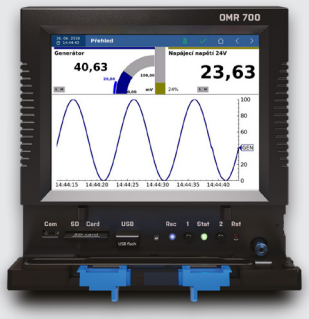
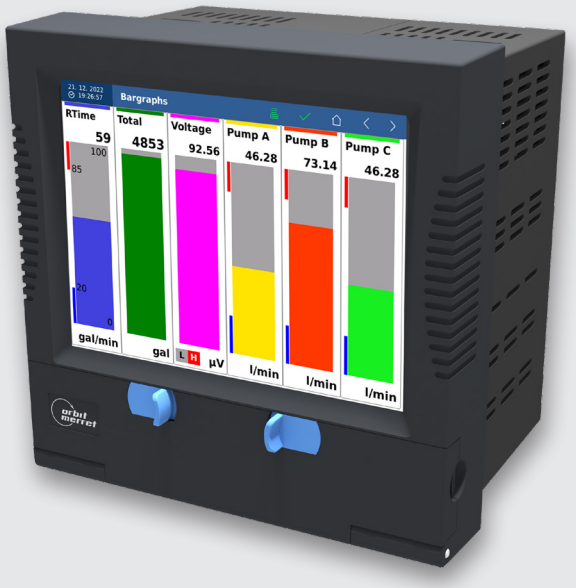



# OMR 700

## PAPERLESS RECORDER




# PAPERLESS RECORDER OMR 700

### MODULAR DATA RECORDER WITH 8 SLOTS FOR PLUG-IN CARDS

- analog inputs, max. 12 inputs/module
- digital inputs, max. 12 inputs/module
- analog outputs, max. 4 outputs/module
- digital outputs, max. 10 outputs/module
- data inputs and outputs

### BASIC FEATURES OF THE RECORDER

- 5.7" TFT color display with a capacitive panel
- primary and backup system
- digital inputs and outputs
- record into internal memory, SD card or USB Flash
- Ethernet 10/100B, Modbus TCP, Modbus RTU
- WiFi 802.11 b/g/n
- USB, microUSB
- internal data memory 2 GB
- built-in buzzer
- RTC, NTP time synchonization
- size 150 x 150 mm
- protection IP64
- power supply 10...30 V or 80...250 V AC/DC

## INTRODUCING THE RECORDER

The OMR 700 is intended for technologies and applications where it is needed to display and/or record a number of electrical and non-electrical values at one place. Universality, versatility and in particular good value for money predestine the recorder to fulfill most of your demanding needs including the IP64 of the front panel.

Our paperless recorder has been developed with versatility and intuitive control in mind. Thanks to its modularity the user can insert input or output cards into any of the 8 available slots. Maximal configuration of the recorder thus allows to measure and record up to 96 inputs. In order to increase reliability, the recorder has two systems - primary and backup.

Always on board are digital control inputs and outputs, communication Modbus RTU/TCP, Ethernet, USB connector as well as 2 GB of internal memory to record the measured data.

### PROJECTION

5.7" TFT color display with fine resolution dominates the device, and provides for an easy control.

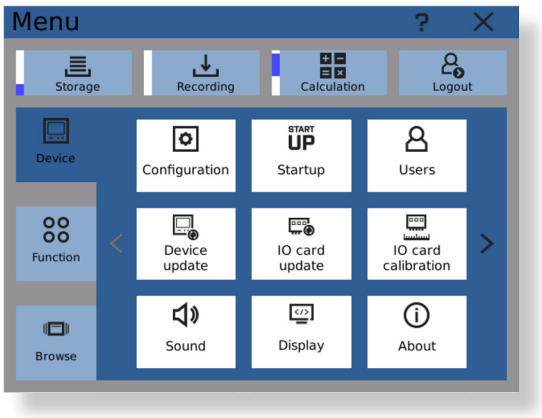
### CONTROL

The OMR 700 is controlled by both the touch screen and the push buttons that are, positioned behind the front lid.Their functions are user selectable.

Two LEDs indicate run/error and state of data recording.

### SETTING

All functions and settings are performed directly on the instrument´s display in a clear graphical menu.



# DATA RECORDING

The OMR 700 can record measured data from any of its active inputs, nodes and mathematical functions. Data are stored in the internal 2 GB memory. Data can also be stored on an external SD card or USB flash drive.

In case of a limited number of measuring inputs, measured data can be stored with a period of up to 1 ms.

The records can be either in BIN or CSV. The latter can by directly imported into and processed by common office software (Excel).

**Internal memory recording speed according to number of channels / memory space**

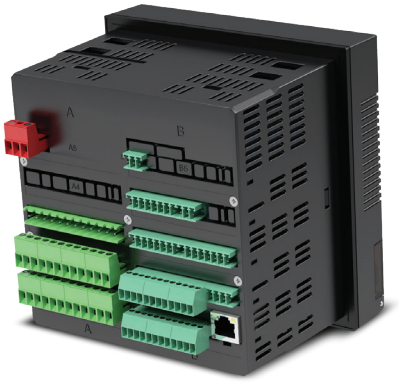
| Recording speed | 16 inputs | 48 inputs | 80 inputs | 96 inputs |
|---|---|---|---|---|
| 1 ms | 4 hours | x | x | x |
| 10 ms | 40 hours | 15 hours | x | x |
| 1 s | 5 months | 2 months | 32 days | 26 days |
| 1 min | 26 years | 10 years | 5 years | 4,5 years |
| 10 min | 264 years | 104 years | 52 years | 44 years |

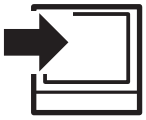
# MODULES

The development of the device has been performed with an increased emphasis on technical solutions and universality. Card design not only allows their use in any position of the recorder, but also their additional insertion into vacant slots. Thus, if new requirements to increase the number or type of inputs and outputs occur in the course of using the recorder, just order another card and insert it into a vacant slot. In this way the instrument can „grow" in compliance with your requirements.

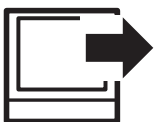
All analogue cards are fully isolated from the internal bus, and some cards have galvanic isolation even between individual channels.

Basic version of the recorder includes a power supply module and a communication module with Ethernet 10/100 (Modbus TCP), RS 485 (MODBUS RTU), five digital inputs and two digital outputs.





- 3x universal - DC, PM, OHM, RTD, Ni, Cu, T/C, DU
- 12x DC - voltage/current input
- 4x/5x RTD input - Pt xxx, Ni xxx, Cu xxx
- 4x T/C input - J/K/T/E/B/S/R/N/L
- 2x DMS - input for strain gauges
- 3x DC - precise voltage and current input
- 2x AC/PWR - voltage/current/power/frequency
- 12x digital input 10…250 V AC/DC
- 12x input counter/frequency
- 2x input Up/DW counter/frequency/IRC



- 4x relay, Form C (SPDT)
- 8x relay, Form A (SPST)
- 8x open collector NPN
- 16x open collector NPN
- 8x open collector PNP
- 6x SSR
- 2x/4x analog output
- 4x Excitation
- 1x PROFIBUS
- 1x PROFINET

## ....AND ON TOP OF IT

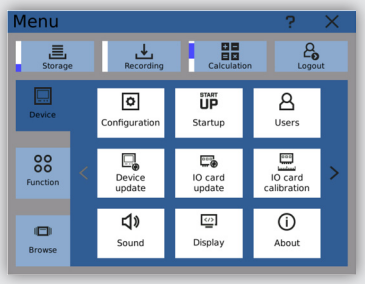
Under the hinged lid, which can be opened by pressing two blue locks, there are to control push buttons, SD card slot, and USB Flash drive connector. In the bottom right corner you will find a Stylus for easier control of the recorder.

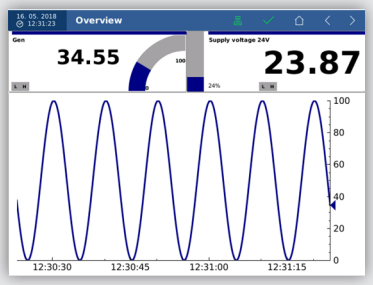
Cover of the lid is IP64 so that your recorder, SD card, and USB Flash drive will always stay dry..

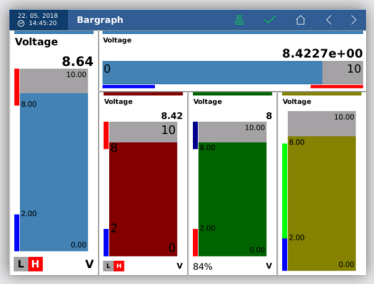
If necessary, a security seal tag can be fitted through the hinged lid to prevent unautorised access.

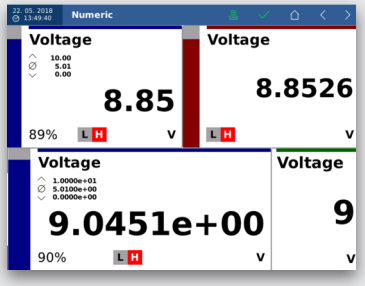
Your SD card or USB Flash drive will remain safely stored.

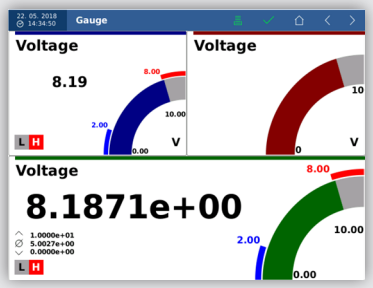
## PROJECTION

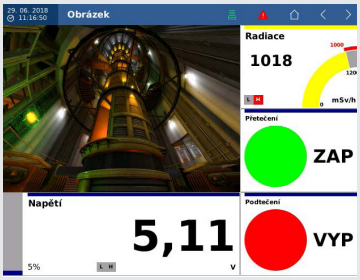


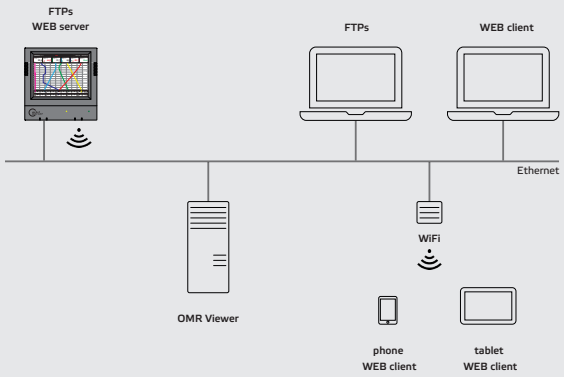



# DATA CONNECTION



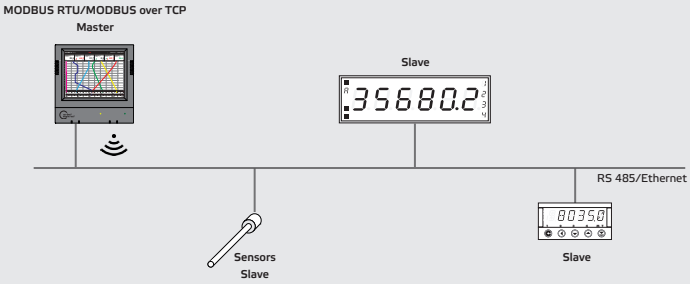

In its basic version the recorder is equipped with

**Ethernet 10/100Base or WiFi connection and it offers**

- display projection
- transfer of stored data (internal memory, SD card, USB Flash)
- recording of events

**Other network functions are**

- time synchronization
- DHCP, TCP/IP Modbus (client)
- MS Azure® cloud connection




**The second version, offering use of RS485 with a MODBUS RTU protocol**

- up to 247 devices can be connected to the bus

The equipment can be used for:

- sensors connection
- projecting measured or calculated values on an external display, such as e.g. OMD 202RS

# BENCHTOP AND OUTDOOR VERSIONS

OMA 710 is a portable bench top laboratory housing.

The type and layout of connectors at the rear of the housing are identical to that of paperless recorder OMR 700.

OMA 710

OMA 713

OMA 713 is a portable heady duty housing for the OMR 700 designed for the most demanding environments. It resists dust, humidity and can withstand complete flooding.

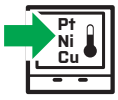
The portable housing is fitted with IP 67 rated connectors, which enable the recorder to be used in harsh conditions.

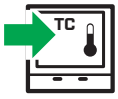
## Digital inputs
5x

HTTPs/FTPs/MODBUS over TCP

## Ethernet
Standard equipment

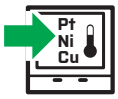


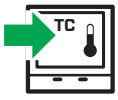




IN.1 3x Universal input, isolated
DC: ±60/±150/±300/±1 200 mV
PM: 0…5 mA/0…20 mA/4…20 mA/±20 mA
±2 V/±5 V/±10 V/±40 V
OHM: 0…100 Ω/0…1/10/100 kΩ/Auto
RTD: Pt 50/100/Pt 500/Pt 1 000
Cu: Cu 50/Cu 100
Ni: Ni 1 000/Ni 10 000
T/C: J/K/T/E/B/S/R/N/L
DU: Linear potentiometer (min. 500 Ω)


IN.2 4x 0…5/20 mA/4…20 mA,
±2/±5/±10/±40 V, isolated
IN.6 12x 0…5/20 mA/4…20 mA
IN.7 12x ±2/±5/±10/±40 V
IN.9 3x 0/4…20 mA; ±5/±10 V, isolated

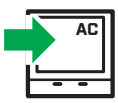



IN.3 4x input for Pt/Ni/Cu xxxx, isolated
2- and 3-wire connection
IN.5 5x input for Pt/Ni/Cu xxxx
2- and 3-wire connection




IN.4 4x input for thermocouples, isolated
J/K/T/E/B/S/R/N/L
with cold junction compensation


IN.8 2x input for strain gauges, isolated
range: 1…2/8/16 mV/V
with sensor excitation

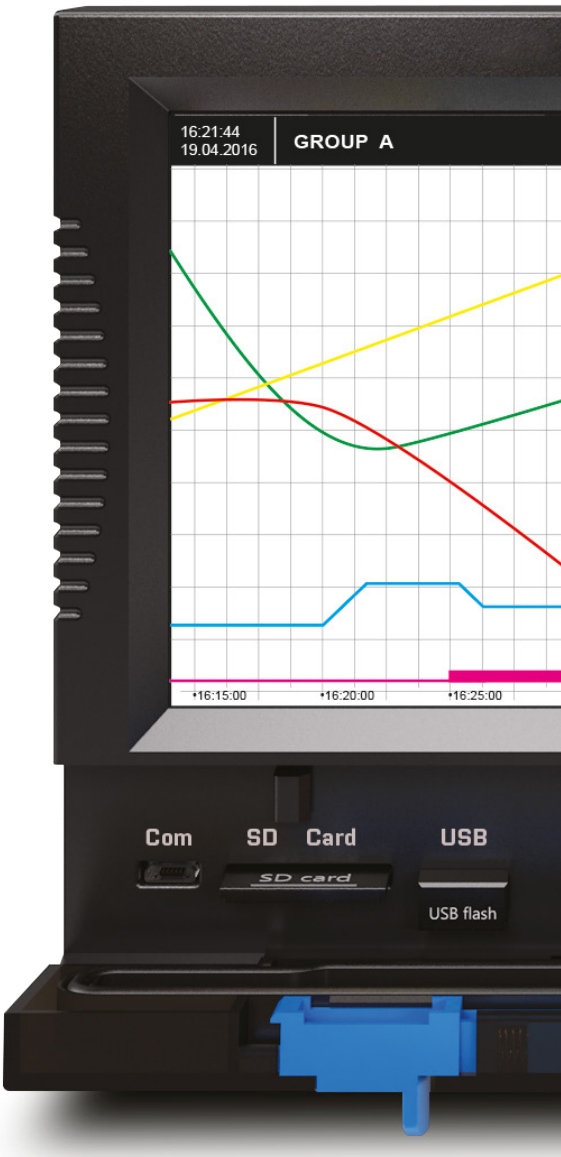



IN.10 2x AC/PWR input, isolated
0…450 V/0…5 A
voltage, current, power, frequency

IN.10 8x digital input
12…250 V AC/DC

IN.12 12x counter/frequency
< 10 kHz
IN.13 2x UP/DW counter/frequency/IRC
< 1 MHz

IN




Under the hinged cover are accessible

**micro USB**

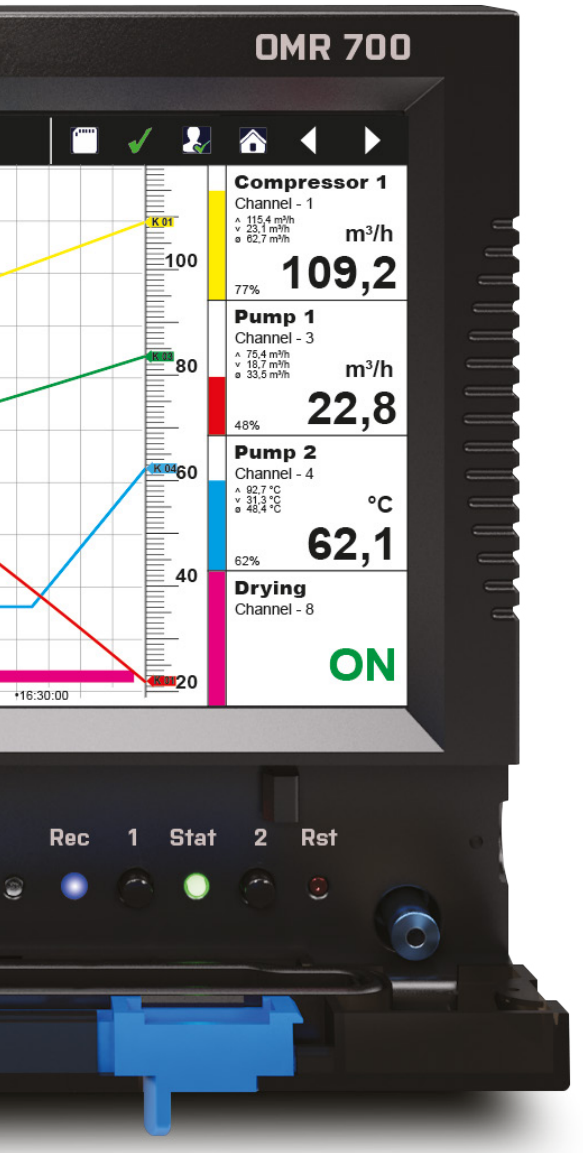
**SD card**
< 32 GB

**USB**
Type A
flash disc
≤ 32 GB

## Digital outputs
2x

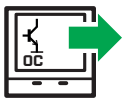



## RS 485
Standard equipment



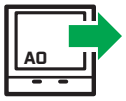

OUT


OUT.1 4x SPDT Relay
OUT.2 8x SPST Relay




OUT.3 8x open collector, NPN
OUT.4 16x open collector, NPN
OUT.5 8x open collector, PNP


OUT.6 6x SSR




AO.1 2x Analog output, isolated
AO.2 4x Analog output, isolated


EXC.1 4x Excitation, isolated

DO.1 1x PROFIBUS

DO.2 1x PROFINET

the following elements and the Stylus

**LED**
run
error
record

**Keys**
menu
record
reset

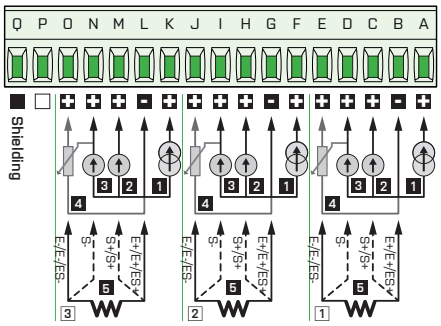
**Stylus**

Recorder can hold up to
8 cards in any combination

# CONNECTION – INPUT

## IN.1 3x Universal input

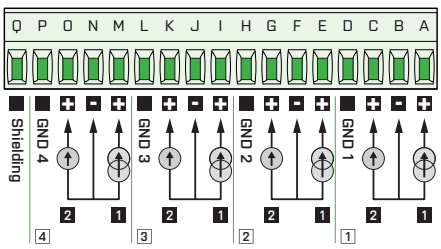
IN.01




**1** **PM:** 0...5/20 mA/4...20 mA
**2** **PM:** ±2 V/±5 V/±10 V/±40 V
**3** **DC:** ±60/±150/±300/±1 200 mV
**T/C:** J/K/T/E/B/S/R/N/L
**4** **DU:** Lin. potentiometer (> 500 Ω)
**5** **OHM:** 0...0,1/0,3/1/3/10/30 kΩ
**RTD:** Pt 50/100/500/1 000
**Cu:** Cu 50/100
**Ni:** Ni 1 000/10 000

## IN.2 4x PM input U-I

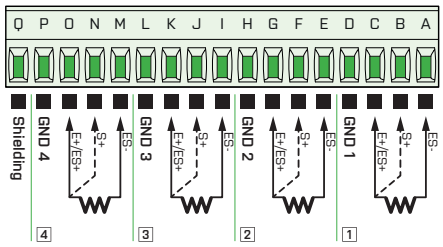
IN.02




**1** **DC - I:** ±5/±20 mA, 0...20/4...20 mA
**2** **DC - U:** ±2/±5/±10/±40 V, 0...2/5/10/40 V

## IN.3 4x RTD input

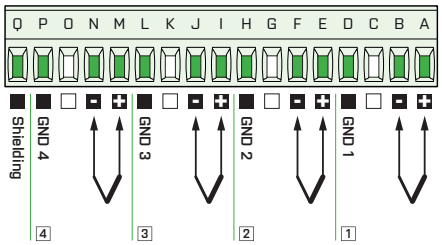
IN.03




**OHM:** 0...0,1/0,3/1/3/10/30 kΩ
**RTD:** Pt 50/100/500/1 000
**Cu:** Cu 50/100
**Ni:** Ni 1 000/10 000

## IN.4 4x T/C input

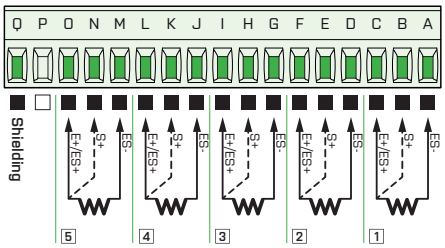
IN.04




**T/C:** J/K/T/E/B/S/R/N/L

## IN.5 5x RTD input

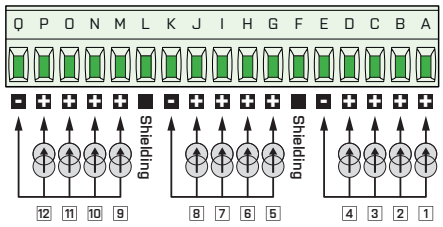
IN.05




**OHM:** 0...0,1/0,3/1/3/10/30 kΩ
**RTD:** Pt 50/100/500/1 000
**Cu:** Cu 50/100
**Ni:** Ni 1 000/10 000

## IN.6 12x DC input, current

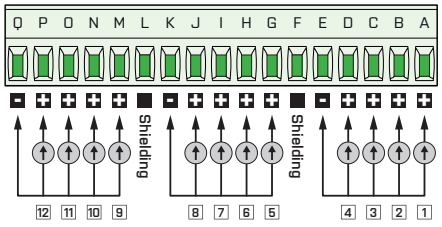
IN.06




**DC - I:** 0...5 mA/0...20 mA/4...20 mA/±5/±20 mA/

## IN.7 12x DC input, voltage

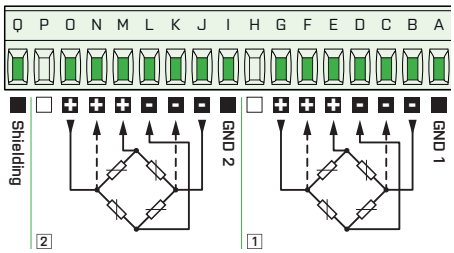
IN.07




**DC - U:** 0...2 V/0...5 V/0...10 V/0...40 V/±2/±5/±10/40 V

## IN.8 2x input for strain gauges

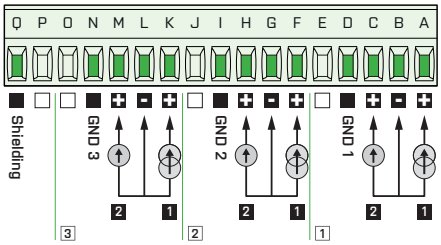
IN.08




**DMS:** 1...16 mV/V

## IN.9 3x PM input U-I

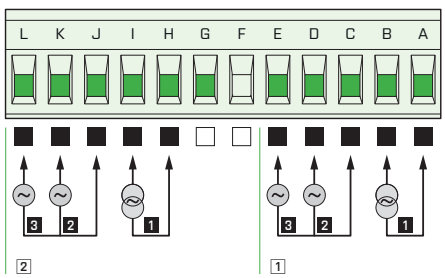
IN.09




**1** **DC - I:** 0...20 mA/4...20 mA/±20 mA
**2** **DC - U:** 0...2 V/0...40 V/±2 V/±40 V

## IN.10 2x AC/PWR input

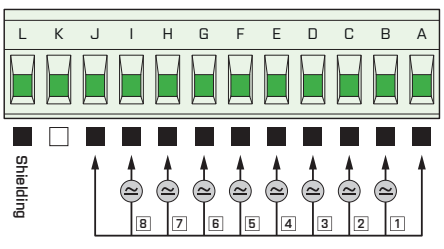
IN.10




**1** **AC - I:** 0...1/5 A
**2** **AC - U1:** 0...120/250 V
**3** **AC - U2:** 0...450 V

## IN.11 8x Digital input

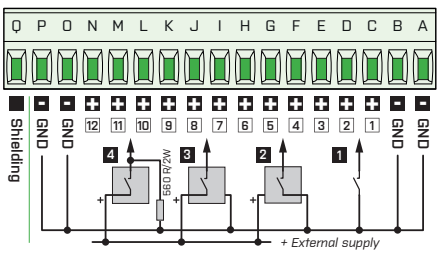
IN.11




**AC/DC:** 12...250 V AC/DC

## IN.12 12x Pulse input

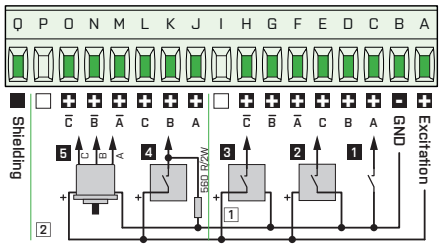
IN.12




**1** contact
**2** 2-wire sensors, **NPN** NO
**3** 3-wire sensors, **PNP** NO
**4** 3-wire sensors, **PNP** NO

## IN.13 2x Fast pulse input

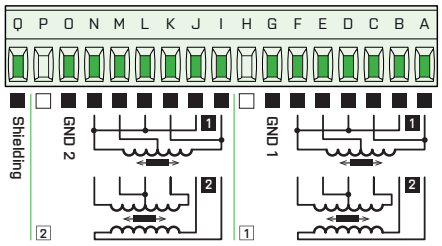
IN.13




1 contact
2 2-wire sensors, **NPN** NO
3 3-wire sensors, **PNP** NO
4 3-wire sensors, **PNP** NO
5 IRC sensors, line/NPN/PNP

## IN.14 2x input for LVDT sensors

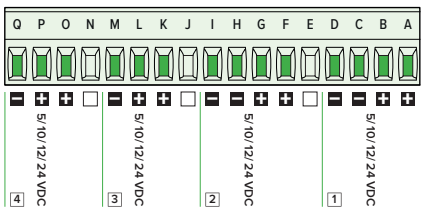
IN.14




1 3-wire LVDT sensors
2 5-wire LVDT sensors

## EXC.1 4x Excitation

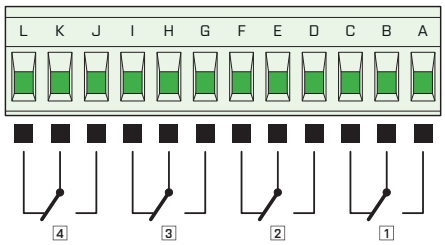
EXC.1




# CONNECTION – OUTPUT

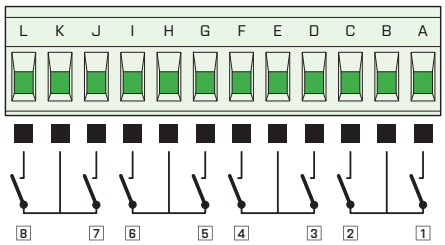
## OUT.1 4x SPDT Relay

OUT.1



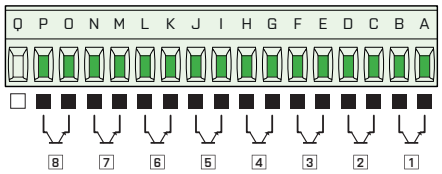

## OUT.2 8x SPST Relay

OUT.2



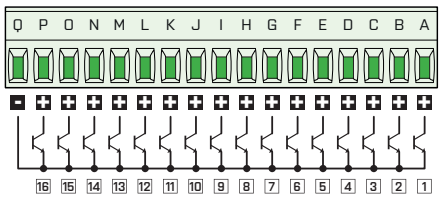

## OUT.3 8x OC, NPN

OUT.3



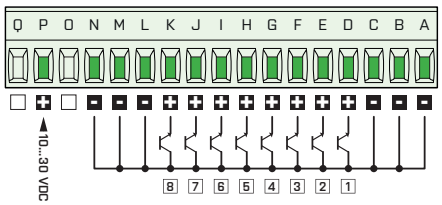

## OUT.4 16x OC, NPN

OUT.4



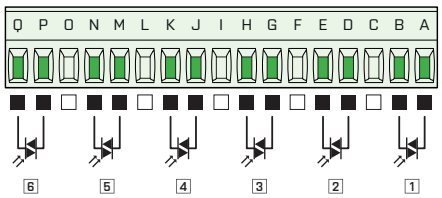

## OUT.5 8x OC, PNP

OUT.5



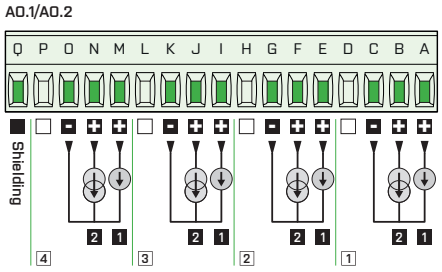

## OUT.6 6x SSR

OUT.6




## AO.1 2/4x Analog output

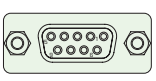
AO.1/AO.2




1 Analog output - voltage
2 Analog output - current

## DO.2 1x PROFIBUS

DO.1



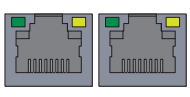
PROFIBUS®

Pin asignment

3 **B:** RxD/TxD-P data reception/transmission, positive
4 **CNTR:** signal for repeater control
5 **DGND:** reference potential for data and +5 V
6 **VP:** +5 V
8 **A:** RxD/TxD-N data reception/transmission, negative

## DO.2 1x PROFINET

DO.2



PROFINET®

Port 1 Port 2

# TECHNICAL DATA

### PROJECTION
**Display:** 5.7"color IPS TFT display with capacitive touch screen
**Brightness:** adjustable

### INSTRUMENT FUNCTIONS
**TC:** 25 ppm/°C
**Accuracy:** depending on the measuring card used
**Rate:** depending on the measuring card used
**Measurement accuracy CJC:** ±1,5°C
**Digital input:** 5x - optional function (< 24 VDC)
**Digital output:** 2x (open collectors) – optional function (24 V/100 mA)
**Acoustic signalization:** sound module for acoustic signalization with buzzer
**Value recording:** internal - 2 GB
USB FLASH with support of FAT 32 up to 32 GB
SD card with support of FAT32 up to 32 GB
**RTC:** 15 ppm/°C, time-date-value channel/display/nod
**Watch-dog:** reset after 500 ms
**Calibration:** at 25°C and 40 % of r.h.

### COMMUNICATION
**Protocol:** Modbus RTU (Master), Modbus TCP (Slave)
**RS 485:** isolated, Modbus RTU (Master)
Data format: 8 bits + without parity + 1 stop bit
Addressing: 1...247 instruments
Rate: 300...230 400 Baud
**Ethernet:** Modbus TCP/IP (Slave) secure communication
Azure: MQTT, MQTT over Web Socket
Rate: 10/100BaseT

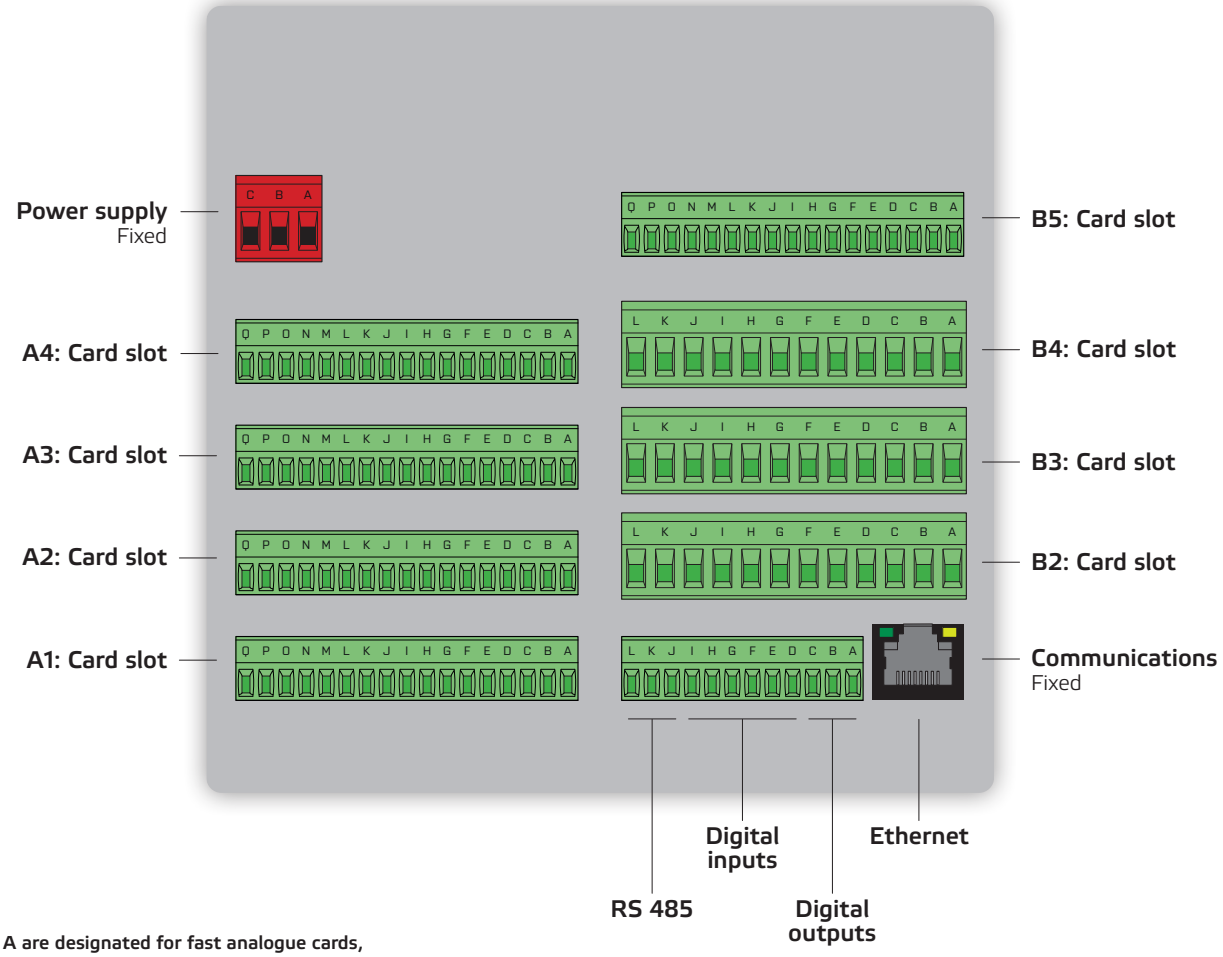
### POWER SUPPLY
**Range:** 10...30 V AC/DC, ±10 %, PF ≥ 0,4, $I_{STP}$< 75 A/2 ms
80...250 V AC/DC, ±10 %, PF ≥ 0,4, $I_{STP}$< 45 A/2 ms
**Consumption:** < 30 VA/< 30 W
Protection by fuse inside the device.

### MECHANIC PROPERTIES
**Material:** Noryl GFN2 SE1, non-flammable UL94 V-I
**Dimensions:** 150 x 150 x 80 mm (w x h x d)
**Depth behind panel:** 85 mm
**Panel cutout:** 136.5 x 136.5 mm
**Securing lid:** the front lid can be sealed

### OPERATING CONDITIONS
**Connection:** connector terminal board, section < 1.5/2.5 mm²
**Stabilisation period:** within 5 minutes after switch-on
**Working temperature:** -20°...60°C
**Storage temperature:** -20°...85°C
**Working humidity:** < 95 % r.h., non condensing
**Protection:** IP64, front panel only
**El. safety:** EN 61010-1, A2
**Dielectric strength:** 4 kVAC per 1 min test between supply and cards
2.5 kVAC per 1 min test between cards
**Insulation resistance*:** for pollution degree II, measurement cat. III.
Instrument power supply > 670 V (ZI), 300 V (DI)
Input, output, PN > 300 V (ZI), 150 V (DI)
**EMC:** EN 61326-1
**RoHS:** EN IEC 63000
**Seismic qualification:** EN IEC 980: 1993, par.6
**Mechanical resistance:** EN 60068-2-6, ed. 2, EN 60068-2-27 ed.2

PI - Primary insulation, DI - Double insulation

# CONNECTOR LAYOUT




Slots A are designated for fast analogue cards,
slot B5 is designated for cards DO.1/2.
There are no restrictions for placement of other cards.

# ORDER CODE

## OMR 700 -□ □-□ □ □ □ □ □ □ □ □-□

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Power supply** | 10…30 V AC/DC, isolated | **0** | | | | | | | | | | | |
| | 80…250 V AC/DC, isolated | **1** | | | | | | | | | | | |
| **Wi-Fi module** | no | | **0** | | | | | | | | | | |
| | yes | | **1** | | | | | | | | | | |
| **Features, see table „Card types"** | | | | ● | ● | ● | ● | ● | ● | ● | ● | | |
| Please list the selected cards here | | | | | | | | | | | | | |
| **Specification** | customised version, do not fill in | | | | | | | | | | | | **00** |

# CARD TYPES

| Order code | Designation | Description | Range | Accuracy (of range) | Transmitter (resolution) | Rate (meas./s) | Isolated channels |
|---|---|---|---|---|---|---|---|
| **0** | **PW.0** | Power supply | 10…30 V AC/DC | | | | yes |
| **1** | **PW.1** | Power supply | 80…250 V AC/DC | | | | yes |
| **A** | **IN.1** | 3x Universal input | DC: ±60/±150/±300/±1 200 mV<br>PM: 0…5 mA/0…20 mA/4…20 mA/±2 V/±5 V/±10 V/±40 V<br>OHM: 0…100 Ω/0…1 kΩ/0…10 kΩ/0…30 kΩ/Auto<br>RTD: Pt 50/100/Pt 500/Pt 1 000<br>Cu: Cu 50/Cu 100<br>Ni: Ni 1 000/Ni 10 000<br>T/C: J/K/T/E/B/S/R/N/L<br>DU: Linear potentiometer (min. 500 Ω) | ±0.15 % | 24 bits | < 320 | yes |
| **B** | **IN.2** | 4x current/voltage input | 0…5 mA/0…20 mA/4…20 mA/ ±2 V/±5 V/±10 V/±40 V | ±0.2 | 16 bits | < 320 | yes |
| **C** | **IN.3** | 4x RTD | Pt 50/100/1000, Ni 1000/10 000, Cu 50/100 | ±0.2 | 16 bits | < 320 | yes |
| **D** | **IN.4** | 4x T/C | J/K/T/E/B/S/R/N/L | ±0.2 | 16 bits | < 320 | yes |
| **E** | **IN.5** | 5x RTD | Pt 50/100/1000, Ni 1000/10 000, Cu 50/100 | ±0.2 | 16 bits | < 320 | no |
| **F** | **IN.6** | 12x current input | ±5 mA/±20 mA/4…20 mA | ±0.2 | 16 bits | < 320 | no |
| **G** | **IN.7** | 12x voltage input | ±2 V/±5 V/±10 V/±40 V | ±0.2 | 16 bits | < 320 | no |
| **H** | **IN.8** | 2x input for strain gauges with excitation | 1…16 mV/V | ±0.02 | 24 bits | < 1 000 | yes |
| **I** | **IN.9** | 3x precise current/voltage input | 0/4…20 mA, ±5/±10 V | ±0.02 | 24 bits | < 1 000 | yes |
| **J** | **IN.10** | voltage ($V_{RMS}$), current ($A_{RMS}$), frequency (Hz), power P, Q, S, cos fi | input U: 0…10 V/0…120 V/0…250 V/0…450 V<br>input I: 0…60 mV/0…150 mV/0…300 mV/0…1 A/0…2,5 A/0…5 A | ±0.3 % | | < 10 | yes |
| **K** | **IN.11** | 8x analog/digital input | 12…250 V AC/DC | | | < 1 ms | no |
| **L** | **IN.12** | 12x counter/frequency | 0…30 V, PNP/NPN/contact, adjustable comparation levels, input frequency 0.1 Hz…10 kHz | | | | no |
| **M** | **IN.13** | 2x UP/D, IRC with excitation | 5/24 V, TTL/Line, adjustable comparation levels, input frequency 0.1 Hz…1 MHz | | | | no |
| **N** | **IN.14** | 2x input for LVDT sensors | 3/5/6-wire, 1/3/5 VAC input frequency 2.5/5/10 kHz | ±0.02 | 24 bits | < 1 000 | yes |
| **1** | **IN.15** | 3-phase measurement voltage ($V_{RMS}$), current ($A_{RMS}$), frequency (Hz), power P, Q, S, cos fi, harmonic distortion, angle | input U: 0…250 V<br>input I: 0…1 A/0…5 A | ±0,3 % | | < 10 | yes |
| **P** | **OUT.1** | 4x SPDT relay | 250 VAC/30 VDC, 3 A | | | < 10 ms | |
| **Q** | **OUT.2** | 8x SPST relay | 250 VAC/30 VDC, 3 A | | | < 10 ms | |
| **R** | **OUT.3** | 8x open collector, NPN | 30 VDC/100 mA | | | < 0,2 ms | |
| **S** | **OUT.4** | 16x open collector, NPN common terminal | 30 VDC/100 mA | | | < 0,2 ms | |
| **T** | **OUT.5** | 8x open collector, PNP | 30 VDC/700 mA | | | < 0,2 ms | |
| **U** | **OUT.6** | 6x SSR | 250 VAC, 1 A | | | < 0,2 ms | |
| **V** | **AO.1** | 2x Analog output | 0…2/5/10 V, ±10 V, 0…5 mA, 0/4…20 mA (comp. < 600 Ω/12 V) | ±0.1% | | < 1 ms | yes |
| **W** | **AO.2** | 4x Analog output | 0…2/5/10 V, ±10 V, 0…5 mA, 0/4…20 mA (comp. < 600 Ω/12 V) | ±0.1% | | < 1 ms | yes |
| **X** | **EXC.1** | 4x excitation | 5/10/12/24 VDC/3 W | ±0.1% | | | yes |
| **Y** | **DO.1** | PROFIBUS | | | | | |
| **Z** | **DO.2** | PROFINET | | | | | |

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