

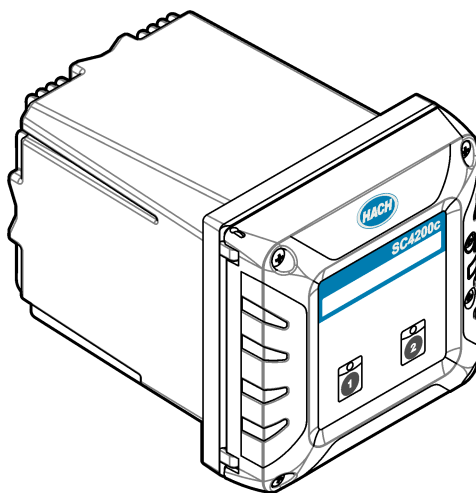


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SC4200c

03/2022, Edition 13

User Manual



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Section 1 Specifications

Specifications are subject to change without notice.

Specification	Details
Dimensions (W x H x D)	½ DIN—144 x 144 x 192 mm (5.7 x 5.7 x 7.6 in.)
Weight	1.7 kg (3.7 lb) (Controller weight without optional modules)
Enclosure	NEMA 4X/IP66 metal enclosure with a corrosion-resistant finish
Operating temperature	–20 to 60 °C (–4 to 140 °F); Cellular version : –20 to 55 °C (–4 to 131 °F)
Storage temperature	–20 to 70 °C (–4 to 158 °F)
Relative humidity	0 to 95%, non-condensing
Altitude	2000 m (6562 ft) maximum
Installation category	II
Pollution degree	2
Protection class	I, connected to protective earth
Power requirements	100–240 VAC ±10%, 50/60 Hz; 0.5 A (7 Watt sensor load)
Measurement	Two device digital SC connectors
Relays high voltage	Two relays (SPDT); Maximum switching voltage : 250 VAC; Maximum switching current : 5 A (resistive only load); Maximum switching power : 1250 VA, 125 W (resistive only load); Wire gauge : 0.75 to 2.5 mm ² (18 to 12 AWG)
Outputs (optional)	Five 4–20 mA analog outputs on each analog output module ¹ Analog input (0–20 mA or 4–20 mA) on each analog input module
Digital communication	Profibus DPV1 card ¹ (optional), Modbus TCP/IP
Network connection ²	LAN version : Two Ethernet connectors (10/100 Mbps), switch function, M12 female D-coding connector; Cellular version (optional): SIM card (3G/4G); WiFi version (optional)
USB port	Used for data download and software upload. The controller records approximately 20,000 data points for each connected sensor.
Compliance information	CE, ETL certified to UL and CSA safety standards (with all sensor types).
Warranty	1 year (EU: 2 years)

Section 2 General information

In no event will the manufacturer be liable for direct, indirect, special, incidental or consequential damages resulting from any defect or omission in this manual. The manufacturer reserves the right to make changes in this manual and the products it describes at any time, without notice or obligation. Revised editions are found on the manufacturer's website.

¹ Refer to the module documentation for additional information.

Note: Connect only one module to one of the available slots.

² The type of connection is dependent on controller configuration.




2.1 Safety information

The manufacturer is not responsible for any damages due to misapplication or misuse of this product including, without limitation, direct, incidental and consequential damages, and disclaims such damages to the full extent permitted under applicable law. The user is solely responsible to identify critical application risks and install appropriate mechanisms to protect processes during a possible equipment malfunction.

Please read this entire manual before unpacking, setting up or operating this equipment. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment.





Make sure that the protection provided by this equipment is not impaired. Do not use or install this equipment in any manner other than that specified in this manual.

2.1.1 Use of hazard information

 DANGER
Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING
Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION
Indicates a potentially hazardous situation that may result in minor or moderate injury.
NOTICE
Indicates a situation which, if not avoided, may cause damage to the instrument. Information that requires special emphasis.

2.1.2 Precautionary labels


Read all labels and tags attached to the instrument. Personal injury or damage to the instrument could occur if not observed. A symbol on the instrument is referenced in the manual with a precautionary statement.

	This is the safety alert symbol. Obey all safety messages that follow this symbol to avoid potential injury. If on the instrument, refer to the instruction manual for operation or safety information.
	This symbol indicates that a risk of electrical shock and/or electrocution exists.
	This symbol indicates the presence of devices sensitive to Electro-static Discharge (ESD) and indicates that care must be taken to prevent damage with the equipment.
	Electrical equipment marked with this symbol may not be disposed of in European domestic or public disposal systems. Return old or end-of-life equipment to the manufacturer for disposal at no charge to the user.


2.1.3 Icons used in illustrations


		
Manufacturer supplied parts	User supplied parts	Do not use tools

2.1.4 Chemical and biological safety

⚠ DANGER	
	Chemical or biological hazards. If this instrument is used to monitor a treatment process and/or chemical feed system for which there are regulatory limits and monitoring requirements related to public health, public safety, food or beverage manufacture or processing, it is the responsibility of the user of this instrument to know and abide by any applicable regulation and to have sufficient and appropriate mechanisms in place for compliance with applicable regulations in the event of malfunction of the instrument.

2.1.5 Certification

⚠ WARNING	
	<p>Pacemaker precautions. If electromagnetic interference (EMI) occurs, it can either:</p> <ul style="list-style-type: none">• Stop the stimulating pulses from the pacemaker that control the rhythm of the heart.• Cause the pacemaker to supply the pulses irregularly.• Cause the pacemaker to ignore the rhythm of the heart and supply pulses at a set interval. <p>Current research shows that cellular devices are not a significant health problem for most pacemakers wearers. However, persons with pacemakers should use precautions to make sure that their device does not cause a problem. Keep the device a minimum of 20 cm (7.9 in.) from the user.</p>

⚠ CAUTION	
	Electromagnetic radiation hazard. Make sure that the antenna is kept at a minimum distance of 20 cm (7.9 in.) from all personnel in normal use. The antenna cannot be co-located or operated in conjunction with any other antenna or transmitters.

NOTICE	
This is a Class A product intended for use in an industrial environment. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.	

NOTICE	
Network and access point security is the responsibility of the customer that uses the wireless instrument. The manufacturer will not be liable for any damages, inclusive however not limited to indirect, special, consequential or incidental damages, that have been caused by a gap in, or breach of network security.	

Regulatory RF Device Approvals: US and Canada

Contains RF Cellular Module:

FCC ID: R17LE910NAV2 or FCC ID: R17LE910SVV2

IC: 5131A-LE910NAV2 or IC: 5131A-LE910SVV2

(Equipment Class: PCS Licensed Transmitter (LTE Module), LE910-NA V2 or LE910-SV V2)

Table 1 Power for Cellular Modem: US and Canada

FCC (IC) rule parts	Frequency range (MHz)	Output (watts)
24E (RSS-133)	1850.7 - 1900.0	0.219
27 (RSS-130)	779.5 - 782.0	0.201
27 (RSS-139)	1710.7 - 1745.0	0.209

Cellular Modem LE910-NA V2 or LE910-SV V2—Important FCC Grant Conditions:

Single Modular Approval. Power output listed is conducted. This device is approved for mobile and fixed use with respect to RF exposure compliance, and may only be marketed to OEM installers. The antenna(s) used for this transmitter, as described in this filing, must be installed to provide a separation distance of at least 20 cm from all persons. Installers and end-users must be provided with operating conditions for satisfying RF exposure compliance. Maximum permitted antenna gain/cable loss: 6.94 dBi for 700 MHz; 6.00 dBi for 1700 MHz; 9.01 dBi for 1900 MHz.

Regulatory RF Device Approvals: EU

Contains RF Cellular Module: Telit LE910-EU V2

Dual-Band EDGE 900/1800

Dual-Band WCDMA/HSPA FDD I / FDD VIII

Penta-Band LTE FDD 1 / FDD 3 / FDD 7 / FDD 8 / FDD 20 wireless module

Table 2 Power for Cellular Modem: EU

Standard	Operating frequency bands	Output power [dBm]	Output power (watts)
ETSI EN 301 908-1 (-13)	EDGE 900	28	0.6
ETSI EN 301 908-1 (-13)	EDGE 1800	27	0.5
ETSI EN 301 908-1 (-13)	WCDMA FDD I/VIII	24.5	0.3
ETSI EN 301 908-1 (-13)	LTE 1/3/7/8/20	24	0.3

Canada (IC)

Contains RF module: IC : 5131A-LE910NAV2 or IC : 5131A-LE910SVV2

This class (A) digital apparatus complies with Canadian ICES-003. This device complies with Industry Canada license exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil numérique de la classe (A) respect toutes les exigences de la norme NMB-003 du Canada. Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et*
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

United States (FCC)

Contains RF Module: FCC ID: R17LE910NAV2 or FCC ID: R17LE910SVV2

Modifications not expressly approved by this company could void the user's authority to operate this equipment (FCC section 15.21).

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 in which case the user will be required to correct the interference at his own expense (FCC section 15.105).

Telit RF Module FCC/IC Regulatory notices

Modification statement

Telit has not approved any changes or modifications to this device by the user. Any changes or modifications could void the user's authority to operate the equipment.


Telit n'approuve aucune modification apportée à l'appareil par l'utilisateur, quelle qu'en soit la nature. Tout changement ou modification peuvent annuler le droit d'utilisation de l'appareil par l'utilisateur.

Interference statement

This device complies with Part 15 of the FCC Rules and Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement. Cet appareil est conforme aux limites d'exposition aux rayonnements de la IC pour un environnement non contrôlé.

2.2 Product overview

⚠ DANGER	
	Chemical or biological hazards. If this instrument is used to monitor a treatment process and/or chemical feed system for which there are regulatory limits and monitoring requirements related to public health, public safety, food or beverage manufacture or processing, it is the responsibility of the user of this instrument to know and abide by any applicable regulation and to have sufficient and appropriate mechanisms in place for compliance with applicable regulations in the event of malfunction of the instrument.

The SC4200c is a 2-channel controller for digital sensors. Refer to [Figure 1](#).

The controller is configured and operated with a Mobile sensor management (MSM) software. The MSM software is accessible through a web application on a customer-supplied device with an internet browser that is connected to the internet. The controller connects to the MSM software with a cellular network (optional), WiFi network (optional) or through LAN connection. The MSM software is also referred as Cloud in this manual.

Note: The controller uses one ethernet port for Modbus TCP/IP based fieldbus communication with PLC/SCADA. Refer to [Modbus TCP/IP](#) on page 20.

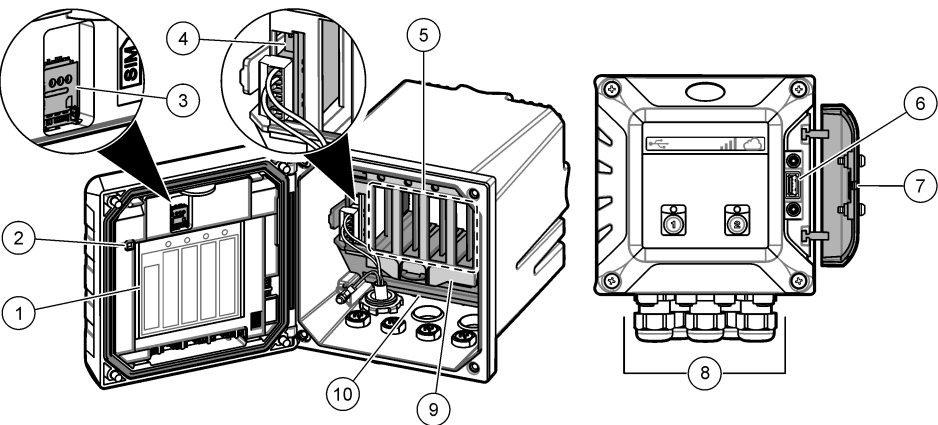
The controller is available with optional expansion modules:

- 4–20 mA analog outputs—Such outputs are commonly used for analog signaling or to control other external devices.
Note: Only one module can be connected.
- Profibus interface—Used to connect the controller to a Profibus DP (Decentralised Peripherals) network. PROFIBUS DP is used to operate sensors and actuators via a centralised controller in production (factory) automation applications.
- 4–20 mA analog inputs—The 4–20 mA input module lets the controller accept one external analog signal (0-20 mA or 4–20 mA).

Note: Only two input devices³ can be connected to the controller at the same time. Refer to the module documentation for additional information.

³ Input devices are mA input modules or digital sensors.

Figure 1 Product overview



1 Label for module installation	6 USB connection
2 Power indicator light	7 USB cover
3 SIM card ⁴	8 Electrical connections and fittings
4 Expansion module ⁵	9 Cover for module installation
5 Additional expansion module slots	10 High-voltage barrier

2.2.1 Claros Connector (optional)

Use the Claros Connector to connect SC200 or SC1000 Controllers that are not Claros enabled to the Claros cloud server.

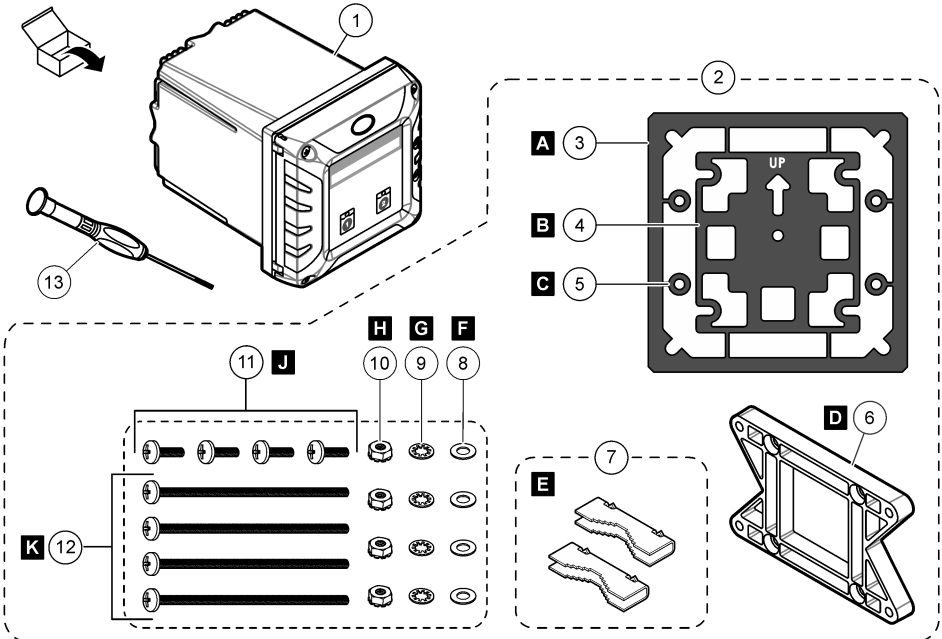
Note: The enclosure of the Claros Connector is the same as the SC4200c controller enclosure, but the Claros Connector does not have the same functions as the SC4200c controller.

⁴ Dependent on controller configuration. The SIM card is factory installed in cellular versions.
⁵ Dependent on controller configuration.

2.3 Product components

Make sure that all components have been received. Refer to [Figure 2](#). If any items are missing or damaged, contact the manufacturer or a sales representative immediately.

Figure 2 Product components



1 SC4200c controller	8 Flat washer, ¼-inch ID (4x)
2 Mounting hardware	9 Lock washer, ¼-inch ID (4x)
3 Sealing gasket for panel mount, Neoprene	10 Keps hexnut, M5 x 0.8 (4x)
4 Vibration isolation gasket for pipe mount	11 Pan head screws, M5 x 0.8 x 15 mm (4x)
5 Vibration isolation washer for pipe mount (4x)	12 Pan head screws, M5 x 0.8 x 100 mm (4x) ⁷
6 Bracket for wall and pipe mounting ⁶	13 Screwdriver, 2-mm wide blade
7 Mounting foot (mounting bracket inserts) (2x)	

Section 3 Installation

⚠ DANGER	
	Multiple hazards. Only qualified personnel must conduct the tasks described in this section of the document.

⁶ A bracket for panel mounting is available as an optional accessory. Refer to [Replacement parts and accessories](#) on page 43.

⁷ Used for variable diameter pipe mount installations.

3.1 Installation guidelines

⚠ DANGER



Electrical shock hazard. Externally connected equipment must have an applicable country safety standard assessment.

NOTICE

Do not install the controller in an environment with a caustic atmosphere without a protective enclosure. A caustic atmosphere will cause damage to electronic circuitry and components.

NOTICE

Do not install the controller outdoors in an environment that receives direct sunlight or UV radiation or damage to the controller can occur. Install the optional UV protection screen with sunroof to prevent damage from UV exposure when installed outdoors in direct sunlight.

Note: Make sure that your IT department has approval for the installation and commissioning of the device. Administrator rights are not necessary. The email address "No-reply@hach.com" sends the setup email and "donotreply@hach.com" sends the system notifications that are necessary for the installation. Add the two email addresses to the safe senders list to make sure to receive mails from these senders. Hach does not send a request to confirm that the sender is not a robot.

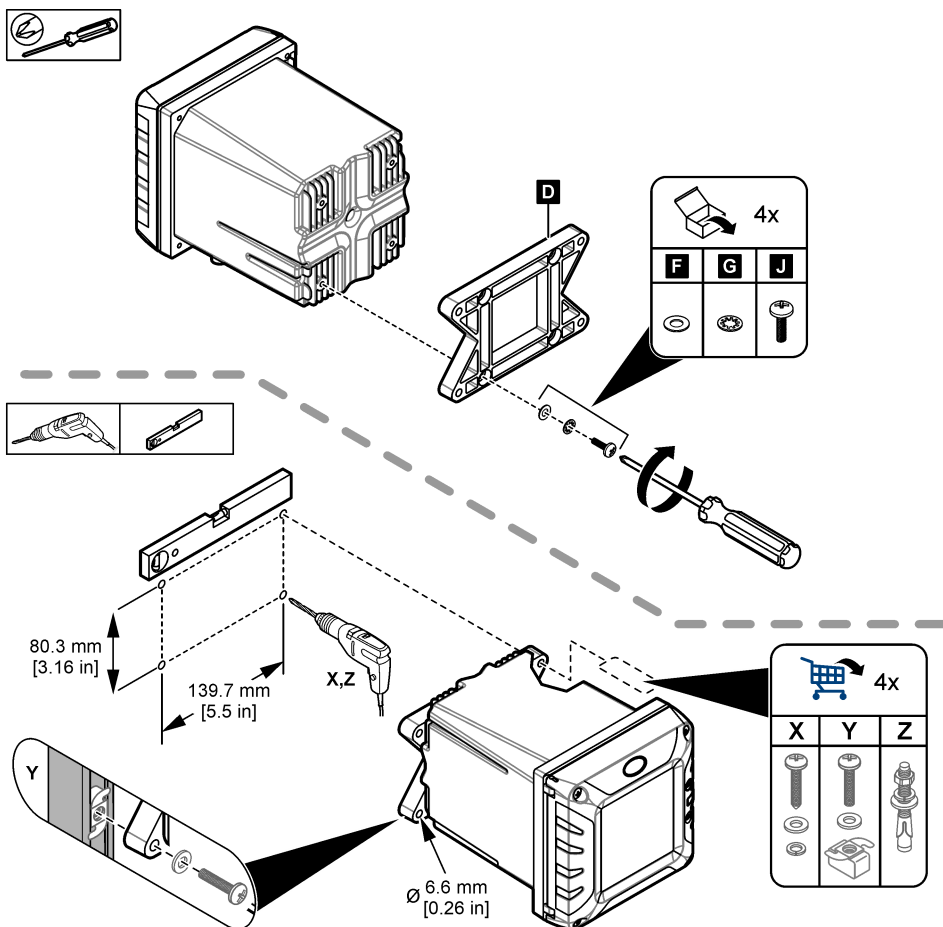
- Install the controller in a location where the power disconnect device for the controller is easily operated.
- Attach the controller upright and level on a flat, vertical surface.
- As an alternative, attach the instrument to a panel, vertical pole or horizontal pole.
- Make sure that the device is in a location where there is sufficient clearance around it to make connections and to do maintenance tasks.
- Make sure that there is a minimum of 16 cm (6.30 in.) of clearance for the enclosure doors to open.
- Install the instrument in a location with minimum vibration.
- The optional holder for mobile phones is recommended for all installations.
- The optional sunroof or the optional UV protection screen with sunroof is recommended for all outdoor installations.
- Give protection to computers or other connected equipment that may not have equivalent environmental ratings based on the enclosure rating of the equipment.
- Obey specified ambient ratings on the internal side of panels for panel mount installations.
- Make sure that the maximum power rating is correct for the ambient temperature.

3.2 Mechanical installation

3.2.1 Attach the instrument to a wall

Attach the controller upright and level on a flat, vertical surface. Make sure that the wall mounting is able to hold 4 times the weight of the equipment. Refer to the illustrated steps in [Figure 3](#) and [Product components](#) on page 9 for the necessary mounting hardware.

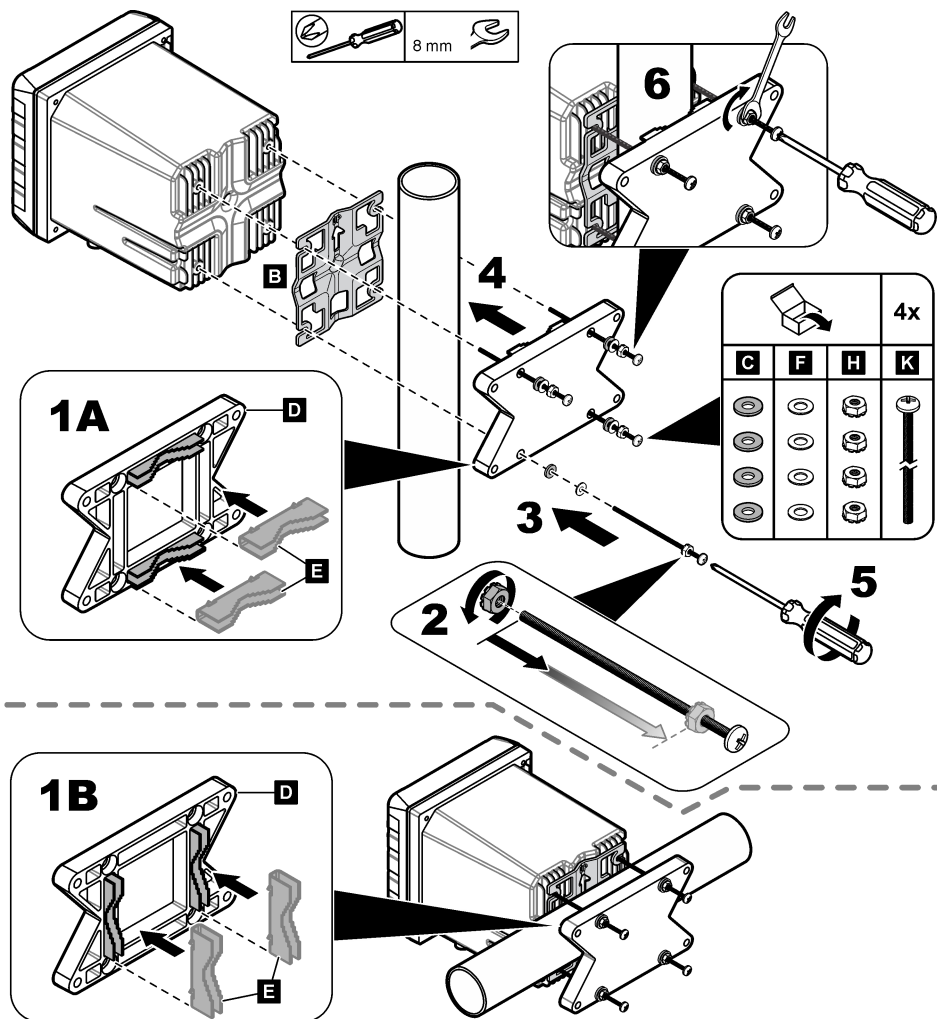
Figure 3 Wall mounting



3.2.2 Attach the instrument to a pole

Attach the controller upright to a pole or pipe (horizontal or vertical). Make sure that the pipe diameter is 19 to 65 mm (0.75 to 2.5 in.) Refer to the illustrated steps in [Figure 4](#) and [Product components](#) on page 9 for the necessary mounting hardware.

Figure 4 Pole mounting

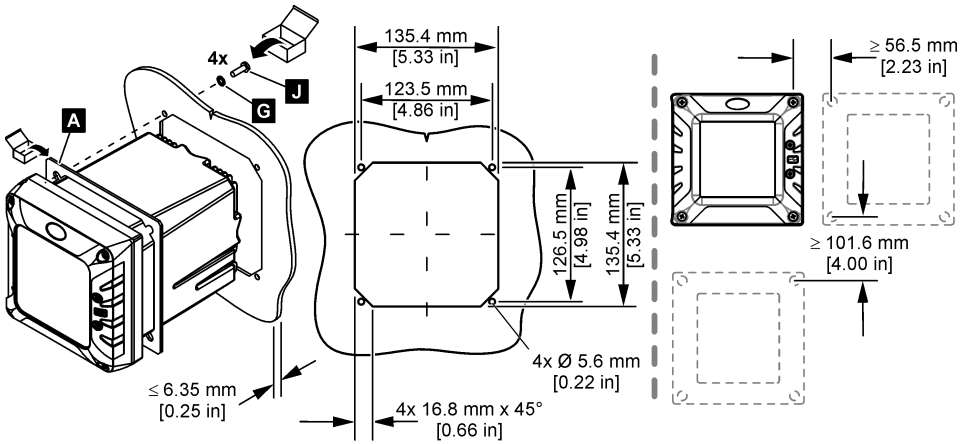


3.2.3 Install the instrument in a panel

A rectangular hole is necessary for panel installation. Use the supplied sealing gasket for panel mount as a template to cut the hole in the panel. Make sure to use the template in the up position to install the controller vertical. Refer to [Figure 5](#).

Note: If using the bracket (optional) for panel mounting, push the controller through the hole in the panel and then slide the bracket over the controller on the back side of the panel. Use the four 15 mm pan head screws (supplied) to attach the bracket to the controller and secure the controller to the panel.

Figure 5 Panel mounting dimensions



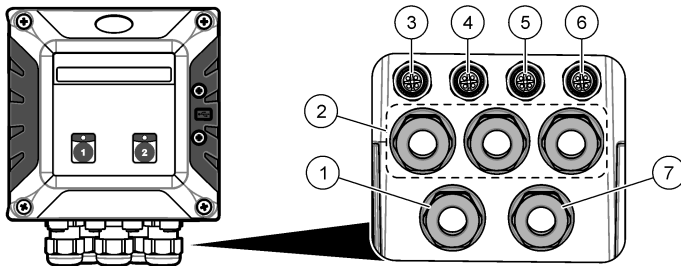
3.3 Electrical installation

3.3.1 Electrical connectors and fittings

Figure 6 shows the electrical connectors and fittings on the instrument. To keep the environmental rating of the enclosure, make sure that there is a plug in the strain relief fittings that are not used and a connector cap on the unused connectors.

Note: The controller is supplied without strain relief fittings installed. The user must order the necessary strain reliefs.

Figure 6 Electrical connectors and fittings



1 Strain relief fitting for relay	5 Digital SC connector: Sensor 1 (Channel 1)
2 Strain relief fitting for modules	6 Digital SC connector: Sensor 2 (Channel 2)
3 Ethernet connector for TCP/IP based fieldbus communication ⁸	7 Power cord (or conduit hub) ¹⁰
4 Ethernet connector for LAN connection ⁹	

⁸ Change the connector configuration for network sharing and share internet connection between controllers. Refer to [Share the LAN](#) on page 32.

⁹ Connector used to give internet access to the controller through a customer network with internet function.

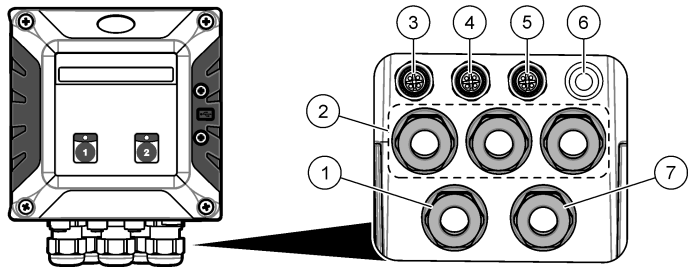
¹⁰ The power cord is factory-installed based on the controller configuration.

3.3.1.1 Claros Connector—Electrical connectors and fittings

Figure 6 on page 13 shows the electrical connectors and fittings on the Claros Connector. To keep the environmental rating of the enclosure, make sure that there is a plug in the strain relief fittings that are not used and a connector cap on the unused connectors.

Note: The Claros Connector is supplied without strain relief fittings installed. The user must order the necessary strain reliefs.


Figure 7 Claros Connector electrical connectors and fittings



1 Strain relief fitting for relay	5 Digital SC connector for SC200 or SC1000 Controllers
2 Strain relief fitting for modules	6 Not used
3 Ethernet connector to share the internet access with other controllers. Refer to Share the LAN on page 32.	7 Power cord (or conduit hub) ¹²
4 Ethernet connector for LAN connection ¹¹	

3.3.2 Electrostatic discharge (ESD) considerations

NOTICE



Potential Instrument Damage. Delicate internal electronic components can be damaged by static electricity, resulting in degraded performance or eventual failure.

Refer to the steps in this procedure to prevent ESD damage to the instrument:

- Touch an earth-grounded metal surface such as the chassis of an instrument, a metal conduit or pipe to discharge static electricity from the body.
- Avoid excessive movement. Transport static-sensitive components in anti-static containers or packages.
- Wear a wrist strap connected by a wire to earth ground.
- Work in a static-safe area with anti-static floor pads and work bench pads.

3.3.3 Power connections

DANGER



Multiple hazards. Only qualified personnel must conduct the tasks described in this section of the document.

¹¹ Connector used to give internet access to the controller through a customer network with internet function.

¹² The power cord is factory-installed based on the Claros Connector configuration.

⚠ DANGER



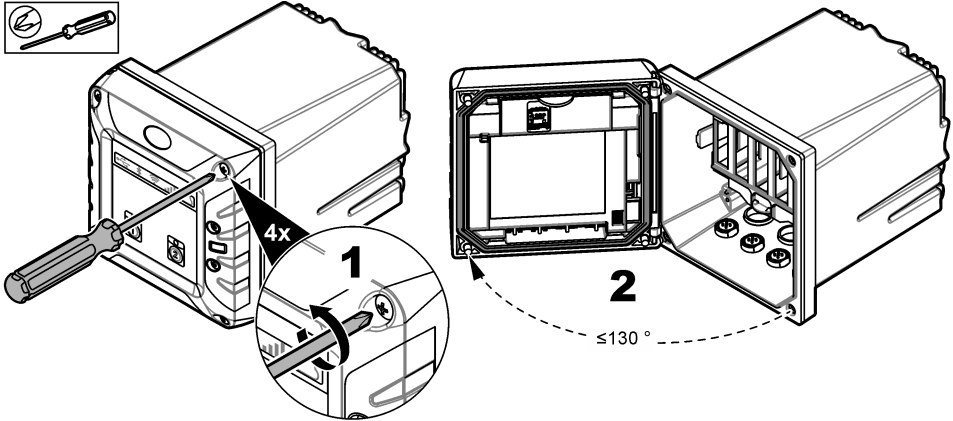
Electrocution hazard. Always remove power to the instrument before making electrical connections.

If the controller does not have an installed power cord, connect power with conduit or a power cord. Refer to the sections that follow to connect power with conduit or a power cord.

3.3.3.1 Open the controller cover

Open the controller cover to get access to the wiring connections. Refer to [Figure 8](#).

Figure 8 Open the controller

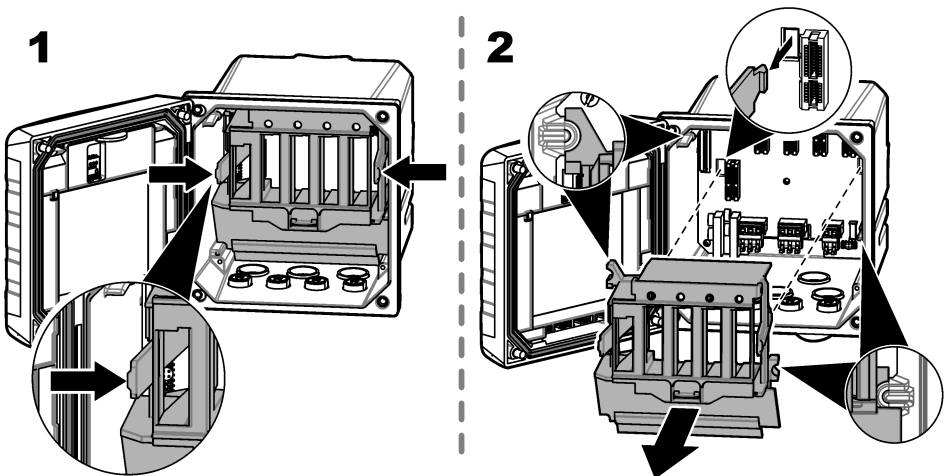


3.3.3.2 Remove the high-voltage barrier

High-voltage wiring for the controller is located behind a high-voltage barrier in the controller enclosure. Do not remove the barrier while power is supplied to the controller. Make sure that the barrier is installed before power is supplied to the controller.

Remove the high-voltage barrier to get access to the high-voltage wiring. Refer to [Figure 9](#).

Figure 9 High-voltage barrier



3.3.3.3 Wiring for power

⚠ DANGER



Electrocution hazard. Protective Earth Ground (PE) connection is required.

⚠ DANGER



Electrical shock and fire hazards. Make sure to identify the local disconnect clearly for the conduit installation.

⚠ WARNING



Potential Electrocution Hazard. If this equipment is used outdoors or in potentially wet locations, a **Ground Fault Interrupt** device must be used for connecting the equipment to its mains power source.

⚠ WARNING



Electrocution hazard. The local disconnection means must disconnect all the electrical current-carrying conductors. Mains connection must keep supply polarity. The separable plug is the disconnect means for cord connected equipment.

⚠ WARNING



Electrical shock and fire hazards. Make sure that the user-supplied power cord and non-locking plug meet the applicable country code requirements.

⚠ WARNING



Explosion hazard. This manual is only for installation of the unit in a non-hazardous location. For installation of the unit in hazardous locations, use only the instructions and approved control drawing provided in the hazardous location installation manual.

NOTICE

Install the device in a location and position that gives easy access to the disconnect device and its operation.

Supply power to the instrument with conduit or a power cable. Make sure that a circuit breaker with sufficient current capacity is installed in the power line. The circuit breaker size is based on the wire gauge used for installation.

For installation with conduit:

- Install a local disconnect for the instrument within 3 m (10 ft) of the instrument. Put a label on the disconnect that identifies it as the main disconnect device for the instrument.
- Rated for at least 90 °C (194 °F) and applicable to the installation environment
- For permanent connections use only solid wires. Use cable dimensions between 0.75 to 1.5 mm² (18 to 16 AWG). Flexible wires must have a crimped ferrule or pin type terminal on the end.
- Connect equipment in accordance with local, state or national electrical codes.
- Connect the conduit through a conduit hub that holds the conduit securely and seals the enclosure when tightened.
- If metal conduit is used, make sure that the conduit hub is tightened so that the conduit hub connects the metal conduit to safety ground.


For installation with a power cable, make sure that the power cable is:

- Less than 3 m (10 ft) in length

- Rated sufficient for the supply voltage and current.
- Rated for at least 90 °C (194 °F) and applicable to the installation environment
- Not less than 0.75 mm² (18 AWG) with applicable insulation colors for local code requirements. Flexible wires must have a crimped ferrule or pin type terminal on the end.
- A power cable with a three-prong plug (with ground connection) that is applicable to the supply connection
- Connected through a cable gland (strain relief) that holds the power cable securely and seals the enclosure when tightened
- Does not have a locking type device on the plug

3.3.3.4 Connect conduit or a power cord

NOTICE	
The manufacturer recommends the use of manufacturer-supplied electrical components, such as power cord, connectors and strain relief fittings.	

NOTICE	
	Make sure that the cable sheath goes through the inner side of the enclosure to keep the environmental rating of the enclosure.

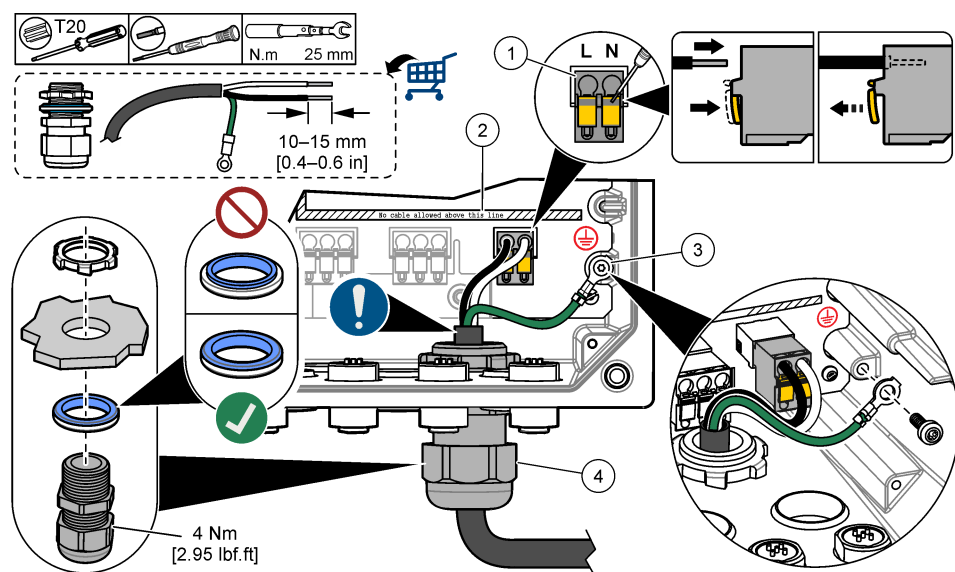
The controller can be wired for line power by hard-wiring in conduit or wiring to a power cord. Regardless of the wire used, the connections are made at the same terminals.

The power cable plug is used to connect and disconnect power to the controller. For installation in conduit, the installed local disconnect is used to connect and disconnect power to the controller.

Refer to [Figure 10](#) and [Table 3](#) to connect conduit or a power cord. Insert each wire into the appropriate terminal until the insulation is seated against the connector with no bare wire exposed. Tug gently after insertion to make sure that there is a secure connection. If necessary, remove the connector from the PCBA for easier wiring of the terminals.

Note: Make sure that all of the cables stay below the cable limit line printed on the PCBA to prevent interferences with the high-voltage barrier. Refer to [Figure 10](#).

Figure 10 Connect conduit or a power cord



1 AC power terminal	3 Protective earth ground
2 Cables limit: do not put cables above the line.	4 Conduit hub (or strain relief fitting for power cord)

Table 3 Wiring information—AC power

Terminal	Description	Color—North America	Color—EU
L	Hot (Line 1)	Black	Brown
N	Neutral (N)	White	Blue
	Protective earth ground	Green	Green with yellow stripe

3.3.4 Connect the high-voltage relays

⚠ DANGER

Electrocution hazard. Always remove power to the instrument before making electrical connections.

⚠ WARNING

Potential Electrocution Hazard. Power and relay terminals are designed for only single wire termination. Do not use more than one wire in each terminal.

⚠ WARNING

Potential fire hazard. Do not daisy-chain the common relay connections or jumper wire from the mains power connection inside the instrument.

⚠ WARNING



Explosion hazard. This manual is only for installation of the unit in a non-hazardous location. For installation of the unit in hazardous locations, use only the instructions and approved control drawing provided in the hazardous location installation manual.

⚠ CAUTION



Fire hazard. Relay loads must be resistive. Always limit current to the relays with an external fuse or breaker. Obey the relay ratings in the Specifications section.

NOTICE



Make sure that the cable sheath goes through the inner side of the enclosure to keep the environmental rating of the enclosure.

The instrument has two non-powered relays, each with a single-pole change-over contact. Each relay changes state when the selected trigger condition for the relay occurs.

The relay terminals are located behind a high-voltage barrier in the controller enclosure. Do not remove the barrier while power is supplied to the relay terminals. Do not supply power to the relay terminals when the barrier is not installed.

Connect each relay to a control device or an alarm device as necessary. Refer to [Figure 11](#) and [Table 4](#) to connect the relays. Use the MSM software to configure the trigger condition for each relay. Refer to [Specifications](#) on page 3 for the relay specifications. The relays are isolated from each other and the low-voltage input/output circuitry.

The largest gauge wire the power and relay plugs are rated for 1.5 mm² (16 AWG). The relay terminals accept 0.75 to 1.5 mm² (18 to 16 AWG) wire (as determined by load application). Use wire with an insulation rating of 300 VAC or higher. Insert each wire into the appropriate terminal until the insulation is seated against the connector with no bare wire exposed. Tug gently after insertion to make sure that there is a secure connection. If necessary, remove the connector from the PCBA for easier wiring of the terminals. Flexible wires must have a crimped ferrule or a pin type terminal on the end.

Note: Make sure that all of the cables stay below the cable limit line printed on the PCBA to prevent interferences with the high-voltage barrier.

The current to the relay contacts must be 5 A (resistive only load), 1250 VA 125 W (resistive only load) or less. Make sure to have a second switch available to remove power from the relays locally in case of an emergency or for maintenance.

Use the relays at high voltage (greater than 30 V-RMS and 42.2 V-PEAK or 60 VDC) only. The maximum switching voltage is 250 VAC Do not configure a combination of both high and low voltage.

Relay terminal connections to the mains circuit in permanent connection applications must have insulation rated for a minimum of 300 V, 90 °C (194 °F). Terminals connected to the mains circuit with a power cord connection must be double insulated and rated 300 V, 90 °C (194 °F) at both the inner and outer insulation levels.

Figure 11 Connect the relays

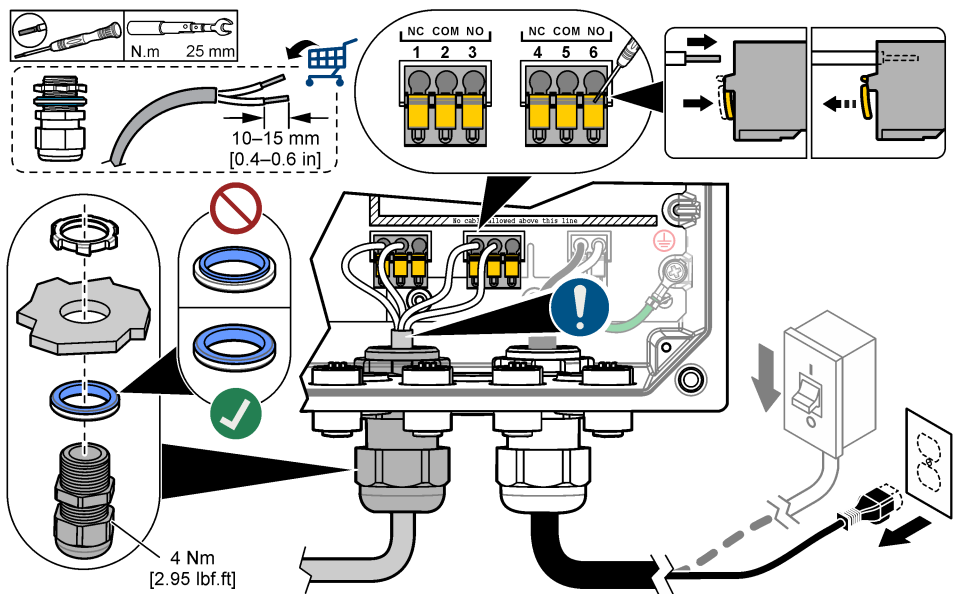


Table 4 Wiring information—relays

Terminal	Description	Terminal	Description
1	Relay 2, NC	4	Relay 1, NC
2	Relay 2, common	5	Relay 1, common
3	Relay 2, NO	6	Relay 1, NO

NC = normally closed; NO = normally open

3.3.5 Install an expansion module



⚠ WARNING

Explosion hazard. This manual is only for installation of the unit in a non-hazardous location. For installation of the unit in hazardous locations, use only the instructions and approved control drawing provided in the hazardous location installation manual.

Expansion modules with analog outputs, analog inputs and Profibus communication are available for the controller. Refer to the documentation supplied with the module for additional information.

3.3.6 Modbus TCP/IP

Modbus TCP/IP is a standard for industrial communications. The Modbus TCP/IP protocol connects computers to measurement and control systems that use the TCP/IP protocol for data transmission. This type of data transmission is known as machine to machine (M2M) communication.

The controller is factory configured to be integrated directly in programmable logic controller (PLC) systems. PLC systems record and process the controller measured data. The data analysis and the procedures caused by the results are programmed in the PLC system.

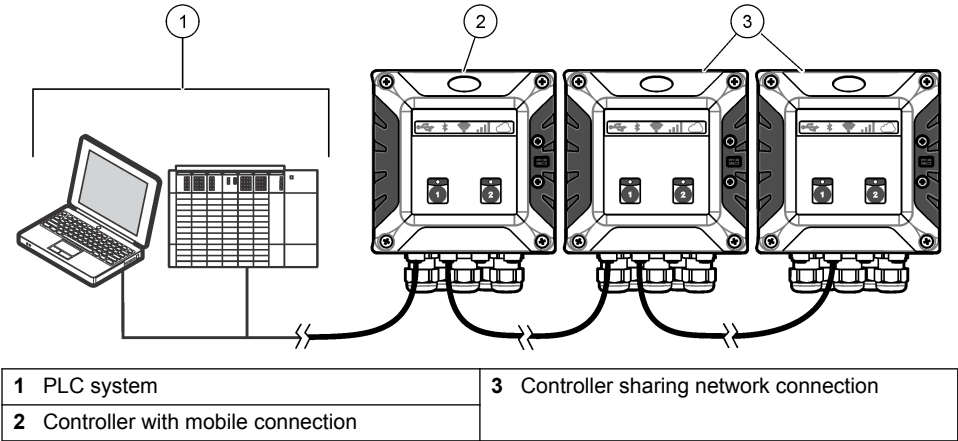
Use the ethernet connector for TCP/IP based fieldbus communications to connect the controller to a PLC system. Refer to [Figure 6](#) on page 13. When the controller is configured to share the LAN, the controller cannot connect to Modbus TCP/IP. Make sure to disable the internet sharing setting and configure the ethernet port to adapt the Modbus TPC slave IP address to the PLC IP subnet

configuration. Refer to [LAN connection](#) on page 32. A Claros™ connection is necessary to configure the Modbus TCP datagram.

A controller with mobile internet connection can connect to Modbus TCP/IP and share the internet connection through LAN. Refer to [Figure 12](#).

Note: Make sure that the Modbus TCP master and one of the controllers are on the same IP sub-network.

Figure 12 Connection diagram



3.4 Close the cover

⚠ DANGER

Electrocution hazard. High voltage wiring for the controller is connected behind the high voltage barrier in the controller enclosure. The barrier must remain in place except when installing modules, or when a qualified installation technician is wiring for power, relays or analog and network cards.

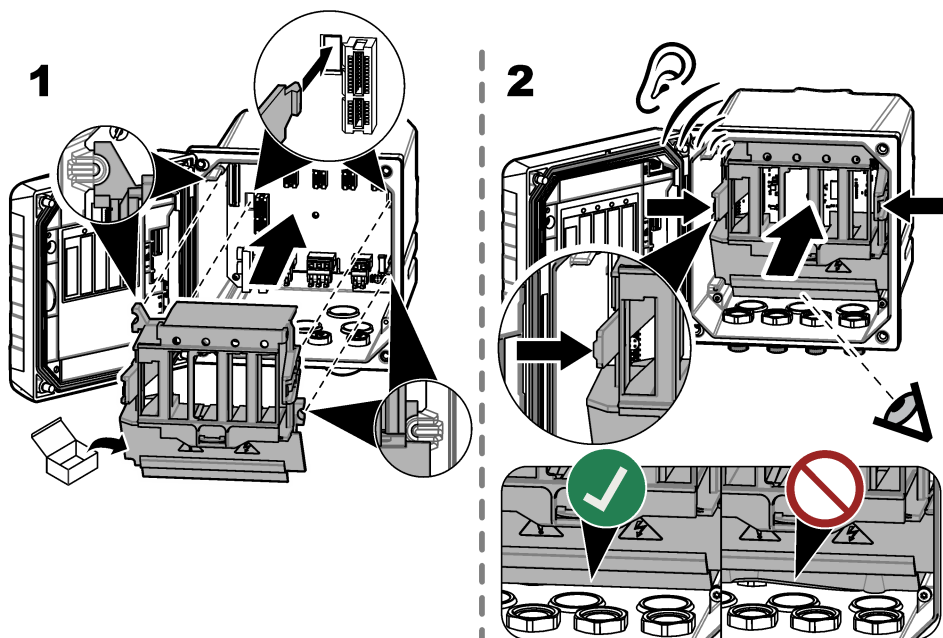
NOTICE

Close the controller cover and make sure that the cover screws are tight to keep the environmental rating of the enclosure.

After the power connections are made, install the high-voltage barrier. Make sure that the high-voltage barrier is correctly put on the enclosure guides and fixed to the main PCBA. Make sure that the lower part of the high-voltage barrier (soft rubber lip) is correctly installed and has no deformation. Refer to [Figure 13](#).

Close the controller cover. Tighten the cover screws with 2 Nm (17.70 lbf-in) torque. Refer to [Figure 8](#) on page 15.

Figure 13 Install the high voltage barrier



3.5 Connect a digital sc sensor

⚠ WARNING



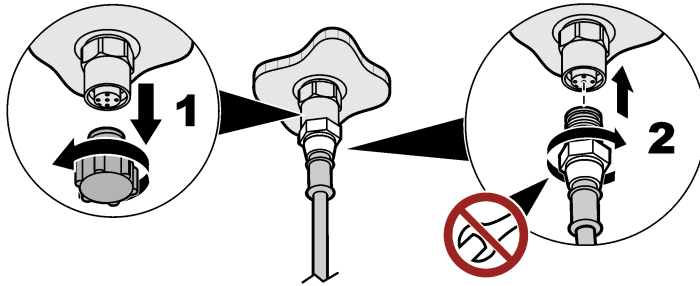
Explosion hazard. This manual is only for installation of the unit in a non-hazardous location. For installation of the unit in hazardous locations, use only the instructions and approved control drawing provided in the hazardous location installation manual.

A digital sc sensor can be connected to the controller using the keyed quick-connect fitting. Refer to [Figure 6](#) on page 13 and [Figure 14](#). A digital sensor can be connected with the controller powered on or off.

The controller automatically finds connected sensors. The sensor status LED on the front panel flashes blue during the connection procedure. When the light stays on, the connection of the sensor is correct. Refer to [User interface](#) on page 24. Use the mobile application to configure and operate the connected sensors.

Retain the connector cap to seal the connector opening in case the sensor must be removed.

Figure 14 Digital sensor quick connect



3.6 Connect the Claros Connector and SC200 Controller

Items to collect:

- Claros Connector
- Remote service connector for the SC200 Controller¹³
- Alternative safety high voltage barrier for SC200 Controller (optional)

1. Remove power from the Claros Connector and controller.
2. Connect the connection cable to the Claros Connector. Refer to [Claros Connector—Electrical connectors and fittings](#) on page 14.
3. Put the other end of the connection cable through an available opening in the SC200 Controller. Hold the cable with a strain relief fitting. Refer to the SC200 Controller documentation.

Note: If all three connectors in the front row of the controller are already in use, use the opening at the back left of the controller. Replace the high voltage barrier with the alternative high voltage barrier. Install the connection cable through the bottom-left opening of the alternative high voltage barrier.

4. Connect the supplied Claros Connector board to the service cable connection in the door of the controller. Make sure that all of the pins are connected.
5. Connect the connection cable to the Claros Connector board.
6. Supply power to the Claros Connector and controller.
7. Provision the Claros Connector in Claros.

3.7 Connect the Claros Connector and SC1000 Controller

Items to collect:

- Claros Connector
- Remote service connector for SC1000 Controller¹⁴

1. Remove power from the Claros Connector and controller.
2. Connect the connection cable to the Claros Connector. Refer to [Claros Connector—Electrical connectors and fittings](#) on page 14.
3. Connect the other end of the connection cable to the network interface connector of the SC1000 Controller. Refer to the SC1000 Controller documentation.
4. Supply power to the Claros Connector and controller.
The SC1000 Controller shows the Claros Connector as a new device.
5. Access the SC1000 Controller through a web browser. Refer to the SC1000 Controller documentation.

¹³ Includes a connection cable and the Claros Connector board.

¹⁴ Includes connection cable.

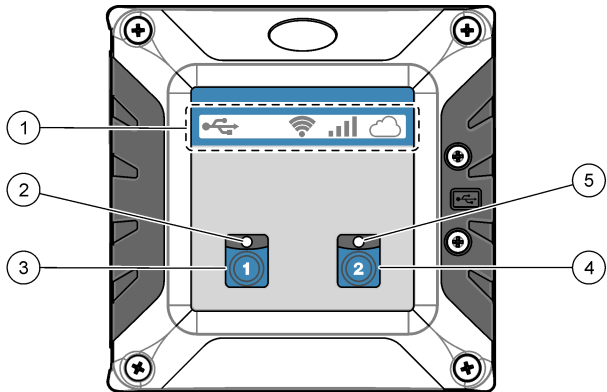
The Claros Connector shows in the measurement view.

6. Select the Claros Connector menu and go to CLAROS DEVICES.
7. Select the devices that will be available in Claros, then push OK.
8. Wait 30 seconds¹⁵ minimum. The selected devices show as Claros Connector measurements and are available in Claros.
9. Provision the Claros Connector in Claros.

Section 4 User interface

The keypad has controller icons, sensor status LEDs and two channel buttons. Refer to [Figure 15](#).

Figure 15 Keypad and front panel overview



1 Controller icons	4 Channel 2 button—Puts all channel outputs on hold.
2 Sensor status LED for Channel 1	5 Sensor status LED for Channel 2
3 Channel 1 button—Puts all channel outputs on hold.	

The front panel has icons at the top that shows the controller condition. Refer to [Table 5](#).

The sensor status LED shows the condition of each sensor. Refer to [Table 6](#). Refer to [Troubleshooting](#) on page 40 to find possible causes and solutions for usual problems.

Table 5 Icon descriptions

Icon	Description	Status
	3G/4G signal strength	All off: no signal All on: best signal
	Cloud connection (MSM)	Off: no internet connection Red on: Correct internet connection, but incorrect cloud connection. Blue on: Correct cloud connection. Controller connected to MSM. Flashes blue: connecting to cloud

¹⁵ The waiting time increases approximately 15 seconds for each connected sensor. For example, 30 seconds for 1 sensor and 2 minutes for 7 sensors.

Table 5 Icon descriptions (continued)



Icon	Description	Status
	USB connection	Off: no USB flash drive connected Blue on: USB flash drive connected Flashes blue: data transmission
	WiFi connection	Off: no WiFi connection Blue on: Controller connected to a WiFi access point.

Table 6 Sensor Status LED descriptions

LED status	Description
Blue on	The sensor is in operation with no warnings, errors or reminders.
Flashes blue	Sensor connection to cloud in progress.
Amber on	The sensor is in operation with active warnings or reminders.
Flashes amber (1-channel)	The outputs of the channel are on hold.
Flashes amber (2-channel)	The channels of the two sensors are on hold or no sensors are connected on the two channels.
Red on	The measurement value is not correct because of sensor error.
Flashes red	Sensor connection issue ¹⁶ The sensor type is not supported by the cloud.
Off	No connected sensor (if the sensor on the other channel is connected)

4.1 User interface and navigation—Mobile device/PC






After a successful login, the start page **My dashboard** shows. Push **Devices** to start the MSM application. Refer to [Table 8](#). Push  to open the main menu. Refer to [Table 7](#).

Table 7 Main menu

Sign	Display	Description	Admin	Basic
	My dashboard	Opens the start page.	X	X
	Devices	Shows the device list for INSTRUMENT MANAGEMENT.	X	X
	Data	Optional: Shows the DATA MANAGEMENT COLLECT, GRAPHS and SPREADSHEETS.	X	X
	Manage	Adds new users and roles. Refer to Add a new user on page 35. Optional for DATA MANAGEMENT: PLANT SETUP	X	

¹⁶ Make sure that only two sensors are installed in the controller. Refer to [Troubleshooting](#) on page 40.

Table 7 Main menu (continued)



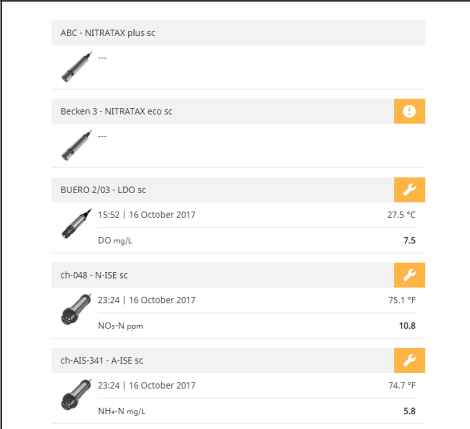
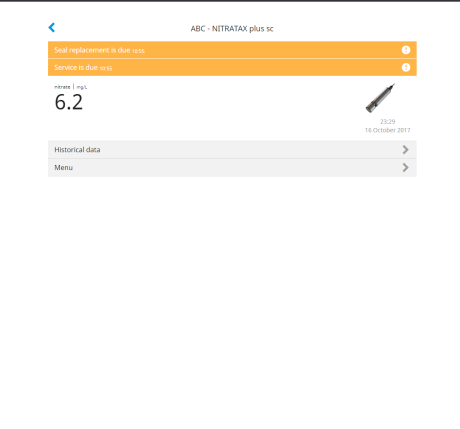












Sign	Display	Description	Admin	Basic
	User profile	Shows the name and email from the actual user.	X	X
	Logout	Exits the MSM application.	X	X

Table 8 Device pages

Device list	Device details page
 <p>ABC - NITRATAX plus sc</p> <p>Becken 3 - NITRATAX eco sc</p> <p>BUERO 2/03 - LDO sc</p> <p>15:52 16 October 2017 27.5 °C</p> <p>DO mg/L 7.5</p> <p>ch-048 - N-ISE sc</p> <p>23:24 16 October 2017 75.1 °F</p> <p>NO₃-N ppm 10.8</p> <p>ch-AIS-341 - A-ISE sc</p> <p>23:24 16 October 2017 74.7 °F</p> <p>NH₄-N mg/L 5.8</p>	 <p>ABC - NITRATAX plus sc</p> <p>Cool replacement is due 10.0</p> <p>Service is due 10.0</p> <p>6.2</p> <p>23:24 16 October 2017</p> <p>Historical data</p> <p>Menu</p>





4.1.1 List of notifications




Message	Description	Action
	Error message shows an urgent alert that needs immediate attention.	<ol style="list-style-type: none"> 1. Push the bar to show the error message. 2. If shown, push  to open a workflow.
	Shows the error message.	Refer to the device user manual for troubleshooting information.
	Warning message shows an alert to inform about upcoming maintenance.	<ol style="list-style-type: none"> 1. Push the bar to show the warning message. 2. If shown, push  to open a workflow.
	Shows the warning message.	Refer to the device user manual for troubleshooting information.
	Notification shows a pending status, e.g. remaining waiting time or that an other user is currently working on a maintenance workflow.	Push the bar to show the notification.


Message	Description	Action
	Opens a workflow to do a maintenance task.	Push the icon to go immediately to the next step. Follow the workflow to complete a maintenance task.
	Shows device is in waiting status.	Wait until the automatic action is done or the user has completed the task.
	Shows that lab values are available.	Push the icon to complete the workflow.
	Goes back to the previous screen.	Push the icon to go back to the previous screen.
	Exits the workflow or maintenance task and goes back to the device list.	Push the icon to go back to the device list. Then the device is unlocked and other users can access the device.

4.1.2 Control function for devices

When a device menu is entered (e.g., calibration or maintenance task), the device is locked for other users.

To exit the device menu push  or . Push  to go to the previous screen. Push  to exit the menu and go back to the device list.

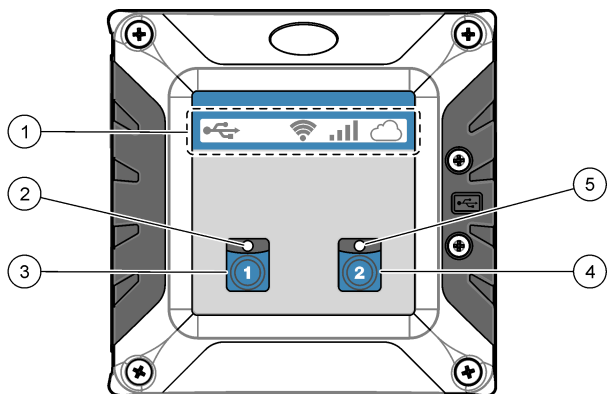
If a maintenance task is entered, follow the task with **Continue** or . To exit the workflow and go back to the device list push **Cancel** or . Push  to go to the previous screen in the workflow.

When in a maintenance task, the device stays locked for other users and work may be discarded if  is pushed from the main menu.

4.2 Claros Connector—User interface

The Claros Connector keypad has icons, status LEDs and two buttons. Refer to [Figure 16](#).

Figure 16 Claros Connector keypad



1 Claros Connector icons	4 Button 2—Enters the Claros menu as a local user.
2 Status LED 1	5 Status LED 2
3 Button 1—Enters the Claros menu as a local user.	

The front panel has icons at the top that shows the Claros Connector condition. Refer to [Table 9](#). The status LED shows the condition of Claros Connector. The two LEDs come on at the same time. Refer to [Table 10](#).

Table 9 Icon descriptions

Icon	Description	Status
	3G/4G signal strength	All off: No signal All on: Best signal
	Cloud connection (MSM)	Off: No internet connection Red on: Correct internet connection, but incorrect cloud connection. Blue on: Correct cloud connection. Controller connected to MSM. Flashes blue: Connecting to cloud
	USB connection	Off: No USB flash drive connected Blue on: USB flash drive connected Flashes blue: Data transmission
	WiFi connection	Off: No WiFi connection Blue on: Controller connected to a WiFi access point.

Table 10 Sensor Status LED descriptions

LED status	Description
Blue on	The Claros Connector is in operation with no warnings, errors or reminders.
Red on	A user has entered the menu of a device through the Claros server.

Table 10 Sensor Status LED descriptions (continued)

LED status	Description
Amber on	A local user has pushed one of the two buttons on the Claros Connector. All devices connected to the system are locked for the user through the Claros server. Push a button again to unlock the device.
Off	The Claros Connector is not energized.

Section 5 Startup

Connect the power cord to an electrical outlet with protective earth ground or set the circuit breaker for the controller to on.

5.1 Web server application

The controller has a web server application that gives access to configuration and diagnostic features. Connect the controller to a PC or laptop to operate with the web server application.

Note: If the supplied SIM card is used with purchased data plans, access to the web server application is not necessary.

5.1.1 Connect the controller to a PC or laptop

Connect the controller to a PC or laptop with a Microsoft Windows operating system.

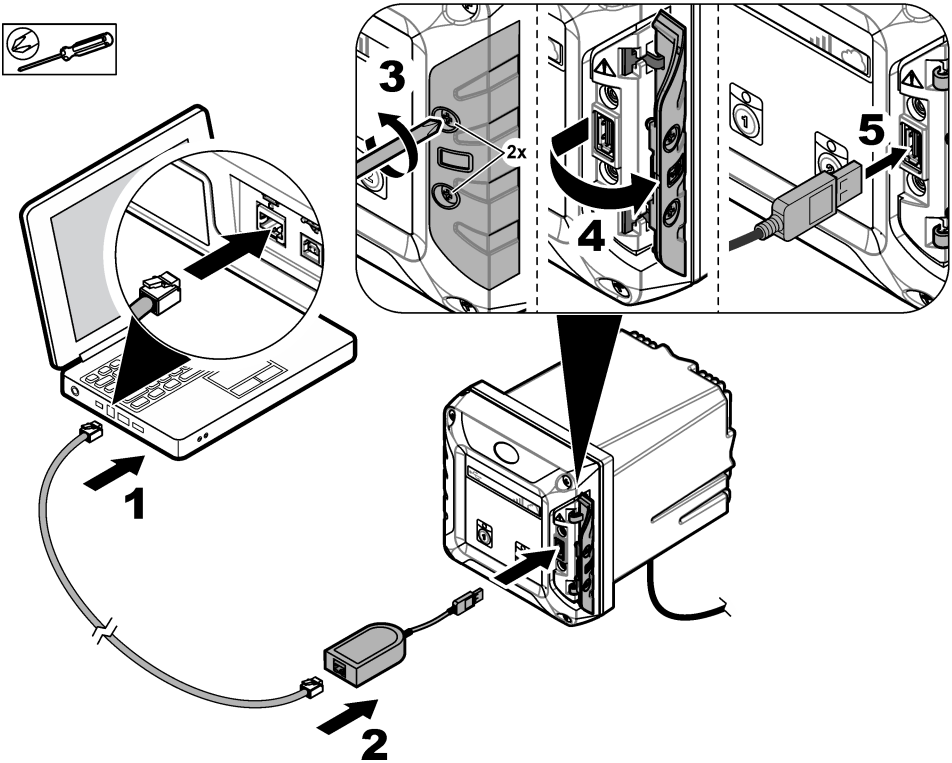
Note: Make sure that the PC or laptop is **not** connected to a LAN.

Items to collect:

- PC or laptop
- USB Ethernet adapter
- RJ45 Ethernet cable

1. Connect the Ethernet cable to the PC. Refer to [Figure 17](#).
2. Connect the other end of the Ethernet cable to the USB Ethernet adapter.
3. Connect the USB Ethernet adapter to the USB port on the controller.

Figure 17 Connect the USB Ethernet adapter



5.1.2 Configure the IP address of the PC

Do the steps that follow to change the IP address in Microsoft Windows on your PC or laptop.

Note: The user must have Windows administrator rights on the computer to change the Windows settings.

- 1. Go to Control Panel > Network and Internet > Network and Sharing center, then select Change adapter settings.
- 2. Right-click Local Area Connection, then select Properties.
- 3. Highlight Internet Protocol Version 4 (TCP/IPv4), then select Properties.
- 4. Select Use the following IP address. Enter the settings that follow.

Option	Description
IP address	192 . 168 . 165 . 1
Subnet mask	255 . 255 . 255 . 0
Default gateway	blank

Note: Record the initial values to change the values back after the configuration.

- 5. Select OK to confirm the settings.
- Note:** Change the settings to the initial values when the configuration is completed.
- 6. Open the web browser on the PC. Enter the IP address that follows to connect to the SC4200c Controller.
"http://192.168.165.30"

5.1.3 Operate the web server application

1. Select Modem menu to configure the modem.
2. Select Ethernet menu to configure the Ethernet interface to get access to the internet and to the MSM.
3. Select Maintenance and select an option.

Option	Description
Network status	<p>Shows the settings of the controller network interfaces, used to access the MSM. Shows a connectivity report and possible solutions to connectivity issues.</p> <ul style="list-style-type: none">• Internet connection—Shows the internet and Tenant connection status.• LAN connection—Shows the cable connection status. Shows the MAC and IP address data. Shows the switch status (ethernet port for network sharing).• Wireless<ul style="list-style-type: none">• WiFi connection—Shows the dongle connection status and the signal strength. Shows the network name and IP address and subnet mask data.• Mobile connection—Shows the modem and SIM connection status and the signal strength. Shows the provider name. Shows the Roaming and APN (modem settings) status. Shows the internet connectivity status (data transmission and data limit).
SC device list	<p>Shows the MSM connectivity status for the expansion modules, sensors and controller.</p> <ul style="list-style-type: none">• Controller—Shows the controller name, controller ID and data for Cloud connectivity condition.• Modules—Shows module name, module ID and data for Cloud connectivity condition.• Sensors—Shows sensor name, sensor ID and data for Cloud connectivity condition.
Versions	Shows the software version of the controller.
Logs and History	Shows the historical data (i.e., configuration and log events) of the controller.
Restart	Sets the controller to off and on again.
Factory reset	Sets the controller history, modem and Ethernet configurations back to factory settings.

5.2 Connect the instrument to a network

The instrument must connect to a network with internet connectivity for configuration and operation. Based on the version, the controller connects to the internet with a cellular network, WiFi network or a LAN connection.

5.2.1 LAN connection

The instrument is factory configured with two subnetworks. This configuration uses the two ethernet ports separately, one for internet access and the other one for TCP/IP based fieldbus communication with PLC/SCADA. To change the Ethernet port configuration and use the port for network sharing, refer to [Share the LAN](#) on page 32.

1. Use a user-supplied ethernet cable (M12 to RJ45) to connect the controller to a device with internet connection. Refer to [Electrical connectors and fittings](#) on page 13.
Note: Connect the ethernet cable to the right ethernet connector.
2. Connect the controller to a PC or laptop. Open the Web server application. Refer to [Web server application](#) on page 29.
3. Go to the Ethernet configuration page and configure the LAN connection.
Note: An internet connection is not necessary to complete this configuration.
4. Open the web browser on the PC. Enter the IP address that follows to connect to the SC4200c controller: "http://192.168.165.30"
5. Select the Ethernet menu.
 - a. If the customer network supports Dynamic Host Configuration Protocol (DHCP), use the setting **Obtain an IP address automatically**.
 - b. If the customer network does not support DHCP, use the setting **Use the following IP address** and complete the settings with IP addresses supplied by the network administrator.

The controller is factory configured with two different subnets on the Ethernet ports:

- Port 1 (fec0): Ethernet interface for LAN connection with dynamic IP address (default)
- Port 2 (fec1): Ethernet interface for Ethernet-based fieldbus with static IP address 192.168.165.20 (default)

Note: Make sure that the network connection sharing setting is disabled to use the ethernet port for Modbus TCP/IP communication. Configure the ethernet port parameters to adapt them to the Modbus TCP/IP master (PLC) configuration.

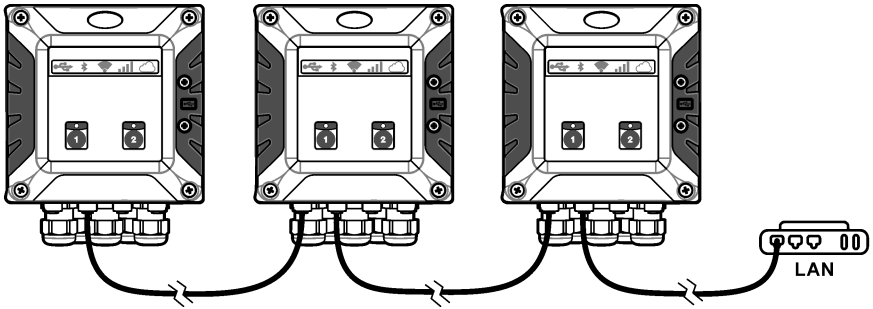
6. Select the correct IP setting (dynamic or static). If necessary, enter the correct settings based on the network topology: IP address, subnet mask and default gateway.
7. Select Network connection sharing to share the internet connection of the instrument with other controllers.
Note: When this setting is selected the two ports are switched together and only one port configuration is necessary. With this configuration the Ethernet port is used for network sharing.
8. Select Apply to save the settings.

5.2.1.1 Share the LAN

The instrument can be configured as an ethernet switch. When the network sharing configuration is enabled, a controller with internet access can share the connection with other controllers. Refer to [Figure 18](#). The two ethernet ports share the configuration. The ethernet configuration page only configures one ethernet port. Refer to [LAN connection](#) on page 32.

Note: When the network sharing configuration is enabled between multiple controllers, if one controller in the chain goes offline, subsequent controllers will also go offline.

Figure 18 Network sharing

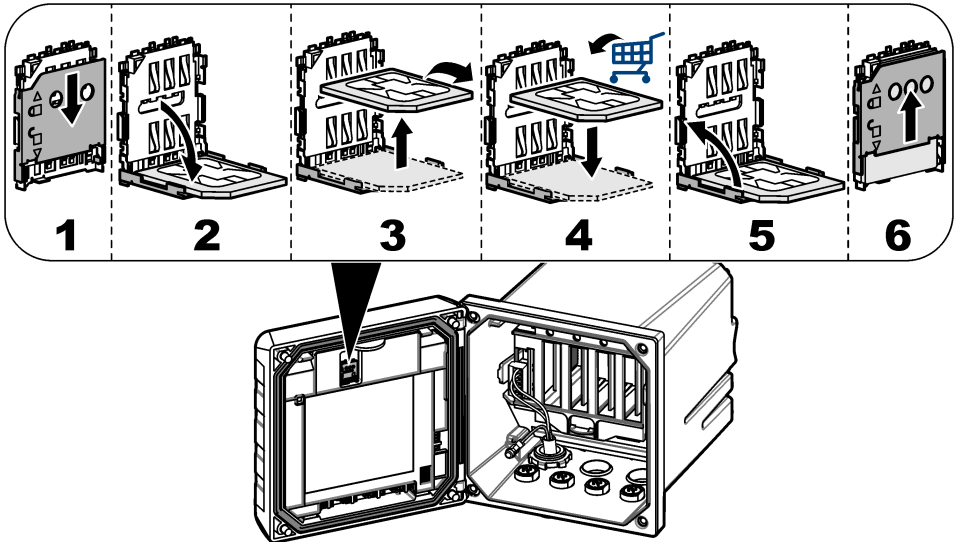


5.2.2 Mobile network connection

If the controller connects to the internet with the factory installed SIM card and the default Hach data plan, no more steps are necessary. To change the SIM card and connect the controller to the internet with a cellular network through a customer supplied data plan, do the steps that follow:

1. Remove the factory installed Micro SIM card.
2. Install a user-supplied Micro SIM card. Refer to [Figure 19](#).

Figure 19 SIM card installation



3. Connect the controller to a PC or laptop. Open the Web server application. Refer to [Web server application](#) on page 29.
4. Configure the modem.
Note: An internet connection is not necessary to complete this configuration.
5. Open the web browser on the PC. Enter the IP address that follows to connect to the SC4200c controller: "http://192.168.165.30"
6. Select the Modem menu.

7. Select the SIM provider from the Provider list. If the provider is not in the list, select Other and enter the settings that follow.

Option	Description
APN	Provider name (Access Point Name)
User name	User name
Password	User password
SIM-PIN	SIM card PIN

8. Select Apply and wait until the message "Modem is currently configured" shows on the PC.
Note: *An internet connection is not necessary to complete this configuration.*
9. Remove the Ethernet cable and the USB Ethernet adapter from the PC and the controller.
10. After a maximum of 5 minutes, examine the signal strength that shows on the front of the controller. The cloud icon stays blue to show a correct connection.
11. Change the settings to the initial values when the configuration is completed.

5.2.3 WiFi network connection

If the controller connects to the internet with a WiFi network, do the steps that follow:

Note: *A USB box and WiFi USB adapter (dongle) are necessary to connect the controller to a WiFi network. Refer to the documentation supplied with the USB box for more information about the WiFi installation.*

1. Connect the controller to a PC or laptop. Open the Web server application. Refer to [Web server application](#) on page 29.
2. Select the WiFi menu.
3. Set the WiFi connectivity button to on. A list of available access points and the signal strength for each access point shows.
4. Select the applicable WiFi access point. If necessary, enter the correct credentials: user name and password.

Note: *The WiFi connectivity currently accepts the authentication methods that follows:*

- **WEP:** *Not recommended. The WEP authentication method has low security.*
- **WPA2 Personal / PSK:** *Standard authentication. Use the password to access the network.*
- **WPA2 Enterprise:** *Authentication for enterprise networks. Use the enterprise credentials (username and password) to access the network.*

5. Select Apply to save the settings.

5.3 Initial setup—Mobile device/PC

5.3.1 Activate the account

The manufacturer makes the CLAROS account.

The administrator of the account (as defined by the customer) receives an invitation email to activate the account.



Note: *The invitation link expires after 24 hours. If the link expires before the account is activated, contact the manufacturer to ask them to send the email again.*

1. Select **ACTIVATE YOUR ACCOUNT** in the invitation email.
2. Follow the instruction to create a username and password.
3. A confirmation email with the login information will be sent.
4. Select the link in the login information email to log in to the account.
The manufacturer recommends that a bookmark is added for this website for faster access.

- EU server: eu.fsn.hach.com
- US server: us.fsn.hach.com

5.3.2 Add a new user

Note: Only account administrators, HST¹⁷ and HSA¹⁸ can add more users.

1. Open the browser and log in to MSM.
2. Push  to open the main menu.
3. Push  and select **Users** to add a new user.
4. Push **ADD**.
5. Enter the first name, last name and email address of the new user.
6. Select the role of the new user.

Option	Description
Administrator	<ul style="list-style-type: none">• Manages administrators and users.• Manages hardware.• Updates software.• Manages and maintains devices.
Basic	<ul style="list-style-type: none">• Manages and maintains devices.

Note: A user can have both Administrator and Basic roles.

7. Push **SAVE**.
The list shows the new user.

An invitation email is sent to the new user to activate the account. Refer to [Activate the account](#) on page 34.

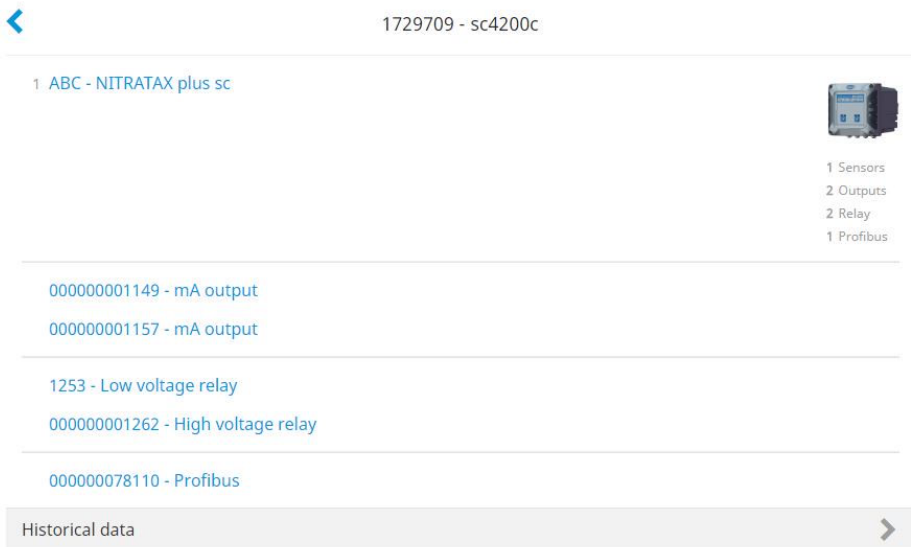
5.3.3 Add a controller

1. Install the mA output cards, relay cards and profibus cards in the controller. Refer to the controller user manual for installation instructions.
2. Connect the sensors to the controller. Refer to the SC1500 and/or SC4200c controller user manual for installation instructions.
3. Supply power to the controller.
4. Connect the controller to the HACH Server.
5. To start the MSM application, open the browser on a Mobile device/PC and log in the account.
6. Push **Devices**.
7. Push **ADD CONTROLLER** to add the controller.
8. Enter the serial number of the controller. Push **Continue** to confirm.
9. Wait 30 seconds, then refresh the browser. The controller will be **Online** on the device list. Refer to [User interface and navigation—Mobile device/PC](#) on page 25.
10. Make sure that the correct serial number and image of the controller are shown.
11. Select the controller on the device list to open the controller details page.
The sensors and cards connected to the controller are shown. Refer to [Figure 20](#).

¹⁷ Hach Service Technicians

¹⁸ Hach Service Admin

Figure 20 Controller details page



5.3.4 Add a sensor

Make sure that the controller is provisioned and connected to the HACH Server.

1. Make sure the controller is **Online** on the device list.
2. Connect the sensor to the controller physically.
Wait 30 seconds, then refresh the browser. The sensor is **Online** on the device list and the device details page. Refer to [User interface and navigation—Mobile device/PC](#) on page 25.
3. Make sure that the correct serial number, image and the correct measurement parameters of the device are shown.
After 30 seconds, the measurement values are updated for all devices. Refer to [User interface and navigation—Mobile device/PC](#) on page 25.

5.3.5 Configure a mA output card


Make sure that the controller is provisioned and connected to the HACH Server.

1. Select the mA output card from the controller details page.
2. Push **MENU** to access the mA output card settings. The mA output card will be locked. Refer to [Control function for devices](#) on page 27.
3. Push **System setup** to show a list of channels.
4. Select a channel and push **Source**.
5. Select a sensor from the list. Push **OK** to confirm.
6. Select a parameter from the list. Push **OK** to confirm.

5.3.6 Configure a profibus card



Make sure that the controller is provisioned and connected to the HACH Server.

1. Select the profibus card from the controller details page.
2. Push **MENU** to access the device settings. The device is locked. Refer to [Control function for devices](#) on page 27


3. Push **Telegram**.
4. Push **Add Sensor** and select a sensor from the list. Push **OK** to confirm.
The selected sensor shows.
5. Select the sensor and push .
6. Push **Add Tag** and select a tag from the list. Push **OK** to confirm.
The selected tag shows.
7. Push **Save**.

5.3.6.1 Change the sensor order

To change the position of the sensors in the list, do the steps that follow:




1. Select **Menu>Telegram** to show the list of the sensors.
2. Select the sensor from the list.
3. Use  and  to move the sensor up or down in the list.
4. Push **Save**.

5.3.6.2 Delete a sensor

1. Select **Menu>Telegram** to show the list of the sensors.
2. Select the sensor and push .
3. Push **Delete Sensor** to delete the sensor and the tags of the sensor from the telegram.
4. Push **Save**.

Note: The list of the remaining sensors is not changed when a sensor is deleted.

5.3.6.3 Change the position and delete tags of a sensor

1. Select **Menu>Telegram** to show the list of the sensors.
2. Select the sensor and push .
3. Select a tag from the list.
 - Use  and  to move the tag up or down in the list.
 - Push **Delete Tag** to delete a tag.
4. Push **Save**.

5.3.7 Add a photometer

1. Set the photometer to ON.
2. Connect the photometer to the HACH Server. Refer to the photometer user manual.
3. Push **Devices** to start the MSM application.
4. Push **ADD DEVICE** to add the photometer.
5. Enter the serial number of the photometer. Push **Continue** to confirm.
6. Wait 30 seconds, then refresh the browser. The photometer will be **Online** on the device list.
Refer to [User interface and navigation—Mobile device/PC](#) on page 25.
7. Make sure that the correct serial number and image of the photometer are shown.

Section 6 Operation

Use the MSM software to interact with the connected measurement devices. Contact Hach Technical Support to get a Claros Mobile Sensor Management account for the first time.

Note: Refer to the manufacturer's website to find more information about the MSM software.

1. Open an internet browser, then enter the correct URL:

- **US:** <https://us.fsn.hach.com>
- **EU:** <https://eu.fsn.hach.com>

2. Enter login information to:

- Receive the status and measurement information about measurement devices.
- Configure and calibrate measurement devices.
- Get access to interactive, step-by-step maintenance guides.

6.1 Data download

The controller records in an internal memory:

- Approximately 20,000 data logs, diagnostics data and an event log of all the connected sensors and modules
- Diagnostic data of the controller

Use the USB connection to download data from the controller. As an alternative, the data download procedure is also available through the user interface on the MSM software.

1. Connect a USB flash drive to the controller. Refer to [Connect a USB flash drive \(optional\)](#) on page 38.
The controller automatically starts the download of all the local data to the USB flash drive: data log, event log and diagnostic data.
2. When the download is complete, remove the USB flash drive.
***Note:** The USB icon in the front panel flashes to show data transmission. Do not remove the USB flash drive until the light flashing stops.*
3. Close the USB cover.

6.2 Firmware update

Make sure that the controller has the latest firmware. Use the USB connection to update the controller firmware. As an alternative, the firmware update procedure is also available through the user interface on the MSM software.

1. Visit www.hach.com and download the latest software version for your instrument.
2. Copy the files to a folder with the name Update in a USB flash drive.
3. Connect a USB flash drive to the controller. Refer to [Connect a USB flash drive \(optional\)](#) on page 38.
The controller automatically finds if there is a software or firmware update in the USB flash drive Update folder and starts the update procedure.
4. When the update is complete, remove the USB flash drive.
***Note:** The USB icon in the front panel flashes to show data transmission. Do not remove the USB flash drive until the light flashing stops.*
5. Close the USB cover.

6.3 Connect a USB flash drive (optional)

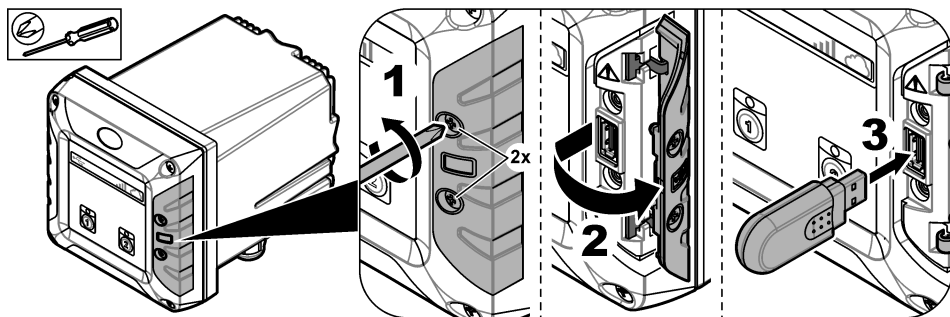
⚠ WARNING



Explosion hazard. This manual is only for installation of the unit in a non-hazardous location. For installation of the unit in hazardous locations, use only the instructions and approved control drawing provided in the hazardous location installation manual.

If necessary for data download or firmware update, connect a USB flash drive to the front panel in the controller. Make sure that the USB flash drive is formatted with FAT32 and has a minimum of 350 Mb capacity. Refer to [Figure 21](#). After the USB flash drive is removed, close the slot cover and tighten the cover screws. Tighten the cover screws with a maximum torque of 1.4 Nm (12.4 in./lb).

Figure 21 USB flash drive connection



6.4 Set the SC sensors on hold

Use the instrument keypad to set connected SC sensors to hold mode during manual operation or maintenance tasks.

1. Push the applicable channel button for 3 seconds.
The sensor status LED changes to orange.
2. Push the channel button again to set the SC sensor back to operation.

6.5 Get access to Claros with Claros Connector

There are two procedures to get access to Claros with the Claros Connector.

6.5.1 Local user

To enter a Claros device menu as a local user, do the steps that follow:

1. Push one of the two buttons on the Claros Connector.
The two LEDs change to amber. All devices are locked for access through the cloud.
2. Complete the Claros device menu.
3. Push one of the buttons again to unlock all devices.
The two LEDs change to blue at the Claros Connector. All devices are unlocked.

6.5.2 Remote user

To enter a Claros device menu through the Claros cloud, do the steps that follow:

1. The two LEDs change to red.
2. If an SC1000 Controller is used, a warning message shows the locked device at the SC1000 Controller display. All other devices are unlocked and a local user can get access.
3. If an SC200 Controller is used, all devices are locked. Wait until the user has complete accessing the Claros cloud and the LEDs are blue again.

6.6 Install a software update—Mobile device/PC

If a software update for a device is available, a notification shows in the device list.



1. Select the device. The notification "Software update is available" shows.
2. Push  to show the information of the software version. Refer to [Figure 22](#).
3. Push **Update** to start the software update.

Figure 22 Software update

Software



Version 0.02
HACH
0.0515 MB


FM.CommonFirmware.3B0760D8-57B2-43B5-8A25-0AB25DF49CC1.0_02

CANCEL

UPDATE


Section 7 Maintenance

⚠ WARNING



Explosion hazard. This manual is only for installation of the unit in a non-hazardous location. For installation of the unit in hazardous locations, use only the instructions and approved control drawing provided in the hazardous location installation manual.


⚠ CAUTION



Multiple hazards. Only qualified personnel must conduct the tasks described in this section of the document.

7.1 Cleaning the controller

⚠ DANGER



Electrocution hazard. Remove power from the instrument before doing maintenance or service activities.

Note: Never use flammable or corrosive solvents to clean any part of the controller. Use of these solvents may degrade the environmental protection of the unit and may void the warranty.

1. Make sure the controller cover is securely closed.
2. Wipe the controller exterior with a cloth dampened with water, or with a mixture of water and mild detergent.

Section 8 Troubleshooting

8.1 LED status

Problem	Possible cause	Solution
The inner green power LED is off. All indicator LEDs are off.	Power is not supplied to the controller.	Make sure the power cable is connected to the controller. Contact technical support.
The sensor status LED stays amber.	A warning message is reported by the sensor.	Refer to the sensor warning description shown in the MSM and to the sensor user manual.

40 English

Problem	Possible cause	Solution
The sensor status LED stays red.	There is an invalid measurement due to a sensor error.	Refer to the sensor error description shown in the MSM and to the sensor user manual.
	There is a communication failure between the sensor and the controller.	Examine the sensor and the sensor cable for damage. If damage is found, contact technical support.
		If no damage is found, disconnect the sensor, wait until the LED red is off, then connect the sensor again. Contact technical support if the LED shows red again.
The sensor status LED flashes red.	The sensor type is not supported by the cloud.	Make sure that the sensor is supported by the MSM.
		If the sensor is supported, contact technical support.
The sensor status LED flashes red.	Sensor connection issue	Make sure that only two sensors are installed in the controller. Although two analog module ports are available, if a digital sensor and two modules are installed, only two of the three devices will be seen by the controller.
		Make sure that the analog module and the digital sensor are not connected to the same channel. The analog module ports are internally connected to the sensor channel. If a digital sensor and an analog module is connected to the same channel only the module is seen by the controller.
		Make sure that the controller is compatible with the mA input module. Contact technical support.
The sensor status LED stays off, but the second sensor operates.	Sensor connection issue	Examine the sensor and the sensor cable for damage. If damage is found, contact technical support.
		If no damage is found, disconnect the sensor, wait for 15 seconds, then connect the sensor again. Contact technical support if the LED stays off again.
The sensor status LED flashes amber, while the second sensor is not connected.	Sensor connection issue	Examine the sensor and the sensor cable for damage. If damage is found, contact technical support.
		If no damage is found, disconnect the sensor, wait for 15 seconds, then connect the sensor again. Contact technical support if the LED flashes amber again.

8.2 Connection problems

Problem	Possible cause	Solution
The cloud connection LED stays red.	No access to cloud, but access to internet	If the controller is connected first time to cloud, make sure that the controller is provisioned by the MSM.
		If the controller was connected to the cloud before, set the controller to off. Set the controller to on again. Contact technical support if the LED stays red again.
The cloud connection LED stays off. Sometimes the LED flashes blue for a short time.	No access to internet	Cellular internet access: <ul style="list-style-type: none"> • Use the web server application to check the SIM card settings (provider, APN etc.). • Use the web server application to check the network status. • Make sure that the prepaid SIM card has credit. • Make sure that the SIM card data volume is not exceeded.
		LAN internet access: <ul style="list-style-type: none"> • Make sure that the controller has approval to be connected in the network. • Make sure that the network cable is connected to the correct Ethernet port. Refer to Figure 6 on page 13. • Use the web server application to examine the network status. • If the network sharing configuration is enabled, search the first controller in the series that is offline and examine for connectivity problems.
	The cloud connection LED is not working.	Make sure that the sensors are connected to MSM. Contact technical support.

8.3 Connection problems—Mobile device/PC

Problem	Solution
No device shows in the device list.	Refresh the browser.
	Make sure that the controller is on and connected to the HACH Server.
	Set the controller to off and then on again.
	Contact technical support.
The sensor connects to the controller. The controller shows "online" in the device list, but the sensor does not show in the device list.	Refresh the browser.
	Make sure that the sensor connection to the controller is correct and the controller is set to on.
	Disconnect the sensor from the controller and then connect the sensor again.

Problem	Solution
The sensor connects to the controller, but the sensor shows the message 'Inactive since'.	Make sure that the sensor connection to the controller is correct.
	Disconnect the sensor and connect the sensor again to controller.
Error or warnings are shown on the device list or device details page of the sensor.	Complete the guided maintenance workflow.
	Refer to the sensor user manual for more information.

Section 9 Replacement parts and accessories

▲ WARNING



Personal injury hazard. Use of non-approved parts may cause personal injury, damage to the instrument or equipment malfunction. The replacement parts in this section are approved by the manufacturer.

Note: Product and Article numbers may vary for some selling regions. Contact the appropriate distributor or refer to the company website for contact information.

Description	Item number
Power Cord Kit, SC4200c, strain relief, 120 VAC, U.S. plug	LXZ524.99.00034
Power Cord Kit, SC4200c, strain relief, 240 VAC, EU plug	LXZ524.99.00035
Power Cord Kit, SC4200c, strain relief, UK	LXZ524.99.00038
SC4200c UV protection screen	LXZ524.99.00004
SC4200c UV protection screen with sunroof	LXZ524.99.00005
SC4200c mA output module, 5 outputs	LXZ524.99.00006
SC4200c Profibus DP network module	LXZ524.99.00007
SC4200c mA input module	8782600
M12/RJ45 connector kit (Ethernet cable)	LXZ524.99.00009
M12/M12 connector kit (Ethernet cable)	LXZ524.99.00010
10 m Ethernet cable M12 to M12	LXZ524.99.00011
5 m Ethernet cable M12 to RJ45	LXZ524.99.00012
Holder for mobiles	LXZ524.99.00013
Sunroof Visor	LXZ524.99.00033
Sunroof	LXZ524.99.00037
Mounting hardware with Sunroof	LXZ524.99.00036
USB cover and screws SC4200c	LXZ524.99.00032
Module holder SC4200c	LXZ524.99.00017
Main board cover and wiring labels SC4200c	LXZ524.99.00019
Set of wiring labels SC4200c	LXZ524.99.00020

Description	Item number
Strain relief kit	4630700
Screwdriver, 2-mm wide blade	LZV680
Plugs kit for openings	LXZ524.99.00031
Panel mount bracket	8001316
Controller installation kit	8806200
Mounting bracket inserts	9177900
Profibus M12 connector kit	9178500
Profibus M12 socket (hard wire to quick connector adapter)	9178200
Profibus M12 T-splitter	9178400
USB to Ethernet adapter for SC4200c, without cable	LZY472-01
Power box with power connection cable for AMTAX sc and PHOSPHAX sc	LQV155.99.00012
Power box without power connection cable for AMTAX sc and PHOSPHAX sc	LQV155.99.00002
WiFi USB adapter for US, 2.4/5 GHz	LZY996
WiFi USB adapter for EU, 2.4/5 GHz	LZY997
External USB box for SC4200c	LXZ524.99.00016

9.1 Remote service connectors

NOTICE

The remote service connectors only apply to LXG524.xx.xxxAx controllers. The manufacturer recommends that the remote service connector is installed only by Hach Service technicians.

Description	Item number
Remote service connector for SC200	LXZ524.99.00046
Remote service connector for SC1000	LXZ524.99.00043
Claros Connector, LAN only	LXV524.99.000A0
Claros Connector, LAN and 3G/4G US AT&T	LXV524.99.010A0
Claros Connector, LAN and 3G/4G EU	LXV524.99.030A0
Claros Connector, LAN and external USB box (for WiFi and Verizon modems)	LXV524.99.040A0
Alternative high voltage barrier for SC200 Controller	9200400

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