Installation Guide	**Stratos Multi E461N**
	Process analysis system

Read before installation.
Keep for future use.

www.knick.de

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1 Safety

Also read the User Manual and the Safety Guide, and follow the safety instructions.

Intended Use

Stratos Multi E461N is an industrial transmitter for PROFINET communication. It features an RJ45 socket and can therefore be connected in a star topology. With the use of a Y cable, it can be connected in a ring 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.

Function Check Mode (HOLD Function)

After activating Parameter Setting, Calibration, or Maintenance, the Stratos Multi enters function check mode (HOLD). PROFINET communication and the relay contacts/current outputs behave in accordance with the parameter settings. The state transmitted via PROFINET is in part dependent on the operating mode.

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

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2 Product

Package Contents

- Basic unit Stratos Multi (front and rear units)
- Bag containing small accessory parts (2x plastic sealing plugs, 1x hinge pin, 1x plate for conduits, 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 according to EN 10204
- Installation Guide
- Safety Guide

Note: The User Manual is published in electronic form. ➔ *knick.de*

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

Nameplate
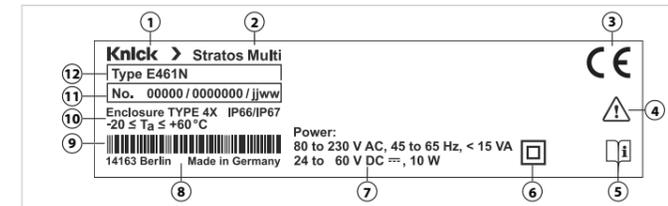
1	Manufacturer	**7**	Power supply
2	Product name	**8**	Manufacturer's address with designation of origin
3	CE mark	**9**	Barcode: Item production number, serial number, check digit
4	Special conditions and danger points	**10**	Protection, permissible ambient temperature
5	Reminder to read the documentation	**11**	Product number/serial number/ production year and week
6	Protection class II	**12**	Model designation

Knick
Elektronische Messgeräte
GmbH & Co. KG

Translation of the original instructions
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Version 2
This document was published on December 13, 2022.
The latest documents are available for download on our website under the corresponding product description.
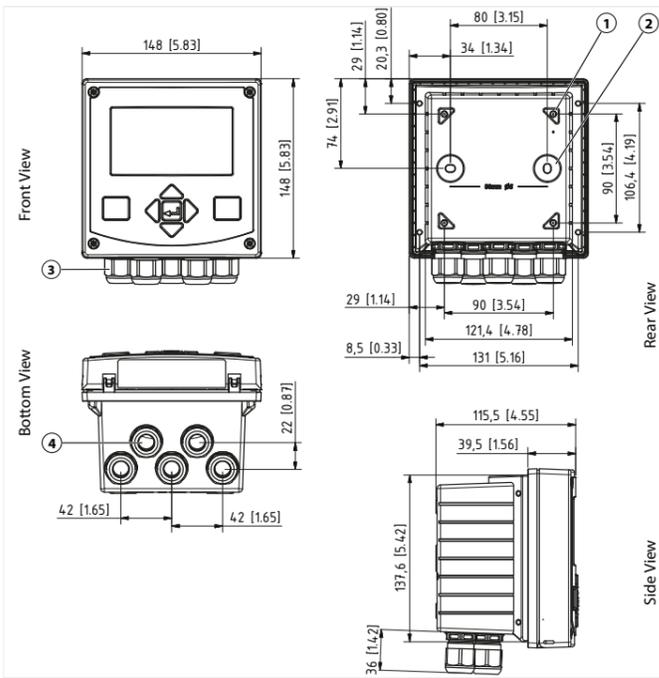
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3 Installation

Mounting

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

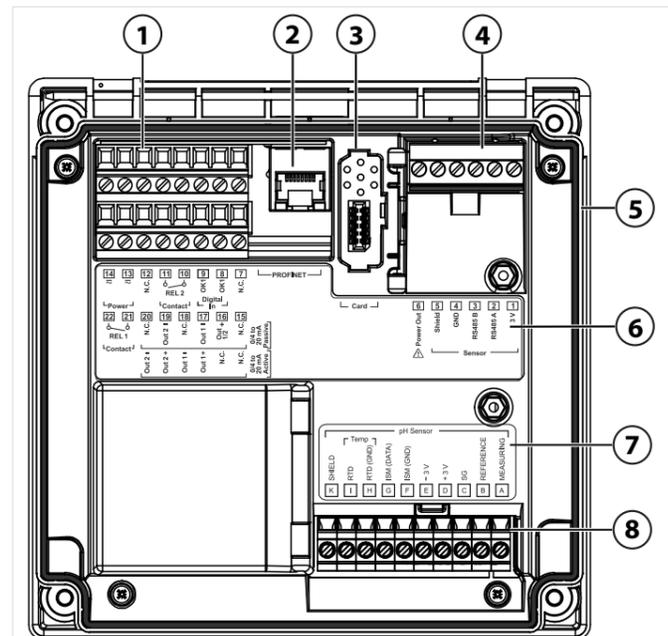|			
1	Holes for pipe mounting, 4x	**3**	Cable glands, 5x
2	Holes for wall mounting, 2x Sealing with plastic sealing plugs	**4**	Holes for cable glands or ½" conduit, ø 21.5 mm, 2x

For other mounting options, see the User Manual.

Connections

Rear of front unit

1	Terminals for inputs, outputs, relay contacts, power supply	**5**	Circumferential seal
2	RJ45 socket for PROFINET	**6**	Terminal plate
3	Slot for memory card (ZU1080-S-*-*)	**7**	Module plate sticker, example of pH module
4	RS-485 interface: Connection for Memosens/optical sensors (SE740)	**8**	Connected measuring module

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3.1 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.

⚠ WARNING! The power line may carry dangerous touch voltages. Always install the product with the power off. Secure the system against unintentional restart.

NOTICE! Strip the insulation from the wires using a suitable tool to prevent damage. Stripping length max. 7 mm.

NOTICE! Damage to the screw terminals due to excessive tightening torque. Tighten the screw terminals with a max. torque of 0.6 Nm.

01. Before commencing with the installation, make sure that all lines to be connected are de-energized.

02. Wire the connections. Deactivate unused current outputs in the parameter settings or use insertable jumpers.

03. Connect the power supply cables.

04. When measuring with analog sensors or a second Memosens sensor: Insert the measuring module into the module slot.

05. Connect the sensor(s).

06. Check whether all connections are correctly wired.

07. Open the front unit and tighten the enclosure screws in a diagonal sequence using a Phillips head screwdriver. Torque 0.5 ... 2 Nm

08. Before switching on the power supply, make sure its voltage is within the specified range (values ➔ *Specifications (Excerpt)*).

09. Switch on the power supply.

3.2 Ethernet Connection

Star topology:
- Adapter cable RJ45/M12 D type ZU1073
- PROFINET cable with RJ45 socket ZU1072
- PROFINET cable with user-configured connector

Ring topology:
- Adapter cable RJ45/M12 A type ZU1166 with Y cable M12 A type/ D type ZU1164 and RJ45 socket ZU1072

Note: To ensure correct data transmission, a suitable PROFINET cable must be connected to the RJ45 socket.

Ring Topology Connection

Stratos Multi E461N supports two Ethernet interfaces for connection in a ring topology. In this case, the ZU1166 adapter cable connected to the ZU1164 Y cable is connected to the RJ45 socket

RJ45 Socket Wiring

Pin	Name	PN Port	M12 Socket 1 with ZU1166 Adapter Cable and ZU1164 Y Cable	M12 socket 2 with ZU1166 Adapter Cable and ZU1164 Y Cable	Description
1	TX1+	2 (PHY1)	Pin 1		Transmitted data +
2	TX1-	2 (PHY1)	Pin 3		Transmitted data -
3	RX1+	2 (PHY1)	Pin 2		Received data +
4	TX0+	1 (PHY0)		Pin 1	Transmitted data +
5	TX0-	1 (PHY0)		Pin 3	Transmitted data -
6	RX1-	2 (PHY1)	Pin 4		Received data -
7	RX0+	1 (PHY0)		Pin 2	Received data +
8	RX0-	1 (PHY0)		Pin 4	Received data -

Note: PN port 2 (PHY1) is used in the event of a star topology connection.

Accessories

Accessories	Order No.
RJ45 socket	ZU1072
Adapter cable RJ45/M12 D-type	ZU1073
Y cable M12 A type/D type	ZU1164
Adapter cable RJ45/M12 A type	ZU1166

For other accessories, see the User Manual.

System Integration

A PROFINET device master file (GSDML file) is required for system integration.

The latest version of the GSDML file is available in the downloads section of the Knick website.

Connecting Digital Sensors

Memosens sensors or 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	

Terminal plate labels: 6 Power Out | 5 Shield | 4 GND | 3 RS485 B | 2 RS485 A | 1 3 V — Sensor

Connecting Analog/Digital Sensors to Measuring Modules

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

Measuring module for analog or ISM sensors[1] or 2nd channel Memosens, non-Ex	Order No.
pH value, ORP measurement	MK-PH015N
Oxygen Measurement	MK-OXY046N
Contacting conductivity measurement (process-wetted)	MK-COND025N
Inductive conductivity measurement	MK-CONDI035N
Dual conductivity measurement	MK-CC065N
Memosens multiparameter (for 2-channel version)	MK-MS095N

[1] ISM with TAN option FW-E053

Terminal Assignments for Measuring Modules

Conductivity (Contacting)

		4-Electrode Sensor	2-Electrode Coax Sensor
A	I_{hi}	Current electrode Hi	
B	U_{hi}	Voltage electrode Hi	Electrode 1
C	U_{lo}	Voltage electrode Lo	Electrode 2
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)	Cable shield
C	LO send	Coax white / Shield (red)	C RTD	Temperature probe
D	HI send	Coax white / Core (blue)	D A RTD (GND)	Temperature probe
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

pH / ORP / Oxygen (Amperometic)

		pH		ORP				Oxygen (Amperometic)	
A	Meas	Coax core		Coax core		A	Cathode	Coax core transparent	
B	Ref	Coax shield		Coax shield		B	Reference		
C	SG	Coax shield		Coax core		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

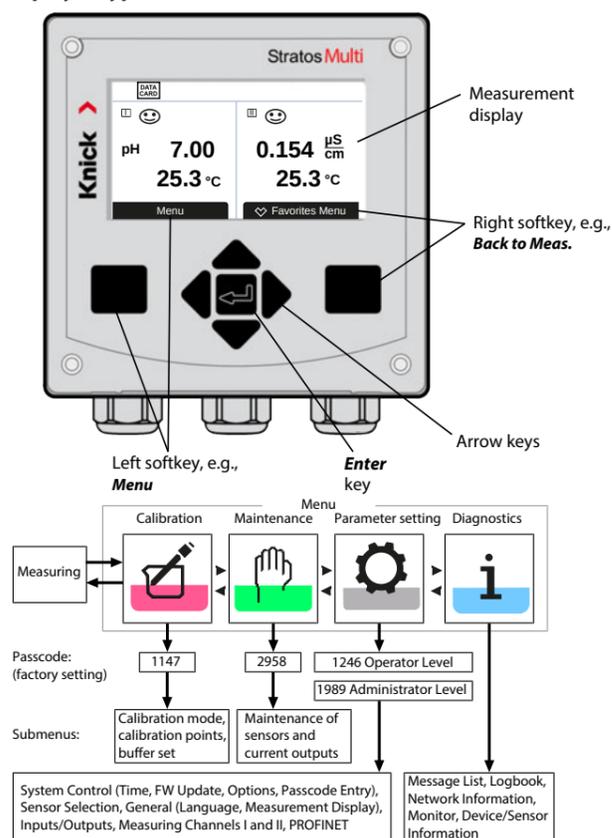## 4 Parameter Setting and Adjustment

See the User Manual for detailed information.

⚠ **CAUTION! Incorrect parameter settings or adjustments can result in incorrect outputs.** A system specialist must therefore commission Stratos Multi, set all its parameters, make all necessary adjustments, and protect it from unauthorized modifications.

5 Operation and Use

See the User Manual for detailed information.

Display, Keypad

Measurement display
Right softkey, e.g., **Back to Meas.**
Arrow keys
Enter key
Left softkey, e.g., **Menu**

Calibration | Maintenance | Parameter setting | Diagnostics
Measuring
Passcode: (factory setting) 1147 | 2958 | 1246 Operator Level
1989 Administrator Level
Submenus: Calibration mode, calibration points, buffer set | Maintenance of sensors and current outputs
System Control (Time, FW Update, Options, Passcode Entry), Sensor Selection, General (Language, Measurement Display), Inputs/Outputs, Measuring Channels I and II, PROFINET | Message List, Logbook, Network Information, Monitor, Device/Sensor Information

6 Messages/Troubleshooting (Excerpt)

Error	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 PROFINET connection	Check the RJ45 connection. Enabled and correctly configure PROFINET in Stratos Multi.
Sensoface	Calibrate and adjust the sensor, check the sensor connection, clean the sensor and replace if necessary, replace the sensor cable.

Note: For other messages, see the User Manual.

7 Specifications (Excerpt)

Power

Power supply, reverse polarity protected, terminals 13, 14	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

PROFINET

Number of Ethernet interfaces	1x RJ45, expandable to 2 interfaces with ZU1166 adapter cable and ZU1164 Y cable
Device type	IO device
IO specification	V2.3
Conformance class	Class B
Network load class	2
Transfer rate	125 Mbit/s (electric 100BASE-TX)
Recommended cable	CAT 5, CAT 5e, CAT 6
Vendor ID	97 (= Knick)
Device ID	0x0003
Min. cycle times	1 ms
Identification & maintenance	I&M1-3, 0
Number of AIs	20
Number of AOs	1
Number of DOs	2

Inputs and Outputs (SELV, PELV)

Sensor input 1	for Memosens/optical sensors (SE740), galvanically isolated
Data in/out	Asynchronous interface, RS-485, 9600/19200 Bd
Sensor input 2	For measuring module or analog/ISM[2] 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 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 Out 1, Out 2	0/4…20 mA, floating, load resistance up to 500 Ω, galvanically connected
	When using the current outputs, neither PROFINET 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

[2] ISM with TAN option FW-E053

Device

Display	Graphical TFT color display, 4.3″, white backlighting
Resolution	480 x 272 pixels

Housing

Molded enclosure	Glass fiber reinforced Front unit material: PBT Rear unit material: PC
Protection	IP66/IP67/TYPE 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 mm²
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

EMC

Emitted interference	Class A (industrial applications)[3]
Interference immunity	Industrial applications

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