



OMR 700

DIGITAL RECORDER

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INSTRUMENTS

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DIGITAL 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 outputs

Basic features of the recorder

- color TFT display 5.7" with a capacitive panel
- primary and backup system
- digital inputs and outputs
- record into internal memory, SD card or USB Flash
- Ethernet 10/100B, RS 485 – Modbus
- USB, microUSB
- internal data memory 2x 512 MB
- built-in speaker
- RTC
- size 150 x 150 mm
- protection IP64
- power supply 80...250 V AC/DC

INTRODUCING THE RECORDER

OMR 700 recorder technology is designed to acquire, record and analyze data from physical signals that can be displayed, stored and compared on screen. It can also be transmitted to a PC, saved, edited and viewed for further analysis using our bundled software or third-party software. Its expandability ensures good value and its extensive signal-type options make it a universal instrument.

Our digital recorder has been developed with versatility and intuitive control in mind. Because its I/O backbone is modular, the user can insert input or output cards into any of the 8 available slots. Maximum configuration of the recorder allows users to measure and record up to 96 inputs. In order to increase reliability, the recorder has two systems - primary and backup.

Included in the core system are digital control inputs and outputs, RS 485, Ethernet and USB communications hardware as well as 512 MB of internal memory to record acquired data.

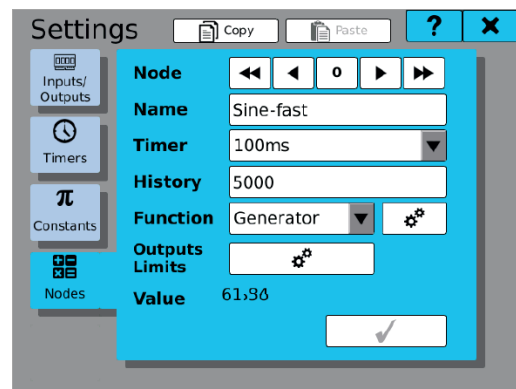
CONTROL

Recorder is controlled by both the touch screen and the push buttons with adjustable functions, positioned underneath the front door.

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

SETTING

All functions and settings can be 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 512 MB memory with compression that allows up to four-fold increase of its physical memory without slowing down. 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 format. However, the latter is much more demanding on memory space.

Recording speed according to number of channels / memory space

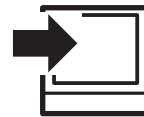
Recording speed	16 inputs	48 inputs	80 inputs	96 inputs
1 ms	2 hours	x	x	x
10 ms	20 hours	7.5 hours	x	x
1 s	2.5 months	1 months	16 days	13 days
1 min	13 years	5 years	2.5 years	2.2 years
10 min	132 years	52 years	26 years	22 years

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 expand to match your requirements.

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

Basic version of the recorder includes power supply module and communication module with Ethernet 10/100, RS 485 (ASCII, MODBUS), 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 a light pressure two blue locks, there is access to control push buttons, microUSB for recorder setting via PC, SD card slot, and USB Flash drive connector. In the bottom right corner you will find a Stylus for easier control of the recorder and for display drawings.

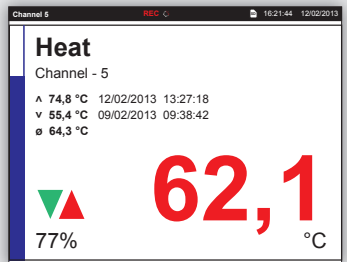
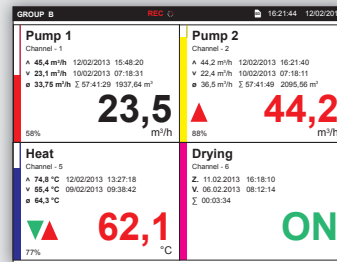
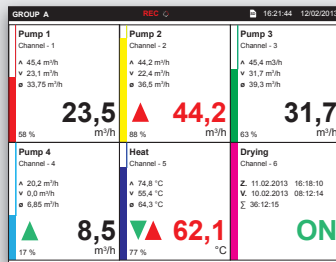
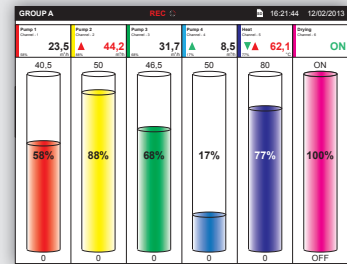
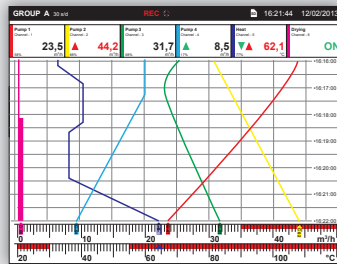
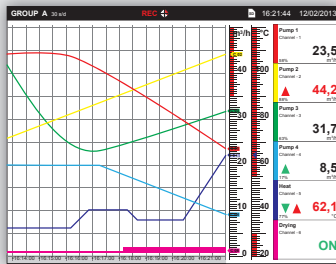


Cover of the lid is IP64 so that your recorder, SD card, and USB Flash drive will always stay dry..

If necessary, a seal can be fitted to the hinged lid as a mechanical security against possible accidental opening. Your SD card or USB Flash drive will remain safely stored.



PROJECTION



RECORDING OF EVENTS

Pos.	Event	Date	Time
01	Switching on	18/01/2013	07:12:15
02	Insert SD card	22/01/2013	09:18:10
03	Insert USB Flash	31/01/2013	14:32:35
04	Change setting - User 1	04/02/2013	10:41:52

No.	Event	Value	Date	Time
01	Pump 2	Flow	20/01/2013	08:11:19
02	Heat	Temperature	20/01/2013	11:18:22
03	Pump 2	Flow	29/01/2013	16:22:30
04	Heat	Temperature	03/02/2013	13:45:52
05	Heat - info@service.au	Temperature	03/02/2013	13:45:52
06	Pump 4	Flow	16/02/2013	12:51:38
07	Pump 4 - User 1	Flow	16/02/2013	12:55:52

Channel	Tag/Value	Source Tag	Date	Time
01	Pump 1	Flow	20/01/2013	08:11:19
A	45,4 m³/h		10/02/2013	15:48:20
V	23,1 m³/h		20/01/2013	07:18:31
●	33,75 m³/h			
Σ	1937,64 m³ / Σ: 57:41:29			
Σ	3193,64 m³ / Σ: 4:57:41			
02	Pump 2	Flow	20/01/2013	08:11:19
A	44,2 m³/h		12/02/2013	16:21:40
V	22,4 m³/h		10/02/2013	07:18:11
●	36,5 m³/h			
Σ	2095,56 m³ / Σ: 57:41:49			
Σ	4293,64 m³ / Σ: 4:57:22			



DATA CONNECTION

FTP server
VNC server
WEB server

FTP client WEB client

Ethernet

VNC client

phone
WEB client

tablet
VNC client

WiFi

In its basic version the recorder is equipped with Ethernet 10/100Base connection and it offers:

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

Other network functions are:

- sending e-mail*
- time synchronization
- DHCP, TCP/IP Modbus (client)

MODBUS RTU/MODBUS over TCP
Master

Slave

35680.2

Sensors Slave

Slave

8035.0

RS 485/Ethernet

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.

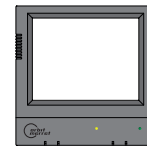


OMA 710



OMA 713

OMA 713 is a portable heavy 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.



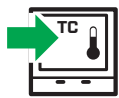
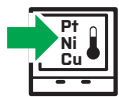
Digital inputs
5x

HTTP/FTP/MODBUS over TCP/email

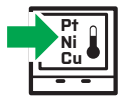
Ethernet
Standard equipment



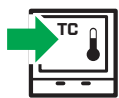
IN.1 3x Universal input, isolated
 DC: $\pm 60/\pm 150/\pm 300/\pm 1\,200$ mV
 PM: 0...5 mA/0...20 mA/4...20 mA/ ± 20 mA
 ± 2 V/ ± 5 V/ ± 10 V/ ± 40 V
 OHM: 0...100 Ω /0...1/10/100 k Ω /Auto
 RTD: Pt 50/100/Pt 500/Pt 1 000
 Cu: Cu 50/Cu 100
 Ni: Ni 1 000/Ni 10 000
 T/C: J/K/T/E/B/S/R/N/L
 DU: Linear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



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



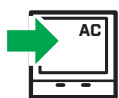
IN.3 4x input for Pt/Ni/Cu xxxx, isolated
 2- and 3-wire connection
IN.5 5x input for Pt/Ni/Cu xxxx
 2- and 3-wire connection



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 power supply



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

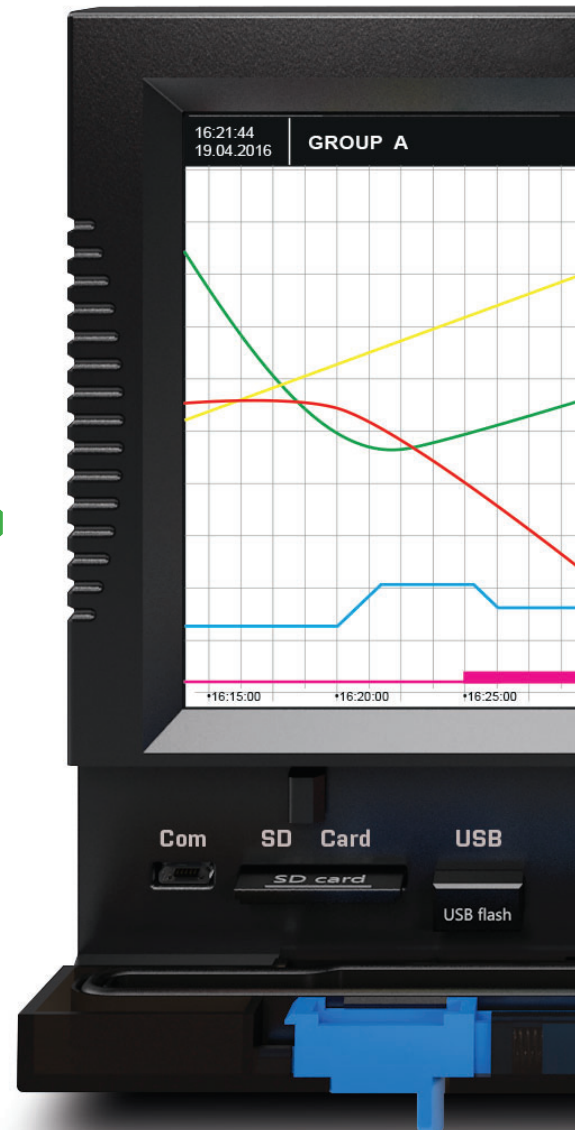


IN.10 8x digital input
 12...250 V AC/DC



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

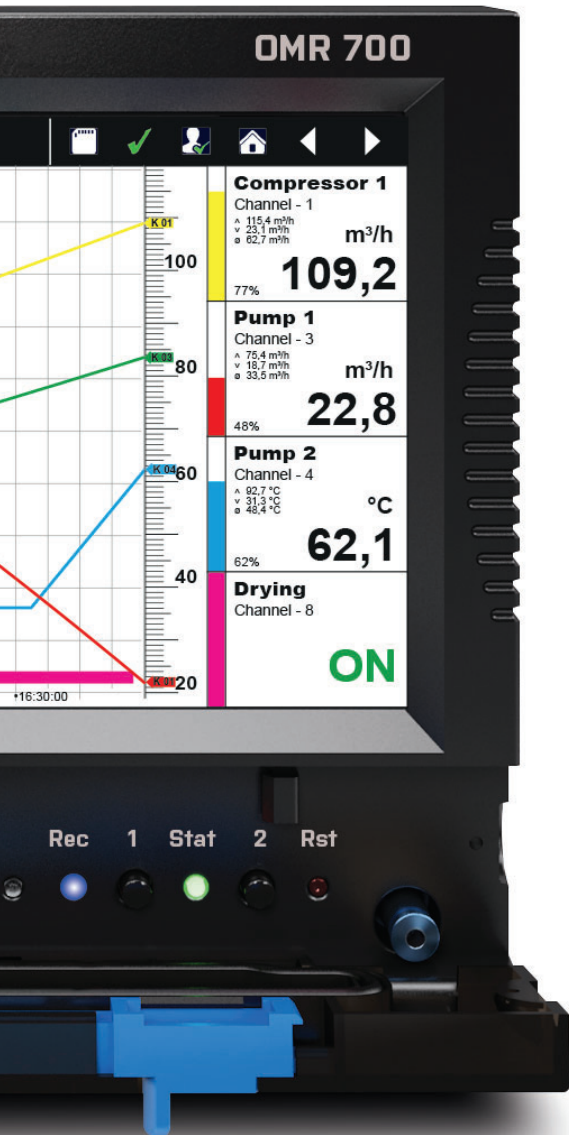


Digital outputs

2x



RS 485
Standard equipment



OUT



OUT.1 4x Relay with a switch-over contact
OUT.2 8x Relay with a switch-on contact



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



OUT.6 6x SSR



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



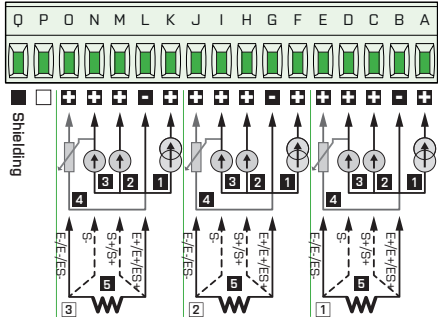
Recorder can hold up to 8 cards in any combination



CONNECTION – INPUT

IN.1 3x Universal input

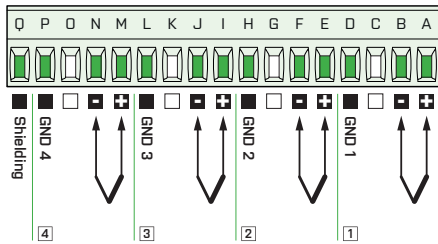
IN.01



- 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 ($> 500 \Omega$)
- 5 OHM: 0...0.1/0.3/1/3/10/30 k Ω
- RTD: Pt 50/100/500/1 000
- Cu: Cu 50/100
- Ni: Ni 1 000/10 000

IN.4 4x T/C input

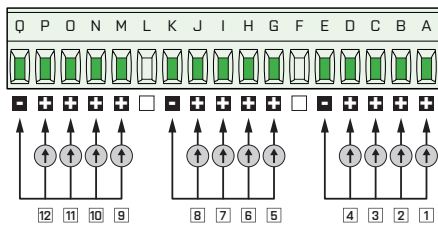
IN.04



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

IN.7 12x DC input, voltage

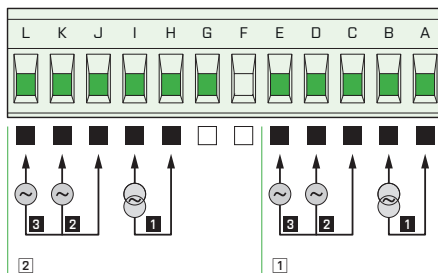
IN.07



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

IN.10 2x AC/PWR input

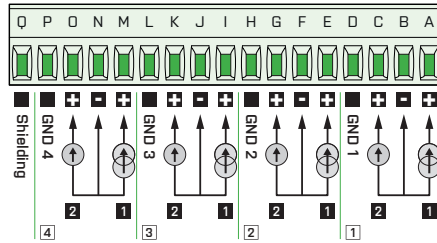
IN.10



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

IN.2 4x PM input U-I

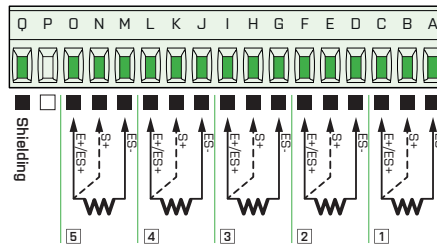
IN.02



- 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.5 5x RTD input

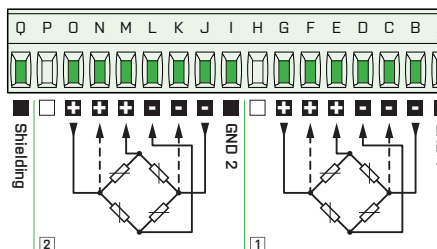
IN.05



OHM: 0...0.1/0.3/1/3/10/30 k Ω
 RTD: Pt 50/100/500/1 000
 Cu: Cu 50/100
 Ni: Ni 1 000/10 000

IN.8 2x input for strain gauges

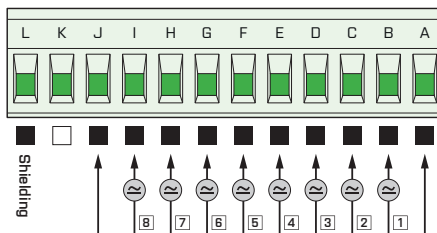
IN.08



DMS: 1...16 mV/V

IN.11 8x Digital input

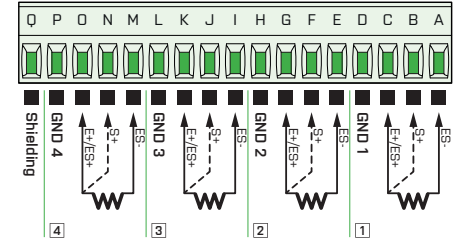
IN.11



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

IN.3 4x RTD input

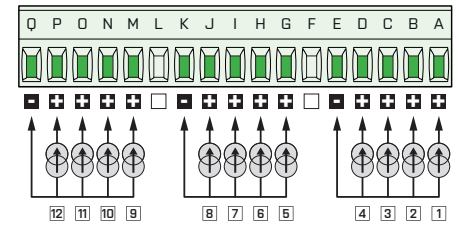
IN.03



OHM: 0...0.1/0.3/1/3/10/30 k Ω
 RTD: Pt 50/100/500/1 000
 Cu: Cu 50/100
 Ni: Ni 1 000/10 000

IN.6 12x DC input, current

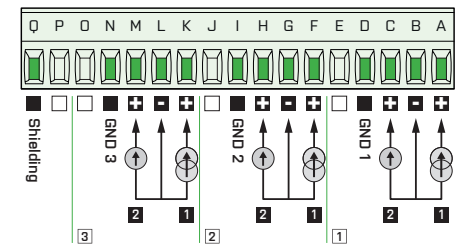
IN.06



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

IN.9 3x PM input U-I

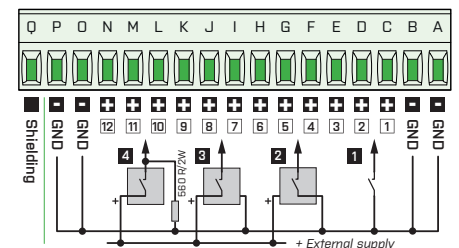
IN.09



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

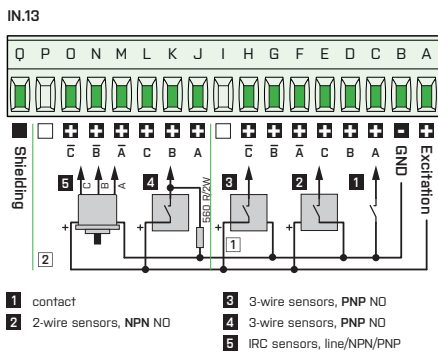
IN.12 12x Pulse input

IN.12

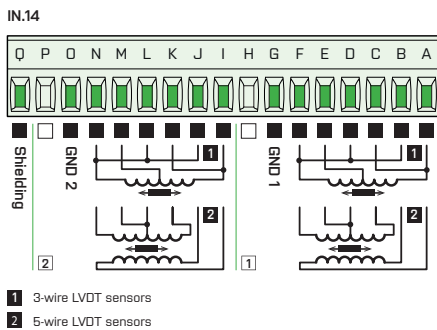


- 1 contact
- 2 2-wire sensors, NPN NO
- 3 3-wire sensors, PNP NO
- 4 3-wire sensors, PNP NO

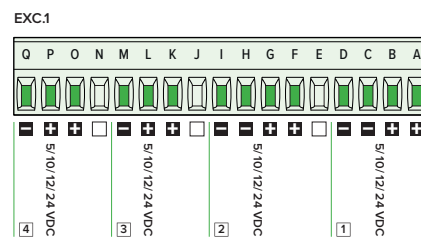
IN.13 2x Fast pulse input



IN.14 2x input for LVDT sensors

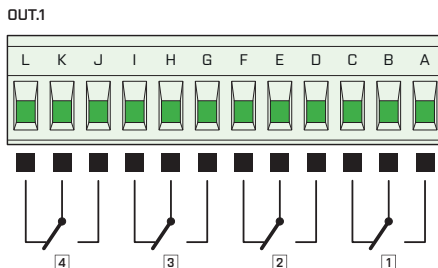


EXC.1 4x Excitation

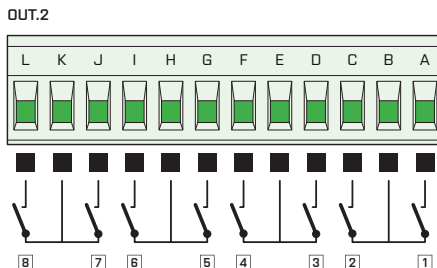


CONNECTION – OUTPUT

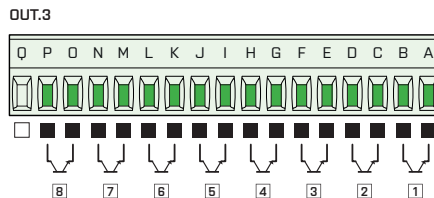
OUT.1 4x Relay, switch-over contact



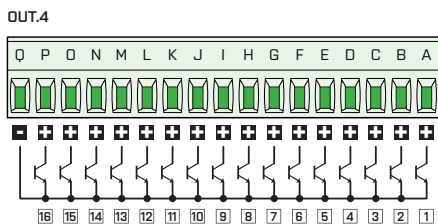
OUT.2 8x Relay, switch-on contact



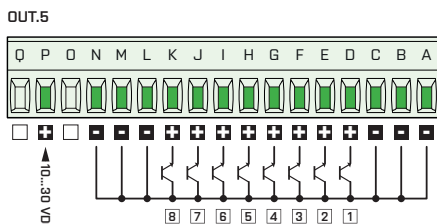
OUT.3 8x OC, NPN



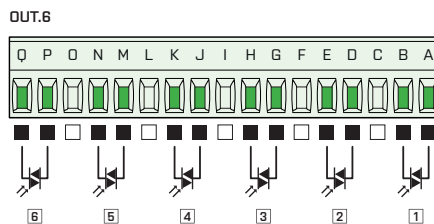
OUT.4 16x OC, NPN



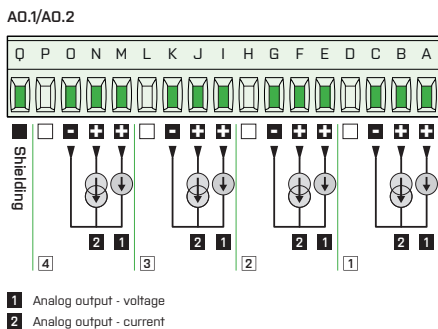
OUT.5 8x OC, PNP



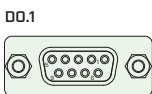
OUT.6 6x SSR



AO.1 2/4x Analogue output

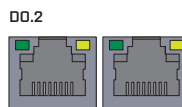


DO.2 1x PROFIBUS



- Pin assignment**
- 3 B: Rx/D/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: Rx/D/TxD-N data reception/transmission, negative

DO.2 1x PROFINET



Port 1 Port 2

TECHNICAL DATA

PROJECTION

Display: 5,7" color 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
Accuracy of cold junction measurement: ±1,5°C
Digital inputs: 5x - optional function (< 24 VDC)
Digital outputs: 2x (open collectors) – optional function (24 V/100 mA)
Acoustic signalization: sound module for acoustic signalization with 1,5 W loud speaker
Value recording: into instrument memory (512 MB) with 4 fold compression
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

Protocols: ASCII, MODBUS RTU, FTP, SMPT
Data format: 8 bits + without parity + 1 stop bit (ASCII)
Rate: 300...230 400 Baud
RS 485: isolated, addressing (max. 31 instrum.), Modbus RTU (Master)
Ethernet: 10/100 BaseT, secure communication, SMPT, FTP, TCP/IP
Modbus (Slave)
Wi-Fi: optional module with standard or industrial temperature range

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
 Power supply is protected by a fuse inside the instrument

MECHANIC PROPERTIES

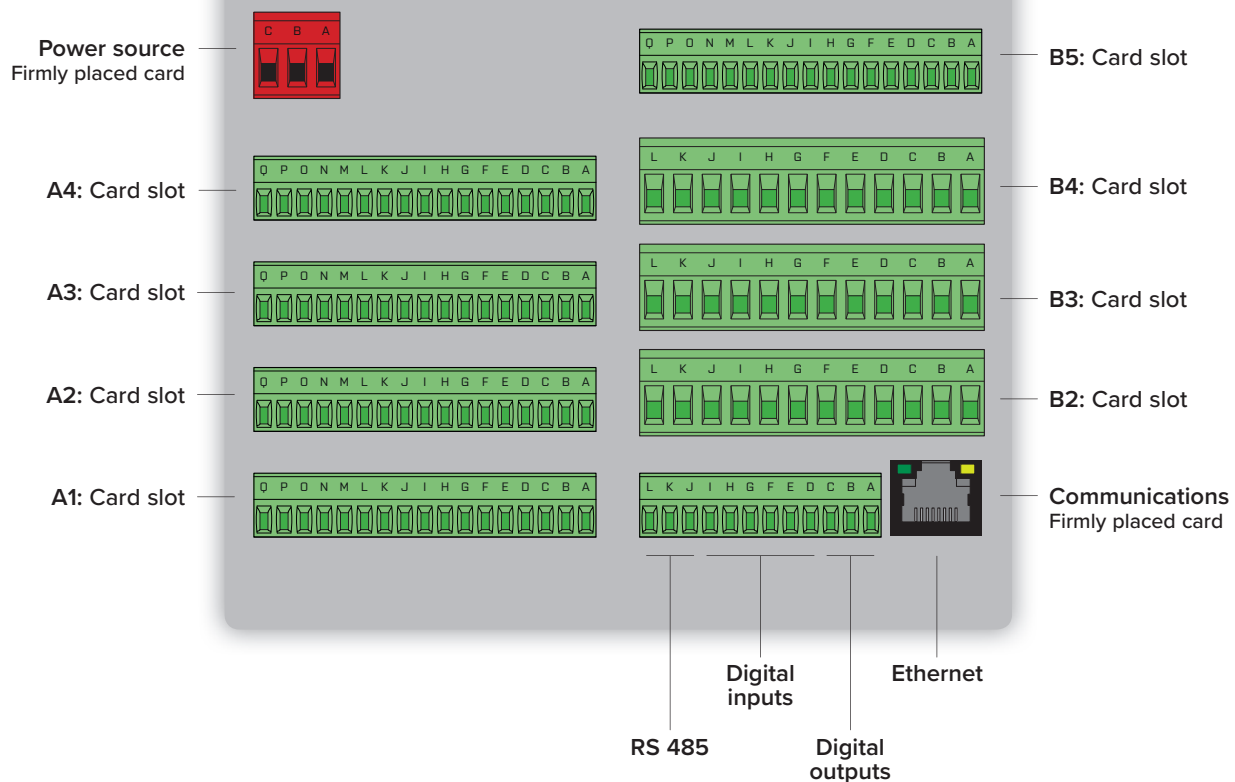
Material: Noryl GFN2 SE1, non-flammable UL94 V-1
Dimensions: 150 x 150 x 80 mm
Depth behind panel: 85 mm
Panel cut-out: 136,5 x 136,5 mm
Securing lid: the front lid can be sealed

OPERATING CONDITIONS

Connection: connector terminal board, conductor cross-section < 1,5/2,5 mm²
Stabilisation period: within 15 minutes after switch-on
Working temperature: -20°...60°C
Storage temperature: -20°...85°C
Protection: IP 64 (front panel only)
Overvoltage category: EN 61010-1, A2
Dielectric strength:
 4 kVAC after 1 min. between power supply and input
 4 kVAC after 1 min. between power supply and data/analogue output
 4 kVAC after 1 min. between input and relay output
 2,5 kVAC after 1 min. between input and data/anal. output
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 61323-1

PI - Primary insulation, DI - Double insulation

CONNECTOR LAYOUT



Slots A are designated for fast analog cards, slot B5 is designated for cards DO1/2. There are no restrictions for placement of other cards.



ORDER CODE

OMR 700

- [] [] - [] [] [] [] [] [] [] [] - []

Power supply	10...30 V AC/DC, isolated 80...250 V AC/DC, isolated	0 1										
Wi-Fi module	no yes, 0°...50°C yes, -20°...60°C	0 1 2										
Features, see table "Card types"	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: $\pm 60/\pm 150/\pm 300/\pm 1200$ mV PM: 0...5 mA/0...20 mA/4...20 mA/ ± 2 V/ ± 5 V/ ± 10 V/ ± 40 V OHM: 0...100 Ω /0...1 k Ω /0...10 k Ω /0...30 k Ω /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)	$\pm 0,15\%$	24 bits	< 320	yes
B	IN.2	4x power/voltage input	0...5 mA/0...20 mA/4...20 mA/ ± 2 V/ ± 5 V/ ± 10 V/ ± 40 V	$\pm 0,2$	16 bits	< 320	yes
C	IN.3	4x RTD	Pt 50/100/1000, Ni 1000/10 000, Cu 50/100	$\pm 0,2$	16 bits	< 320	yes
D	IN.4	4x T/C	J/K/T/E/B/S/R/N/L	$\pm 0,2$	16 bits	< 320	yes
E	IN.5	5x RTD	Pt 50/100/1000, Ni 1000/10 000, Cu 50/100	$\pm 0,2$	16 bits	< 320	no
F	IN.6	12x power input	± 5 mA/ ± 20 mA/4...20 mA	$\pm 0,2$	16 bits	< 320	no
G	IN.7	12x voltage input	± 2 V/ ± 5 V/ ± 10 V/ ± 40 V	$\pm 0,2$	16 bits	< 320	no
H	IN.8	2x input for strain gauges with excitation	1...16 mV/V	$\pm 0,02$	24 bits	< 1 000	yes
I	IN.9	3x precise power/voltage input	0/4...20 mA, $\pm 5/\pm 10$ V	$\pm 0,02$	24 bits	< 1 000	yes
J	IN.10	2x 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 input I: 0...60 mV/0...150 mV/0...300 mV/0...1 A/0...2,5 A/0...5 A	$\pm 0,3\%$		< 10	yes
K	IN.11	8x analogue/digital input	12...250 V AC/DC			< 1 ms	no
L	IN.12	12x counter/frequency	0...30 V, PNP/NPN/contact, adjustable comparison levels, input frequency 0,1 Hz...10 kHz				no
M	IN.13	2x UP/D, IRC with excitation	5/24 V, TTL/Line, adjustable comparison 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	$\pm 0,02$	24 bits	< 1 000	yes
P	OUT.1	4x relay with switch-over contact	250 VAC/30 VDC, 3 A			< 10 ms	
Q	OUT.2	8x relay with switch-on contact	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 Analogue output	0...2/5/10 V, ± 10 V, 0...5 mA, 0/4...20 mA (comp. < 600 Ω /12 V)	$\pm 0,1\%$		< 1 ms	yes
W	AO.2	4x Analogue output	0...2/5/10 V, ± 10 V, 0...5 mA, 0/4...20 mA (comp. < 600 Ω /12 V)	$\pm 0,1\%$		< 1 ms	yes
X	EXC.1	4x excitation	5/10/12/24 VDC/3 W	$\pm 0,1\%$			yes
Y	DO.1	PROFIBUS					
Z	DO.2	PROFINET					



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