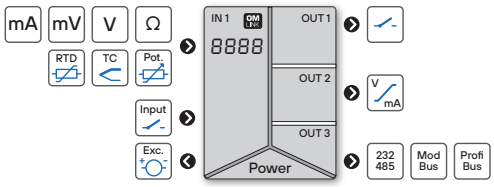
UNIVERSAL BARGRAPH



OMB 412UNI

- Vertical bargraf - 24 LED with display
- Multifunction input (DC, PM, RTD, T/C, DU)
- Digital filters, Tare, Linearization
- Size of DIN 48 x 96 mm
- Power supply 10...30 V AC/DC; 80...250 V AC/DC

Option

Comparators ● Data output ● Analog output ● Measured data record

The OMB 412 model series are panel programmable three-color bargraphs with auxiliary display designed for maximum efficiency and user comfort while maintaining its favourable price.

The OMB 412UNI is a multifunction instrument with the option of configuration for 8 various input options, easily configurable in the instrument menu.

The instrument is based on a microcontroller and multichannel 24-bit ΔΣ ADC, which secures high accuracy, stability and easy operation of the instrument.

OPERATION

The instrument is set and controlled by five buttons located on the front panel. All programmable settings of the instrument may be performed in three adjusting modes:

LIGHT MENU is protected by optional number code and contains solely items necessary for instrument setting.

PROFI MENU is protected by optional number code and contains complete instrument setting.

USER MENU may contain arbitrary items from the programming menu (LIGHT/PROFI), which determine the right (see, change). Access w/o password.

Standard equipment is the OM Link interface, which together with operation program enables modification and filing of all instrument settings as well as performing firmware updates (with OML cable). The program is also designed for visualization and filing of measured values from more instruments.

OPTION

COMPARATORS are assigned to monitor four or eight limit values with relay output. For each input the user may select an arbitrary number of relays with the regime: LIMIT/BATCH/FROM-TO. The limits have adjustable hysteresis within full range of the display and selectable delay of the switch-on within the range of 0...99 s. Reaching the preset limits is signalled by LED and simultaneously by the switch-on of the relevant relay.

DATA OUTPUTS are for their rate and accuracy suitable for transmission of the measured data for further projection or directly into the control systems. We offer an isolated RS232 and RS485 with the ASCII/MESSBUS/Modbus/PROFIBUS protocol.

ANALOG OUTPUTS will find their place in applications where further evaluating or processing of measured data is required in external devices. We offer universal analog output with the option of selection of the type of output - voltage/current and the option of assigning it to arbitrary input. The value of analog output corresp. with the displayed data and its type and range are selectable in menu.

MEASURED DATA RECORD is an internal time control of data collection. It is suitable where it is necessary to register measured values. Two modes may be used. FAST is designed for fast storage (40 records/s) of all measured values up to 8 000 records. Second mode is RTC, where data record is governed by Real Time with data storage in a selected time segment and cycle. Up to 266 000 values may be stored in the instrument memory. Data transmission into PC via serial interface RS232/485 and OM Link.

STANDARD FUNCTIONS

PROGRAMMABLE PROJECTION
Selection: of input type and measuring range
Measuring range: adjustable, either fixed or with automatic change (OHM)
Setting: manual, optional projection on the display may be set in menu for both limit values of the input signal, e.g. input 0...10 V > 0...850.0
Projection: 24 LED + 3-digit auxiliary display

EXCITATION
Range: 5...24 VDC/1.2 W for feeding sensors and transmitters

COMPENSATION
Wiring (RTD, OHM): automatic (3- or 4-wire) or manual in menu (2-wire)
Probes (RTD): internal wiring (resistance of conductors in the measuring head)
CJC (T/C): manual or automatic (terminal temperature)

FUNCTIONS
Linearization: non-linear signal is converted by a 50-point linear interpolation
Tare: designed to reset display upon non-zero input signal
Min./max. value: registration of min./max. value reached during measurement
Peak value: the display shows only max. or min. value
Mathemat. operations: polynom, 1/x, logarithm, exponential, power, root, sin x

DIGITAL FILTERS
Floating / Exponential / Arithmetic average: from 2 to 100 measurements
Rounding: setting the display step for the display

EXTERNAL CONTROL
Lock: control keys blocking
Hold: display/instrument blocking
Tare: tare activation
Resetting Min/Max: resetting min/max value

TECHNICAL DATA

INPUT

No. of inputs	1 The range is adjustable in the instrument menu		
DC Range	±60 mV	> 100 MΩ	Input U
	±150 mV	> 100 MΩ	Input U
	±300 mV	> 100 MΩ	Input U
	±1 200 mV	> 100 MΩ	Input U
PM Range	0...20 mA	< 400 mV	Input I
	4...20 mA	< 400 mV	Input I
	±2 V	1 MΩ	Input U
	±5 V	1 MΩ	Input U
	±10 V	1 MΩ	Input U
	±40 V	1 MΩ	Input U
OHM Range	0...100 Ω 0...1 / 10 / 100 kΩ		
Connection	2-, 3- and 4-wire		
RTD Range	Pt 100/500/1 000, 3 850 ppm/°C		-50°...450°C
	Pt 100, 3 920 ppm/°C		-50°...450°C
	Pt 50, 3 910 ppm/°C		-200°...1100°C
	Pt 100, 3 910 ppm/°C		-200°...450°C
Connection	2-, 3- and 4-wire		
Ni Range	Ni 1 000/10 000, 5 000 ppm/°C		-50°...250°C
	Ni 1 000/10 000, 6 180 ppm/°C		-200°...250°C
Connection	2-, 3- and 4-wire		
Cu Range	Cu 50/100, 4 260 ppm/°C		-50°...200°C
	Cu 50/100, 4 280 ppm/°C		-200°...200°C
Connection	2-, 3- and 4-wire		
T/C Range	J (Fe-CuNi)		-200°...900°C
	K (NiCr-Ni)		-200°...1 300°C
	T (Cu-CuNi)		-200°...400°C
	E (NiCr-CuNi)		-200°...690°C
	B (PtRh30-PtRh6)		300°...1 820°C
	S (PtRh10-Pt)		-50°...1 760°C
	R (Pt13Rh-Pt)		-50°...1 740°C
	N (Omegalloy)		-200°...1 300°C
	L (Fe-CuNi)		-200°...900°C
CJC	adjustable -20°...99°C or automatical		
DU Sensor power supply	2 VDC/6 mA, potentiometer resistance > 500 Ω		

OPTION „A"

No. of inputs	1 The range is adjustable in the instrument menu		
DC Range	±0.1 A	< 300 mV	Input I
	±0.25 A	< 300 mV	Input I
	±0.5 A	< 300 mV	Input I
	±1 A	< 30 mV	Input I
	±5 A	< 150 mV	Input I
	±100 V	20 MΩ	Input U
	±250 V	20 MΩ	Input U
	±500 V	20 MΩ	Input U

EXTERNAL INPUT

No. of inputs	3, on contact
Function	No function assigned Measurement paused Control keys blocking Menu access blocking Activation of Tare Reset of Tare Resetting min/max value Data recording start (FAST/RTC) Data recording reset (FAST/RTC) Value display „Channel A" Value display „Channel A" + filter Value display „Math. functions" Sequential or BCD channel switching

PROJECTION

Bargraph display	24 LED
Bar color	red / green / orange
Display	-99...999, single color 7-segment LED
Digit height	9.1 mm
Display color	red or green
Decimal point	adjustable - in menu
Brightness	adjustable - in menu

INSTRUMENT SPECIFICATION

TC	50 ppm/°C	
Accuracy	±0.1 % of FS ±0.15 % of FS RTD / T/C *above accuracies apply for projection 9999 and 5 meas./s*	
Rate	0.1...40 measurement/s	
Overload	10x (t < 30 ms), 2x *not valid for 250 / 450 V and 5 A ranges*	
Compensation of conduct	< 30 Ω	RTD
Measurement accuracy CJC	±1.5°C	T/C
Functions	offset, Min/max value, Tare, peak value, math. functions	
Digital filters	exponential / floating / arithmetic average, rouding	
Math functions	polynomial / inverse polynomial / logarithm / exponential / power / root	
Linearization	linear interpolation in 50 points *setup only via OM Link*	
Measured data logging	RTC time-date-display value < 266 000 records FAST display value < 8 000 records	
OM Link	company communication interface for operation, setting and update of instruments	
Watch-dog	reset after 400 ms	
Calibration	at 25°C and 40 % r.h.	

RELAYS / OC OUTPUT

No. of outputs	up to 4
Type	digital, menu adjustable
Mode	HYSTER. active above set value WINDOW active in the set window / band BATCH active in set period
Function Relays/OC	CLOSE is closed in active mode OPEN is open in active mode
Limits	-99999...999999
Hysteresis	0...999999
Delay	0...99.9 s
Outputs	1...2x relay with switch-on contact (Form A) (250 VAC/30 VDC, 3 A)* 1...2x relay with switching contact (Form C) (250 VAC/50 VDC, 3 A)* 2x bistable relays (250 VAC/250 VDC, 3 A/0.3 A) 2...4x open collector (30 VDC/100 mA)
Relays	1/8 HP 277 VAC, 1/10 HP 125 V, Pilot Duty D300

* values apply for resistance load

ANALOG OUTPUTS

No. of outputs	1	
Type	isolated, adjustable with 16-bit DAC, output type and range is selectable	
TC	15 ppm/°C	
Accuracy	±0.02 % of FS ±0.03 % of FS ±0.06 % of FS	0...5 V 0...2 V / 0...5 mA
Rate	response to change of value < 1 ms	
Ranges	0...2 / 5 / 10 V, ±10 V, resistive load ≥ 1 kΩ 0...5 / 20 mA /4...20 mA, comp. < 600 Ω/12 V Indication of error message (output < 3.2 mA)	

DATA OUTPUTS

No. of outputs	1
Protocol	ASCII, MESSBUS, Modbus RTU, PROFIBUS DP
Data format	8 bit + no parity + 1 stop bit (ASCII) 7 bit + even parity + 1 stop bit (Messbus)
Rate	300...230 400 Baud 9 600 Baud...12 Mbaud (PROFIBUS)
RS 232	isolated
RS 485	isolated, addressing (max. 31 instruments)

EXCITATION

Adjustable	5...24 VDC, <1.2 W, isolated

POWER SUPPLY

Range	10...30 V AC/DC, ±10 %, PF ≥ 0.4, I_{STP} < 40 A / 1 ms, isolated 80...250 V AC/DC, ±10 %, PF ≥ 0.4, I_{STP} < 40 A / 1 ms, isolated *Protection by fuse inside the device.*
Consumption	< 10.3 W / 10.1 VA

MECHANIC PROPERTIES

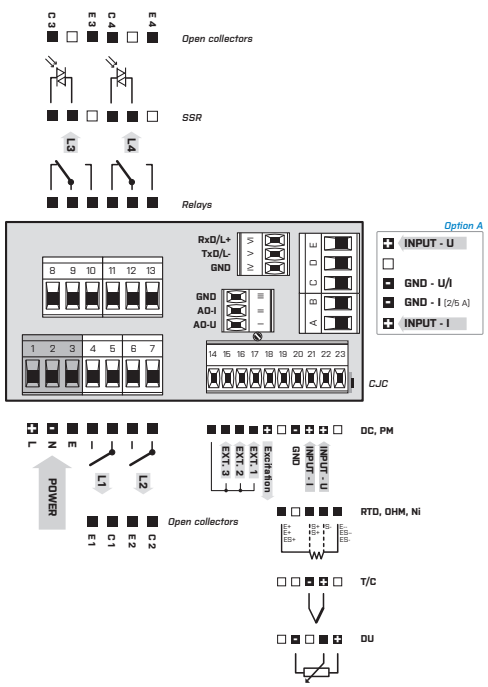
Material	Noryl GFN2 SE1, incombustible UL 94 V-I, black
Dimensions	48 x 96 x 120 mm (w x h x d)
Panel cutout	45 x 90.5 mm (w x h)

OPERATING CONDITIONS

Connection	connector terminal blocks, section < 1.5 / 2.5 mm²
Stabilization period	within 5 minutes after switch-on
Working temperat.	-20°...60°C
Storage temperat.	-20°...85°C
Working humidity	< 95 % r.v., non condensing
Protection	IP64, front panel only
Construction	safety class I
El. safety	EN 61010-1, A2
Dielectric strength	4 kVAC per 1 min test between supply and input 4 kVAC per 1 min test between supply and data/ analog output 4 kVAC per 1 min test between input and relay output 2.5 kVAC per 1 min test between input and data/ analog output
Insulation resist.*	for pollution degree II, measuring cat. III power supply, input > 670 V (PI), 300 (DI) input, output, excitation > 300 V (PI), 150 V (DI)
EMC	EN 61326-1:2021, Industrial area EN IEC 62003:2021, Nuclear facilities
RoHS	EN IEC 63000:2018
Seismic qualification	IEC/IEEE 60980-344 Edition 1.0, 2020, par. 6, 9
Mechanical resistance	EN 60068-2-6 ed. 2:2008
SW validation	Class B, C in compl. with IEC 62138, 61226

* PI - Primary insulation, DI - Double insulation

CONNECTION



*GND (Input + Option A) is galvanically connected with inputs EXT. and the OM Link connector

ORDER CODE

OMB 412UNI - [ ][ ][ ][ ][ ]**1**[ ][ ] - [ ]

Power supply	10...30 VDC / 24 VAC	**0**									
	80...250 V AC/DC	**1**									
Measuring range	standard		**0**								
	option „A"		**A**								
Comparators	no			**0**							
	1x relay (Form A)			**1**							
	2x relay (Form A)			**2**							
	3x relays (2x Form A + 1x Form C)			**3**							
	4x relays (2x Form A + 2x Form C)			**4**							
	2x open collector			**5**							
	4x open collector			**6**							
	2x open collector + 2x relays (Form C)			**7**							
	2x relays (Form C)			**8**							
	2x SSR			**9**							
	2x relays, bistable			**A**							
	1x relay (Form C)			**B**							
Analog output	no				**0**						
	yes (comp. < 600 Ω/12 V)				**1**						
	yes (compensation < 1000 Ω/24 V)				**2**						
Data output	no					**0**					
	RS 232					**1**					
	RS 485					**2**					
	Modbus*					**3**					
	PROFIBUS					**4**					
Excitation	yes						**1**				
Data record	no							**0**			
	RTC							**1**			
	FAST							**2**			
Display color	red (14 mm)								**1**		
	green (14 mm)								**2**		
Specification	customized version, do not fill in										**00**
	SW validation - IEC 62138, IEC 61226										**VS**

Basic configuration of the instrument is indicated in bold.

* Unavailable in combination with RTC/FAST