

## OM 402UNI



The OM 402 model series are 4-digit panel programmable instruments designed for maximum efficiency and user comfort while maintaining their favourable price.

Type OML 402UNI is a multifunction instrument with the option of configuration for 8 different input options, easily configurable in the instrument menu. By completing the input modules, larger ranges of DC voltage and current can be measured to extend the number of inputs to 4 (applies to PM).

The instrument is based on a single-chip microcontroller and a multichannel 24-bit sigma-delta converter, which secures high accuracy, stability and easy operation of the instrument.

### UNIVERSAL INSTRUMENT

- 4-digit programmable projection
- Multifunction input (DC, PM, RTD, T/C, DU)
- Digital filters, Tare, Linearization
- Size of DIN 96 x 48 mm
- Power supply 10...30 V AC/DC; 80...250 V AC/DC
- Option
  - Comparators • Data output • Analog output
  - Data record • Three-color display - 20 mm

### OM 402UNI

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).

### OPTION

**COMPARATORS** are assigned to monitor one, two, three or four limit values with relay output. As a user you can select the mode limit: LIMIT/BATCH/FROM-TO. The limits have adjustable hysteresis within the full range of the display as well as selectable delay of the switch-on in the range of 0...99,9 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/PROFIBUS protocols.

**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. The value of analog output corresponds with the displayed data. 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:** -9999...9999

#### 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:** linear interpolation in 50 points (only via OM Link)

**Min./max. value:** registration of min./max. value reached during measurement

**Tare:** designed to reset display upon non-zero input signal

**Peak value:** the display shows only max. or min. value

**Mathemat. operations:** polynom, 1/x, logarithmus, exponenciál, root, root and operations between inputs - součet, podíl

#### DIGITAL FILTERS

**Floating/Exp./Arithm. average:** from 2...30/100/100 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>DC</b>	Range	optional in configuration menu			
		±60 mV > 100 MΩ	Input U		
		±150 mV > 100 MΩ	Input U		
		±300 mV > 100 MΩ	Input U		
<b>PM</b>	Range	optional in configuration menu			
		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		
<b>OHM</b>	Range	optional in configuration menu with aut. range change			
		0...100 Ω			
		0...1 kΩ			
		0...10 kΩ			
		0...100 kΩ			
Connect.	2, 3 or 4 wire				
<b>RTD</b>	Type	optional in configuration menu			
		EU > 100/500/1 000 Ω, w. 3 850 ppm/°C	-50°...450°C		
		US > 100 Ω, with 3 920 ppm/°C	-50°...450°C		
		RU > 50 Ω with 3 910 ppm/°C	-200°...1 100°C		
Connect.	2, 3 or 4 wire				
<b>Ni</b>	Type	optional in configuration menu			
		Ni 1 000/10 000 with 5 000 ppm/°C	-50°...250°C		
Connect.	2, 3 or 4 wire				
<b>Cu</b>	Type	optional in configuration menu			
		Cu 50/100 with 4 260 ppm/°C	-50°...200°C		
Connect.	2, 3 or 4 wire				
<b>T/C</b>	Type	optional in configuration menu			
		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		
		<b>DU</b>	Supply	2 VDC/6 mA, Potentiometer resistance > 500 Ω	
Ext. inputs	3 inputs, on contact				
	The following functions can be assigned: OFF / HOLD / LOCK / PASS. / TARE / CL. TA. / CL. M.M. / SAVE / CL. ME. / CHAN. A. / FIL. A. / MAT. FN. / SWIT.				

OPTION „A“			
<b>DC</b>	Range	optional in configuration menu	
		±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 U
		±100 V 20 MΩ	Input U
<b>PM</b>	Range	±250 V 20 MΩ	Input U
		±500 V 20 MΩ	Input U
OPTION „B“			
<b>3x PM</b>	Range	optional in configuration menu	
		0...20 mA < 400 mV	Input 2, 3, 4 - I
		4...20 mA < 400 mV	Input 2, 3, 4 - I
		±2 V 1 MΩ	Input 2, 3, 4 - U
		±5 V 1 MΩ	Input 2, 3, 4 - U
		±10 V 1 MΩ	Input 2, 3, 4 - U
		±40 V 1 MΩ	Input 2, 3, 4 - U

**PROJECTION**  
**Display:** -99999...999999, single color 14-segment LED;  
-999...9999, 3-color 7-segment LED  
**Digit height:** 14 or 20 mm  
**Display color:** red or green (height 14 mm)  
red/green/orange (height 20 mm)  
**Description:** last two characters on the display may be used for description of measured quantities (only 14 mm display)  
**Decimal point:** adjustable - in menu  
**Brightness:** adjustable - in menu

**INSTRUMENT ACCURACY**  
**TK:** 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 measur./s  
**Overload capacity:** 2x; 10x (t < 30 ms) - not for > 200 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:** min./max. value, tare, peak value, math. 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 ±1/2 Hys. "

and time (0...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  
**TK:** 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

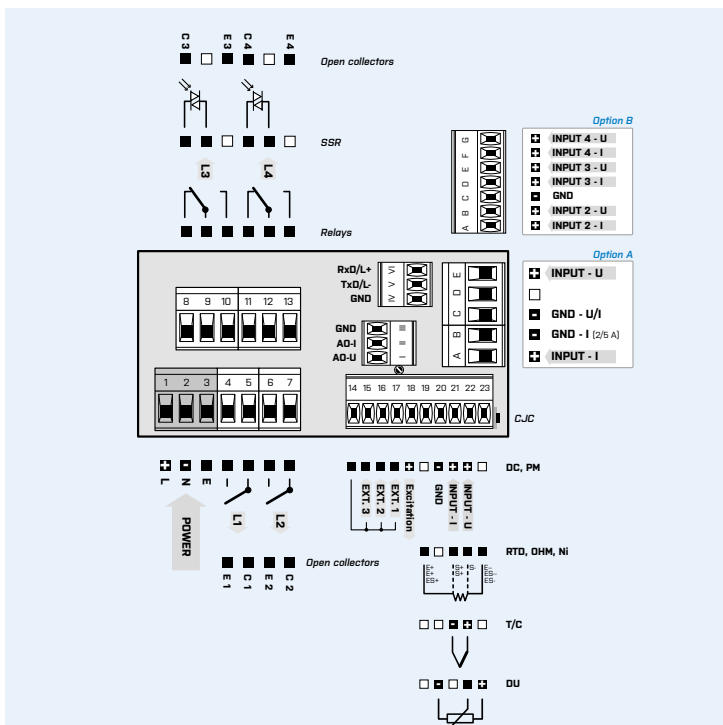
**POWER SUPPLY**  
**Range:** 10...30 V AC/DC, ±10 %, PF≥0.4, I<sub>typ</sub>< 40 A/1 ms, isolated  
80...250 V AC/DC, ±10 %, PF≥0.4, I<sub>sp</sub>< 40 A/1 ms, isolated  
**Consumption:** < 9.4 W/9.2 VA  
**Power supply is protected by a fuse inside the instrument.**

**MECHANIC PROPERTIES**  
**Material:** Noryl GFN2 SE1, incombustible UL 94 V-1  
**Dimensions:** 96 x 48 x 120 mm (w x h x d)  
**Panel cutout:** 90.5 x 45 mm (w x h)

**OPERATING CONDITIONS**  
**Connection:** connector terminal blocks, section < 1.5/2.5 mm<sup>2</sup>  
**Stabilization period:** within 5 minutes after switch-on  
**Temper. working/storage:** -20°...60°C/-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



\*GND (Input + Option A) is galvanically connected with inputs EXT. and the OM Link connector  
\*In case of Option B we recommend to connect terminals GND (main board/addit. board) by ext. connection

## ORDER CODE

OM 402UNI		- [ ] [ ] [ ] [ ] 1 [ ] [ ] - [ ]			
<b>Power supply</b>	10...30 V AC/DC 80...250 V AC/DC	<b>0</b>			
<b>Measuring range</b>	standard option „A“ option „B“	<b>1</b>			
<b>Comparators</b>	no 1x relay (Form A) 2x relay (Form A) 3x relays (2x Form A + 1x Form C) 4x relays (2x Form A + 2x Form C) 2x open collector 4x open collector 2x open collector + 2x relays (Form C) 2x relays (Form C) 2x SSR 2x relays, bistabile 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>8</b> <b>9</b> <b>A</b> <b>B</b>			
<b>Analog output</b>	no yes (compensation < 600 Ω/12 V) yes (compensation < 1000 Ω/24 V)	<b>0</b> <b>1</b> <b>2</b>			
<b>Data output</b>	no RS 232 RS 485 MODBUS* 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 RTC FAST		<b>0</b> <b>1</b> <b>2</b>		
<b>Display color</b>	red (14 mm) green (14 mm) red/green (20 mm)			<b>1</b> <b>2</b> <b>3</b>	
<b>Specification</b>	customized version, do not fill in SW validation - IEC 62138, IEC 61226				<b>00</b> <b>VS</b>

Basic configuration of the instrument is indicated in bold.

\* Unavailable in combination with RTC/FAST