5 flat washer and nut. These fasteners are required to maintain IP65 rating on remote lid.

4.2.7 Remote panel mount cutout

Remote panel cutout dimensions

**Note**

Cutout template (printed to scale) shipped with remote panel mount option.

4.2.8 Remote mounted lid with extension cable

The optional blank lid can be mounted remotely up to 5 m from the device. The optional extension cable can be used for such an installation.

1. Remove lid from the enclosure.

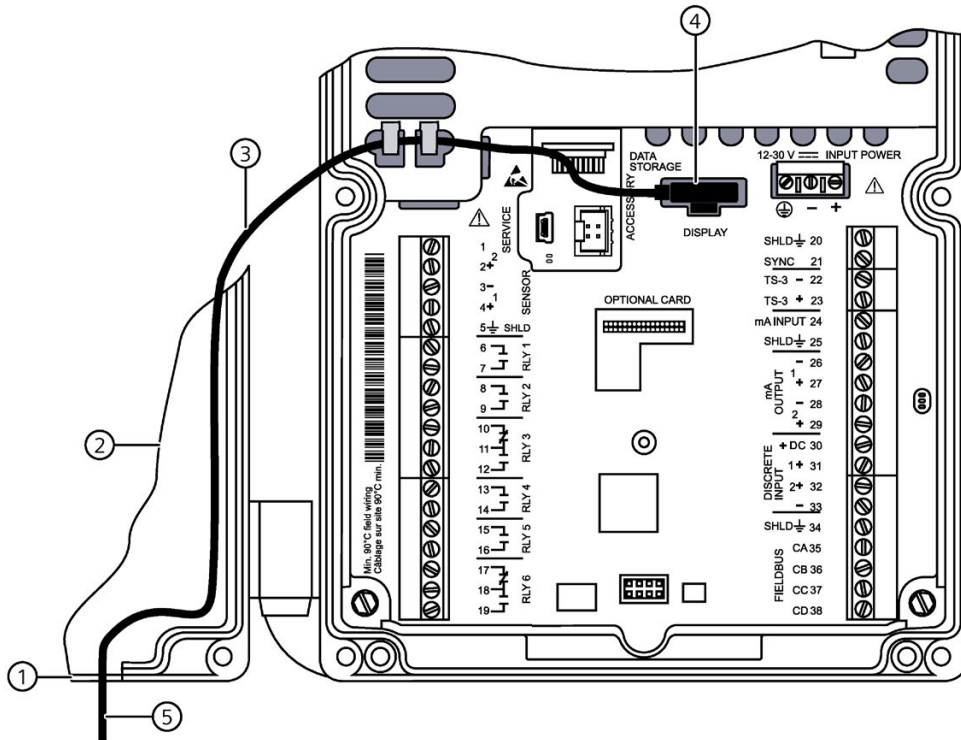
⚠ WARNING

Loss of protection

Loss of protection can result from improper installation.

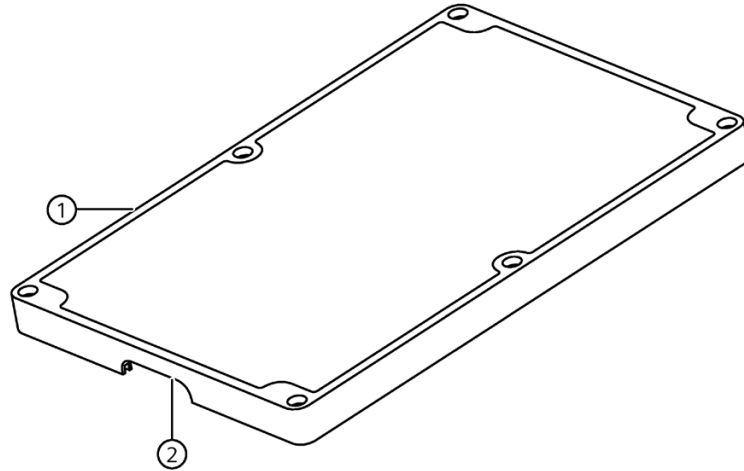
- The blank lid of the remote panel mount version must be installed in an additional enclosure having Type 4X, IP65 ratings, to maintain all approvals.

2. Connect the extension cable to the display connector on the terminal board and secure under retaining clips. (If desired, attach second extension cable to the other end of the first extension cable.)



- ① Cable entry cutout
- ② Blank lid
- ③ Extension cable
- ④ Display cable connector
- ⑤ Extension cable (2.5 or 5 m in length), to be connected to remote display lid

3. Feed the free end of the extension cable through cable entry hole on blank lid.



- ① Remote lid
- ② Cable entry cutout

4. Connect extension cable to display cable on remote lid.
5. Secure blank lid on device and mount display lid remotely per illustration in Remote panel mounting (Page 22).

4.2.9 Extension cable

Optional extension cables (2.5 m cables) are available to be used with remote mounted lid. Two cables can be connected together for an extension of up to 5 meters.

Note

It is recommended that the exposed extension cable be secured along a wall, or run through conduit to prevent damage to device, should cable be accidentally subjected to stress.

4.3 Installing the communication card

Communication cards are generally pre-installed. If necessary, follow these steps to install the card:

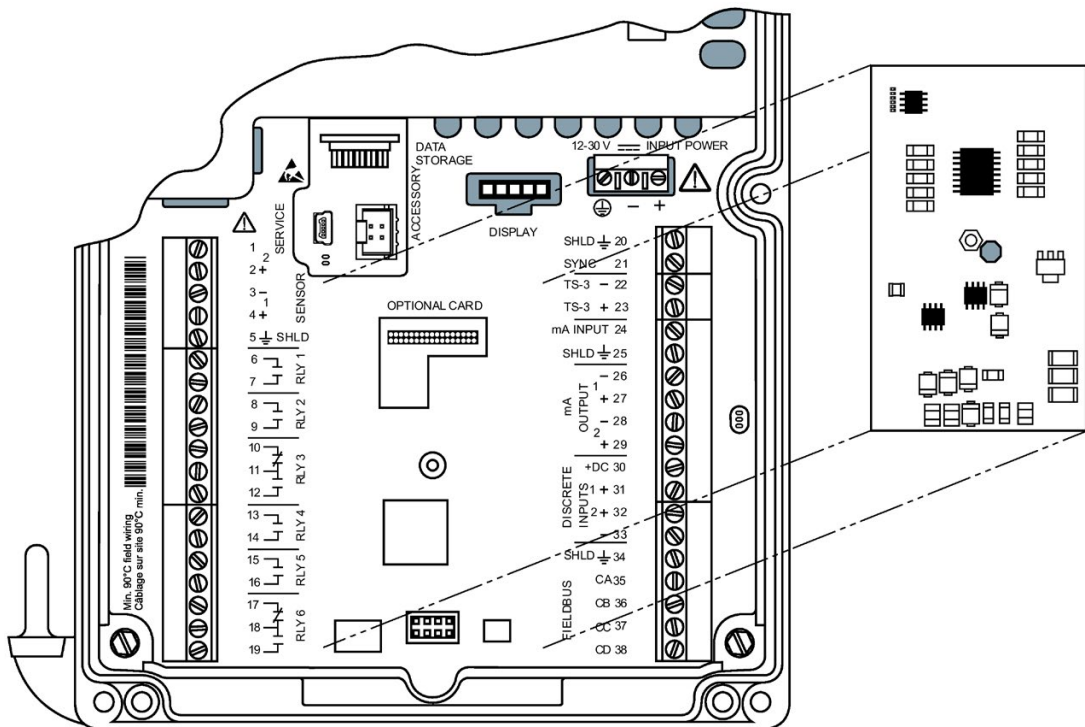
Procedure

CAUTION

Damage from electrostatic discharge (ESD)

Some components in the device (such as communication cards, or memory cards) are sensitive to electrostatic discharge and could be damaged. Be sure to handle such components in a manner that avoids any potential damage due to ESD.

1. Disconnect power to the device.
2. Insert the plastic screw standoff (supplied with the card).
3. Align card with the mounting post and then press-fit with the two sockets.
4. Use the screw supplied with the card to secure it to the mounting post.
5. To complete installation, see wiring instructions for optional cards in Communication (Page 43)).



4.4 Installing the memory card

Memory card is generally pre-installed. If unit does not have one, follow these steps to install the card:

Procedure

 CAUTION**Damage from electrostatic discharge (ESD)**

Some components in the device (such as communication cards, or memory cards) are sensitive to electrostatic discharge and could be damaged. Be sure to handle such components in a manner that avoids any potential damage due to ESD.

1. Disconnect power to the device.
2. Align card with memory card holder.
3. Press into place.

For location of card holder see illustration in Accessing wiring compartment (Page 34).

4.5 Disassembly

 WARNING**Incorrect disassembly**

Injury through electric shock may result from incorrect disassembly.

In order to disassemble correctly, observe the following:

- Before starting work, make sure that you have switched off all physical variables such as pressure, temperature, electricity etc. or that they have a harmless value.
- Secure the remaining connections so that no damage can result if the process is started unintentionally.

5.1 Basic safety notes

 **WARNING**

Missing PE/ground connection

Risk of electric shock.

Depending on the device version, connect the power supply as follows:

- **Power plug:** Ensure that the used socket has a PE/ground conductor connection. Check that the PE/ground conductor connection of the socket and power plug match each other.
- **Connecting terminals:** Connect the terminals according to the terminal connection diagram. First connect the PE/ground conductor.

 **WARNING**

Loss of protection

Loss of approvals can result from improper connection.

- Check the nameplate on your device, to verify the approval rating.
- Use appropriate cable entry seals to maintain applicable Type, IP ratings.

 **WARNING**

Not initial connection

Risk of electric shock.

If this is not the initial connection, disconnect any power sources before adding or changing any wiring connections.

! WARNING**Unsuitable cables, cable glands and/or plugs**

Risk of explosion in hazardous areas.

- Use only cable glands/plugs that comply with the requirements for the relevant type of protection.
- Tighten the cable glands in accordance with the torques specified in Technical specifications (Page 102).
- Close unused cable inlets for the electrical connections.
- When replacing cable glands, only use cable glands of the same type.
- After installation, check that the cables are seated firmly.

! WARNING**Incorrect conduit system**

Risk of explosion in hazardous areas as result of open cable inlet or incorrect conduit system.

- In the case of a conduit system, mount a spark barrier at a defined distance from the device input. Observe national regulations and the requirements stated in the relevant approvals.

! WARNING**Hazardous contact voltage**

Risk of electric shock in case of incorrect connection.

- For the electrical connection specifications, refer to the information in Technical specifications (Page 102).
- At the mounting location of the device observe the applicable directives and laws for installation of electrical power installations with rated voltages below 1000 V.

! WARNING**Improper power supply**

Risk of explosion in hazardous areas as result of incorrect power supply.

- Connect the device in accordance with the specified power supply and signal circuits. The relevant specifications can be found in the certificates, in Technical specifications (Page 102) or on the nameplate.

 **WARNING**

Connecting or disconnecting in explosive environments

Connecting or disconnecting a powered device in explosive environments can lead to an explosion.

- Connect and disconnect in **non**-explosive environments.
 - or-
- Remove power to the device before connecting or disconnecting in explosive atmosphere.

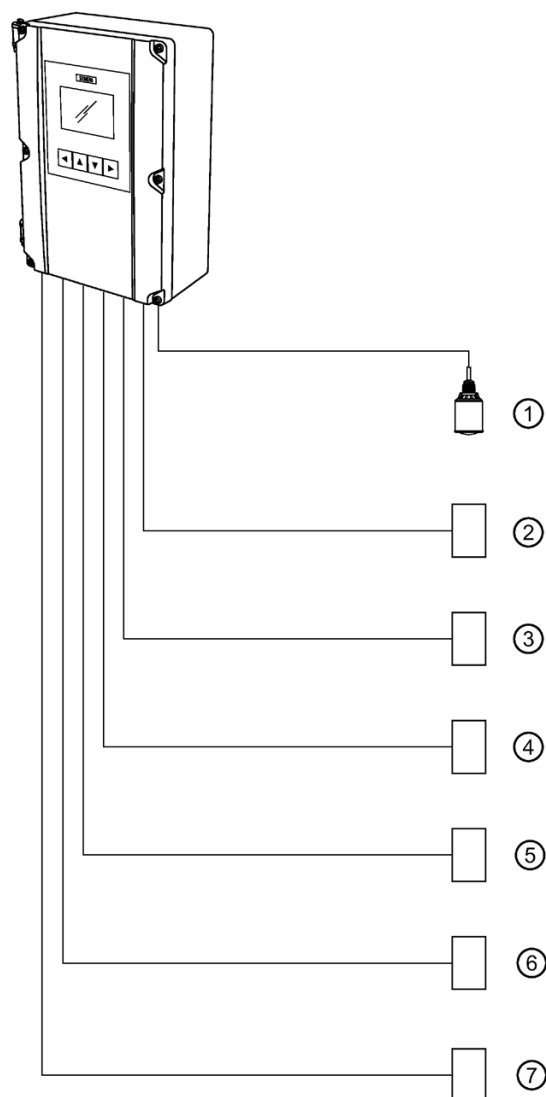
Note

Incorrect torque

Ensure torque is set properly or damage to the device may occur.

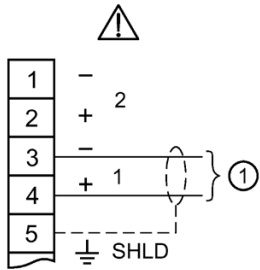
- Tighten lid screws to 0.7 to 0.9 Nm (6 to 8 lb-inch).
 - Tighten remote lid screws to 1.1 Nm (10 lb-inch).
 - Tighten terminal screws in wiring compartment to 0.56 to 0.79 Nm (5 to 7 lb-inch).
-

5.2 Connecting SITRANS LT500




- | | |
|---|--|
| ① Supported sensor(s) | ⑤ Communication card |
| ② Customer alarm, pump, or control device | ⑥ Display, chart recorder, or other control device |
| ③ Customer device, digital output | ⑦ Computer running SIMATIC PDM, or FDT. |
| ④ Service interface | |

5.2.1 Sensor connections



- ① To sensor (measurement point 1)
Note that for EchoMax transducer connection:
positive = black wire
negative = white wire

 WARNING
Hazardous voltage Hazardous voltage present on transducer terminals during operation.

Note

Important wiring notes

- Do not connect coaxial cable directly to the device due to high voltage transmitted on shield of coaxial cable; use coaxial cable converter box instead (see wiring below).
- Do not connect the device shield and white transducer wires together; wire to separate terminals.
- Disregard older transducer manuals that recommend these practices.

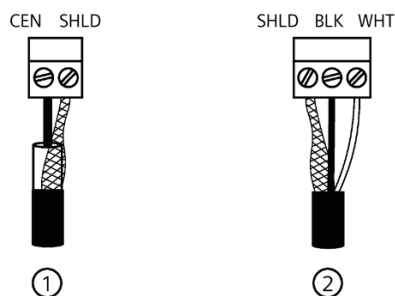
Coaxial cable converter wiring

Note

Improper installation in hazardous areas

Coaxial cable converter is available with approvals for ordinary location applications.

- Do not install in hazardous areas.



- ① Coaxial cable to transducer
- ② Twisted, shielded cable to controller

Note

Avoiding damage to connected sensor

The device supports several different transducers. Some, like the XPS-30, are driven by a low power level, while others, like the XPS-15, are driven by a high power level. It may be possible to damage a low power transducer like the XPS-30 if the transducer selection is currently set to one of the high power transducers. Follow the steps below to avoid this possibility:

1. Set parameter "Sensor type" to "Disabled" before powering down the device.
2. Connect the new transducer.
3. Power up the device and select the correct transducer in parameter "Sensor type". This way, the transducer will not be driven with the wrong power level, even for the short period of time until the correct selection is made.

5.2.2 Wiring compartment

Terminal strips can be removed to improve ease of wiring.

Separate cables and conduits may be required to conform to standard instrumentation wiring practices or electrical codes.

CAUTION

Terminal strip termination

Ensure the terminal strips are terminated to the correct location during re-installation. Failure to do so may result in damage to the device or the external equipment that is attached.

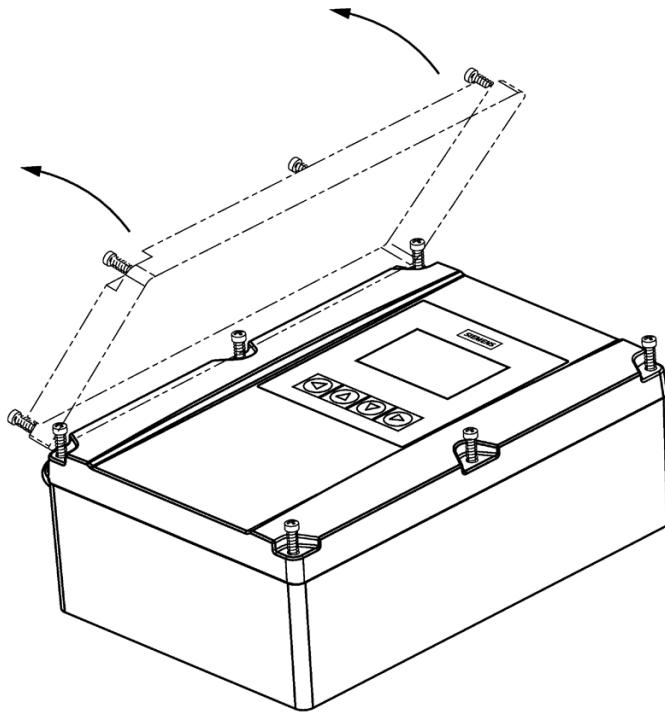
5.2.3 Accessing wiring compartment

Condition

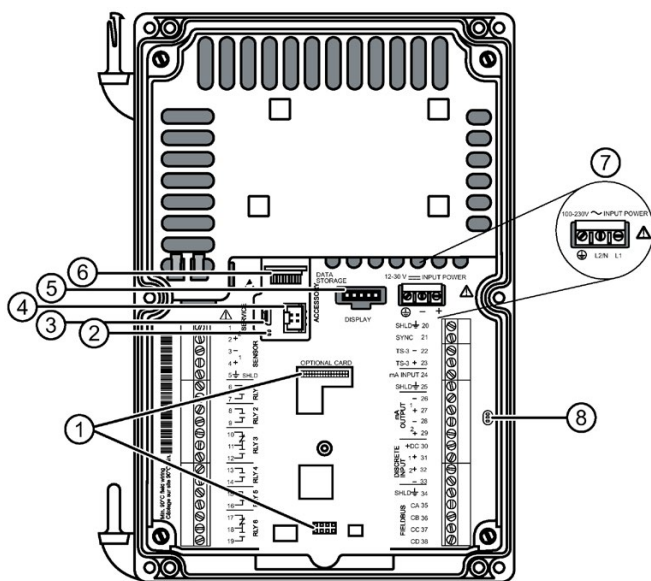
The following have been reviewed: Basic safety notes (Page 28).

Procedure

1. Loosen six screws on lid.
2. Lift lid up and to the left on its hinges.
3. The lid can remain open connected by hinges to access wiring compartment.



4. Make all connections as per instructions that follow.
5. When wiring complete, replace device lid.
6. Screw the lid in place noting recommended torque values.



- | | |
|---|---------------------------|
| ① Socket to connect optional communication card (2) | ⑤ Display connector |
| ② Sensor LEDs | ⑥ Memory card holder |
| ③ Service port | ⑦ Power supply (AC or DC) |
| ④ Accessory port | ⑧ Diagnostic LEDs |

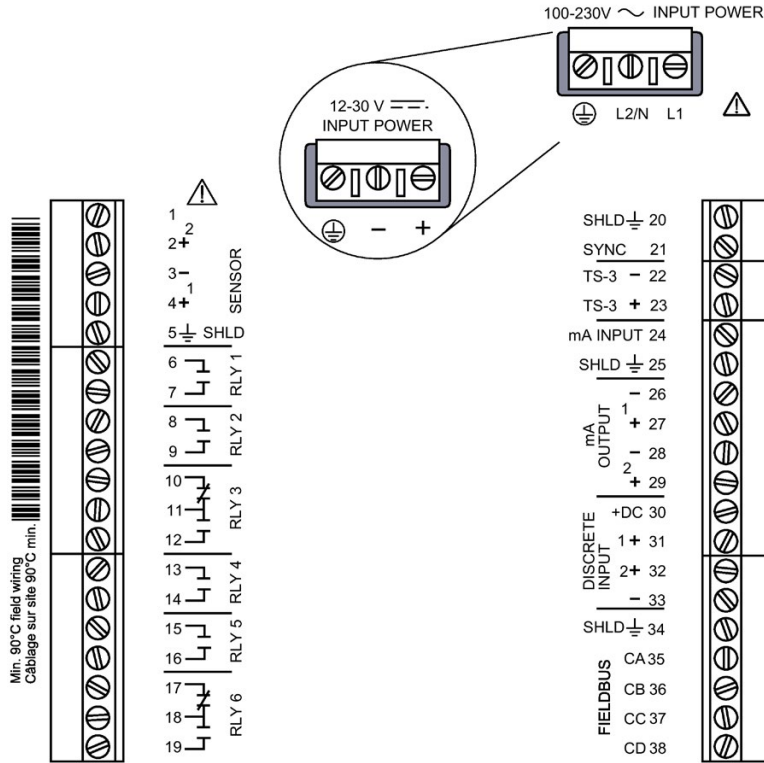
5.2.4 Terminal board

Note

Recommended torque on terminal clamping screws

- 0.56 to 0.79 Nm (5 to 7 lb-inch)

Do not overtighten.




5.2.5 Cables

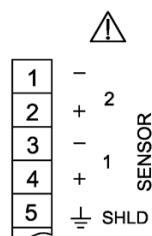
Connection	Cable type
Sensor, mA output, mA input, Digital input, Sync, TS-3	<ul style="list-style-type: none"> • 2 copper conductors, twisted, with shield ¹⁾/drain wire, 0.324 ... 0.823 mm² (22 ... 18 AWG) • Insulation rated to 300 Vrms • Maximum length: 365 m
Relay output, AC input	Relay to be copper conductors per local requirements to meet 250 V 5A contact rating.

¹⁾ Preferred shielding is braided screen.

All field wiring cables must have a temperature rating of at least 90 °C.

 WARNING
<p>Risk due to use of coaxial transducer cable extension</p> <p>Do not use a coaxial transducer cable extension with the device. High voltage transmitted on shield of coaxial cable could result in personal injury, damage to equipment, or poor device performance.</p> <ul style="list-style-type: none"> • Use coaxial cable converter box instead. See wiring under Sensor connections (Page 32).

5.2.6 Supported sensors



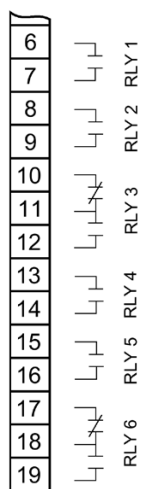
Up to two sensors can be connected.

5.2.7 Relays

Relay contacts are shown in the de-energized state. All relays are handled identically and can be configured as positive or negative logic using parameter Polarity 2.4.6.14 (per relay).

Relay ratings

- Four Form A, NO relays (1, 2, 4, 5)
- Two Form C, NO or NC relays (3, 6)
- 5A at 250 V AC, non-inductive

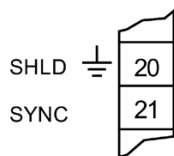


Note

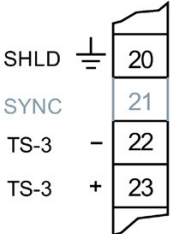
Power failure

- All relays will fail in their de-energized states. Relays 1, 2, 4, and 5 are normally open and will fail open.
 - Relays 3 and 6 can be wired either normally open or normally closed.
-

5.2.8 Synchronization



5.2.9 TS-3 temperature sensor

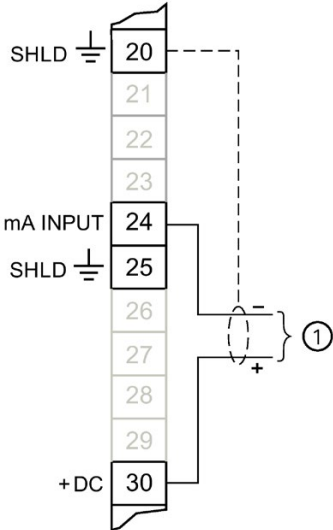


Note that for TS-3 temperature sensor connection:
positive = black wire
negative = white wire

5.2.10 mA input

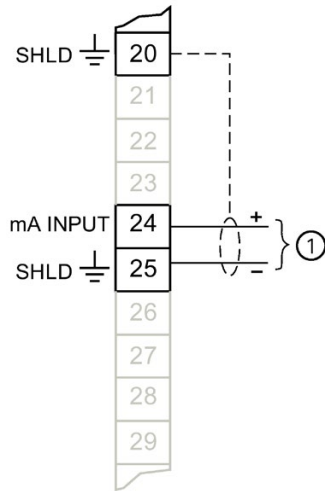
The mA input accepts a 4 to 20 mA input from a loop powered device, which can be powered from the bias (terminal 30). Alternatively, the 4 to 20 mA input can come from a device with its own power supply.

mA input used with internal bias



① To 4 to 20 mA loop powered device

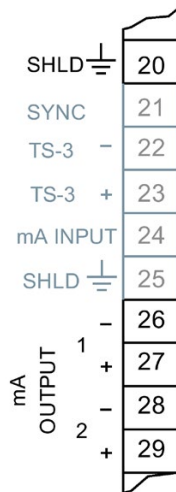
mA input used with external power supply



① To 4 to 20 mA loop powered device

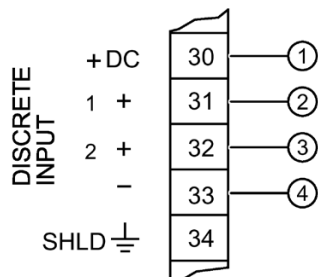
5.2.11 mA output

For more information on auxiliary mA outputs, see the complete operating instructions, and consult current output parameters in menu Inputs and outputs (2.4).



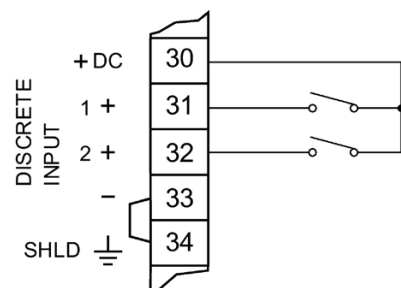
5.2.12 Digital inputs

The digital inputs can be powered from the internal DC power supply (terminal 30), or they can be powered from an external power supply.



- ① DC power supply for positive digital inputs
- ② Positive input for digital input 1
- ③ Positive input for digital input 2
- ④ Common negative for digital inputs

Digital inputs used with internal DC power supply

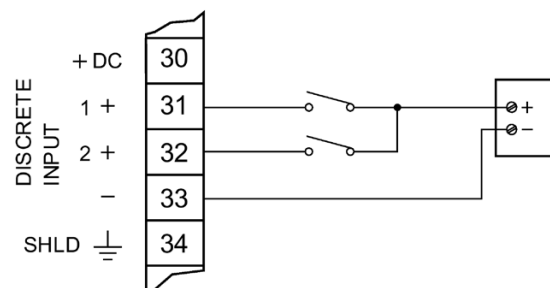


Note

Proper connection for use with internal DC power supply

Terminals 33 and 34 must be connected together.

Digital inputs used with external power supply



5.2.13 Power

⚠ WARNING

Improper power connection

Risk to personnel, system and environment can result from improper power connection.

- Before applying power to the device for the first time, ensure any connected alarm/control equipment is disabled until satisfactory system operation and performance is verified.
- This product is susceptible to electrostatic shock. Follow proper grounding procedures.
- All field wiring must have insulation suitable for rated voltages.
- Relay contact terminals are for use with equipment that has no accessible live parts. The maximum allowable working voltage between adjacent relay contacts shall be 250 V.
- The non-metallic enclosure does not provide grounding between conduit connections. Use grounding type bushings and jumpers.

AC power:

- All current-carrying conductors must be protected by a fuse or circuit breaker in the building installation, having a breaking capacity of up to 15A.
- A circuit breaker or switch in the building installation, marked as the disconnect switch, must be in close proximity to the equipment and within easy reach of the operator, and must disconnect all current-carrying conductors.

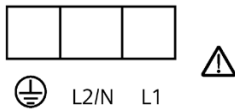
DC power:

- The DC input terminals shall be supplied from a source providing electrical isolation between the input and output, in order to meet the applicable safety requirements of IEC 61010-1. For example, SELV source.

Ensure that the device is connected to a reliable ground.

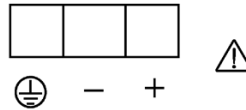
AC power

100-230V ~ INPUT POWER



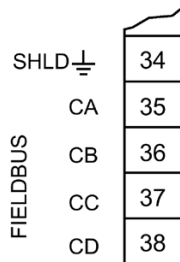
DC power

12-30 V --- INPUT POWER



5.2.14 Communication

5.2.14.1 Communication fieldbus

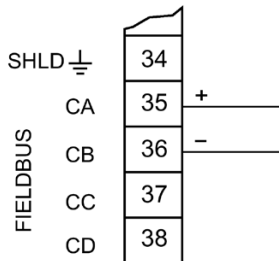


Connect, based on protocols that follow.

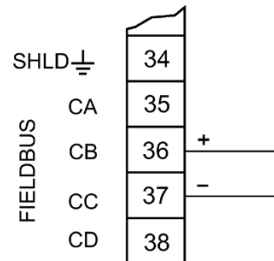
For a list of supported protocols see AUTOHOTSPOT.

5.2.14.2 HART

Active



Passive

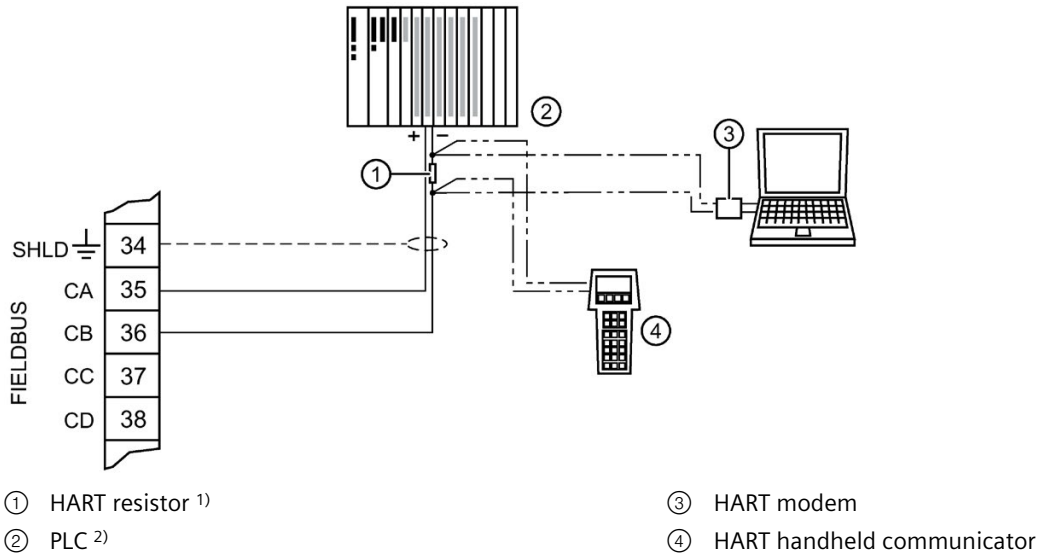


For **Active** HART connection (using LT500 integral power supply), connect terminals 35 and 36.

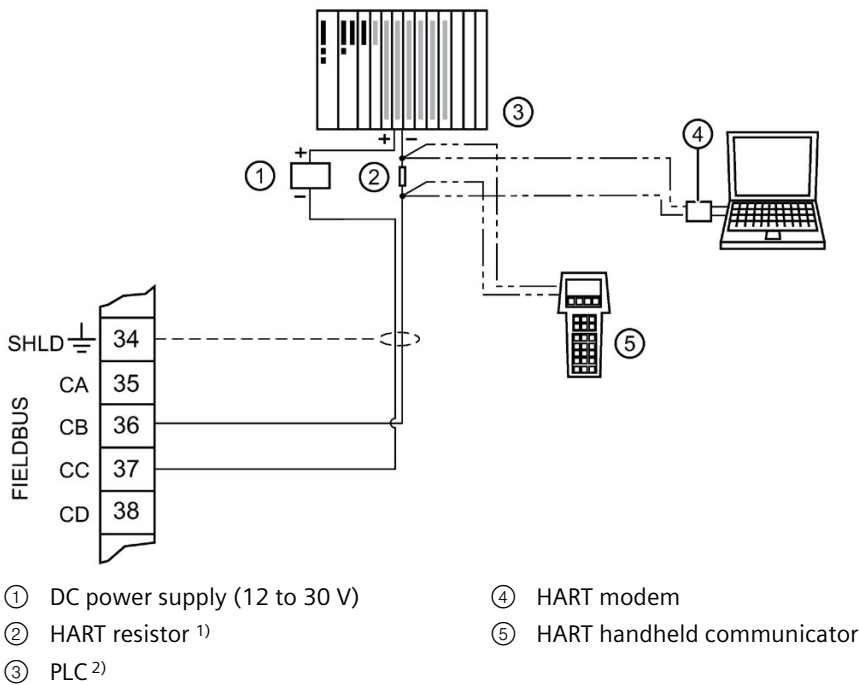
For **Passive** HART connection (using external power supply), connect terminals 36 and 37.

For more information, consult the mA output parameters [Current output (HART) (2.4.1)] in the parameter assignment section of the complete operating instructions.

Typical PLC configuration with Active HART connection



Typical PLC configuration with Passive HART connection

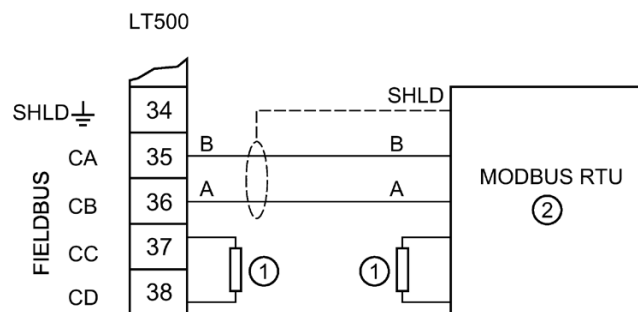


¹⁾ The nominal value for the HART resistor is 250 Ohm. For more information see application guide "Working with HART", which can be downloaded from the product page of our website. Go to: Product page (www.siemens.com/sitransLT500) then under Support, click Application Guides.

²⁾ Depending on the system design, the power supply may be separate from the PLC, or integral to it.

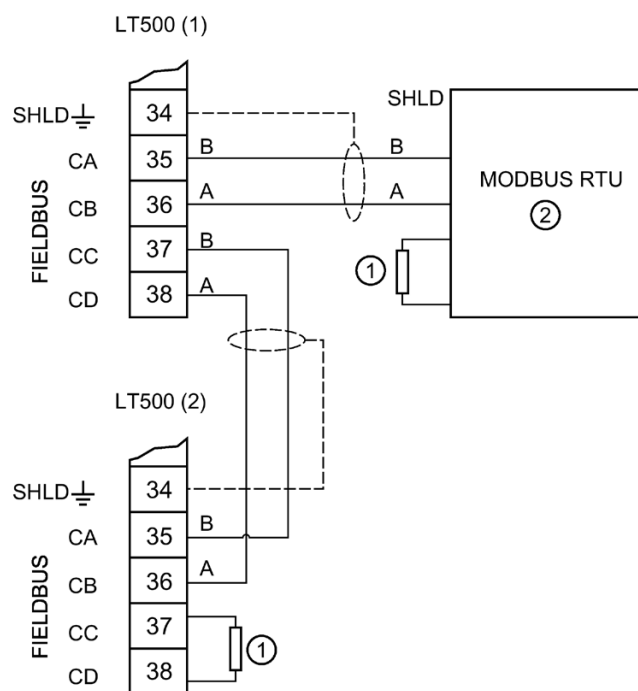
5.2.14.3 Modbus RTU

EIA-RS485 point-to-point connection to Modbus RTU master



- ① Termination resistors
- ② Modbus RTU master

EIA-RS485 multidrop connection to a Modbus RTU master



- ① Termination resistors
- ② Modbus RTU master

Note

Termination resistors

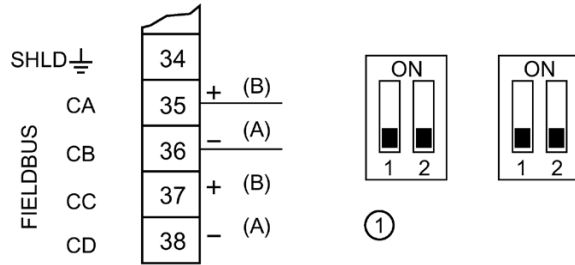
Termination resistors are typically 120R, however check the EIA-RS485 guidelines for more information.

Note

Cable type

Use cable type Belden 9841 or equivalent.

5.2.14.4 PROFIBUS PA/DP



- ① Termination for Profibus DP (dip switches on Profibus DP card only, normally set in OFF position as shown here)
- If LT500 is an end node on the bus, all switches should be set in ON position
 - If LT500 is located elsewhere on the bus, all switches should be set in OFF position

Termination for Profibus PA to be provided externally.

+ - Profibus PA connections

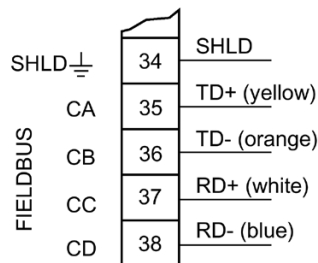
A B Profibus DP connections

Note

Cable requirements

It is recommended to use cable type A for both Profibus DP and Profibus PA, however Profibus DP and Profibus PA cables have different characteristics so the Profibus DP cable should not be used for Profibus PA, and vice versa.

5.2.14.5 PROFINET



5.3 Hazardous area installations


5.3.1 Improper power supply


**WARNING****Improper power supply**


Risk of explosion in hazardous areas as result of incorrect power supply.


- Connect the device in accordance with the specified power supply and signal circuits. The relevant specifications can be found in the certificates, in Technical specifications (Page 102) or on the nameplate.

6.1 Basic safety notes

 DANGER
Toxic gases and liquids Danger of poisoning when venting the device: if toxic process media are measured, toxic gases and liquids can be released. <ul style="list-style-type: none">• Before venting ensure that there are no toxic gases or liquids in the device, or take the appropriate safety measures.

 WARNING
Hazardous contact voltage Risk of injury through hazardous contact voltage when the device is open or not completely closed. The degree of protection specified on the nameplate or in Technical specifications (Page 102) is no longer guaranteed if the device is open or not properly closed. <ul style="list-style-type: none">• Make sure that the device is securely closed.

 WARNING
Improper commissioning in hazardous areas Device failure or risk of explosion in hazardous areas. <ul style="list-style-type: none">• Do not commission the device until it has been mounted completely and connected in accordance with the information in Technical specifications (Page 102).• Before commissioning take the effect on other devices in the system into account.

 WARNING
Loss of explosion protection Risk of explosion in hazardous areas if the device is open or not properly closed. <ul style="list-style-type: none">• Close the device as described in Installing/mounting (Page 15).

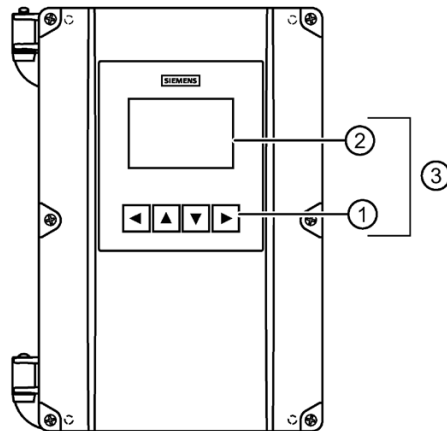
6.2 General requirements

Before commissioning it must be checked that:

- The device has been installed and connected in accordance with the guidelines provided in Installing/mounting (Page 15) and Connecting (Page 28).
- The device meets the local governing codes and good engineering practises for use in a critical application with applicable backup systems and alarms.

6.3 Local operation

The device is built for easy operation, making it possible to be commissioned quickly. Its parameters are menu-driven and can be modified through local operation, using the display and buttons, also known as the Human Machine Interface (HMI).



- ① Local buttons
- ② Graphical display
- ③ Local operation (HMI)

For details on how to use the interface, see Operating chapter in full Operating instructions.

Note

Output remains active

While the device is being configured, the output remains active and continues to respond to changes in the process.

Note

Local display timeout

If no button is pressed for 10 minutes, display switches to operation view. If parameter "Backlight" is set to "Auto", display backlight goes off automatically 30 seconds after the last button press.

6.4 Device startup

Condition

- The following have been reviewed: Basic safety notes (Page 48).
- Device has been properly installed and connected, including the connection of any remote sensors.

Procedure

1. Power-on the device.
For an initial startup, prompts for each of the following steps appear after power-on.
2. Set the language.
The first time the device is configured, you will be prompted to set the language. The parameter "Language" always appears in English. To change the language again (after initial setup), see menu parameter "Language" (6).
3. Set the date and time.
The correct date and time should be set prior to configuring the device.
4. Run the "Quick commissioning wizard" or accept the default values of the device.
Essential parameters should be considered before using the device for the first time.
 - Choose "Yes" (recommended) to start the "Quick commissioning" wizard.
 - Choose "No", you accept the default values of the device (no sensors are configured).
The next HMI view will be the operation view 1.

For any subsequent startup, after power-on, the device automatically starts in operation view. A transition screen showing first the Siemens logo and then the current firmware revision of the product is displayed while the first measurement is being processed.

- If configured, measurement values in operation view will show as dashes (---) during the startup process until a valid measurement is obtained from remote sensors.
- Measurement values in operation view will also shows dashes (---) when:
 - Level difference or Level average is configured, but one of the remote sensors is disabled,
 - A process value on point 2 is configured, but the device is a single-point version.

Before initiating a Quick start wizard to configure the device, you may wish to gather the necessary parameter values. Parameter configuration charts that list all parameters and available options for each application type are available on our website.

Go to Product page (www.siemens.com/sitransLT500).

Click "Support > Application examples".

Record data and select from options on the chart that apply to your application, then with this data on hand, complete the quick start wizards.

6.5 Local commissioning

6.5.1 Wizard order

Procedure

The quick start wizards provide an easy step-by-step procedure to help configure the device for various applications. We recommend that configuration is done in the following order:

1. First, run the appropriate "Quick commissioning" wizard for your application (Level, Space, Distance, Volume, Volume flow).
2. Set up pumps (if applicable) via the "Pump control" wizard.
3. Configure control relays (if applicable) via the "Basic control" wizard.
4. Configure alarms (if applicable) via the "Alarm" wizard.
5. Configure totalizers and samplers (if applicable) referencing the respective parameters.

It is important that alarms and other controls are configured last to avoid pump relay assignments being overridden by the "Quick commissioning" wizard.

6.5.2 Wizards

6.5.2.1 Wizard overview

Note

Important information regarding the use of commissioning wizard

- A reset to defaults should be performed before running "Quick commissioning" wizard if the device has been used in a previous application.
 - Settings for quick commissioning wizard are inter-related and changes apply only after "Apply?" is set to "Yes" in final step.
 - **Exception: All local units are set immediately in the wizard, even if the wizard is cancelled in the final step.**
 - Do not use quick commissioning wizard to modify individual parameters. Perform customization for your application only *after* "Quick commissioning" wizard has been completed.
-

Note

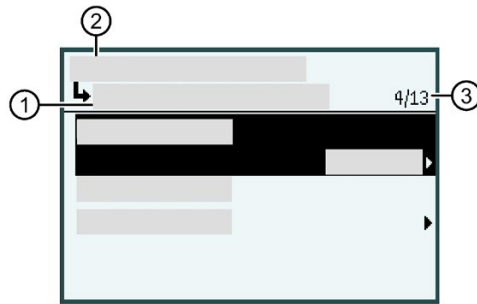
Parameter settings properly stored

In order to ensure parameter settings are properly stored in the device and to the memory card (if data logging is enabled), wait 30 seconds after any configuration change before removing power from the device.

1. From initial power up of device, after setting the language and date/time, you will be prompted to run the quick commissioning wizard. To run the wizard if this is not the initial power up, press ► from operation view.
2. Press ► to enter the "Quick start" menu, and again to start the "Quick commissioning" wizard. After reading what the wizard does in step one, press ► to choose a measurement point (appears only on a dual-point device), then the application for this point: Level, Space, Distance, Volume, or Volume flow.
3. Configure each parameter per step, then select "Next" to proceed. In the final step, when asked to "Apply?", choose "Yes" to save changes.
4. Next, configure a second measurement point, or "Exit" the wizard. After exiting the wizard, press ◀ button twice to return to operation view.

The wizard illustrations in this section show an overview of each commissioning wizard and of the buttons used to navigate through the wizards.

In the upper left corner of each view, the wizard name appears, followed by each step name. In the upper right corner, the view number is shown.



- ① Step name/Parameter name, e.g. "Units"
- ② Wizard name, e.g. "Quick commissioning"
- ③ View number/Total views in wizard, e.g. 4th view of 13

A wizard provides an easy step-by-step procedure to guide you through a quick setup of various parameters.

The following Quick start wizards are available:

- Quick commissioning
- Pump control
- Basic control
- Alarms

Use the ▲ and ▼ buttons to highlight the desired HMI wizard and press the ► button to enter the wizard.





The first view in each wizard (About) is a description of which settings/actions can be performed using the specific wizard.

The last view in each wizard (Apply?) allows user to apply selected settings.

Note

Parameter visibility

A full list of available parameters and settings for each are shown in the manual. However, some parameters and settings may not appear on the device, as visibility is based on the application and configuration selected.

Button	Function
	Leave menu without saving changes
	Scroll up in list of options
	Scroll down in list of options
	Select option. Confirm selection and save setting.

With the successful completion of each quick commissioning wizard, the following are set:

- Units set in the wizard are applied to device display and fieldbus
- Sensor damping is set per wizard parameter "Response rate", and all other damping (local display, current output, fieldbus) is set to zero (disabled).
- Process value per application (Level, Space, Distance, Volume, Volume flow) is set as the source for:
 - "Current output (HART)" - channel 1 (CH1) (if HART communication card installed), and "Current output 1" - channel 2 (CH2) for measurement point 1
 - "Current output 2" - channel 3 (CH3) for measurement point 2
- Process value per application are used in operation view: "View 1" and "View 3"
- Additionally, for Volume flow application:
 - Volume flow is used as the source, and sets units for totalizers
 - "Totalizer 1" (TOT1) and "Totalizer 2" (TOT2) on measurement point 1
 - "Totalizer 3" (TOT3) and "Totalizer 4" (TOT4) on measurement point 2
 - "View 2" uses Head as the source for "Totalizer 1" (TOT1)
 - "View 4" uses Head as the source for "Totalizer 3" (TOT3)

A successfully completed pump control, basic control or alarms wizard does not set any views, or other parameters, external to the wizard.

Note**Damping via commissioning wizard vs menu parameters**

Upon successful completion of the wizard:

- Sensor damping is set on the supported sensor by wizard parameter "Response rate".
- All other damping (local display, current output, fieldbus) is set to zero (disabled).

To affect damping on a mA input, or to set further damping of the device outputs, use menu parameter "Damping value" (per local display, current output, fieldbus), after completing the wizard.

- Note that this additional damping will compound the effect of any damping set by parameter "Response rate".
-

6.5.2.2 Quick commissioning





Quick commissioning wizards via HMI

Procedure

Quick commissioning wizard

The SITRANS LT500 provides several quick commissioning wizards that can be used for various applications.


The initial wizard steps are common for all application types. Subsequent wizard parameters will vary depending on the application you choose. For the purpose of documenting, three separate lists follow. These lists include the wizard parameters available to commission each application type (see links below).

1. From **operation view**, press  button to enter **parameter view**. The first level menu "Quick start" will display. Press  button to enter this menu.
2. Press  button again to enter "Quick commissioning" wizard. Press  button to enter **edit view** for each parameter.

In the wizard, when there is more than one parameter per step, press  button to configure each parameter, then press  button to navigate to "Next" step.

3. Setup each measurement point to configure it for an application type (Level, Space, Distance, Volume, Volume flow).

Subsequent wizard parameters will vary depending on the application you choose. See links below to step you through the wizard appropriate to your application.

4. Select "Yes" to "Apply?". This confirms all parameter changes as the final step in the quick commissioning wizard.
For a dual-point device, complete the wizard for the second measurement point, then press "Exit" to return to **parameter view**.
5. Press  button two times to return to **operation view**.

6.5 Local commissioning

For more information about commissioning a Level, Space, or Distance application, go to Quick commissioning: Level/Space/Distance (Page 57).

For more information about commissioning a Volume application, go to Quick commissioning: Volume (Page 63).

For more information about commissioning a Volume flow application, go to Quick commissioning: Volume flow (Page 71).

Note

Important information regarding the use of commissioning wizard

- A reset to defaults should be performed before running "Quick commissioning wizard" if the device has been used in a previous application.
- Settings for quick commissioning wizard are inter-related and changes apply only after "Apply?" is set to 'Yes' in final step.
- Do not use quick commissioning wizard to modify individual parameters. Perform customization for your application only *after* "Quick commissioning wizard" has been completed.

Note

Output remains active

While the device is being configured, the output remains active and continues to respond to changes in the process.

Quick Commissioning wizard (menu item 1.1)

The Quick commissioning wizard will guide you through configuration of parameters essential for your application. You configure parameters essential for your application by selecting the configuration path and sub-wizards appropriate for your application.

Step: Select application

With a dual-point device, you will be prompted to set up each point individually, otherwise set the type of measurement required for the application.

This is done in the 'Select application' step.

The options available are:

- Level
- Space
- Distance
- Volume
- Volume flow

The remaining parameters to be configured in the wizard will depend on the application selected, and on the type of sensor connected.

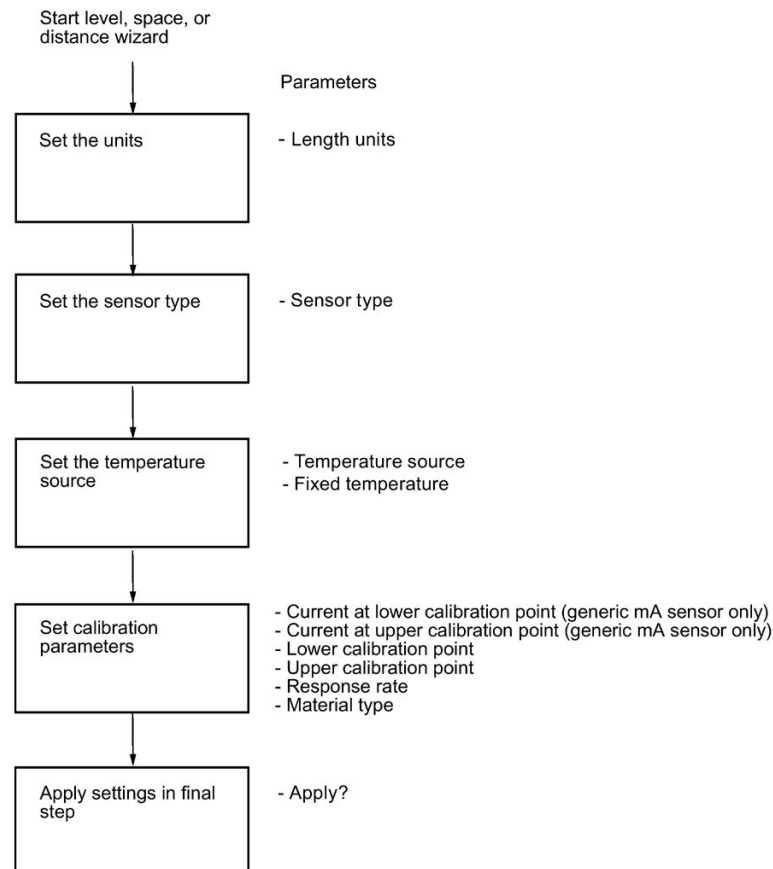
Note

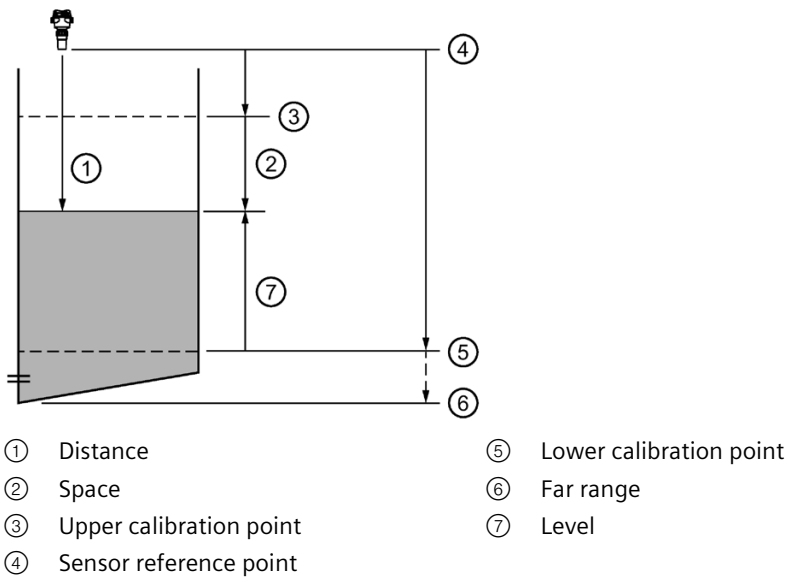
Dual-point device applications

An application setting of "Level average" or "Level difference" is only possible with a dual-point version, and must be set outside of the commissioning wizard.

- First, complete the commissioning wizard for a Level application on both points, then set the process value:
 - For the configured current output to follow "Level average" or "Level difference"
For example, see Process value (2.4.1.4) for "Current output (HART)"
 - For a pump control application based on "Level average" or "Level difference"
For example, see Process value (2.5.4.2) under menu "Application>Pump control"
- Next, configure the operation views to display "Level average" or "Level difference"
For example, see 1st value (2.8.5.2) for "View 1" under menu "Local display"

Quick commissioning: Level/Space/Distance





Setting	Description	Reference point
Level	Height of material	Lower calibration point (process empty level)
Space	Distance to material surface	Upper calibration point (process full level)
Distance		Sensor reference point

Step: Length units

Note
Local units set immediately by wizard

All local units are set immediately in wizard when "Units" step completed.

- Units are an exception to the general rule for all other wizard settings: Settings for quick commissioning wizard are inter-related and changes apply only after "Apply?" is set to "Yes" in final step.
- Units for local operation are applied even if wizard is cancelled in final step. Therefore, re-run the wizard if a change must be made to units setting.

Length units

Sets the length units applied for local operation and the communication interface, on measurement point 1 and 2.

Setting	<ul style="list-style-type: none"> • m (meters) • cm (centimeters) • mm (millimeters) • ft (feet) • in (inches)
Default	m

Note

Process value too large to display

In some cases, it is possible that the process value is too large to show on the local display, "#####" will show instead.

If this occurs in a typical application:

- Adjust parameter "Units" so that a smaller value can be shown, e.g. use meters instead of millimeters.

If this occurs in a custom application:

- Adjust parameter "Custom units" so that a smaller value can be shown, e.g. use tons instead of pounds.
- Note that a change to custom units also requires a manual scaling adjustment.

Step: Sensor type

Sensor type

Sets the limit condition that is applied to the sensor input

Setting	<ul style="list-style-type: none"> • EchoMax XRS-5 • EchoMax XPS-10 • EchoMax XPS-15 • EchoMax XPS-30 • EchoMax XPS-40 • ST-H • EchoMax XCT-8 • EchoMax XCT-12 • EchoMax XLT-30 • EchoMax XLT-60 • ST-25 • ST-50 • ST-100 • LR13 • LR21 • 4 ... 20 mA
Default	EchoMax XRS-5

Note

Damping via wizard with supported remote sensor

Damping of process values in the supported remote sensor is set based on wizard parameter "Response rate".

Step: Temperature source

Temperature source

Sets the source of the temperature reading that is used to adjust the speed of sound.

Setting	<ul style="list-style-type: none"> • Auto • Fixed temperature • Transducer • External TS-3 • Average of sensors
Default	Transducer

Fixed temperature

Sets a fixed temperature value if a temperature sensing device is not used.

Setting	-100.0 ... +150.0 °C
Default	+20.0 °C

This parameter is only visible when parameter "Temperature source" is set to "Fixed temperature".

Enter the temperature (in °C) of the atmosphere within the transducer acoustic beam. If the temperature varies with distance from the transducer, enter the average temperature.

Step: Calibration

Current at lower calibration point

Sets loop current produced by the mA input when material is at lower calibration point.

Setting	4 ... 20 mA
Default	4 mA

This parameter is only visible when the sensor type is set to "4 ... 20 mA".

Current at upper calibration point

Sets loop current produced by the mA input when material is at upper calibration point.

Setting	4 ... 20 mA
Default	20 mA

This parameter is only visible when the sensor type is set to "4 ... 20 mA".

Lower calibration point

Sets distance from sensor reference point to lower calibration point: usually process empty level.

Setting	Sensor specific
Default	6 m

Upper calibration point

Sets distance from sensor reference point to upper calibration point: usually process full level.

Setting	Sensor specific
Default	0 m

Response rate

Sets reaction speed of device to measurement changes in target range.

Use a setting just faster than the maximum filling or emptying rate (whichever is faster).

Setting	Slow	0.1 m/min (fill/empty rate)
	Medium	1.0 m/min (fill/empty rate)
	Fast	10.0 m/min (fill/empty rate)
Default	Medium	

Note**Rate parameters**

Alarm and limit parameters for fill and empty rates work in conjunction, and are affected by parameter "Response rate" (set in the "Quick commissioning" wizard). The rate parameters automatically adjust when parameter "Response rate" is altered, but any changes made to the rate parameters following the completion of the wizard will supersede the response rate setting. See menu Rate (2.1.8).

Material type

Used to optimize performance based on material type.

Setting	<ul style="list-style-type: none"> • Liquid • Solid
Default	Liquid

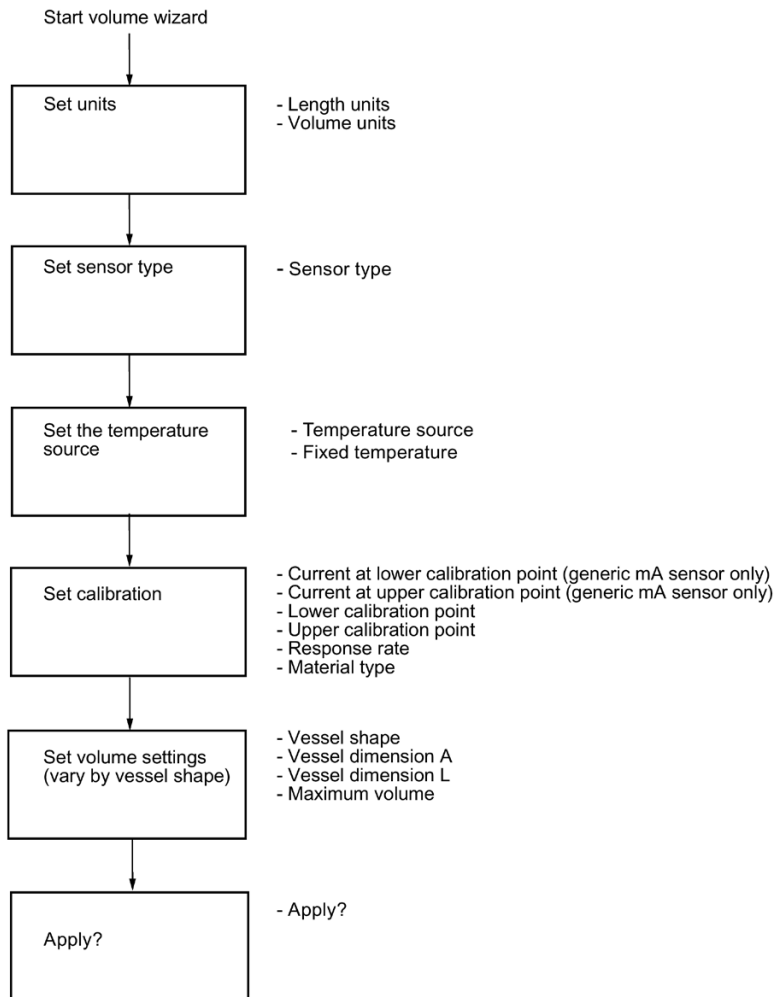
This parameter does not appear in the quick commissioning wizard when the sensor type is set to "4 ... 20 mA".

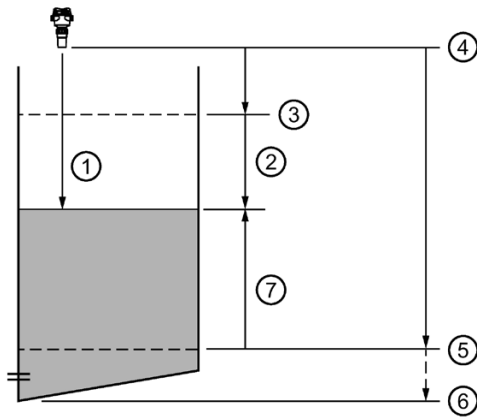
Step: Apply?**Apply?**

Applies settings as last step in wizard.

Setting	Yes	Wizard completes and settings are applied.
	No	Returned to start of wizard.
Default	No	

Quick commissioning: Volume





- ① Distance
- ② Space
- ③ Upper calibration point
- ④ Sensor reference point
- ⑤ Lower calibration point
- ⑥ Far range
- ⑦ Level

Setting	Description	Reference point
Volume	Volume of material in Volume units (based on level)	Lower calibration point

Step: Units

Note

Local units set immediately by wizard

All local units are set immediately in wizard when "Units" step completed.

- Units are an exception to the general rule for all other wizard settings: Settings for quick commissioning wizard are inter-related and changes apply only after "Apply?" is set to "Yes" in final step.
- Units for local operation are applied even if wizard is cancelled in final step. Therefore, re-run the wizard if a change must be made to units setting.

Length units

Sets the length units applied for local operation and the communication interface, on measurement point 1 and 2.

Setting	<ul style="list-style-type: none"> • m (meters) • cm (centimeters) • mm (millimeters) • ft (feet) • in (inches)
Default	m

Volume units

Sets the volume units applied for local operation and the communication interface, on measurement point 1 and 2.

Setting	<ul style="list-style-type: none"> • l (liters) • hl (hectoliters) • m³ (cubic meters) • gal (UK) (imperial gallons) • in³ (cubic inches) • gal (US gallons) • ft³ (cubic feet) 	<ul style="list-style-type: none"> • bu (bushels) • bbl-beer (31 US gallon barrels) • bbl (US) (31.5 gallon barrels) • bbl (42 US gallon barrels) • yd³ (cubic yards) • Mgal (US megagallons) • Ml (megaliters) • Custom
Default	l (liters)	

Note

Process value too large to display

In some cases, it is possible that the process value is too large to show on the local display, "#####" will show instead.

If this occurs in a typical application:

- Adjust parameter "Units" so that a smaller value can be shown, e.g. use meters instead of millimeters.

If this occurs in a custom application:

- Adjust parameter "Custom units" so that a smaller value can be shown, e.g. use tons instead of pounds.
- Note that a change to custom units also requires a manual scaling adjustment.

Step: Sensor type

Sensor type

Sets the limit condition that is applied to the sensor input

Setting	<ul style="list-style-type: none"> • EchoMax XRS-5 • EchoMax XPS-10 • EchoMax XPS-15 • EchoMax XPS-30 • EchoMax XPS-40 • ST-H • EchoMax XCT-8 • EchoMax XCT-12 • EchoMax XLT-30 • EchoMax XLT-60 • ST-25 • ST-50 • ST-100 • LR13 • LR21 • 4 ... 20 mA
Default	EchoMax XRS-5

Note

Damping via wizard with supported remote sensor

Damping of process values in the supported remote sensor is set based on wizard parameter "Response rate".

Step: Temperature source

Temperature source

Sets the source of the temperature reading that is used to adjust the speed of sound.

Setting	<ul style="list-style-type: none"> • Auto • Fixed temperature • Transducer • External TS-3 • Average of sensors
Default	Transducer

Fixed temperature

Sets a fixed temperature value if a temperature sensing device is not used.

Setting	-100.0 ... +150.0 °C
Default	+20.0 °C

This parameter is only visible when parameter "Temperature source" is set to "Fixed temperature".

Enter the temperature (in °C) of the atmosphere within the transducer acoustic beam. If the temperature varies with distance from the transducer, enter the average temperature.

Step: Calibration

Current at lower calibration point

Sets loop current produced by the mA input when material is at lower calibration point.

Setting	4 ... 20 mA
Default	4 mA

This parameter is only visible when the sensor type is set to "4 ... 20 mA".

Current at upper calibration point

Sets loop current produced by the mA input when material is at upper calibration point.

Setting	4 ... 20 mA
Default	20 mA

This parameter is only visible when the sensor type is set to "4 ... 20 mA".

Lower calibration point

Sets distance from sensor reference point to lower calibration point: usually process empty level.

Setting	Sensor specific
Default	6 m

Upper calibration point

Sets distance from sensor reference point to upper calibration point: usually process full level.

Setting	Sensor specific
Default	0 m

Response rate

Sets reaction speed of device to measurement changes in target range.

Use a setting just faster than the maximum filling or emptying rate (whichever is faster).

Setting	Slow	0.1 m/min (fill/empty rate)
	Medium	1.0 m/min (fill/empty rate)
	Fast	10.0 m/min (fill/empty rate)
Default	Medium	

Note

Rate parameters

Alarm and limit parameters for fill and empty rates work in conjunction, and are affected by parameter "Response rate" (set in the "Quick commissioning" wizard). The rate parameters automatically adjust when parameter "Response rate" is altered, but any changes made to the rate parameters following the completion of the wizard will supersede the response rate setting. See menu Rate (2.1.8).

Material type

Used to optimize performance based on material type.

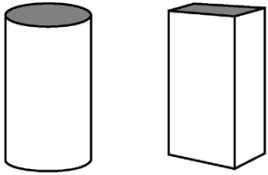
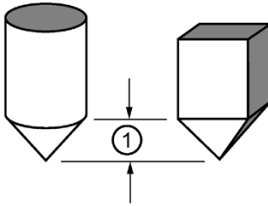
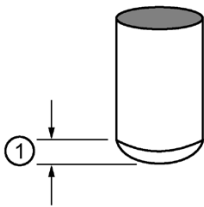
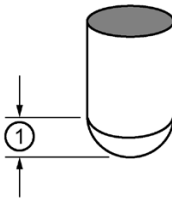
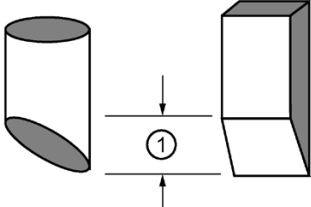
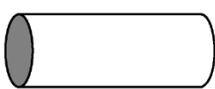
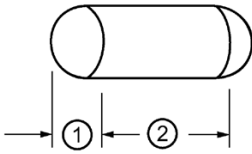
Setting	<ul style="list-style-type: none"> • Liquid • Solid
Default	Liquid

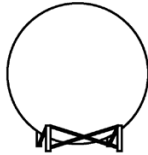
This parameter does not appear in the quick commissioning wizard when the sensor type is set to "4 ... 20 mA".

Step: Volume settings

Vessel shape

Sets vessel shape, and allows device to calculate volume in addition to level.

	Display name/description	Vessel shape	Other parameter settings required
Setting	Linear vessel		Maximum volume
	Conical bottom vessel		Maximum volume, Vessel dimension A
	Parabolic bottom vessel		Maximum volume, Vessel dimension A
	Half sphere bottom vessel		Maximum volume, Vessel dimension A
	Flat sloped bottom vessel		Maximum volume, Vessel dimension A
	Cylinder vessel		Maximum volume
	Parabolic ends vessel		Maximum volume, Vessel dimension A, Vessel dimension L

	Display name/description	Vessel shape	Other parameter settings required
	Sphere vessel		Maximum volume
	Custom	Use for custom volume application.	
Default	Linear vessel		Maximum volume

① Vessel dimension A ② Vessel dimension L

Vessel dimension A

Sets height of vessel bottom when bottom is conical, parabolic, half spherical, or flat sloped. If horizontal parabolic ends vessel, sets depth of end.

Setting	0 ... 99999
Default	0 m

Vessel dimension L

Sets length of cylindrical section of horizontal parabolic ends vessel.

Setting	0 ... 99999
Default	0 m

Maximum volume

Sets the maximum volume of the vessel.

Enter the vessel volume corresponding to the upper calibration point.

Setting	0 ... 99999 liters
Default	100 liters

Step: Apply?

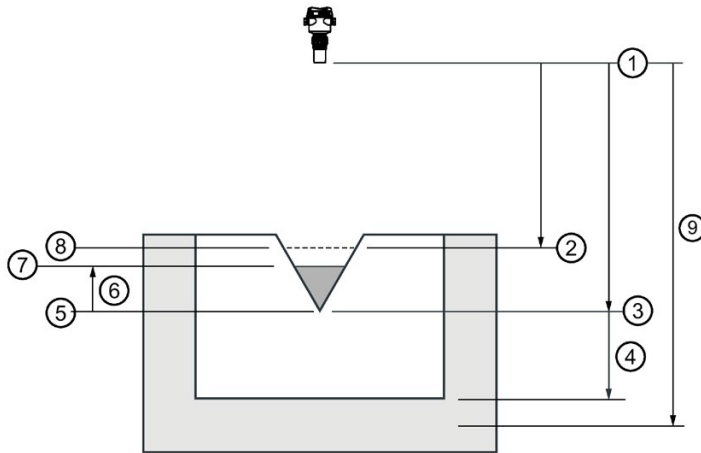
Apply?

Applies settings as last step in wizard.

Setting	Yes	Wizard completes and settings are applied.
	No	Returned to start of wizard.
Default	No	

Quick commissioning: Volume flow





- ① Sensor reference point
- ② Upper calibration point
- ③ Lower calibration point
- ④ Zero head offset
- ⑤ Zero head
- ⑥ Head
- ⑦ Material surface
- ⑧ Maximum head/Maximum flow
- ⑨ Far range

Setting	Description	Reference point
Volume flow	Flow rate in an open channel in Volume flow units	Zero head, zero flow

Step: Units

Note

Local units set immediately by wizard

All local units are set immediately in wizard when "Units" step completed.

- Units are an exception to the general rule for all other wizard settings: Settings for quick commissioning wizard are inter-related and changes apply only after "Apply?" is set to "Yes" in final step.
- Units for local operation are applied even if wizard is cancelled in final step. Therefore, re-run the wizard if a change must be made to units setting.

Length units

Sets the length units applied for local operation and the communication interface, on measurement point 1 and 2.

Setting	<ul style="list-style-type: none">• m (meters)• cm (centimeters)• mm (millimeters)• ft (feet)• in (inches)
Default	m

Volume flow units

Sets the volume flow units applied for local operation and the communication interface, on measurement point 1 and 2.

Setting	<ul style="list-style-type: none"> • l/d (liters per day) • l/h (liters per hour) • l/min (liters per minute) • l/s (liters per second) • hl/d (hectoliters per day) • hl/h (hectoliters per hour) • hl/min (hectoliters per minute) • hl/s (hectoliters per second) • Ml/d (megaliters per day) • m³/d (cubic meters per day) • m³/h (cubic meters per hour) • m³/min (cubic meters per minute) • m³/s (cubic meters per second) • Mm³/d (million cubic meters per day) • gal (UK)/d (imperial gallons per day) • gal (UK)/h (imperial gallons per hour) • gal (UK)/min (imperial gallons per minute) • gal (UK)/s (imperial gallons per second) • in³/d (cubic inches per day) • in³/h (cubic inches per hour) • in³/min (cubic inches per minute) • in³/s (cubic inches per second) • gal/d (US gallons per day) • gal/h (US gallons per hour) • gal/min (US gallons per minute) • gal/s (US gallons per second) • Mgal/d (US megagallons per day) • ft³/d (cubic feet per day) • ft³/h (cubic feet per hour) • ft³/min (cubic feet per minute) • ft³/s (cubic feet per second) 	<ul style="list-style-type: none"> • Mft³/d (million cubic feet per day) • bu/d (bushels per day) • bu/h (bushels per hour) • bu/min (bushels per minute) • bu/s (bushels per second) • bbl-beer/d (31 US gallon barrels per day) • bbl-beer/h (31 US gallon barrels per hour) • bbl-beer/min (31 US gallon barrels per minute) • bbl-beer/s (31 US gallon barrels per second) • bbl (US)/d (31.5 US gallon barrels per day) • bbl (US)/h (31.5 US gallon barrels per hour) • bbl (US)/min (31.5 US gallon barrels per minute) • bbl (US)/s (31.5 US gallon barrels per second) • bbl/d (42 US gallon barrels per day) • bbl/h (42 US gallon barrels per hour) • bbl/min (42 US gallon barrels per minute) • bbl/s (42 US gallon barrels per second) • kbb/d (thousand 42 US gallon barrels per day) • kbb/h (thousand 42 US gallon barrels per hour) • kbb/min (thousand 42 US gallon barrels per minute) • kbb/s (thousand 42 US gallon barrels per second) • Mbb/d (million 42 US gallon barrels per day) • yd³/d (cubic yards per day) • yd³/h (cubic yards per hour) • yd³/min (cubic yards per minute) • yd³/s (cubic yards per second) • AF/d (acre-feet per day) • AF/h (acre-feet per hour) • AF/min (acre-feet per minute) • Custom
Default	l/s (liters per second)	

Volume units

Sets the volume units for totalizers, applied for local operation and the communication interface.

- For measurement point 1, volume units are set for totalizer 1 and 2.
- For measurement point 2, volume units are set for totalizer 3 and 4.

Setting	<ul style="list-style-type: none"> • l (liters) • hl (hectoliters) • m³ (cubic meters) • gal (UK) (imperial gallons) • in³ (cubic inches) • gal (US gallons) • ft³ (cubic feet) 	<ul style="list-style-type: none"> • bu (bushels) • bbl-beer (31 US gallon barrels) • bbl (US) (31.5 gallon barrels) • bbl (42 US gallon barrels) • yd³ (cubic yards) • Mgal (US megagallons) • Ml (megaliters) • Custom
Default	l (liters)	

Note

Process value too large to display

In some cases, it is possible that the process value is too large to show on the local display, "#####" will show instead.

If this occurs in a typical application:

- Adjust parameter "Units" so that a smaller value can be shown, e.g. use meters instead of millimeters.

If this occurs in a custom application:

- Adjust parameter "Custom units" so that a smaller value can be shown, e.g. use tons instead of pounds.
- Note that a change to custom units also requires a manual scaling adjustment.

Step: Sensor type**Sensor type**

Sets the limit condition that is applied to the sensor input

Setting	<ul style="list-style-type: none"> • EchoMax XRS-5 • EchoMax XPS-10 • EchoMax XPS-15 • EchoMax XPS-30 • EchoMax XPS-40 • ST-H • EchoMax XCT-8 • EchoMax XCT-12 • EchoMax XLT-30 • EchoMax XLT-60 • ST-25 • ST-50 • ST-100 • LR13 • LR21 • 4 ... 20 mA
Default	EchoMax XRS-5

Note**Damping via wizard with supported remote sensor**

Damping of process values in the supported remote sensor is set based on wizard parameter "Response rate".

Step: Temperature source**Temperature source**

Sets the source of the temperature reading that is used to adjust the speed of sound.

Setting	<ul style="list-style-type: none"> • Auto • Fixed temperature • Transducer • External TS-3 • Average of sensors
Default	Transducer

Fixed temperature

Sets a fixed temperature value if a temperature sensing device is not used.

Setting	-100.0 ... +150.0 °C
Default	+20.0 °C

This parameter is only visible when parameter "Temperature source" is set to "Fixed temperature".

Enter the temperature (in °C) of the atmosphere within the transducer acoustic beam. If the temperature varies with distance from the transducer, enter the average temperature.

Step: Calibration

Current at lower calibration point

Sets loop current produced by the mA input when material is at lower calibration point.

Setting	4 ... 20 mA
Default	4 mA

This parameter is only visible when the sensor type is set to "4 ... 20 mA".

Current at upper calibration point

Sets loop current produced by the mA input when material is at upper calibration point.

Setting	4 ... 20 mA
Default	20 mA

This parameter is only visible when the sensor type is set to "4 ... 20 mA".

Lower calibration point

Sets distance from sensor reference point to lower calibration point: usually process empty level.

Setting	Sensor specific
Default	6 m

Upper calibration point

Sets distance from sensor reference point to upper calibration point: usually process full level.

Setting	Sensor specific
Default	0 m

Response rate

Sets reaction speed of device to measurement changes in target range.

Use a setting just faster than the maximum filling or emptying rate (whichever is faster).

Setting	Slow	0.1 m/min (fill/empty rate)
	Medium	1.0 m/min (fill/empty rate)
	Fast	10.0 m/min (fill/empty rate)
Default	Medium	

Note

Rate parameters

Alarm and limit parameters for fill and empty rates work in conjunction, and are affected by parameter "Response rate" (set in the "Quick commissioning" wizard). The rate parameters automatically adjust when parameter "Response rate" is altered, but any changes made to the rate parameters following the completion of the wizard will supersede the response rate setting. See menu Rate (2.1.8).

Material type

Used to optimize performance based on material type.

Setting	<ul style="list-style-type: none"> • Liquid • Solid
Default	Liquid

This parameter does not appear in the quick commissioning wizard when the sensor type is set to "4 ... 20 mA".

Step: Primary measuring device

Primary measuring device (PMD)

Sets the type of primary measuring device (PMD) used.

Setting	<ul style="list-style-type: none"> • Exponential devices • Rectangular flume BS 3680/ISO 4373 • Round nose horizontal crest weir BS 3680/ISO 4373 • Trapezoidal flume BS 3680/ISO 4373 • U-flume BS 3680/ISO 4373 • Finite crest weir BS 3680/ISO 4373 • Thin plate rectangular weir BS 3680/ISO 4373 • Thin plate V-notch weir BS 3680/ISO 4373 • Rectangular weir contracted • Round pipe • Palmer-Bowlus flume • H-flume • Custom
Default	Exponential devices

If PMD is not listed, set to "Custom" and use a volume flow calculation.

Step: Method of flow calculation

Method of flow calculation

Sets method of flow calculation.

Setting	<ul style="list-style-type: none"> • Absolute • Ratiometric
Default	Absolute

Set this parameter to "Ratiometric" only if the primary measuring device (PMD) supports ratiometric calculations. (Note that Palmer Bowlus Flume and H-Flume support ratiometric calculations only.)

Step: Flow settings (vary by PMD)**Note****Two parts to "Step: Flow settings" (vary by PMD)**

Part 1 - The dimensions (one to four), based on the selected PMD, are set.

Part 2 - Other required flow settings, based on the selected PMD, are set.

Only the settings required for the selected PMD are visible in the wizard on the HMI. Refer to Operating instructions for a full list of settings per PMD.

Step: Flow settings (common)**Maximum head (2.5.6.4.)**

Sets the maximum head value associated with the PMD and works in conjunction with parameter "Maximum flow" for ratiometric calculations.

Setting	0 ... 9999999 m
Default	6 m

Zero head offset (2.5.6.7.)

Sets the difference (positive) between the lower calibration point and zero head (level at zero flow).

Setting	0 ... 9999999 m
Default	0 m

The value for this parameter is set automatically based on the configuration applied in the quick commissioning wizard.

Maximum flow (2.5.6.6.)

Sets the maximum flowrate associated with value in parameter "Maximum head".

Setting	0 ... 9999999 l/s
Default	100 l/s

Low flow cutoff (2.5.6.9.)

Sets the flow limit for low flow cut-off. Flow values below this limit are forced to zero.

Setting	0 ... 9999999 l/s
Default	0 l/s

Step: Apply?

Apply?

Applies settings as last step in wizard.

Setting	Yes	Wizard completes and settings are applied.
	No	Returned to start of wizard.
Default	No	

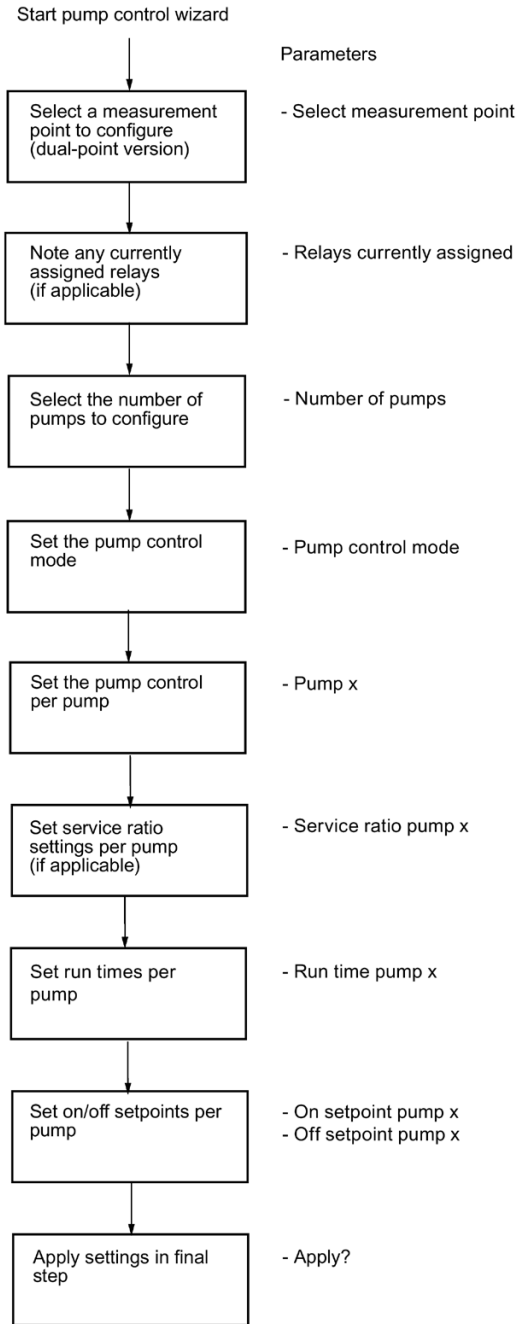
Volume flow wizard_note for zero head

Note

Head calibration can improve accuracy

It is strongly recommended that a zero head calibration be performed after completion of the wizard to ensure best accuracy.

6.5.2.3 Pump control



Step: About

Provides step-by-step procedure to configure the control of one or more pumps. This is the first step in the wizard.

Step: Select measurement point

Select measurement point

Sets the measurement point to be configured for pump control function.

This step will not appear on a single-point device.

Setting	<ul style="list-style-type: none">• Measurement point 1• Measurement point 2• Exit
Default	Measurement point 1

Step: Relays currently assigned

Relays currently assigned

Displays any relays that are currently configured for other applications, as a reference of relay availability for the pump control function.

This step does not appear if no relays are configured for other applications.

Step: Number of pumps

Number of pumps

Sets the number of pumps to configure.

Setting	<ul style="list-style-type: none">• 1• 2• 3• 4• 5• 6
Default	2

Step: Pump control mode**Pump control mode**

Sets the control algorithm used to activate the relay.

Setting	<ul style="list-style-type: none"> • Alternate duty assist • Alternate duty backup • Service ratio duty assist • Service ratio duty backup • Fixed duty assist • Fixed duty backup
Default	Alternate duty assist

This step is only visible if previous step "Number of pumps" is set to a value greater than one.

Step: Pump control**Note****Step is repeated per pump**

The parameters in this step will need to be set for each pump used in the application.

Pump 1

Sets relay assigned to pump.

Setting	<ul style="list-style-type: none"> • Relay output 1 • Relay output 2 • Relay output 3 • Relay output 4 • Relay output 5 • Relay output 6
Default	Not applicable

⚠ CAUTION

Relay conflicts

If relays are assigned to another application, notification is present at the start of the wizard, but assigned relays remain available here. If a pump is assigned in the wizard to one of these relays, the assignment from the wizard will be used.

- When wizard settings are applied in the final step, any relays configured by the pump control wizard are assigned as needed, including disabling another application if there is a relay conflict.
- If an assignment is made in error, continue to the end of the wizard and select "No" in the final step "Apply?". Then re-run the wizard. (Selecting "Yes" to apply the wizard settings in this scenario, means the application will be incorrect and pumps may be assigned to relays incorrectly.)

Step: Service ratios

Note

Step is repeated per pump

The parameter in this step will need to be set for each pump used in the application.

This step is only visible if pump control mode is set to "Service ratio duty assist" or "Service ratio duty backup".

Service ratio pump 1

Sets pump usage based on run time ratio rather than last pump used (see parameter "Runtime relay x").

Setting	0 ... 255
Default	1

This parameter only relates to relays set to mode "Service ratio duty assist" or "Service ratio duty backup".

The number assigned to each pump relay represents the ratio applied to decide the next pump to start or stop.

Note

Pump runtime ratios

- The device will not sacrifice other pumping strategies to ensure that the ratio is held true.
 - If the pump relays are set to the same value then the ratio equals 1:1 and all pumps are used equally (default).
-

Step: Pump run times

Note

Step is repeated per pump

The parameter in this step will need to be set for each pump used in the application.

This step is only visible if pump control mode is set to "Service ratio duty assist" or "Service ratio duty backup".

Run time pump 1

Sets the amount of time the pump has been in operation.

Setting	hhhh: 0...99999 mm: 0...59
Default	0 h

Enter the run time of an existing pump to be used in this application. Leave as default of zero hours if using a new pump that has never run.

The value entered here is written to parameter "Runtime relay x" (found in menu "Pump control" (3.4.4.)), where 'x' refers to the relay assigned to the pump being configured here. If any value has been previously set in "Runtime relay x", it will be displayed here, and any value written by the wizard will supersede other values upon completion of the wizard.

Step: On/off setpoints

Note

Step is repeated per pump

The parameters in this step will need to be set for each pump used in the application.

Note

On/Off setpoints per application

The setpoints must be set correctly for the application:

- For a pump down application, *all* of the off setpoints must be less than *all* of the on setpoints,
 - For a pump up application, *all* of the on setpoints must be less than *all* of the off setpoints.
-

On setpoint pump 1

Sets the level at which pump turns on.

Setting	-99999 ... 99999 m
Default	0 m

Off setpoint pump 1

Sets the level at which pump turns off.

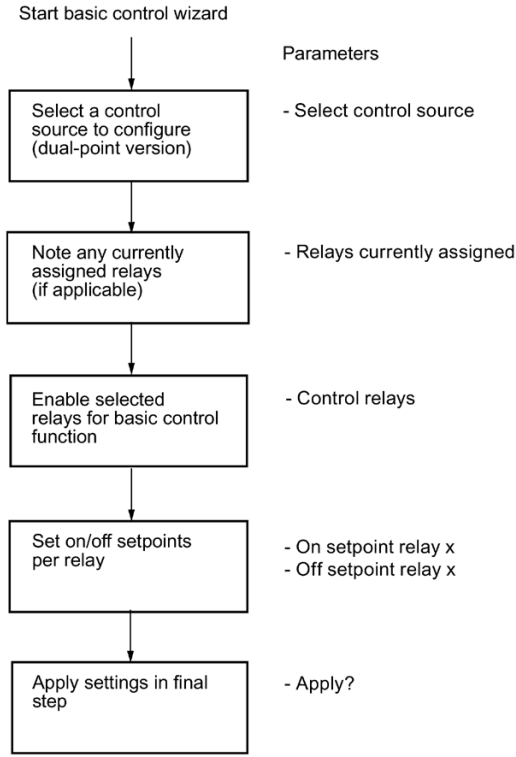
Setting	-99999 ... 99999 m
Default	0 m

Step: Apply?**Apply?**

Applies settings as last step in wizard.

Setting	Yes	Wizard completes and settings are applied.
	No	Returned to start of wizard.
Default	No	

6.5.2.4 Basic control



Step: About

Provides step-by-step procedure to configure the control of one or more relays based on a measurement.

This is the first step in the wizard.

Step: Select control source

Select control source

Sets the control source to be configured for a basic control application.

This step will not appear on a single-point device.

Setting	<ul style="list-style-type: none"> • Level (point 1) • Level (point 2) • Level difference • Level average • Exit
Default	Level (point 1)

Step: Relays currently assigned

Relays currently assigned

Displays any relays that are currently configured for other applications, as a reference of relay availability for the basic control function.

This step does not appear if no relays are configured for other applications.

Step: Control relays

Control relays

Enables selected relays for basic control function.

Deselecting an already programmed relay will disable it.

Setting	<input type="checkbox"/> Relay output 1 <input type="checkbox"/> Relay output 2 <input type="checkbox"/> Relay output 3 <input type="checkbox"/> Relay output 4 <input type="checkbox"/> Relay output 5 <input type="checkbox"/> Relay output 6
Default	<input checked="" type="checkbox"/> indicates enabled by default <input type="checkbox"/> indicates disabled by default

Step: On/off setpoints

Note

Step is repeated per relay

The parameters in this step will need to be set for each relay used in the application.

On setpoint relay 1

Sets the level at which the relay turns on.

Setting	-99999 ... 99999 m
Default	0.0 m

Off setpoint relay 1

Sets the level at which the relay turns off.

Setting	-99999 ... 99999 m
Default	0.0 m

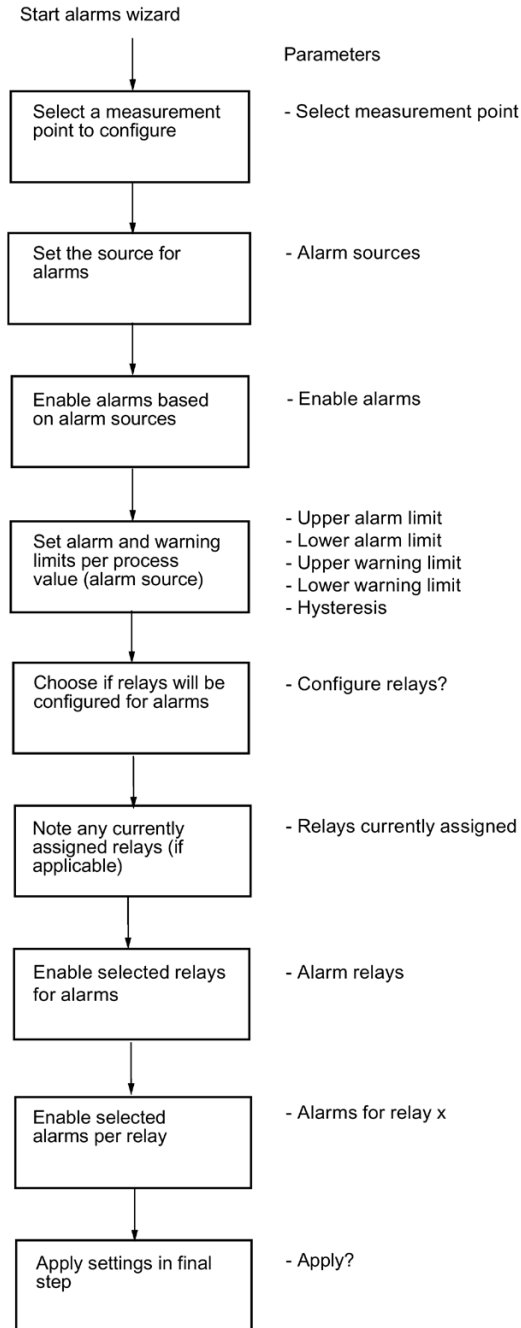
Step: Apply?

Apply?

Applies settings as last step in wizard.

Setting	Yes	Wizard completes and settings are applied.
	No	Returned to start of wizard.
Default	No	

6.5.2.5 Alarms



Step: About

Provides step-by-step procedure to configure alarms.
This is the first step in the wizard.

Step: Select measurement point

Select measurement point

Sets the measurement point to be configured for alarms.

Setting	<ul style="list-style-type: none"> • Measurement point 1 • Measurement point 2 • External TS-3 • Exit
Default	Measurement point 1

Step: Alarm sources

Alarm sources

Sets the source for alarms.

Select setting "Sensor diagnostics" to configure alarms based on diagnostics, such as loss of echo (LOE).

This step will not appear if setting "External TS-3" is selected in the previous step of the wizard.

Setting	<ul style="list-style-type: none"> • Level • Space • Distance • Head • Volume • Volume flow • Sensor temperature • Sensor diagnostics
Default	Not applicable

The list of process values available in this step is based on any configuration completed via "Quick commissioning" wizards prior to running this wizard. For example, if a level application is configured via the quick commissioning wizard, only the setting "Level" will be available in this step. To set alarms for other process values, see menu "Process values" (2.2) (after completing the alarms wizard).

Select the setting "Sensor diagnostics" to configure alarms based on a pre-defined list of diagnostics:

	Measurement point 1	Measurement point 2
Sensor diagnostic message	Diagnostic ID	Diagnostic ID
Sensor not found.	0	22
Loss of echo.	12	34
Submergence detected.	13	35

Step: Enable alarms

Enable alarms

Enables alarms based on alarm sources.

	Measurement point 1	Measurement point 2
Setting	<input type="checkbox"/> 320 Level (point 1) above alarm limit <input type="checkbox"/> 321 Level (point 1) above warning limit <input type="checkbox"/> 322 Level (point 1) below warning limit <input type="checkbox"/> 323 Level (point 1) below alarm limit <input type="checkbox"/> 324 Space (point 1) above alarm limit <input type="checkbox"/> 325 Space (point 1) above warning limit <input type="checkbox"/> 326 Space (point 1) below warning limit <input type="checkbox"/> 327 Space (point 1) below alarm limit <input type="checkbox"/> 328 Distance (point 1) above alarm limit <input type="checkbox"/> 329 Distance (point 1) above warning limit <input type="checkbox"/> 330 Distance (point 1) below warning limit <input type="checkbox"/> 331 Distance (point 1) below alarm limit <input type="checkbox"/> 336 Head (point 1) above alarm limit <input type="checkbox"/> 337 Head (point 1) above warning limit <input type="checkbox"/> 338 Head (point 1) below warning limit <input type="checkbox"/> 339 Head (point 1) below alarm limit <input type="checkbox"/> 332 Volume (point 1) above alarm limit <input type="checkbox"/> 333 Volume (point 1) above warning limit <input type="checkbox"/> 334 Volume (point 1) below warning limit <input type="checkbox"/> 335 Volume (point 1) below alarm limit <input type="checkbox"/> 100 Volume flow (point 1) above alarm limit <input type="checkbox"/> 101 Volume flow (point 1) above warning limit <input type="checkbox"/> 102 Volume flow (point 1) below warning limit <input type="checkbox"/> 103 Volume flow (point 1) below alarm limit <input type="checkbox"/> 108 Sensor temperature (point 1) above alarm limit <input type="checkbox"/> 109 Sensor temperature (point 1) above warning limit <input type="checkbox"/> 110 Sensor temperature (point 1) below warning limit <input type="checkbox"/> 111 Sensor temperature (point 1) below alarm limit	<input type="checkbox"/> 340 Level (point 2) above alarm limit <input type="checkbox"/> 341 Level (point 2) above warning limit <input type="checkbox"/> 342 Level (point 2) below warning limit <input type="checkbox"/> 343 Level (point 2) below alarm limit <input type="checkbox"/> 344 Space (point 2) above alarm limit <input type="checkbox"/> 345 Space (point 2) above warning limit <input type="checkbox"/> 346 Space (point 2) below warning limit <input type="checkbox"/> 347 Space (point 2) below alarm limit <input type="checkbox"/> 348 Distance (point 2) above alarm limit <input type="checkbox"/> 349 Distance (point 2) above warning limit <input type="checkbox"/> 350 Distance (point 2) below warning limit <input type="checkbox"/> 351 Distance (point 2) below alarm limit <input type="checkbox"/> 356 Head (point 2) above alarm limit <input type="checkbox"/> 357 Head (point 2) above warning limit <input type="checkbox"/> 358 Head (point 2) below warning limit <input type="checkbox"/> 359 Head (point 2) below alarm limit <input type="checkbox"/> 352 Volume (point 2) above alarm limit <input type="checkbox"/> 353 Volume (point 2) above warning limit <input type="checkbox"/> 354 Volume (point 2) below warning limit <input type="checkbox"/> 355 Volume (point 2) below alarm limit <input type="checkbox"/> 360 Volume flow (point 2) above alarm limit <input type="checkbox"/> 361 Volume flow (point 2) above warning limit <input type="checkbox"/> 362 Volume flow (point 2) below warning limit <input type="checkbox"/> 363 Volume flow (point 2) below alarm limit <input type="checkbox"/> 364 Sensor temperature (point 2) above alarm limit <input type="checkbox"/> 365 Sensor temperature (point 2) above warning limit <input type="checkbox"/> 366 Sensor temperature (point 2) below warning limit <input type="checkbox"/> 367 Sensor temperature (point 2) below alarm limit
Default	<input checked="" type="checkbox"/> indicates enabled by default <input type="checkbox"/> indicates disabled by default	

The alarms available in this step are based on process values selected in "Step: Alarm sources", with one exception.

When "External TS-3" is selected as the measurement point in the first step of the wizard, the alarms available in this step are as follows:

Setting	<input type="checkbox"/> 376 Auxiliary temperature above alarm limit <input type="checkbox"/> 377 Auxiliary temperature above warning limit <input type="checkbox"/> 378 Auxiliary temperature below warning limit <input type="checkbox"/> 379 Auxiliary temperature below alarm limit
Default	<input checked="" type="checkbox"/> indicates enabled by default <input type="checkbox"/> indicates disabled by default

Step: <Process value> limits

Note

Step is repeated per process value

The parameters in this step need to be set for each process value selected as an alarm source.

All related parameters are shown below for the "Level" process value.

Settings and defaults for the limit parameters can be found in the menu Process values (2.2).

Level limits

Upper alarm limit

Sets the upper alarm limit. A diagnostic is generated if the process value exceeds this limit.

Setting	-99999 ... 99999 m
Default	6.0 m

Lower alarm limit

Sets the lower alarm limit. A diagnostic is generated if the process value falls below this limit.

Setting	-99999 ... 99999 m
Default	0.0 m

Upper warning limit

Sets the upper warning limit. A diagnostic is generated if the process value exceeds this limit.

Setting	-99999 ... 99999 m
Default	6.0 m

Lower warning limit

Sets the lower warning limit. A diagnostic is generated if the process value falls below this limit.

Setting	-99999 ... 99999 m
Default	0.0 m

Hysteresis

Sets hysteresis for alarm and warning limits. Hysteresis is distance between limits for activation and deactivation of an alarm/warning.

Setting	0 ... 99999 m
Default	0.1 m

Step: Configure relays?

Configure relays?

Allows user to configure relays if required for application.

Select "Yes" to assign a relay output to the alarm. Select "No" to configure alarms only for the local display, communication interface, and diagnostic log.

Setting	Yes	Continue to next step to configure relays.
	No	Skip step to configure relays, and go to last step in wizard.
Default	Yes	

NOTICE

Relay configuration overwritten by Alarms wizard

It is recommended to complete the wizard prior to any manual parameter adjustments, as relay settings configured in the Alarms wizard will supersede any relay settings previously configured outside of the wizard.

Step: Relays currently assigned

Relays currently assigned

Displays any relays that are currently configured for other applications, as a reference of relay availability for the alarms.

This step does not appear if no relays are configured for other applications.

⚠ CAUTION

Relay conflicts

Notification of relays assigned to other applications is given here, but assigned relays remain available for alarms. If one of these relays is assigned in the next step, the assignment from this wizard is used.

- When wizard settings are applied in the final step, any relays configured by the alarms wizard are assigned as needed, including disabling another application if there is a relay conflict.
- If an assignment is made in error, continue to the end of the wizard and select "No" in the final step ("Apply?"). Then re-run the wizard. (Selecting "Yes" to apply the wizard settings in this scenario, means the application will be incorrect and relays may be configured incorrectly.)

Step: Alarm relays

Alarm relays

Enables selected relays for alarms.

Setting	<input type="checkbox"/> Relay output 1 <input type="checkbox"/> Relay output 2 <input type="checkbox"/> Relay output 3 <input type="checkbox"/> Relay output 4 <input type="checkbox"/> Relay output 5 <input type="checkbox"/> Relay output 6
Default	<input checked="" type="checkbox"/> indicates enabled by default * <input type="checkbox"/> indicates disabled by default

* Upon entering this step, relays will appear as enabled if they are currently assigned to any alarm or diagnostic on the current measurement point. Deselecting an already programmed relay will disable it.

Step: Alarms for relay 1

Note

Step is repeated per selected relay

This parameter must be set for each relay selected in "Step: Alarm relays".

Only the parameter for relay 1 is shown here as an example.

Alarms for relay 1

Enables selected alarms per relay.

List of available alarms is based on selections in "Step: Enable alarms", and if "Sensor diagnostics" was enabled in "Step: Alarm sources".

All alarms are disabled by default, and as each alarm is enabled for the current relay, it is no longer available for the next relay in this step.

Selections made here, including those made to a relay already configured for another application, will take effect when the wizard is completed.

Step: Apply?

Apply?

Applies settings as last step in wizard.

Setting	Yes	Wizard completes and settings are applied.
	No	Returned to start of wizard.
Default	No	

Service and maintenance

7.1 Basic safety notes

7.1.1 Maintenance

The device is maintenance-free. However, a periodic inspection according to pertinent directives and regulations must be carried out.

An inspection can include:

- Ambient conditions
- Seal integrity of the process connections, cable entries, and cover
- Reliability of power supply, lightning protection, and grounds

NOTICE

Penetration of moisture into the device

Damage to device.

- Make sure when carrying out cleaning and maintenance work that no moisture penetrates the inside of the device.

7.2 Cleaning

Cleaning the enclosure

- Clean the outside of the enclosure with the inscriptions and the display window using a cloth moistened with water or a mild detergent.
- Do not use any aggressive cleansing agents or solvents, e.g. acetone. Plastic parts or the painted surface could be damaged. The inscriptions could become unreadable.

WARNING

Electrostatic charge

Risk of explosion in hazardous areas if electrostatic charges develop, for example, when cleaning plastic surfaces with a dry cloth.

- Prevent electrostatic charging in hazardous areas.

7.3 Maintenance and repair work

WARNING

Impermissible repair of the device

- Repair must be carried out by Siemens authorized personnel only.

CAUTION

Hazardous voltage at open device

Risk of electric shock when the enclosure is opened or enclosure parts are removed.

- Before you open the enclosure or remove enclosure parts, de-energize the device.
- If maintenance measures in an energized state are necessary, observe the particular precautionary measures. Have maintenance work carried out by qualified personnel.

7.3.1 Replacing memory card

Procedure

1. Use parameter Connect/disconnect (3.7.2.2) to enable the MSD function. This step ensures no further writing to the card from the device (e.g. data logging) is permitted.
2. Isolate the device from power.
3. Open the device lid: Loosen six screws on lid. Lift lid up and to the left on its hinges.
4. Remove the memory card by pressing and releasing it.
Recommended: Insert card that was removed into a PC and make a backup of all files.
5. Insert the replacement memory card, close the device lid, and reconnect power to device.

Value for parameter Installed (3.7.1) will display "Yes" when memory card is installed properly.

Note

Diagnostic may result when replacing memory card

- If memory card is replaced with a blank card, no diagnostic is displayed.
- If memory card is replaced with a card from another device, diagnostic ID 151 displays. This diagnostic is a notice that configurations can be copied from one device to another without overwriting data. When the memory card is once again inserted into the original device, the data is unchanged, and the memory card works with the original device.

7.4 Return procedure

To return a product to Siemens, see Returns to Siemens (www.siemens.com/returns-to-siemens).

Contact your Siemens representative to clarify if a product is repairable, and how to return it. They can also help with quick repair processing, a repair cost estimate, or a repair report/cause of failure report.

NOTICE

Decontamination

The product may have to be decontaminated before it is returned. Your Siemens contact person will let you know for which products this is required.

7.5 Disposal



Devices described in this manual should be recycled. They may not be disposed of in the municipal waste disposal services according to the Directive 2012/19/EC on waste electronic and electrical equipment (WEEE).

Devices can be returned to the supplier within the EC and UK, or to a locally approved disposal service for eco-friendly recycling. Observe the specific regulations valid in your country.

Further information about devices containing batteries can be found at: Information about battery / product return (WEEE) (<https://support.industry.siemens.com/cs/document/109479891/>)

Note

Special disposal required

The device includes components that require special disposal.

- Dispose of the device properly and environmentally through a local waste disposal contractor.

Technical specifications

Note

Device specifications

Siemens makes every attempt to ensure the accuracy of these specifications but reserves the right to change them at any time.

 CAUTION
--

Impaired protection

The device is to be used only in the manner outlined in this instruction manual or protection provided by the equipment may be impaired.

Note

Device-specific approvals

Always refer to nameplates on the device for device-specific approvals.

8.1 Power

AC version	<ul style="list-style-type: none"> 100 to 230 V AC $\pm 15\%$, 50/60 Hz, 36 VA (17W) ¹⁾ Fuse ²⁾: 2 AG, Slow Blow, 0.375 A, 250 V
DC version	<ul style="list-style-type: none"> 12 to 30 V DC, 20 W ¹⁾ Fuse ²⁾: 2 AG, Slow Blow, 2A, 250 V

¹⁾ Power consumption is listed at maximum.

²⁾ Fuse is not replaceable.

8.2 Performance

Measurement rate	<ul style="list-style-type: none"> 1/second ¹⁾
Range	<ul style="list-style-type: none"> 0.3 to 60 m (1 to 196 ft), dependent on transducer
Accuracy (measured under Reference Conditions similar to IEC 60770-1) ²⁾	
	<ul style="list-style-type: none"> Standard operation: ± 1 mm (0.04") plus 0.17% of measured distance High accuracy OCM ³⁾: ± 1 mm (0.04"), within 3 m (9.84 ft) range
Resolution (measured under Reference Conditions similar to IEC 60770-1)	
	<ul style="list-style-type: none"> Standard operation: 0.1 % of range or 2 mm (0.08"), whichever is greater High accuracy OCM ³⁾: 1 mm (0.04") ⁴⁾, within 3 m (9.84 ft) range
Reference operating conditions according to IEC 60770-1	
	<ul style="list-style-type: none"> ambient temperature +15 to +25 °C (+59 to +77 °F) humidity 45% to 75% relative humidity ambient pressure 860 to 1060 mbar g (86 000 to 106 000 N/m² g)
Temperature compensation	Range: -40 to +150 °C (-40 to +300 °F)
Source	<ul style="list-style-type: none"> Integral transducer sensor TS-3 temperature sensor Average (integral transducer and TS-3) Programmable fixed temperature
Temperature error	0.17 % per °C deviation from programmed value
Memory	<ul style="list-style-type: none"> Capacity: 8 GB (micro SD card shipped with device) File system support: FAT32 / 8.3 Maximum 32 GB capacity micro SD card can be used with device

¹⁾ Based on single point measurement only

²⁾ Ultrasonic measurement requires that the sound wave travel through the atmosphere in a consistent manner. Applications with atmospheric conditions different from air (including, but not limited to gas layer stratification, very high methane or CO₂ concentrations), should be properly assessed to ensure safe reliable use in the event of measurement errors due to sound wave velocity changes. Please contact your local Siemens representative for assistance.

³⁾ A high accuracy configuration consists of the device using XRS-5 transducer, TS-3 temperature sensor, and a lower calibration point of 3 m or less.

⁴⁾ Achieved with a 100 μs shot width

Note

Memory card functions support

Only the supplied microSD card is supported for backup, restore, logging, and firmware update.

8.3 User Interfaces

Configuration	Local buttons	
Display (local)	Advanced graphical liquid crystal display	
Connectors	<ul style="list-style-type: none"> • USB Service port <ul style="list-style-type: none"> – USB version: V2.0 – USB socket: Mini-B • Accessory port 	USB port used for SIMATIC PDM/SITRANS DTM, FW update, Data log extract

8.4 Outputs

mA analog active output	<ul style="list-style-type: none"> • Single-point version includes one mA output • Dual-point version includes two mA outputs 	<ul style="list-style-type: none"> • 0 to 20 mA • 4 to 20 mA • Accuracy <ul style="list-style-type: none"> – $\pm 20 \mu\text{A}$, over 3.5 to 22.6 mA – $\pm 40 \mu\text{A}$, below 3.5 mA • Resolution 3 μA, over 0.1 to 22.6 mA maximum • 750 ohm maximum • Isolated (500 V DC)
Relays ¹⁾	<ul style="list-style-type: none"> • Six, maximum ²⁾ 	<ul style="list-style-type: none"> • 4 control • 2 alarm control • All relays rated 5A at 250 V AC, non-inductive
Control relay		4 Form A, NO relay (numbers 1, 2, 4, 5)
Alarm relay		2 Form C, NO, or NC relay (numbers 3, 6)
Optional analog channel on the HART communication card		0 to 20 mA without HART 4 to 20 mA with HART: <ul style="list-style-type: none"> • Passive - 14 to 30 V (at the terminals), 500 ohm maximum • Active - 350 ohm maximum

¹⁾ All relays are certified only for use with equipment that fails in a state at or under the rated maximums of the relays.

²⁾ Orderable with 1, 3, or 6 relays

8.5 Inputs

Supported sensors (see full list below)	EchoMax series, ST series, LR series	
• Transducer frequency	10 to 52 kHz	
• Polling rate	> 1 Hz	
mA (analog) (1)	Wiring:	2 conductor, twisted, shielded, 0.324 ... 0.823 mm ² (22 ... 18 AWG)
	Maximum cable length:	500 m (1640.42 ft)
	4 ... 20 mA input: <ul style="list-style-type: none"> • Resolution - 0.025 % of full scale • Accuracy - 0.1 % of full scale • Polling rate - > 1 Hz 	
Digital (2)	Switching threshold, low	Logical 0 = 0 ... 0.5 V DC
	Switching threshold, high	Logical 1 = 10 ... 50 V DC
	Input current	3 mA maximum draw
Internal DC power supply	+DC to mA INPUT	> 16 V ... 20 V
	Output resistance	40 ohm
	Maximum current limit:	40 mA

Supported sensors

- EchoMax XRS-5
- EchoMax XPS-10, EchoMax XPS-15, EchoMax XPS-30, EchoMax XPS-40
- ST-H
- EchoMax XCT-8, EchoMax XCT-12
- EchoMax XLT-30, EchoMax XLT-60
- ST-25, ST-50, ST-100
- LR13, LR21

Note

Use of sensors that are not supported

Although XLS-30 and XLS-60 are not listed as supported sensors, they can be used by selecting:

- EchoMax XLT-30 (for EchoMax XLS-30)
- EchoMax XLT-60 (for EchoMax XLS-60)

8.6 Construction

Enclosure	
<ul style="list-style-type: none"> Wall mount, standard enclosure 	<ul style="list-style-type: none"> 240 mm (9.5 inch) x 175 mm (6.9 inch). Width dimension includes hinges. Type 4X, IP65 ¹⁾ Polycarbonate
<ul style="list-style-type: none"> Wall mount, 4 entries with M20 cable glands included 	<ul style="list-style-type: none"> 240 mm (9.5 inch) x 175 mm (6.9 inch). Width dimension includes hinges. Type 4X, IP65 ¹⁾ Polycarbonate
<ul style="list-style-type: none"> Panel mount 	<ul style="list-style-type: none"> 278 mm (10.93 inch) x 198 mm (7.8 inch), width dimension includes flange. Type 3, IP54 ¹⁾ Polycarbonate
Remote panel mount	
<ul style="list-style-type: none"> Remote display lid 	<ul style="list-style-type: none"> 144 mm (5.7") x 144 mm (5.7") x 22 mm (0.87") IP65 ¹⁾ Polycarbonate Operational up to 5 m from enclosure base
<ul style="list-style-type: none"> Blank lid ²⁾ 	<ul style="list-style-type: none"> 241 mm (9.5") x 160 mm (6.3") x 15 mm (0.60") Polycarbonate
Display	<ul style="list-style-type: none"> Backlit HMI LCD display Dimensions: -60 x 40 mm (2.36 x 1.57") Resolution: -240 x 160 pixels Removable display, operational up to 5 m from enclosure base
Cable	<ul style="list-style-type: none"> Using a co-axial cable with the device is NOT recommended. If it is really necessary to use such cable, see Sensor connections (Page 32) for important wiring notes. Sensor, mA output, mA input, Digital input, Sync, TS-3 cables: cable to be two copper conductors, twisted shielded wire, 0.324 ... 0.823 mm² (22 ... 18 AWG), nominal capacitance between adjacent conductors @ 1 kHz = 62.3 pF/m (19 pF/ft), nominal capacitance between conductor and shield @ 1 kHz = 108.3 pF/m (33 pF/ft) (Belden ³⁾ 8760 is acceptable) Insulation rated to 300 Vrms Maximum length: 365 m
Weight	<ul style="list-style-type: none"> Wall mount: 1.22 kg (2.68 lb) Panel mount: 1.35 kg (2.97 lb) Remote panel mount: 1.73 kg (3.80 lb)

¹⁾ Use appropriate cable entry seals to maintain applicable Type, IP rating.

²⁾ Must be installed in a Type 4X, IP65 enclosure.

³⁾ Belden is a registered trademark of Belden Wire & Cable Company.

8.7 Operating conditions

Location	Indoor/outdoor	
Altitude	2000 m (6,562 ft) maximum	
Vibration resistance	0.5 g at frequencies from 10 Hz to 100 Hz	
Bump/shock resistance	25 g	
Ambient temperature	Storage	-20 to +50 °C (-5 to +122 °F)
	Operating	-20 to +50 °C (-5 to +122 °F)
	Operating - MCERTS	-20 to +55 °C (-5 to +131 °F)
Degree of ingress protection	<ul style="list-style-type: none"> • Wall mount: suitable for outdoor (Type 4X, IP65 enclosure) • Panel mount: suitable for outdoor (Type 3, IP54 enclosure) • Remote panel mount: suitable for outdoor (only with Type 4X, IP65 enclosure) 	
Installation category	II	
Pollution degree	4	

8.8 Communication

Communication type	Optional ¹⁾ : <ul style="list-style-type: none"> • HART ²⁾ • Modbus RTU • PROFIBUS PA • PROFIBUS DP • PROFINET
--------------------	---

¹⁾ For a complete list of available communication cards, see latest catalog information at Product page (www.siemens.com/sitransLT500).

²⁾ Under severe EMI/EMC environments per IEC 61326-1, the accuracy on the HART Fieldbus mA output may decrease to a maximum of $\pm 250\mu\text{A}$, and the HART communication may be interrupted.

HART	Version: 7.5
Physical layer	HART Physical layer (2 wire half duplex, HART FSK)
Connections	See HART (Page 43)
Termination	Not applicable
Application	General purpose
Device address	0 to 63 (Set via communication or HMI)
Data rate	1.2 Kbps
Data bits	Always 8
Parity	Odd parity, 1 stop bit
Byte order	MSB

Note

Replacing HART card

The HART long address is bound to the specific card installed. If this card is replaced the master system will need to be updated.

Modbus RTU	Version: V1.1B3
Physical layer	EIA-RS485 (2 wire half duplex)
Connections	See Modbus RTU (Page 45)
Termination	External 120R resistor across Fieldbus connections 35 and 36
Application	General purpose
Device address	Set by Modbus or HMI range from 1 to 247
Data rate	1.2 Kbps
	2.4 Kbps
	4.8 Kbps
	9.6 Kbps
	19.2 Kbps (default)
	38.4 Kbps
	57.6 Kbps
	76.8 Kbps
115.2 Kbps	
Data bits	Always 8
Parity	Even parity, 1 stop bit (default)
	Odd parity, 1 stop bit
	No parity, 2 stop bits
	No parity, 1 stop bit
Byte order	Byte order adjustable via Modbus or HMI, default Big endian

PROFIBUS PA	Version: Profile for Process Control Devices 4.01
Physical layer	MBP (2 wire half duplex), IEC 61158-2
Connections	See PROFIBUS PA/DP (Page 46)
Termination	To be provided externally
Application	General purpose
Device address	0 to 126 (Set via communication or HMI)
Data rate	31.25 Kbps
Data bits	Always 8
Parity	Even parity, 1 stop bit
Byte order	MSB
Bus loading	10 mA

PROFIBUS DP	Version: Profile for Process Control Devices 4.01
Physical layer	EIA-RS485 (2 wire half duplex)
Connections	See PROFIBUS PA/DP (Page 46)
Termination	All DIP switches 'On' to enable internal terminations
Application	General purpose
Device address	0 to 126 (Set via communication or HMI)
Data rate	9.6 Kbps
	19.2 Kbps
	93.75 Kbps
	187.5 Kbps
	0.5 Mbps
	1.5 Mbps
	3 Mbps
	6 Mbps
	12 Mbps
Data bits	Always 8
Parity	Even parity, 1 stop bit
Byte order	MSB
Bus loading	10 mA

8.9 Certificates and approvals

PROFINET	Version: Profile for Process Control Devices 4.01
Profile 4	Ready
Physical layer	1 Port, SDMA/CD 100Base-TX Ethernet (IEEE 802.3)
Connections	See PROFINET (Page 46)
Class	B
Redundant mode	S2 support
Application	General purpose
Device address	Station name: sitrans-lt500-pbd-xxxxxxx
Network settings	IP address subnet mask default gateway set via communication
Data rate	100 Mbps
Parity	IEEE 802.3 Frame check sequence (32-bit CRC)
Byte order	MSB

8.9 Certificates and approvals

Ordinary locations	cCSA _{US} , CE, UKCA, FM, cUL _{US} , MCERTS
Hazardous locations	<ul style="list-style-type: none"> • Non-incendive • cCSA_{US} Class I, Div. 2, Groups A, B, C, D; Class II, Div. 2, Groups F, G; Class III

See also Certificates (<http://www.siemens.com/processinstrumentation/certificates>).

Product documentation and support

A.1 Product documentation

Process instrumentation product documentation is available in the following formats:

- Certificates (<http://www.siemens.com/processinstrumentation/certificates>)
- Downloads (firmware, EDDs, software) (<http://www.siemens.com/processinstrumentation/downloads>)
- Catalog and catalog sheets (<http://www.siemens.com/processinstrumentation/catalogs>)
- Manuals (<http://www.siemens.com/processinstrumentation/documentation>)

You have the option to show, open, save, or configure the manual.

- "Display": Open the manual in HTML5 format
- "Configure": Register and configure the documentation specific to your plant
- "Download": Open or save the manual in PDF format
- "Download as html5, only PC": Open or save the manual in the HTML5 view on your PC

You can also find manuals with the Mobile app at Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/sc/2067>). Download the app to your mobile device and scan the device QR code.

Product documentation by serial number

Using the PIA Life Cycle Portal, you can access the serial number-specific product information including technical specifications, spare parts, calibration data, or factory certificates.

Entering a serial number

1. Open the PIA Life Cycle Portal (<https://www.pia-portal.automation.siemens.com>).
2. Select the desired language.
3. Enter the serial number of your device. The product documentation relevant for your device is displayed and can be downloaded.

To display factory certificates, if available, log in to the PIA Life Cycle Portal using your login or register.

Scanning a QR code

1. Scan the QR code on your device with a mobile device.
2. Click "PIA Portal".

To display factory certificates, if available, log in to the PIA Life Cycle Portal using your login or register.

A.2 Technical support

Technical support

If this documentation does not completely answer your technical questions, you can enter a Support Request (<http://www.siemens.com/automation/support-request>).

For help creating a support request, view this video here (www.siemens.com/opensr).

Additional information on our technical support can be found at Technical Support (<http://www.siemens.com/automation/csi/service>).

Service & support on the Internet

In addition to our technical support, Siemens offers comprehensive online services at service & support (<http://www.siemens.com/automation/serviceandsupport>).

Contact

If you have further questions about the device, contact your local Siemens representative, by doing the following:

1. Visit Contact at Siemens (<http://www.automation.siemens.com/partner>).
2. Select "All Products and Branches" > "Products & Services" > "Industrial automation".
3. Choose either "Process analytics" or "Process instrumentation", depending on your product.
4. Select the product category ("Pressure measurement", for example), then select your product.
5. Click "Search".

The contacts for your product in all regions display.

Contact address for business unit:

Siemens AG
Digital Industries
Process Automation
Östliche Rheinbrückenstr. 50
76187 Karlsruhe, Germany

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