

Manual

con::nect B-33-012

April 2020 Release



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1 General

This manual contains, firstly, general information (chapter 1) and safety guidelines (chapter 2). The next chapter (chapter 3) provides a technical description of the s::can product itself as well as information regarding transport and storage of the product. In further chapters the installation (chapter 4) and the initial startup (chapter 5) are explained. Furthermore information regarding how to perform a functional check (chapter 6) and maintenance (chapter 7) can be found in this manual. Information regarding troubleshooting (chapter 8) and the technical specifications (chapter 9) complete the document.

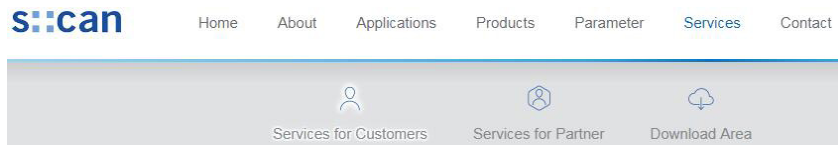
Each term in this document that is marked *italic and underlined*, can be found on the display of your controller for operation or as lettering on your s::can product.

In spite of careful elaboration this manual may contain errors or incompleteness. s::can does not assume liability for errors or loss of data due to such faults in the manual. The original manual is published in English and German by s::can. This original manual serves as the reference in case discrepancies occur in versions of the manual after translation into third languages.

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This manual, at the time of its publication (see release date printed on the top of this document), concerns the s::can products listed in chapter 3. Information and technical specifications regarding these items in s::can manuals from earlier release dates are herewith replaced by this manual.

The electronic version (pdf-document) of this manual is available on the s::can Customer Portal (Services for Customer) of the s::can website (www.s-can.at).



2 Safety Guidelines

Installation, electrical connection, initial startup, operation and maintenance of any s::can product as well as complete s::can measuring systems must only be performed by qualified personnel. This qualified personnel has to be trained and authorised by the plant operator or by s::can for these activities. The qualified personnel must have read and understood this manual and have to follow the instructions contained in this manual.



For proper initial startup of complete s::can measuring systems, the manuals for the controller and software used for operation (e.g. con::lyte, con::cube, con::nect, moni::tool), the connected probes and sensors as well as the used additional devices (e.g. compressor) have to be consulted.

The operator has to obtain the local operating permits and has to comply with the joint constraints associated with these. Additionally, the local legal requirements have to be observed (e.g. regarding safety of personnel and means of labour, disposal of products and materials, cleaning, environmental constraints). Before putting the measuring device into operation, the operator has to ensure that during mounting and initial startup – in case they are executed by the operator himself – the local legislation and requirements (e.g. regarding electrical connection) are observed.

All s::can products are leaving our factory in immaculate technical and safety conditions. Inappropriate or not intended use of the product, however, can cause danger! The manufacturer is not responsible for damage caused by incorrect or unauthorised use. Any kind of manipulation of the instrument is strictly prohibited - except for the activities described in this document. Conversions and changes to the device must not be made, otherwise all certifications and guarantee / warranty become invalid. For details regarding guarantee and warranty please refer to our general terms and conditions.

2.1 Declaration of Conformity

This s::can product has been developed, tested and manufactured for electromagnetic compatibility (EMC) and according to applicable European standards, as defined in the declaration of conformity.

CE-marks are applied on the device. The declaration of conformity related to this marking can be requested from s::can or your local s::can sales partner or can be downloaded from the s::can Customer Portal.

2.2 Special Hazard Warning



Because the s::can measuring systems are frequently installed in industrial and municipal waste water applications, one has to take care during mounting and demounting of the system, as parts of the device can be contaminated with dangerous chemicals or pathogenic germs. All necessary precautions should be taken to prevent endangering of one's health during work with the measuring device.

3 Technical Description

3.1 Intended Use

The con::nect is a connection box for on-line operation of s::can spectrometer probes V3 (G-Series and spectro::lyser). It ensures power supply for the connected spectrometer probe, activation of the automatic cleaning and the transfer of the readings and status information to the connected operating terminal. This terminal (con::cube, PC or SCADA) can either be connected via Ethernet interface or via RS485.

In all types of applications, the respective acceptable limits, which are provided in the technical specifications in the respective s::can manuals, have to be observed. All applications falling outside of these limits, and which are not authorised by s::can Messtechnik GmbH in written form, do not fall under the manufacturer’s liability.

The device must only be used for the purpose described in this manual. Use in applications not described in this manual, or modification of the device without written agreement from s::can, is not allowed. s::can is not liable for claims following from such unauthorised use. In such a case, the risks are the sole responsibility of the operator.

3.2 Functional Principle

The con::nect is a power supply box in case the s::can spectrometer probe V3 is used without an operation terminal (e.g. con::cube, con::lyte). Futhermore it enables steering of the automatic cleaning (e.g. cleaning valve, autobrush) and data transfer via Ethernet or Modbus RTU. The con::nect box is also needed if more than one spectrometer probe is connected to a con::cube.

3.3 Product

The following device variants of the con::nect are available. Regarding detailed information of the device variants please refer to the technical specifications located at the end of this manual.

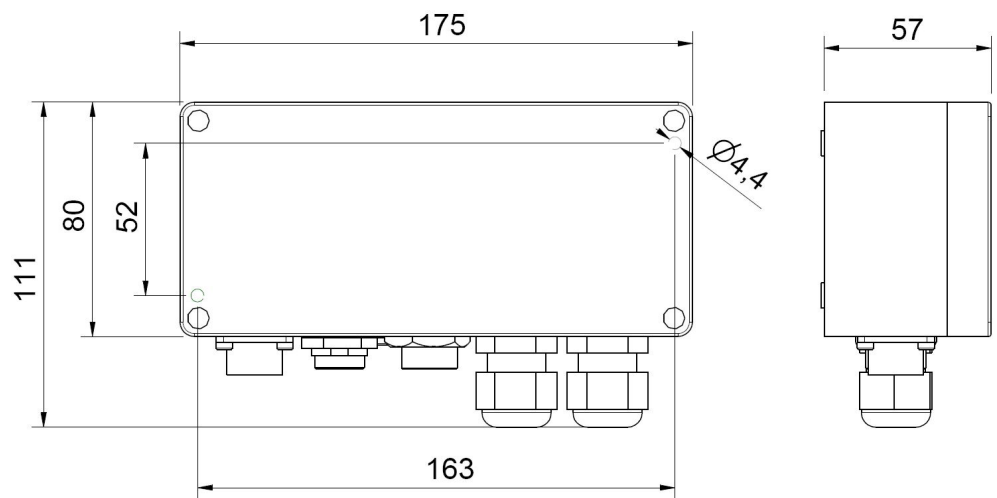
Type	Specification
B-33-012	con::nect interface with 12 VDC main power supply

The device is typified by a type label, as shown on the right, that contains the following information:

- Manufacturer’s name and country of origin
- Several certification marks
- Device name (con::nect)
- Type of power supply
- Bar code
- Device serial number (S/N)
- Information on power supply
- Environment rating (IP)
- Acceptable humidity and temperature limits
- Item number (Type)
- QR code



- 1** Housing cover
- 2** Screws to open housing cover
- 3** Connector for s::can spectrometer probe (M12)
- 4** LAN connector for Ethernet (RJ45)
- 5** Cable gland for data transfer and / or cleaning device
- 6** Cable gland for power supply



Dimensions of con::nect in mm

3.4 Storage and Transport

The limiting values for device storage and transport, which are described in the section technical specifications, have to be observed at all times. The device shall not be exposed to strong impacts, mechanical loads or vibrations. The device should be kept free of corrosive or organic solvent vapours, nuclear radiation as well as electromagnetic radiation.

Transport should be done in a packaging that protects the device (original packaging or protective covering if possible).



This product is marked with the WEEE symbol to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2012/19/EC. The symbol indicates that this product should not be treated as household waste. It must be disposed and recycled as electronic waste. Please assist to keep our environment clean.

3.5 Scope of Delivery

Immediately upon receipt, please check the received consignment for completeness on the basis of the delivery note and check for any possible damage incurred during shipping. Please inform the delivering dispatcher and s::can immediately in case of any damages in transit.

The following parts should be included in the delivery:

- s::can con::nect (part-no. B-33-012)
- s::can manual con::nect (part-no. S-443-M)

In case of incompleteness please contact your s::can sales partner immediately!

3.6 Product Updates, Other

The manufacturer reserves the rights to implement, without prior notice, technical developments and modifications in the light of continuous product care.

4 Installation

4.1 Environment

The con::nect is designed according to environmental protection rating IP 65 and is resistant against environment effects. Nevertheless, please avoid extreme conditions (e.g. heavy rain or splash water, excessive heat, strong electromagnetic fields, corroding chemicals, mechanical loads, vibrations).

Enclosure class IP 65 protection is only guaranteed if the housing cover is fixed tightly with the four screws and the sealing of the housing cover is undamaged and placed correctly. In addition all cable glands have to be sealed correctly in that way they are closed tightly with the appropriate cables or dummy caps. All connectors must be covered with corresponding caps when not in use. Any damage caused by intrusion of water will not be covered by the warranty.

The correct installation of measuring instruments is an important prerequisite for satisfactory operation. Therefore the following checklist for the installation place to be selected and the needed infrastructure can be used to ensure that all sources for potential operational problems can be ruled out to the greatest possible extent, allowing the s::can monitoring system to operate properly.

- Easy accessibility (mounting, sampling, functional check, demounting)
- Availability of sufficient space (probe, sensor, installation fitting, terminal, etc.)
- Adherence to limit values (see technical specifications located at the end of this manual)
- Protection against splash water and extreme weather conditions
- Power supply for terminal (operational reliability, voltage, power)
- Oil- and particle free compressed-air supply (optional for automatic probe / sensor cleaning)
- Shortest possible distances between system components (probe – terminal – compressed-air supply – energy supply)
- Best possible layout of cables (non-buckling, working dependability, no damage etc.)

4.2 Mounting

For mounting and electrical installation the following tools and materials are necessary:

- Phillips screw driver (size 2) to open housing cover
- Screw driver (3 mm) for wiring on cable terminals
- 2 screws (M4) for fastening the con::nect on the wall (if required)
- Power supply with connection cable
- Stripping tool for power supply line
- Cable end sleeves and crimper

The con::nect can be mounted quickly and easily onto a flat wall using two M4 screws (not included in delivery). The screws can be screwed through the provided drillings of the housing from the front. The housing cover has to be removed first.

For the correct dimensioning and space required for mounting please refer to the figure in section 3.3 and the technical specifications.

5 Initial Startup

Once mounting and installation of the con::nect have been completed and checked (see section 4) the initial startup of the s::can monitoring system will require the following actions, in the order presented below:

- Connect the s::can spectrometer probe (see section 5.2).
- Connect the cleaning devices to the proper terminal connections in the cable terminal compartment (see section 5.3).
- Establish 12 VDC main power supply to the con::nect (see section 5.4).
- Connect the con::nect to the proper terminal via LAN cable and configure the local network. Refer to section 5.5.1 in case of using con::cube and refer to section 5.5.2 in case of using PC / notebook.
- Start probe initialisation of monitoring station according to the instruction in the manual of the used operation terminal.
- Configure the measurement and cleaning settings (please refer to manual of operating software).
- Check whether the cleaning system works properly.
- Connection and parameterisation of data transfer when desired (please refer to manual of operating software).

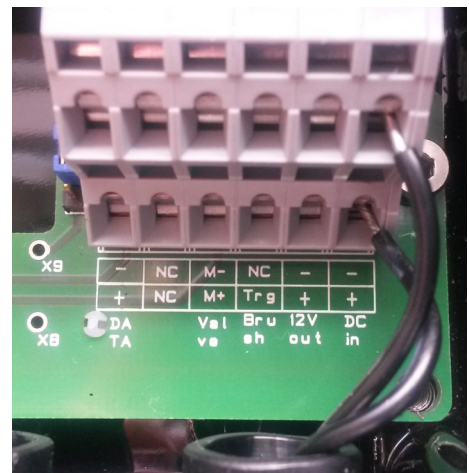
5.1 Plan of Terminal Connections

Once the cover has been opened (four phillips head screws removed) you have access to the cable terminal compartment of the con::nect.

The con::nect is equipped with spring terminals that enable quick and easy wiring.

- Insert a small screwdriver into the slot above the cable clamp you want to connect.
- Move the screwdriver upwards, which opens the cable clamp, and insert the wire.
- Move the screwdriver downwards and remove it. Now wire is locked in the cable clamp.

s::can recommends to use wires with isolated end sleeves for power supply and data transfer.



5.2 Connection of s::can Spectrometer Probes

An s::can spectrometer probe can be connected to the compatible socket for spectrometer probes marked with no. 3 in the figure of section 3.3. Ensure that the sensor plug and the socket are dry and clean. Otherwise communication errors and / or device damage might occur.

5.3 Connection of Cleaning Devices

For those installations in which the automatic cleaning of the s::can spectrometer probe is not steered by the terminal used for operation, the automatic cleaning can be wired to the con::nect directly and will be steered by the spectrometer probe.



Please note that spectrometer probe can either steer the automatic cleaning or use Modbus RTU for data communication. Both features at the same time cannot be used.

The table below displays the different possibilities for connection.

Cleaning Device	Colour of wire	Terminal Labelling
Cleaning valve	Blue	M+ Valve
	Brown	M- Valve
Autobrush	Purple (Yellow ¹⁾)	Trg Brush
	Black (Brown ¹⁾)	- 12V Out
	Red (White ¹⁾)	+ 12V Out
ruck::sack	Purple	Trg Brush
	Black	- 12V Out
	Red	+ 12V Out

¹⁾ previous used cable version

Once the cleaning device has been electrically connected, the device needs to be parameterised within the operating software (please refer to according manual).

5.4 Connection of Main Power Supply



This type of work must be performed by authorised persons only! (see section 2).

The connection of power supply must be done with an earthed conductor wire (PE - „protective earth“)!

Connection of power supply for con::nect B-33-012	
Power supply	Terminal Labelling
- 12 VDC	- DC in
+ 12 VDC	+ DC in

The power supply earth (PE) is to be made properly. Proper grounding implies suitable wiring for grounding which includes proper wire size (see technical specification) and a suitable equipment ground. Process medium (e.g. waste water) must be connected to the same earth ground with less than 0.5 Ohm.

5.5 Connection to Operation Terminal

To operate the complete s::can monitoring system equipped with a con::nect, a s::can con::cube is used normally (see section 5.5.1). In specific cases also a PC / notebook (see section 5.5.2) or an external terminal (see section 5.5.3) can be used.

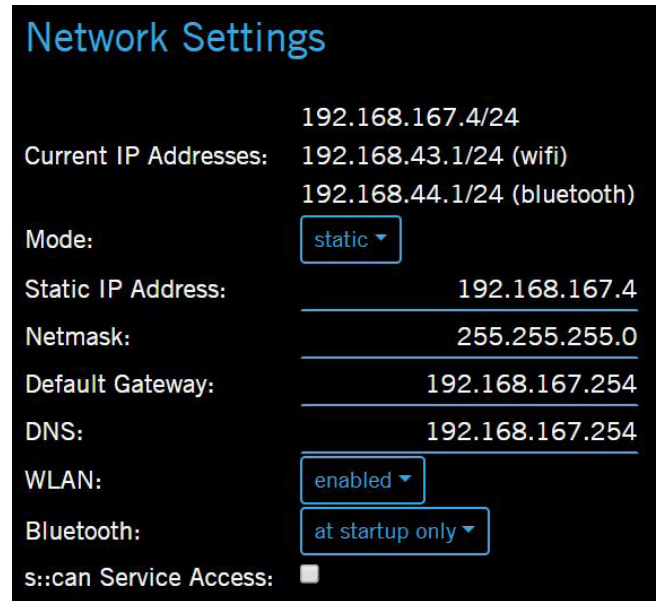
For operation of spectrometer probe and terminal via Ethernet, both devices have to use the same IP subnet. The spectrometer probe offers the following possibilities to check or change the IP address.

- Immediately after startup the DHCP is activated for approx. 10 minutes on the spectrometer.
- The spectrometer probe has a fixed static IP address which is 192.168.42.10.
- This fixed IP address as well as all other network settings on the spectrometer probe can be changed using the software `lo::Tool`.

Please refer to spectrometer probe manual how to start `lo::Tool` and change network settings (section *Probe Initialisation using con::nect and lo::Tool* and section *Check of Device Settings using con::nect and lo::Tool*).



To change the *Network Settings* on the spectrometer probe using `lo::Tool` you have to logon as user `expert` with password `scan`.



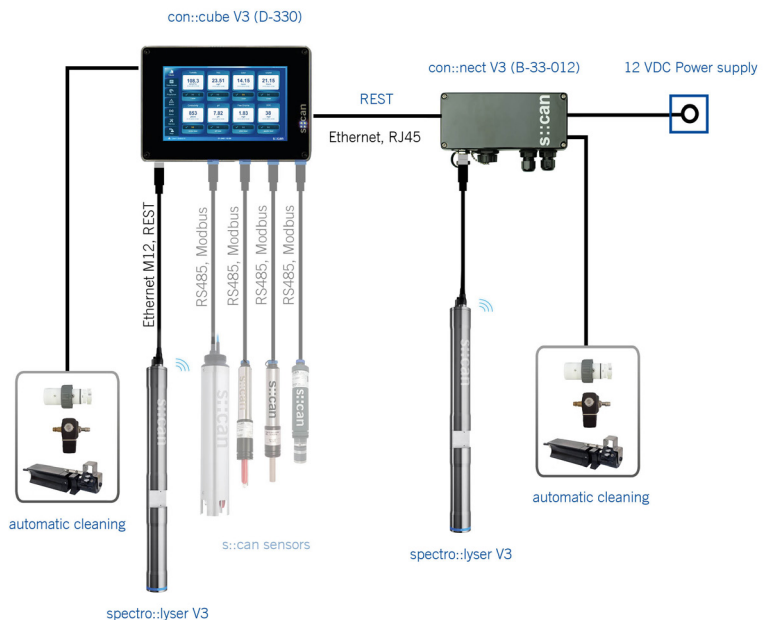
5.5.1 Connection to con::cube

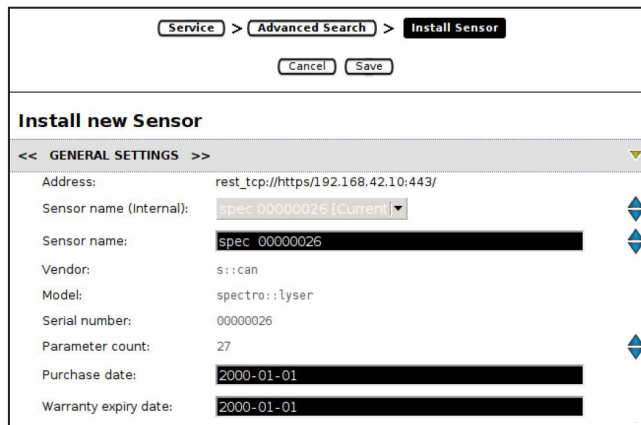
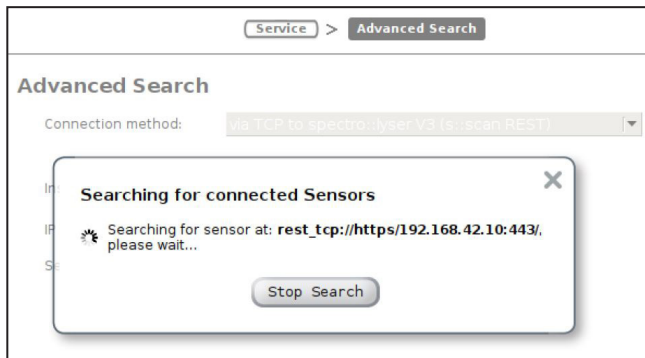
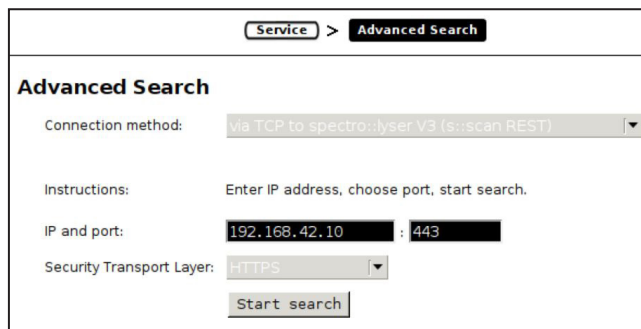
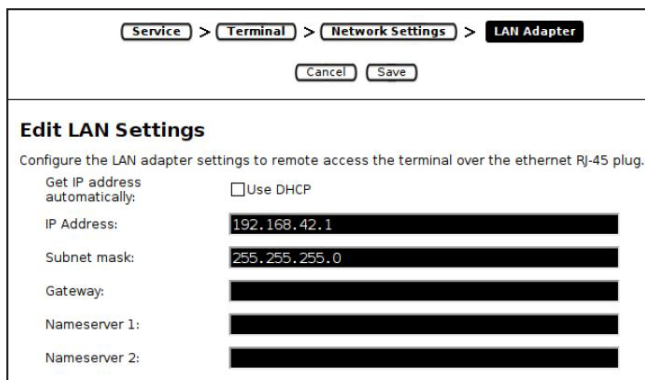
A con::nect is either needed if a spectrometer probe V3 is operated with an old con::cube D-315 or if more than one spectrometer probe V3 shall be operated with a con::cube D-330 (see figure on the right).

The connection is performed by the following steps:

- Use a LAN cable to connect the con::nect box to the con::cube.
- Connect the main power supply (DC in) to the con::nect.
- Ensure that con::cube and spectrometer probe are using the same IP subnet. LAN settings of con::cube can be checked and configured in *Service > Terminal > Network Settings > LAN Adapter*.
- Start `moni::tool` menu for *Advanced Search* and select Connection method *via TCP to spectro::lyser V3 (s::can REST)*.
- Enter the correct IP Address of the spectrometer and push the button *Start search*.
- Once the spectrometer was found check the settings and push *Save* to finish the initialisation.

2 x spectro::lyser V3 on con::cube V3

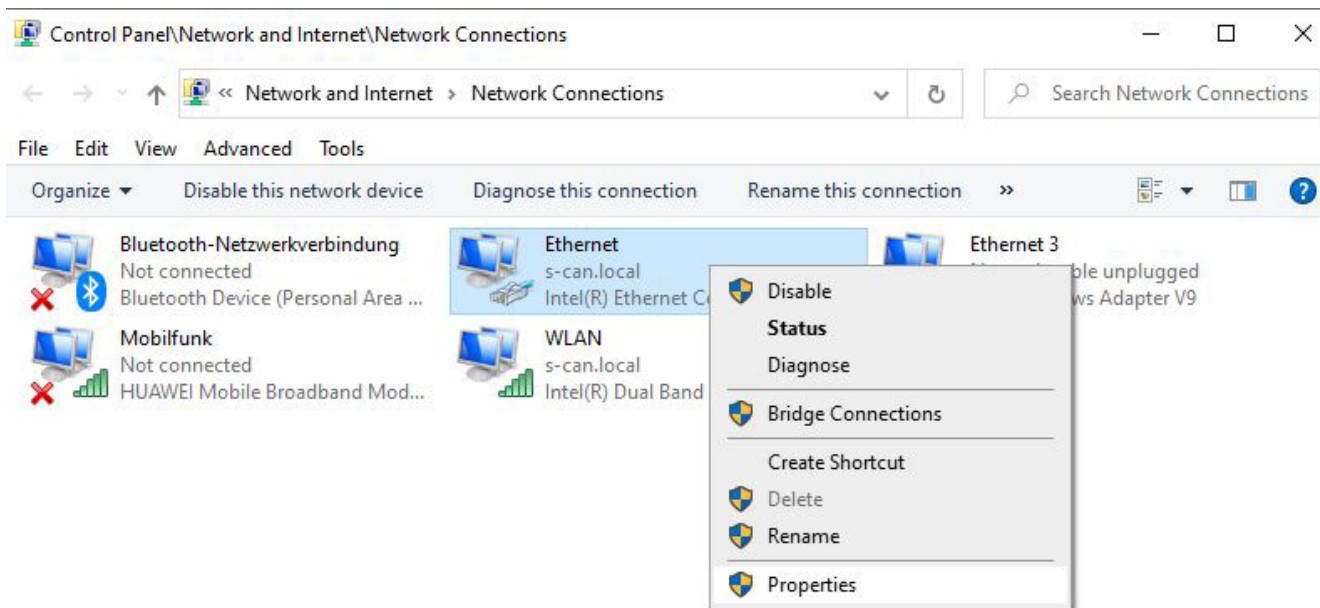




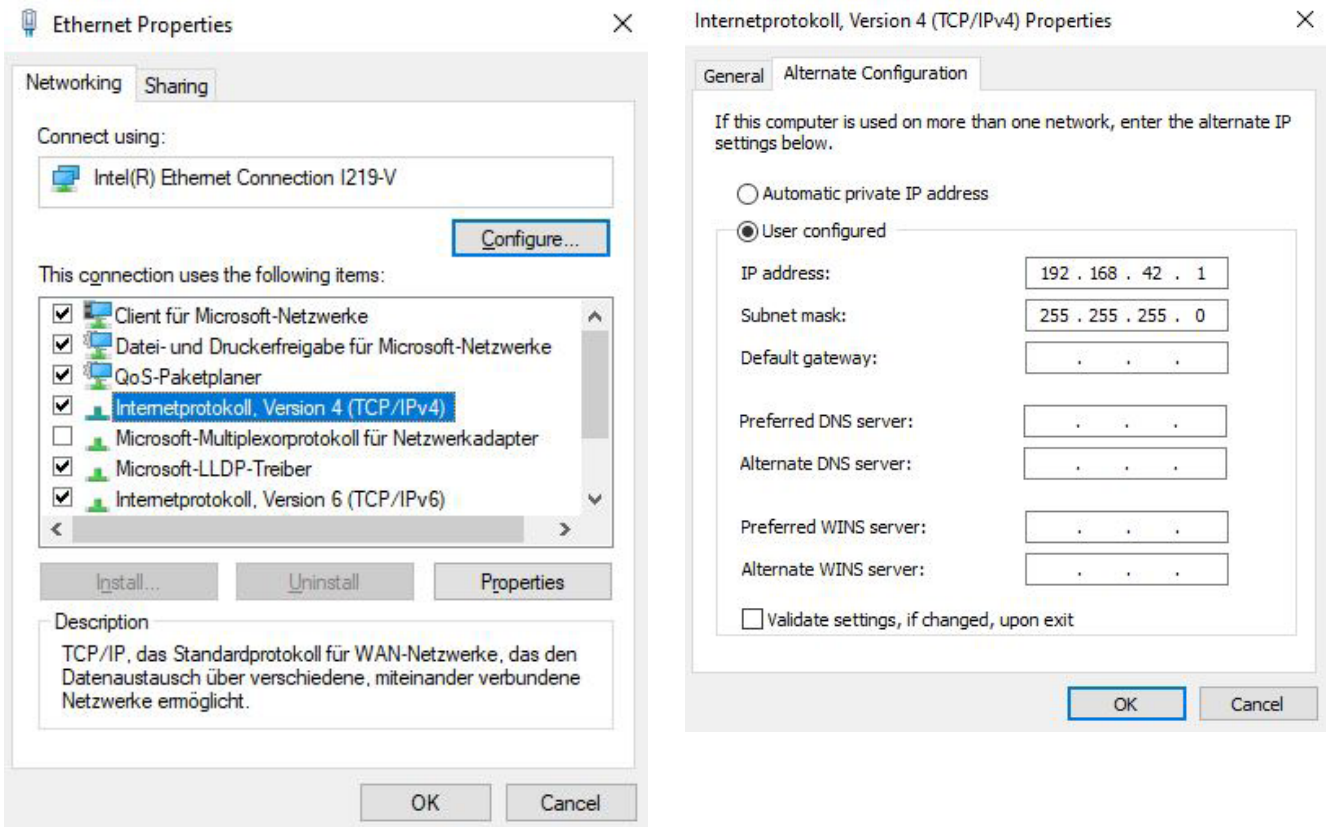
5.5.2 Connection to PC / Notebook

For operation of the spectrometer probe V3 with a PC or notebook the con::nect can be used. The connection is performed by the following steps:

- Use a LAN cable to connect the con::nect box to the PC or notebook.
- Connect the main power supply (DC in) to the con::nect.
- Ensure that PC or notebook and spectrometer probe are using the same IP subnet.
- Open *Network Connection* to modify the *Properties* of your *Ethernet* connection.



- Select Internetprotocol Version 4 and push the button Properties.
- Enter the needed IP address as Alternate Configuration and push OK.



- Enter the IP address of the spectrometer probe into the Web-Browser to start lo::Tool.

5.5.3 Connection to External Terminal

On the con::nect itself, no data can be stored. The con::nect transfers the data to the connected operation terminal only. In case the data transfer will be used for an external terminal, please ask your s::can sales partner to provide the needed documentation with the register mapping, etc. (signed non-disclosure agreement necessary).



6 Functional Check

A functional check might be required for one of the following reasons:

- Initial startup
- Routine functional check
- Suspicion of monitoring system malfunction
- Modification of monitoring system (e.g. integration of additional sensor or device)
- Change of measuring location

Depending on the application (water composition), the probes and sensors connected and the environmental conditions a regular functional check (weekly to monthly) is recommended. The following sections provide an overview of all the actions that have to be performed to check the monitoring system quickly (see section 6.1). To check the plausibility of the displayed and collected readings and the integrity of a single probe or sensor, please refer to the according manuals of the connected probes and sensors.

6.1 Check System / Monitoring Station

What to check	How to check	What to do, if check failed
Power supply	LED ring on spectrometer is on or blinking	Check power supply Dis- and reconnect power supply
System running (up-to-date)	Check system clock at the bottom of the lo::Tool screen if current time and time of last measurement is current.	Check time and measurement settings. Please remind that polling of readings needs several seconds.
Automatic measurement active	Readings are actualized? Service mode not active?	Check measuring settings Leave Service mode
System status	LED ring on spectrometer is blue?	See spectrometer manual for further details.
Installation	Housing, cable connections and plugs are undamaged and tight?	Repair or replace damaged parts, that might influence the IP 65 protection (see section 4.1)
Function of automatic cleaning	Wait for next cleaning cycle or activate cleaning manually. Watch for air bubbles or listen if brush is rotating.	Check configuration, electrical connection, air tubes and cleaning device itself.
Efficiency of automatic cleaning	Perform functional check of the probes and sensors connected to the automatic cleaning.	Improve automatic cleaning settings. Replace cleaning brush
Datatransfer	Compare the readings displayed on the s::can terminal for operation with those readings received by the used SCADA system.	Check data transfer settings. Use test function to check data transfer.

7 Maintenance

7.1 Cleaning

The device housing is made of aluminium alloy. Only use a wet cloth tissue and drinking water and / or mild detergents (e.g. dish washing soap) for cleaning.

7.2 Housing

To ensure IP 65 grade protection, gaskets and case edges have to be checked for cleanliness, possible damage and dirt or foreign bodies before closing the housing cover every time. In case of damage to the cord gasket in the housing cover it has to be repaired!

The cover must be tightly screwed (tightening torque 2.5 Nm) and the cable glands filled with cable or fitting plugs, must also be tight (tightening torque 2.5 Nm for 16 mm). All sockets not in use (e.g. RJ-45) must be covered with corresponding caps. Damage caused by intrusion of water will not be covered by the warranty.

8 Troubleshooting

8.1 Return Consignment (RMA - Return Material Authorization)

Return consignments of the s::can monitoring system, or parts of the system, shall be done in a packaging that protects the device (original packaging or protective covering if possible). Before returning a consignment, you have to contact your s::can sales partner or s::can customer support (support@s-can.at). A RMA number will be assigned for each device, independent if the reason of the return consignment is service, repair or demo equipment.

RMA numbers can be requested from the s::can Customer Portal available on the s::can homepage directly. Return consignments without an RMA number will not be accepted. The customer always has to bear the costs for return consignment.

9 Technical Specifications

Name	Specification	Remark
Part-no.	B-33-012	
Dimensions housing	175 / 80 / 57 mm	W / H / D (without cable glands)
Required space	180 / 200 / 60 mm	W / H / D (incl. cable glands and M12 plug)
Weight	approx. 0.6 kg	
Material housing	Aluminium AlSi12, powder coated	
Material other	Neoprene, V2A, PA	
Environment rating (IP)	IP 65	if customer's cable connections are sealed off and housing cover closed tightly.
Operation humidity	5 to 90%	non-condensing
Operation temperature	-20 to 50°C (-4 to 122°F)	
Mounting	2 holes on backside, 4.5 mm diameter	connectors and cables facing downward recommended
Power supply	12 VDC	
Power consumption	passive device	for proper operation use power supply with min.18 W at 12 VDC
Cable type power supply	cable with minimum of 1.5 mm ² effective copper area	
Cable length power supply	max. 10 m (12 VDC, 1.5 mm ²) max. 20 m (12 VDC, 2.5 mm ²)	
Interface to s::can spectrometer probe	1 x M12 RSTS 8Y, RS485, Ethernet	
Interface to automatic cleaning	12 V+10%, max. 18 W total load	
Interface to SCADA / PC	1 x Ethernet connector (RJ-45) 1 x RS485 on internal terminals	
Conformity - ECM	passive device	
Conformity - safety	passive device	
Storage temperature	-20 to 50°C (-4 to 122°F)	
Typical lifespan (application)	8 years	
Typical life time (storage)	8 years	



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