Data Sheet

OM 402UNI
4- or 6-Digit Programmable Panel Meter

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OM 402UNI

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

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.

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

Number of inputs	1		
DC Range	optional in configuration menu		
	±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	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
	±40 V	1 MΩ	Input U
OHM Range	optional in configuration menu with autorange		
	0...100 Ω		
	0...1 kΩ		
	0...10 kΩ		
	0...100 kΩ		
Connection	2, 3 or 4 wire		
Pt Type	optional in configuration menu		
	EU > 100/500/1 000 Ω, 3 850 ppm/°C		-50°...450°C
	US > 100 Ω, 3 920 ppm/°C		-50°...450°C
	RU > 50 Ω, 3 910 ppm/°C		-200°...1 100°C
	RU > 100 Ω, 3 910 ppm/°C		-200°...450°C
Connection	2, 3 or 4 wire		
Ni Type	optional in configuration menu		
	Ni 1 000/10 000 with 5 000 ppm/°C		-50°...250°C
	Ni 1 000/10 000 with 6 180 ppm/°C		-50°...250°C
Connection	2, 3 or 4 wire		
Cu Type	optional in configuration menu		
	Cu 50/100 with 4 260 ppm/°C		-50°...200°C
	Cu 50/100 with 4 280 ppm/°C		-200°...200°C
Connection	2, 3 or 4 wire		
T/C 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
DU 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"

DC 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 I
	±100 V	20 MΩ	Input U
	±250 V	20 MΩ	Input U
	±500 V	20 MΩ	Input U

OPTION „B"

Number of inputs	3		
PM 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

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 > 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 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_{STP} < 40 A/1 ms, isolated
80...250 V AC/DC, ±10 %, PF ≥ 0,4, I_{STP} < 40 A/1 ms, isolated
Consumption: < 9,4 W/9,2 VA
Power supply is protected by a fuse inside the instrument.

MECHANIC PROPERTIES

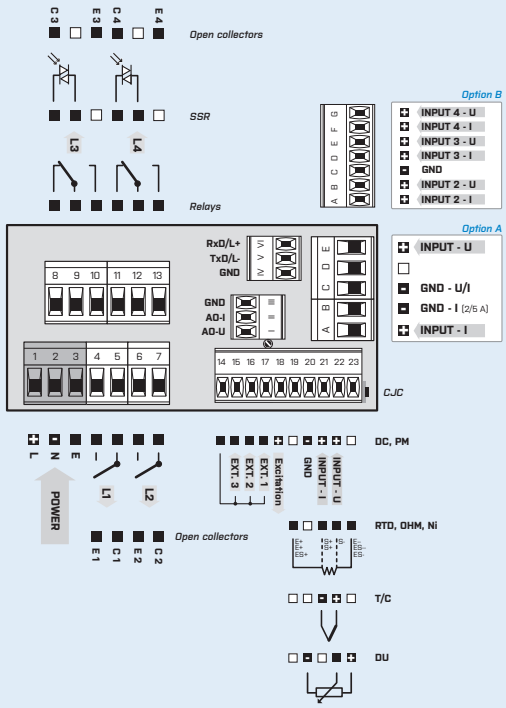
Material: Noryl GFN2 SE1, incombustible UL 94 V-I
Dimensions: 96 x 48 x 120 mm (w x h x d)
Panel cutout: 90,5 x 45 mm (w x h)

OPERATING CONDITIONS

Connection: connector terminal blocks, section < 1,5/2,5 mm²
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[ ][ ] - [ ]

Power supply	10...30 V AC/DC	**0**
	80...250 V AC/DC	**1**
Measuring range	**standard**	**0**
	option „A"	**A**
	option „B"	**B**
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 (compensation < 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**
	red/green (20 mm)	**3**
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