

## OMB 412UNI



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 single-chip microcontroller with multichannel 4-bit sigma-delta converter, which secures high accuracy, stability and easy operation of the instrument.

### UNIVERSAL BARGRAPH

- 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

### OMB 412UNI

DC VOLTMETER AND AMMETER  
 PROCESS MONITOR  
 OHMMETER  
 THERMOMETER FOR Pt/Cu/Ni/THERMOCOUPLES  
 DISPLAY UNIT FOR LINEAR POTENTIOMETERS

### 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.

All settings are stored in the EEPROM memory (settings hold even after the instrument is switched off). The measured units may be projected on the display.

### 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...10,00 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

**Of conduct (RTD, OHM):** automatic (3- or 4-wire) or manual in menu (2-wire)

**Of conduct in probe (RTD):** internal connection (conduct resistance in measuring head)

**Of CJC (T/C):** manual or automatic, in menu it is possible to perform selection of the type of thermocouple and compensation of cold junctions, which is adjustable or automatic (temperature of terminals)

#### FUNCTIONS

**Linearization:** non-linear signals can be linearized by the means of a linearization table (up to 50 points)

**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 average:** from 2...30 measurements

**Exponential average:** from 2...100 measurements

**Arithmetic average:** from 2...100 measurements

**Rounding:** setting the projection step for display

#### EXTERNAL CONTROL

**Lock:** control keys blocking

**Hold:** display/instrument blocking

**Tare:** tare activation

**Resetting MM:** resetting min/max value

## TECHNICAL DATA

| INPUT                   |   |
|-------------------------|---|
| <b>Number of inputs</b> | 1   |
| <b>DC Range</b>         | optional in configuration menu<br>±60 mV > 100 MΩ Input U<br>±150 mV > 100 MΩ Input U<br>±300 mV > 100 MΩ Input U<br>±1 200 mV > 100 MΩ Input U   |
| <b>PM Range</b>         | optional in configuration menu<br>0...20 mA < 400 mV Input I<br>4...20 mA < 400 mV Input I<br>±2 V 1 MΩ Input U<br>±5 V 1 MΩ Input U<br>±10 V 1 MΩ Input U<br>±40 V 1 MΩ Input U  |
| <b>OHM Range</b>        | optional in configuration menu with autorange<br>0...100 Ω<br>0...1 kΩ<br>0...10 kΩ<br>0...100 kΩ   |
| <b>Connection</b>       | 2, 3 or 4 wire  |
| <b>Pt Type</b>          | optional in configuration menu<br>EU > 100/500/1 000 Ω, 3 850 ppm/°C -50°...450°C<br>US > 100 Ω, 3 920 ppm/°C -50°...450°C<br>RU > 50 Ω, 3 910 ppm/°C -200°...1100°C<br>RU > 100 Ω, 3 910 ppm/°C -200°...450°C  |
| <b>Connection</b>       | 2, 3 or 4 wire  |
| <b>Ni Type</b>          | optional in configuration menu<br>Ni 1 000/10 000 with 5 000 ppm/°C -50°...250°C<br>Ni 1 000/10 000 with 6 180 ppm/°C -50°...250°C  |
| <b>Connection</b>       | 2, 3 or 4 wire  |
| <b>Cu Type</b>          | optional in configuration menu<br>Cu 50/100 with 4 260 ppm/°C -50°...200°C<br>Cu 50/100 with 4 280 ppm/°C -200°...200°C   |
| <b>Connection</b>       | 2, 3 or 4 wire  |
| <b>T/C Type</b>         | optional in configuration menu<br>J (Fe-CuNi) -200°...900°C<br>K (NiCr-Ni) -200°...1 300°C<br>T (Cu-CuNi) -200°...400°C<br>E (NiCr-CuNi) -200°...690°C<br>B (PtRh30-PtRh6) 300°...1 820°C<br>S (PtRh10-Pt) -50°...1 760°C<br>R (Pt13Rh-Pt) -50°...1 740°C<br>N (Omega alloy) -200°...1 300°C<br>L (Fe-CuNi) -200°...900°C |
| <b>DU P. supply</b>     | 2 VDC/6 mA, Potentiometer resistance > 500 Ω  |
| <b>Ext. inputs</b>      | 3 inputs, on contact<br><br>The following functions can be assigned:<br>OFF / HOLD / LOCK / PASS. / TARE / CL. TA. /<br>CL. M.M. / SAVE / CL. ME. / CHAN. A. / FIL. A. / MAT.<br>FN. / SWITCH.  |

| OPTION „A“      |   |
|-----------------|---|
| <b>DC Range</b> | optional in configuration menu<br>±0.1 A < 300 mV Input I<br>±0.25 A < 300 mV Input I<br>±0.5 A < 300 mV Input I<br>±1 A < 30 mV Input I<br>±5 A < 150 mV Input I<br>±100 V 20 MΩ Input U<br>±250 V 20 MΩ Input U<br>±500 V 20 MΩ Input U |

### PROJECTION

**Bargraph display:** 24 LED  
**Bar color:** red/green/orange  
**Auxiliary display:** -99...999, single color 7-segment LED  
**Digit height:** 9,1mm  
**Display color:** red or green  
**Decimal point:** adjustable - in menu  
**Brightness:** adjustable - in menu

### INSTRUMENT ACCURACY

**TC:** 50 ppm/°C  
**Accuracy:** ±0.1% of range + 1 digit (for proj. 9999 and 5 measur./s)  
±0.15% of range + 1 digit **RTD, T/C**  
**Accuracy of cold junction measur.:** ±1.5°C  
**Rate:** 0.1...40 measurement/s  
**Overload capacity:** 2x, 10x (t < 30 ms) - not for > 250 V and 5 A  
**Resolution (RTD, T/C):** 1/0.1°/0.01°C  
**Line compensation:** max. 30 Ω (RTD)  
**Cold junction compens.:** adjustable -20°...99°C or automatic  
**Linearization:** linear interpolation in 50 points (only via OM Link)  
**Digital filters:** Exp./Floating/Arithm. average, Rounding  
**Functions:** Offset, Min/max value, Tare, Peak value, Mat. operations  
**Data record:** measured data record into instrument memory  
**RTC:** - 15 ppm/°C, time-date-display value < 266k data  
**FAST:** - display value < 8k data  
**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.

### COMPARATOR

**Type:** digital, menu adjustable, contact switch-on < 30 ms  
**Hysteresis mode:** switching limit, hysteresis band (Lim and ±1/2 Hys.) and time (±99.9 s) determining the switching delay  
**Mode From-To:** switching on and switching off interval  
**Mode Batch:** period, its multiples and time (0...99.9 s), within which the output is active  
**Output:** 1...2x relays Form A (250 VAC/30 VDC, 3 A) and 1...2x relays Form C (250 VAC/50 VDC, 3 A);  
2x/4x open collector (30 VDC/100 mA); 2x SSR (250 VAC/1 A);  
2x bistable relays (250 VAC/250 VDC, 3 A/0.3 A)

### DATA OUTPUTS

**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:** 600...230 400 Baud, 0.0096...12 Mbaud (PROFIBUS)  
**RS 232:** isolated  
**RS 485:** isolated, addressing (max. 31 instruments)

### ANALOG OUTPUTS

**Type:** isolated, programmable with a 16-bit D/A converter, output type and range are optional in the menu  
**Non-linearity:** 0.1% of range  
**TC:** 15 ppm/°C  
**Rate:** response to change of value < 1 ms  
**Ranges:** 0...2/5/10 V, ±10 V, 0...5 mA, 0/4...20 mA (comp. < 600 Ω/12 V or 1 000 Ω/24 V)

### EXCITATION

**Adjustable:** 5...24 VDC/max. 1.2 W

### POWER SUPPLY

**Range:** 10...30 V AC/DC, ±10%, PF≥0.4, I<sub>sp</sub>< 40 A/1 ms, isolated  
80...250 V AC/DC, ±10%, PF≥0.4, I<sub>sp</sub>< 40 A/1 ms, isolated  
**Consumption:** < 10.3 W/10.1 VA  
**Power supply is protected by a fuse inside the instrument.**

### MECHANIC PROPERTIES

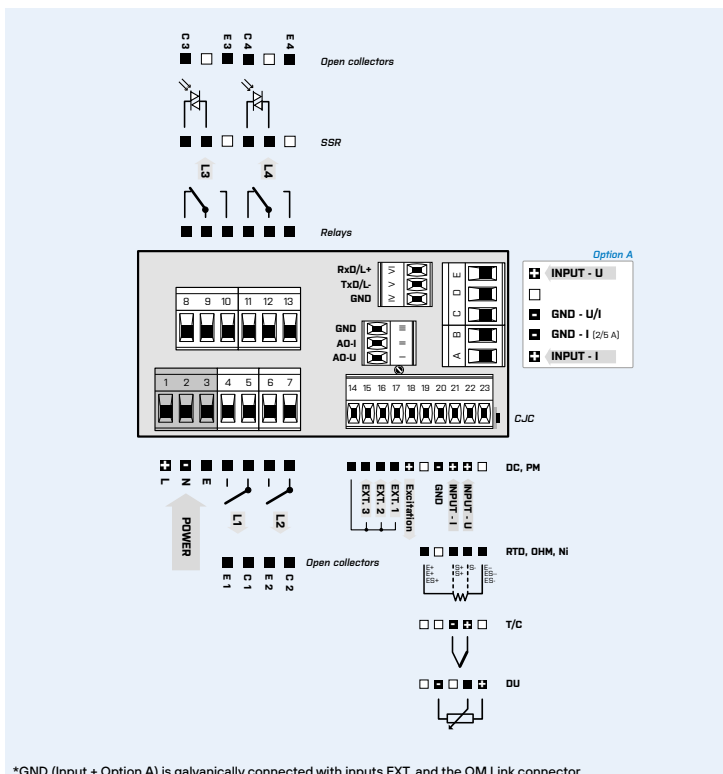
**Material:** Noryl GFN2 SEI, incombustible UL 94 V-I  
**Dimensions:** 48 x 96 x 120 mm (w x h x d)  
**Panel cutout:** 45 x 90.5 mm (w x h)

### OPERATING CONDITIONS

**Connection:** connector terminal blocks, section < 1.5/2.5 mm<sup>2</sup>  
**Working temperature:** -20°...60°C  
**Storage temperature:** -20°...80°C  
**Protection:** IP64 (front panel only)  
**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 resistance:** for pollution degree II, measuring cat. III  
power supply > 670 V (PI), 300 V (DI)  
input, output, PN > 300 V (PI), 150 V (DI)  
**EMC:** EN 61326-1  
**Seismic capacity:** IEC 980: 1993, par. 6  
**SW validation:** Class B, C in compl. with IEC 62138, 61226

PI - Primary insulation, DI - Double insulation

## CONNECTION



## ORDER CODE

### OMB 412UNI

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

Basic configuration of the instrument is indicated in bold.

\* Unavailable in combination with RTC/FAST