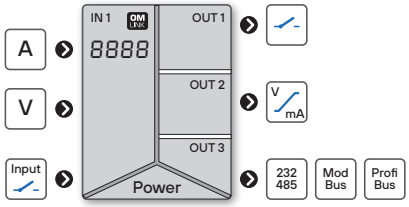
OM 402PWR

- 4-digit programmable projection
- Range 0…1/2.5/5 A; 0…60/150/300 mV
  0…10/120/250/450 V
- 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)

AC / DC V-A METER/NETWORK ANALYSER



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

Type OM 402PWR is a universal alternating current V-A meter with the extention of functions for further network analysis. The instrument measures voltage, current, active power, frequency, and with calculation also reactive power, apparent power and cos fi.

The instrument is based on a microcontroller and true RMS trasmitters, which ensures good 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.

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
Measuring range: adjustable in menu
Measuring modes: voltage (V_{RMS}), current (A_{RMS}), power (W), frequency (Hz) and with calculation reactive power (Q), apparent power (S), power factor (cos fi)
Setting: manual, optional projection on the display may be set in menu for both limit values of the input signal, e.g. input 0…60 mV > 0…500.0
Projection: -999…9999

FUNCTIONS
Linearization: non-linear signal is converted by a 50-point linear interpolation
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, logarithm, exponential, power, root, sin x

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: activation and tare resetting
Resetting Min/Max: resetting min/max value

TECHNICAL DATA

INPUT

No. of inputs	1 The range is adjustable in the instrument menu		
PWR Range	0…60 mV	21 kΩ	Input 1 - I'
	0…150 mV	21 kΩ	Input 1 - I
	0…300 mV	1.2 kΩ	Input 1 - I
	0…1 A	< 150 mV	Input 1 - I
	0…2.5 A	< 150 mV	Input 1 - I
	0…5 A	< 150 mV	Input 1 - I
	0…10 V	150 kΩ	Input 2 - U
	0…120 V	930 kΩ	Input 3 - U
	0…250 V	730 kΩ	Input 2 - U
	0…450 V	930 kΩ	Input 3 - U
Input frequency	0…400 Hz for amplitude from 8 V		
Measured quantities	Voltage (V_{RMS}) Current (A_{RMS}) Active power (P) Frequency (Hz) **with calculation** Reactive power (Q) Apparent power (S) Power factor (cos fi) **DC Voltage, Current and Power can also be measured when the AC filter is disabled in the device menu**		

EXTERNAL INPUT

No. of inputs	3, on contact	
Function	OFF	no function assigned
	LOCK	control keys blocking
	HOLD	measurement paused
	PASS.	menu access blocking
	TARE I	tare activation for „Channel I"
	TARE U	tare activation for „Channel U"
	TARE P	tare activation for „Channel P"
	TARE F	tare activation for „Channel F"
	C.T. AL.	tare resetting on all channels
	C.T. ACT.	tare resetting on current channel
	CL. M.M.	resetting min/max value
	SAVE	data recording start (RTC)
	CL. ME.	data recording reset (RTC)

PROJECTION

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

INSTRUMENT SPECIFICATION

TC	50 ppm/ºC
Accuracy	±0.3 % of FS + 1 digit ±0.6 % of FS + 1 digit S ±0.9 % of FS + 1 digit Q, Cos F *above accuracies apply for projection 9999 and 5 meas./s*
Rate	0.5…5 measurement/s
Overload	10x (t < 30 ms), 2x *not valid for 250 / 450 V and 5 A ranges*
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*
Data record	RTC 15 ppm/ºC, time-date-display value < 266k data
OM Link	company communication interface for operation, setting and update of instruments
Watch-dog	reset after 400 ms
Calibration	at 25ºC 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/ºC
Non-linearity	0.1 % from FS
Accuracy	±0.02 % of FS
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, compensation < 600 Ω/12 V or 1000 Ω / 24 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	< 9.4 W / 9.2 VA

MECHANIC PROPERTIES

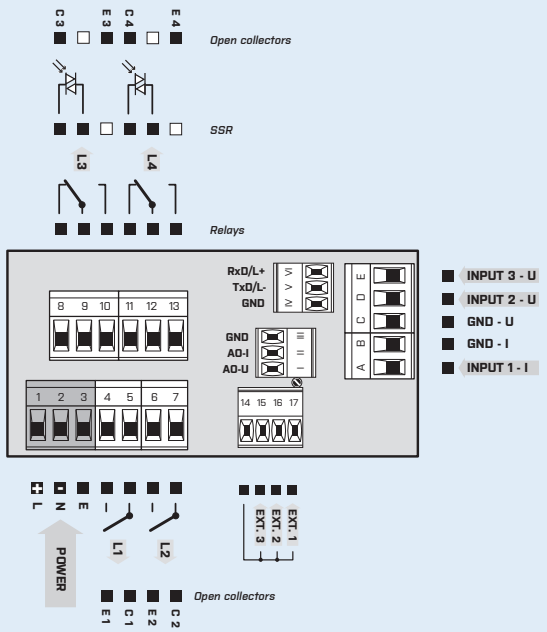
Material	Noryl GFN2 SE1, incombustible UL 94 V-I, black
Dimensions	96 x 48 x 120 mm (w x h x d)
Panel cutout	90.5 x 45 mm (w x h)

OPERATING CONDITIONS

Connection	connector terminal blocks, section < 1.5 / 2.5 mm²
Stabilization period	within 5 minutes after switch-on
Working temperat.	-20º…60ºC
Storage temperat.	-20º…85ºC
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, Industrial area
Seismic capacity	IEC 980: 1993, par. 6

* PI - Primary insulation, DI - Double insulation

CONNECTION



* GND (input) is galvanically connected with inputs EXT. and the OM Link connector

ORDER CODE

OM 402PWR - [ ][ ][ ][ ][ ][ ][ ][ ][ ] - [ ]

Power supply	10…30 V AC/DC	**0**
	80…250 V AC/DC	**1**
Measuring range - U	0…10/120 V	**S**
	0…250/450 V	**U**
	on request	**Z**
Measuring range - I	0…60/150/300 mV	**K**
	0…1/2,5/5 A	**P**
	on request	**Z**
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	no	**0**
	yes	**1**
Data record	no	**0**
	RTC	**1**
Display color	red (14 mm)	**1**
	green (14 mm)	**2**
	red/green (20 mm)	**3**
Specification	customized version, do not fill in	**00**

Basic configuration of the instrument is indicated in bold.

* Unavailable in combination with RTC/FAST