The Art of Measuring.

Knick

Compact Transmitter
with Modbus Interface

MemoRail Modbus

MemoRail Modbus A 1405 N

Compact and Inexpensive.

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.

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
- Up to 32 devices in parallel on a Modbus master
- Power supply 24 V DC
- 3-year warranty

Installation in a control cabinet

MEMOSENS

Compact Transmitter with Modbus Interface

Knick

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.

MemoRail Modbus A 1405 N

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.

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.

MEMOSENS

Compact Transmitter with Modbus Interface

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 AC (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

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

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

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

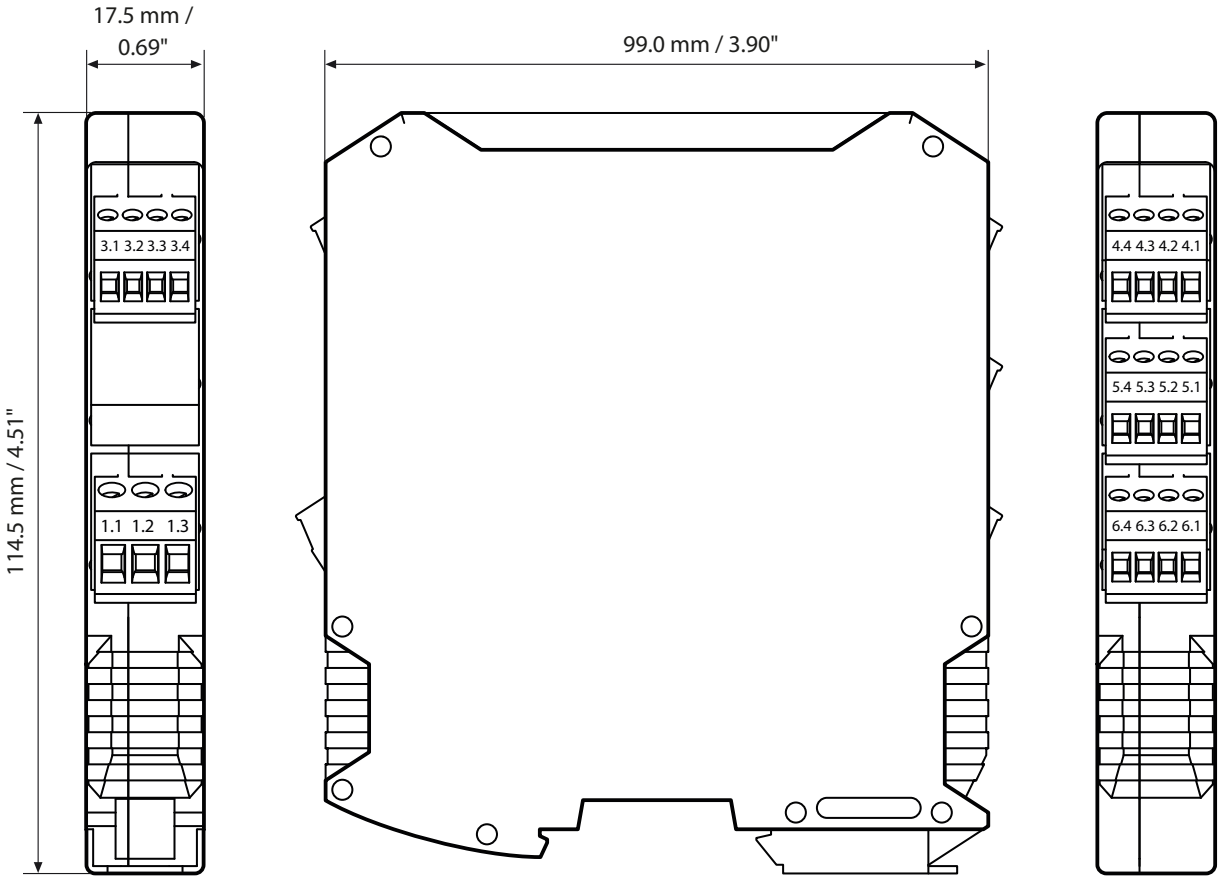
Accessories	Order No.
DIN rail bus connector	ZU 0678

MemoRail Modbus A 1405 N

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
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 mm^2 AWG 28-16, tightening torque 0.25 Nm
		3 terminals, conductor cross-section max. 2.5 mm^2 AWG 20-14, tightening torque 0.6 Nm
	Weight	Approx. 120 g

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)

Knick

Interface Technology
Indicators
Industrial Transmitters
Portable Meters
Laboratory Meters
Sensors
Fittings

Knick
Elektronische Messgeräte
GmbH & Co. KG

Beuckestraße 22, 14163 Berlin,
Germany
Phone: +49 30 80191-0
Fax: +49 30 80191-200
info@knick.de · www.knick.de

TP-273.001.KAT-MemoRail A1405N – EN 0217 Subject to change without notice