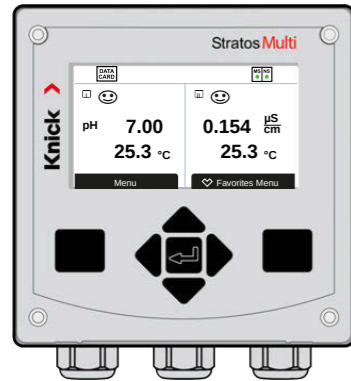


EtherNet/IP



www.knick.de

Read before installation.
Keep for future use.

1 Safety

Also read the user manual and safety guide, and follow the safety instructions.

Intended Use

Stratos Multi E471N is an industrial transmitter in 4-wire technology for EtherNet/IP communication. It features an RJ45 socket and can therefore be connected in a star topology. In the field of liquid analysis, the device can measure pH values, ORP, conductivity (contacting or inductive), and oxygen content, both dissolved and in the gaseous phase.

The defined rated operating conditions must be observed when using this product. These conditions are set out in full in the Specifications chapter of the user manual, as well as in parts of this installation guide.

Function Check Mode (HOLD Function)

When you open the Parameter Setting, Calibration, or Maintenance menus, Stratos Multi switches to the function check (HOLD) mode. EtherNet/IP communication and the relay contacts/current outputs behave in accordance with the parameter settings. The state transmitted via EtherNet/IP is in part dependent on the operating mode.

Operations must not be carried out while the device is in function check (HOLD) mode, as the system may behave unexpectedly and put users at risk.

Inputs and Outputs (SELV, PELV)

All inputs and outputs must be connected to SELV/PELV circuits.

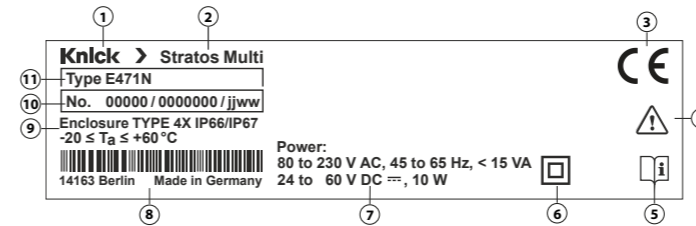
2 Product

Package Contents

- Stratos Multi basic unit
- Bag containing small accessory parts (2x plastic sealing plugs, 1x hinge pin, 2x insertable jumpers, 1x reduction sealing insert, 1x multiple sealing insert, 2x blanking plugs, 5x cable glands and M20x1.5 hex nuts)
- Test Report 2.2 acc. to EN 10204
- Installation Guide
- Safety Guide

Note: Check all components for damage upon receipt. Do not use damaged parts.

Nameplate



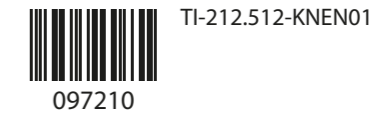
1 Name of manufacturer	6 Protection class II
2 Product name	7 Power supply
3 CE mark	8 Manufacturer's address with barcode
4 Special conditions: Read the user manual, observe the specifications, and follow the instructions in the safety guide.	9 Protection, permissible ambient temperature
5 Reminder to read the documentation	10 Product number/serial number/production year and week
	11 Model designation

Note: The MAC address (00:19:10:xx:xx:xx) is located on a separate label.

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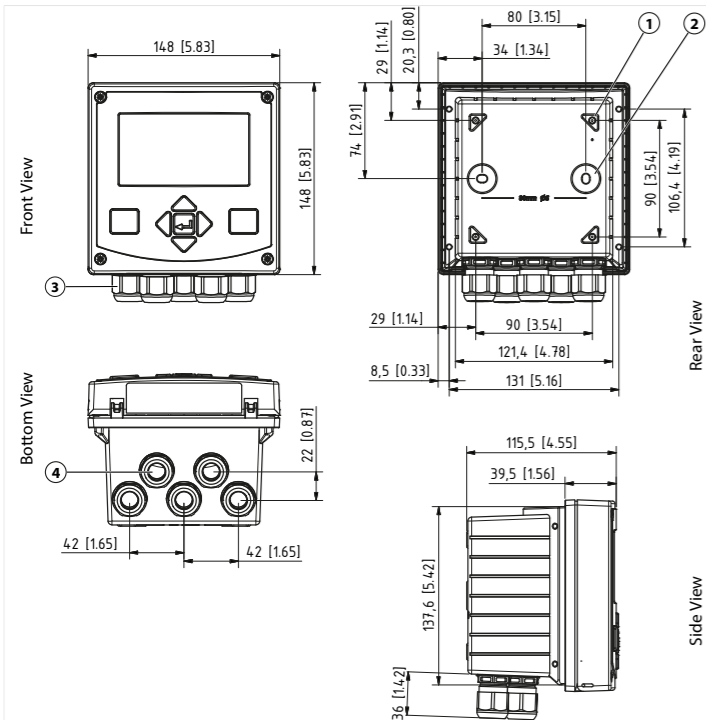
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Version 1
This document was published on March 16, 2021.
The latest documents are available for download on our website under the corresponding product description.



3 Commissioning

Dimension Drawings

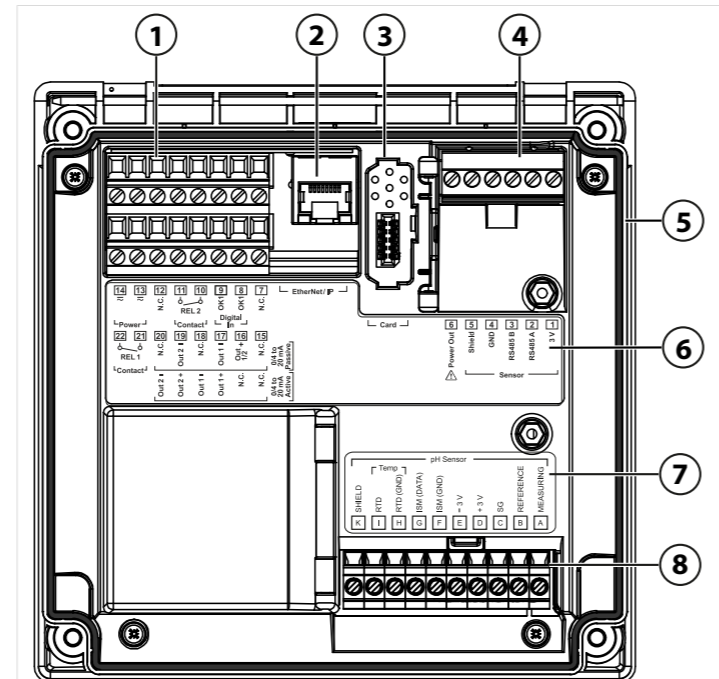
Note: All dimensions are given in millimeters [inches].



- | | |
|---|--|
| 1 Holes for pipe mounting, 4x | 3 Cable glands, 5x |
| 2 Holes for wall mounting, 2x
Sealing with plastic sealing plugs | 4 Holes for cable glands or
½" conduit, ø 21.5 mm, 2x |

Connections

Rear of front unit



- | | |
|---|---|
| 1 Terminals for inputs, outputs, relay contacts, power supply | 5 Circular seal |
| 2 RJ45 socket for EtherNet/IP | 6 Terminal plate |
| 3 Slot for the memory card. Follow the instructions for installing the memory card. | 7 Module plate for analog sensors;
example for pH module |
| 4 RS-485 interface: Sensor connection for Memosens or digital sensors | 8 Module slot for measuring modules |

Electrical Installation

WARNING! The transmitter does not have a power switch. An appropriately arranged and accessible disconnecting device for the transmitter must be present in the system installation. The disconnecting device must disconnect all non-grounded, current-carrying wires and be labeled such that the associated transmitter can be identified. Before commencing with the installation, make sure that all lines to be connected are de-energized.

CAUTION! Risk of losing the specified ingress protection. Fasten the cable glands and screw together the housing correctly. Observe the permissible cable diameters and tightening torques. Only use original accessories and spare parts.

NOTICE! Strip the insulation from the wires using a suitable tool to prevent damage.

1. Wire the connections. Deactivate unused current outputs in the parameter settings or use jumpers.
2. Connect the power supply (for ratings, see specifications).
3. When measuring with analog sensors: Insert the measuring module into the module slot.
4. Connect the sensor.
5. Check whether all connections are correctly wired.
6. Close the housing and successively tighten the enclosure screws in a diagonal pattern.
7. Before switching on the power supply, make sure its voltage is within the specified range.
8. Switch on the power supply.

CAUTION! Incorrect parameter settings or adjustments can result in incorrect outputs. Stratos Multi must therefore be commissioned by a system specialist, all its parameters must be set, and it must be fully adjusted.

Connecting the Power Supply

The power line may carry dangerous touch voltages. It is connected to terminals 17 and 18. Touch protection must be ensured by proper installation.

Terminal	Description
17, 18	Power supply, reverse polarity protected, see specifications

RJ45 Ethernet Socket Wiring

Pin	Name	Description
1	TD+	Transmitted data +
2	TD-	Transmitted data -
3	RD+	Received data +
6	RD-	Received data -

Accessories

Accessories	Order no.
RJ45 socket	ZU1072
Adapter cable RJ45/M12 D-type	ZU1073

System Integration

An EtherNet/IP EDS file (electronic data sheet) is required for system integration.

The latest version of the EDS file, "E471N-Vxxxxx.eds", is available to download from the Knick website.

Network Settings

Network settings can be adjusted via the Ethernet interface or via local operation.

Parameter Setting ▶ EtherNet/IP ▶ Usage : On

IPv4 Address Mode : DHCP or Custom

If you select the "Custom" IPv4 address mode, also enter the IPv4 address, the subnet mask, and the standard gateway. Enter the IPv4 address 0.0.0.0 if no gateway is available.

Display the current IP and MAC addresses:

Menu Selection ▶ Diagnostics ▶ Network Information

Connecting Digital Sensors

Memosens sensors and the SE740 (LDO) optical oxygen sensor are connected to the RS-485 interface of the Stratos Multi. Next, select the relevant process variable for the connected sensor in the parameter settings.

Menu ▶ Parameter Setting ▶ Sensor Selection [I] [II] ▶ Sensor Selection [I]

Terminal	Wire color	Memosens cable or M12 cable	Terminal plate
1	Brown	+3V	
2	Green LDO: Gray	RS-485 A	
3	Yellow LDO: Pink	RS-485 B	
4	White LDO: Brown	GND LDO: Shield	
5	Transparent	Shield	
6	LDO: White	LDO: Power Out	

Memosens Module Terminal Assignments

A second Memosens sensor can be connected to the MK-MS095N Memosens module.

Terminal	Wire color	Memosens cable	Terminal plate
A	Brown	+3V	
B	Green	RS-485 A	
C	Yellow	RS-485 B	
D	White	GND	
E	Transparent	Shield	

Connecting Analog Sensors

pH/ORP measuring module	MK-PH015N
Oxygen measuring module	MK-OXY046N
Module for contacting conductivity measurement	MK-CONDO25N
Module for inductive conductivity measurement	MK-CONDI035N
Module for dual conductivity measurement	MK-CC065N

Terminal Assignments for Measuring Modules

	pH		ORP		Oxygen (Amperometric)	
A Meas	Coax core] = Insert jumper	Coax shield	A Cathode	Coax core transparent	
B Ref	Coax shield		Coax core	B Reference] = Insert jumper	
C SG	Coax core		Coax shield	C Anode		Coax shield red
D +3 V source			D Guard	Gray + green		
E +3 V drain			E ISM (GND)			
F ISM (GND)			F ISM (DATA)			
G ISM (DATA)			G RTD (GND)	Green		
H RTD (GND)	Temperature probe	Temperature probe	H RTD	White		
I RTD	Temperature probe	Temperature probe	I Shield	Cable shield yellow/green		
K Shield	Cable shield	Cable shield				

] = Insert jumper

		Conductivity (Contacting)	
		4-Electrode Sensor	2-Electrode Coax Sensor
A	I _{hi}	Current electrode Hi] = Insert jumper
B	U _{hi}	Voltage electrode Hi	
C	U _{lo}	Voltage electrode Lo] = Insert jumper
D	I _{lo}	Current electrode Lo	
E	RTD GND	Temperature probe	Temperature probe
F	RTD	Temperature probe	Temperature probe
G	RTD (SENSE)	Temperature probe	Temperature probe
H	Shield	Cable shield	Cable shield

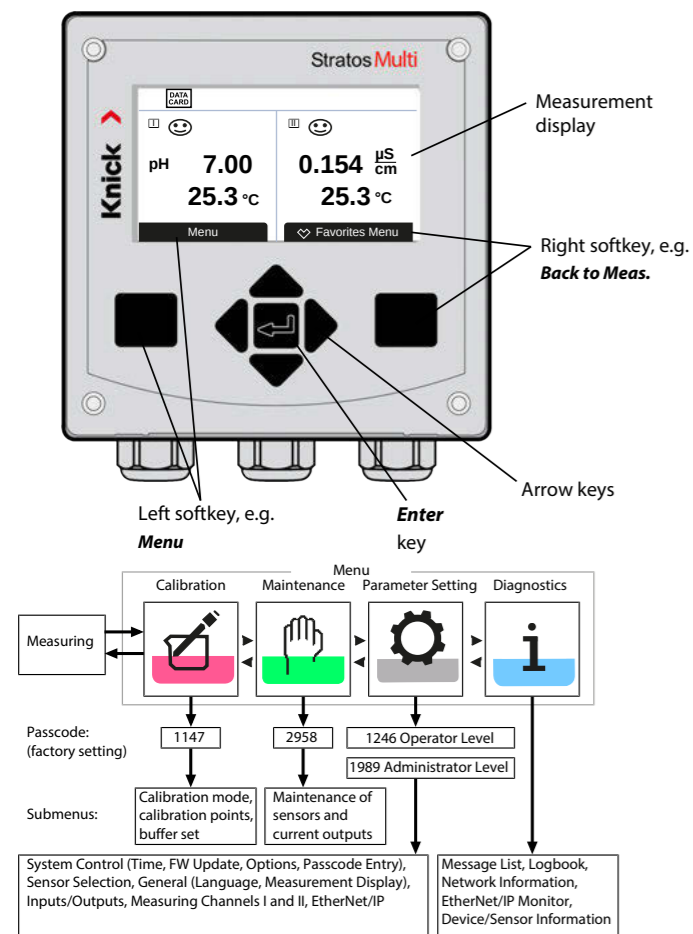
Conductivity (Inductive) SE 655 / SE 656			Conductivity (Dual) 2 x 2-Electrode Sensor	
A	Hi receive	Coax red	Core (blue)	A A CELL
B	LO receive	Coax red	Shield (red)	B A CELL (GND)
C	LO send	Coax white	Shield (red)	C RTD
D	Hi send	Coax white	Core (blue)	D A RTD (GND)
E	RTD GND	Green	E A Shield	
F	RTD	White	F B CELL	
G	RTD (SENSE)	Yellow	G B CELL (GND)	Cable shield
H	Shield	Cable shield green/yellow	H B RTD	Temperature probe
			I B RTD (GND)	Temperature probe
			K B Shield	

] = Insert jumper

⋮ = Jumper if only 2-wire temperature probe is used

4 Operation and Use

Display, Keypad



5 Messages/Troubleshooting (Excerpt)

Messages/Troubleshooting (Excerpt)

Error	Message	Remedy
	Display is blank	Press any key to wake the display following a possible auto-off. Check the voltage supply.
	No measurement, no error message	Check the sensor connection/install the module properly. Configure the measurement display.
	No connection via EtherNet/IP	Check the RJ45 connection. Ping the device in the local network.
	Sensoface	Calibrate and adjust the sensor, check the sensor connection, clean the sensor and replace if necessary, replace the sensor cable.
B073/ B078	Current I1/I2 Load Error	Check the current loop, deactivate or short-circuit unused current outputs.

Note: For other messages, see the user manual..

6 Specifications (Excerpt)

Power

Power supply, terminals 17, 18	80 V (- 15 %) ... 230 (+ 10 %) V AC; approx. 15 VA; 45 ... 65 Hz 24 V (- 15 %) ... 60 (+ 10 %) V DC; 10 W Overvoltage category II, protection class II, pollution degree 2
Test voltage	Type test 3 kV AC 1 min after moisture pre-treatment Routine test 1.4 kV for 2 s

EtherNet/IP

Standards	IEEE 802.3, IEC 61784-1
ODVA vendor ID	1593
ODVA device ID	Generic Device (43)
ODVA name of station	Stratos Multi E471N
Terminals	1x RJ45
RJ45 communication	10 Mbit/s (10BASE-T), 100 Mbit/s (100BASE-TX)
Cable recommendation	CAT 5, CAT 5e, CAT 6
Galvanic isolation	Shield to ground
Insulation strength	2250 V DC 250 V / 1,5 kV AC (50/60 Hz) for 60 s

Inputs and Outputs (SELV, PELV)

Sensor input 1	for Memosens/optical sensors (SE 740), galvanically isolated
Data In/Out	Asynchronous interface RS-485, 9600/19200 Bd
Sensor input 2	For measuring module or analog/ISM ¹⁾ measuring module, galvanically isolated
Data In/Out	Asynchronous interface RS-485, 9600 Bd
Input OK1	Galvanically isolated (optocoupler) Switching between parameter sets A/B, flow measurement, function check
Power Out	Power supply output, short circuit-proof, 0.5 W, for operating the SE740 sensor Off; 3.1 V (2.99 ... 3.25 V); 14 V (12.0 ... 16.0 V); 24 V (23.5 ... 24.9 V)
Output 1, 2	0/4 ... 20 mA, floating, load resistance up to 500 Ω, galvanically connected
Out 1, Out 2	When using the current outputs, neither Ethernet nor the relay contacts can be used.
Failure message	3.6 mA or 22 mA, adjustable
Active	Max. 11 V
Passive	Supply voltage 3 ... 24 V
Contact REL1, REL2	Relay contact, floating
Contact rating with ohmic load	AC < 30 V _{rms} / < 15 VA DC < 30 V / < 15 W
Max. switching current	3 A, max. 25 ms
Max. continuous current	500 mA
Device	
Display	Graphical TFT color display, 4.3", white backlighting
Resolution	480 x 272 pixels

¹⁾ ISM with TAN option FW-E053

Housing

Molded enclosure	Glass fiber reinforced Front unit material: PBT Rear unit material: PC
Protection	IP66/IP67/TYP 4X outdoor (with pressure compensation) when the device is closed
Flammability	UL 94 V-0 for external parts
Weight	1.2 kg (1.6 kg incl. accessories and packaging)
Terminals	
Screw terminals	For single and stranded wires 0.2 ... 2.5 mm ²
Tightening torque	0.5 ... 0.6 Nm
Wiring	
Stripping length	Max. 7 mm
Temperature resistance	> 75 °C / 167 °F

Rated Operating Conditions

Climatic class	3K5 according to EN 60721-3-3
Location class	C1 according to EN 60654-1
Ambient temperature	-20 ... 60 °C / -4 ... 140 °F
Altitude of installation site	Max. 60 V DC power supply at altitudes above 2000 m (AMSL)
Relative humidity	5 ... 95 %

Transport and Storage

Transport/storage temperature	-30 ... 70 °C / -22 ... 158 °F
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EMC

Emitted interference	Class A (industrial applications) ²⁾
Interference immunity	Industrial applications

²⁾ This equipment is not designed for domestic use, and is unable to guarantee adequate protection of the radio reception in such environments.