MemoRail A 1405

MemoRail Modbus is a space-saving transmitter with Modbus RTU interface in a 17.5 mm modular housing. Available as a 1- or 2-channel version for operation with contactless Memosens sensors as well as the SE 680 digital conductivity sensor and the SE 740 optical oxygen sensor.

Versatile Functionality

The compact multi-parameter analyzer supports a variety of process variables:
– pH
– ORP
– Contacting conductivity
– Inductive conductivity
– Amperometric oxygen
– Optical oxygen
– Temperature

Red and green LEDs report the operating and sensor states. 1- and 2-channel versions are available to optimally suit your application.

Easy to Use

For quick Modbus configuration, the network address is directly set on the MemoRail Modbus devices using the DIP switches on the front panel. 24 V DC is supplied via plug-in terminals or bus connectors.

DTM for PACTware™ FDT or UnityPro XL FDT Version 13 for easy handling of offline and online configurations. Available on www.knick.de

Memosens and Digital Sensors

The use of digital sensors and Memosens sensors with contactless Memosens technology ensures maximum reliability and availability of the measuring point.
MemoRail Modbus is ready to use immediately after a Memosens or digital sensor is connected.

Universal Use

MemoRail Modbus is an attractively priced solution in process analytics and optimally suited for use in numerous industries:
• Pharmaceutical industry, biotechnology
  – Upstream/downstream process
  – CIP/SIP systems
• Food & beverage
  – Process monitoring
  – CIP/SIP systems
• Water treatment plants/ equipment
• Power generation, etc.
Because of their narrow modular housing, these DIN rail devices are ideal for installations where space is limited — in fermentation plants and in control cabinets, for example.

Facts and Features

– Slim modular housing with 17.5 mm width
– Memosens communication
– 1- and 2-channel version
– With pH/ORP combo sensors, measurement of up to four process values simultaneously plus temperature
– Modbus RTU protocol with standard RS-485 interface
– DTM for PACTware™ FDT or UnityPro XL FDT version 13
– Up to 32 devices in parallel on a Modbus master
– Power supply 24 V DC
– 3-year warranty

Installation in a control cabinet

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MEMO SENS

pH/ORP

Conductivity

Oxygen (optical)

Conductivity (inductive)

Oxygen (amperometric)

Wide Range of Sensors

pH/ORP
Memosens sensors for measuring pH, ORP, and temperature.

Perfectly adaptable to miscellaneous process requirements due to different pH glasses or ISFET, reference systems, designs or lengths.

Conductivity
2-electrode sensors with Memosens technology for measuring very low to medium conductivities.

Digital inductive conductivity sensors with extremely wide measuring range up to the highest conductivities.
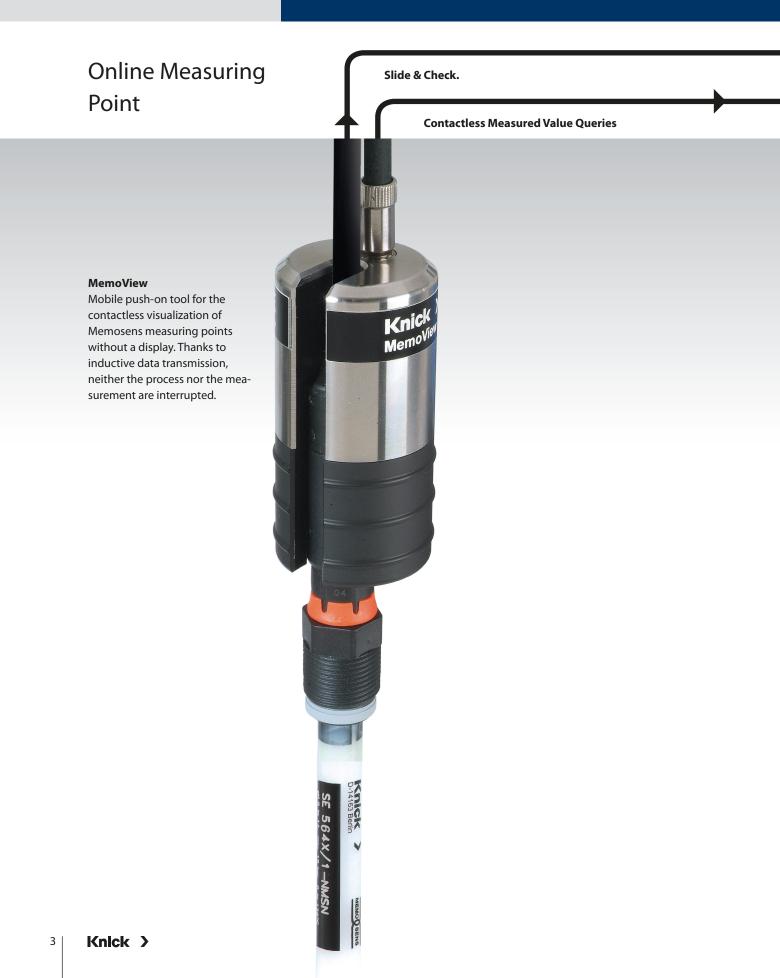
Applications ranging from ultrapure water to concentration determination.

Oxygen
Amperometric Memosens sensors for measuring very low oxygen values up to pure oxygen, dissolved in water or gaseous.

Flow-independent optical oxygen sensor with fast response time. For measurements in hygienic areas; steam-sterilizable, autoclavable, and CIP-resistant.

Online Measuring Point

Slide & Check.

Contactless Measured Value Queries

MemoView
Mobile push-on tool for the contactless visualization of Memosens measuring points without a display. Thanks to inductive data transmission, neither the process nor the measurement are interrupted.

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Portavo 907/908 Multi
Multiparameter portable devices for
Memosens sensors. With data logger,
USB port and full graphic display.
Measurement and sensor data will be
saved directly; they can be called up
and processed further.

MemoRail Modbus A1405
Extremely compact transmitter in
17.5 mm modular housing, without
display, with Modbus RTU interface.
For pH/ORP, conductivity, oxygen
and temperature measurement using
Memosens sensors.
Also in 2-channel version.

Convenient Calibration

Easy Sensor Calibration via Modbus
MemoRail Modbus A1405 N offers the option to calibrate the sensors directly on site using the Modbus.
A variety of calibration procedures is available for the various parameters.

Easy sensor calibration via the process control system with the free of charge DTM for PACTware™ FDT or UnityPro FDT. Available on www.knick.de.

Mobile Sensor Calibration
A mobile alternative for offline calibration and adjustment of Memosens sensors is provided by the Portavo 908 Multi analyzer from Knick, which can also be used directly on site. The integrated temperature detector of the Memosens sensor can be very easily calibrated with the Portavo 908 Multi.

The Portavo 908 Multi portable multi-parameter analyzer for measuring pH, ORP, conductivity, or oxygen is available as a GLP-compliant version with printer interface for use in the pharmaceutical and biotechnology industries.

Sensor Calibration via MemoSuite
The flexible and intuitive MemoSuite software tool enables easy calibration of Memosens sensors in the lab. On-site calibration under adverse ambient conditions is no longer necessary. The only thing required there is the quick and uncomplicated replacement of the used sensors with pre-calibrated sensors.
Extensive buffer management is offered by the convenient compilation of individual buffer sets from an extensive library. It is also a simple matter to enter special, user-specific buffer tables incl. temperature values.

To meet a variety of application-specific requirements, MemoSuite is available in different versions:

- **MemoSuite Basic** for calibration of Memosens sensors.

- **MemoSuite Advanced** for calibration, diagnostics and database documentation of the sensors. Up to 10 sensors can be calibrated simultaneously. The database complies with the requirements of GMP and FDA CFR 21 Part 11; the complete documentation can be output either as a calibration report or as a dataset in Excel format.

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Product Range

MemoRail Modbus

		A1405	N	–	P2	–			
Explosion protection	Without								
Inputs	1-channel: 1 x Memosens / 1 x SE 740						1		
	2-channel: 2 x Memosens / 1 x Memosens, 1 x SE 740						2		
Outputs	Modbus RTU (RS485)							1	
Power supply	24 V DC (connection via terminals or bus connector)								0

Configurations

1-channel version	1 x Memosens sensor or digital sensor or 1 x SE 740 optical oxygen sensor
2-channel version	2 x Memosens sensors or digital sensors or 1 x Memosens sensor or digital sensor and 1 x SE 740 optical oxygen sensor

MemoView	Length	Order No.
MemoView incl. MemoView cable	2.9 m / 9.51 ft	ZU 1059
MemoView cable	2.9 m / 9.51 ft	ZU 1060
Portavo 907		907 Multi pH
		907 Multi Cond
		907 Multi Oxy
Portavo 908		908 Multi

MemoSuite Basic	Length	Order No.
MemoSuite Basic with calibration function		SW-MS1400-B
Memosens lab cable (Ex and non-Ex, M12 plug)	1.5 m / 4.92 ft	CA/MS-001XDA-L
	2.9 m / 9.51 ft	CA/MS-003XDA-L

MemoSuite Advanced	Length	Order No.
MemoSuite Advanced with calibration function, diagnostics, database, 1 channel		SW-MS1400-A
Memosens lab cable (Ex and non-Ex, M12 plug)	1.5 m / 4.92 ft	CA/MS-001XDA-L
	2.9 m / 9.51 ft	CA/MS-003XDA-L

Further Channel (for MemoSuite Advanced only)	Length	Order No.
MemoLink		ML1400
Memosens lab cable (Ex and non-Ex, M12 plug)	1.5 m / 4.92 ft	CA/MS-001XDA-L
	2.9 m / 9.51 ft	CA/MS-003XDA-L

Accessories	Order No.
DIN rail bus connector	ZU 0678

Specifications

Sensor I	For connection of Memosens or SE 740 optical oxygen sensor	
	Power supply Memosens	U_0 = 3.05 ... 3.15 V/ Ri < 5 ohms / I > 8 mA
	Power supply SE 740	U_0 = 10.5 ... 13.5 V/ Ri < 10 ohms / I > 100 mA
	Interface	RS 485
	Baud rate	9600/19200 Bd
	Max. cable length	Memosens: 100 m / 328.1 ft SE 740: 30 m / 98.4 ft
Sensor II	For connection of Memosens sensors	
	Power supply	U_0 = 3.05 … 3.15 V/ Ri < 5 ohms / I > 8 mA
	Interface	RS 485
	Transfer rate	9600 Bd
	Max. cable length	100 m / 328.1 ft (30 m / 98.4 ft if SE 740 optical oxygen sensor is connected to channel 1)
Modbus RTU	Interface	RS 485, max. 32 devices
	Baud rate	4800 … 115200 Bd (19200 Bd)
	Addressing	Bus address set by dip switches
	Data format	Set by dip switches
	Max. cable length	100 m / 328,1 ft (depending on baud rate)
		DIN rail bus connector < 30 m / 98.4 ft
DTM	for PACTware™ FDT Version 4.1	
	for UnityPro XL FDT Version 13	
Power supply	24 V DC (± 25 %), < 2 W	
	Supply via DIN rail bus connector	24 V DC (± 25 %), < 2 W
Isolation	3-port isolation between:	Sensor inputs (Sensor I / Sensor II)
		Modbus RTU
		Power supply
EMC	EN 61326	
	Emitted interference	Industrial environment
	Immunity to interference	Industrial environment
Data retention	> 10 years	
RoHS conformity	According to EU directive 2011/65/EU	
Nominal operating conditions	Ambient temperature	−10 ... +65 °C / +14 ... +149 °F
	Transport/Storage temp.	−25 ... +85 °C / −13 ... +185 °F
	Humidity	< 85 %
	Max. operating height	2000 m above sea level
Further data	Housing	17.5 mm / 0.69 inch modular housing
	Material	PA 66
	Housing color	Pigeon blue RAL 5014
	Protection	Housing: IP 40, terminals: IP 20
	Mounting	For 35 mm top hat rail (EN 50022)
	Connections	16 terminals, conductor cross-section max. 1.5 mm²
		AWG 28-16, tightening torque 0.25 Nm
		3 terminals, conductor cross-section max. 2.5 mm²
		AWG 20-14, tightening torque 0.6 Nm
	Weight	Approx. 120 g
MemoView function	Firmware 01.01.00 or higher	

Dimension Drawing and Terminal Assignments

1.1 Power Supply +	1.2 Power Supply –	1.3 Not Connected	
2.1 Not Connected	2.2 Not Connected	2.3 Not Connected	2.4 Not Connected
3.1 Modbus RTU (shield)	3.2 Modbus RTU (RS 485 A)	3.3 Modbus RTU (RS 485 B)	3.4 GND
4.1 3 V (Sensor I)	4.2 RS 485 A (Sensor I)	4.3 RS 485 B (Sensor I)	4.4 GND (Sensor I)
5.1 12 V (Sensor I)	5.2 12 V (Sensor II)	5.3 Shield	5.4 Shield
6.1 3 V (Sensor II)	6.2 RS 485 A (Sensor II)	6.3 RS 485 B (Sensor II)	6.4 GND (Sensor II)