

# MH1U – 3-digit digital indicator for top hat rail mounting

**Multifunctional measuring input:** Direct voltage, direct current, Pt100(0), Thermocouple, Frequency, Rotational speed, Counter

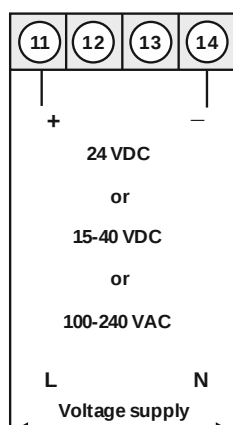
- red display of -199...999 Digits
- digit height approx. 7mm
- min/max value recording
- 9 adjustable supporting points
- display flashing at threshold value exceedance / threshold value undercut
- Tara function
- programming interlock via access code
- pluggable screw-terminal
- optional: analog output 0-10 VDC, 0/4-20 mA switchable
- optional: interfaces RS232 / RS485 / Bluetooth
- optional: sensor supply incl. digital input
- optional: 2 relay outputs / 2 PhotoMos-outputs / 2 relay outputs & 2 PhotoMos-outputs
- optional: Bluetooth interface
- optional: data logger
- accessories: PC-based configuration kit PM-TOOL with CD & USB adapter



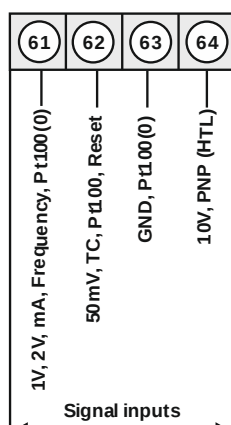
**ORDER NUMBER** **EUR**  
(without options)

## • Multifunction measuring input

Terminal 1



Terminal 6



Supply 24 VDC galv. isolated

**MH-1UR3A.000X.760A** **148,00**

Supply 100-240 VAC/DC  $\pm 10\%$

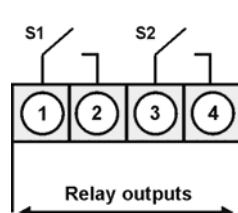
**MH-1UR3A.000X.S60A** **173,00**

Supply 15-40 VDC / 20-30 VAC

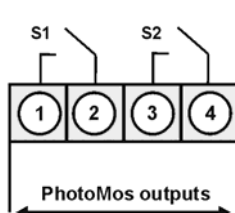
**MH-1UR3A.000X.W60A** **180,00**

## Options

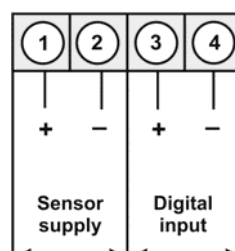
Terminal 2



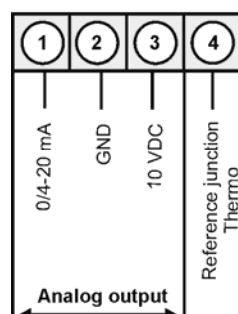
Terminal 3



Terminal 5

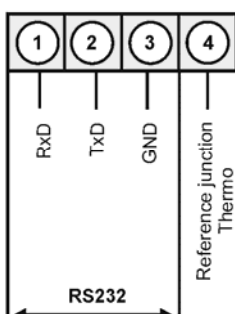


Terminal 4

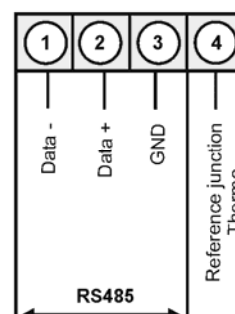


alternative to analog output

Terminal 4



or



• Order key for options

|   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |
|---|----|---|---|---|---|----|---|---|---|----|---|---|---|---|
| M | H- | 1 | U | R | 3 | A. | 0 | 0 | 0 | X. | 7 | 6 | 0 | A |
| M | H- | 1 | U | R | 3 | A. | 0 | 0 | 0 | X. | S | 7 | 0 | A |
| M | H- | 1 | U | R | 3 | A. | 0 | 0 | 0 | X. | W | 7 | 0 | A |

EUR

|                                            |   |                                                                                    |                 |
|--------------------------------------------|---|------------------------------------------------------------------------------------|-----------------|
| <div>May be combined to some extend.</div> | 2 | 2 Relay outputs                                                                    | 20,00           |
|                                            | 3 | 2 PhotoMos outputs                                                                 | 25,00           |
|                                            | 5 | 2 PhotoMos- and 2 relay outputs                                                    | 45,00           |
|                                            | X | Analog output                                                                      | 65,00           |
|                                            | 3 | Sensor supply 24VDC/50mA incl. digital input for 24VDC power supply                | 40,00           |
|                                            | 3 | Sensor supply 24VDC/50mA incl. digital input for 10-30VDC, 100-240VAC power supply | 20,00           |
|                                            | 3 | Interface RS232                                                                    | 55,00           |
|                                            | 4 | Interface RS485                                                                    | 55,00           |
|                                            | C | Bluetooth interface                                                                | In preparation. |
|                                            | D | Data logger                                                                        |                 |

• Parameterisation software

PC-based configuration software PM-TOOL, for devices without keypad; for a simple adjustment of standard devices, incl. CD & USB adapter.  
Programming happens via interface.

PM-TOOL-USB

29,00

• Technical data

|                         |                  |                                                    |
|-------------------------|------------------|----------------------------------------------------|
| Housing                 | Dimensions       | W22.5 x H117.2 x D107 mm                           |
|                         | Fixing           | top hat rail                                       |
|                         | Housing material | PA6.6, black, UL94V-0                              |
|                         | Connection       | plug-in terminal; wire cross section up to 1.5 mm² |
| Display                 | Display          | 3-digit                                            |
|                         | Digit height     | 7 mm                                               |
|                         | Segment colour   | red                                                |
|                         | Range of display | -199 to 999                                        |
|                         | Switching points | LED S1, LED S2, LED S3, LED S4                     |
|                         | Overflow         | horizontal bars at the top                         |
|                         | Underflow        | horizontal bars at the bottom                      |
| Display time/Meas. time |                  | 0.1 to 10.0 seconds                                |

Measuring input

| Signal           | Measuring range                 | Measuring span | Resolution    |
|------------------|---------------------------------|----------------|---------------|
| Voltage          | 0...10 V (Ri > 100 kOhm)        | 0...12 V       | ≥ 14 bit      |
| Voltage          | 0...2 V (Ri ≥ 10 kOhm)          | 0...2,2 V      | ≥ 14 bit      |
| Voltage          | 0...1 V (Ri ≥ 10 kOhm)          | 0...1,1 V      | ≥ 14 bit      |
| Voltage          | 0...50 mV (Ri ≥ 10 kOhm)        | 0...75 mV      |               |
| Current          | 4...20 mA (Ri = ~125 Ohm)       | 1...22 mA      |               |
| Current          | 0...20 mA (Ri = ~125 Ohm)       | 0...22 mA      |               |
| Pt100-3-wire     | -50...200°C                     | -58...392°F    | 0,1°C / 0,1°F |
| Pt100-3-wire     | -200...850°C                    | -328...1562°F  | 1°C / 1°F     |
| Pt1000-2-wire    | -200...850°C                    | -328...1562°F  | 1°C / 1°F     |
| Thermo K         | -270...1350°C                   | -454...2462°F  | 1°C / 1°F     |
| Thermo S         | -50...1750°C                    | -328...3182°F  | 1°C / 1°F     |
| Thermo N         | -270...1300°C                   | -454...2372°F  | 1°C / 1°F     |
| Thermo J         | -170...950°C                    | -274...1742°F  | 1°C / 1°F     |
| Thermo T         | -270...400°C                    | -454...752°F   | 1°C / 1°F     |
| Thermo R         | -50...1768°C                    | -58...3214°F   | 1°C / 1°F     |
| Thermo B         | 80...1820°C                     | 176...3308°F   | 1°C / 1°F     |
| Thermo E         | -270...1000°C                   | -454...1832°F  | 1°C / 1°F     |
| Thermo L         | -200...900°C                    | -328...1652°F  | 1°C / 1°F     |
| Frequency        | 0...10 kHz                      | 0...10 kHz     | 0.001 Hz /    |
| NPN              | 0...3 kHz                       | 0...3 kHz      | 0.001 Hz /    |
| PNP              | 0...1 kHz                       | 0...1 kHz      | 0.001 Hz      |
| Rotational speed | 0...9999 1/min                  | 0...9999 1/min | 0.001 1/min   |
| Counter          | 0...9999 (prescaler up to 1000) |                |               |

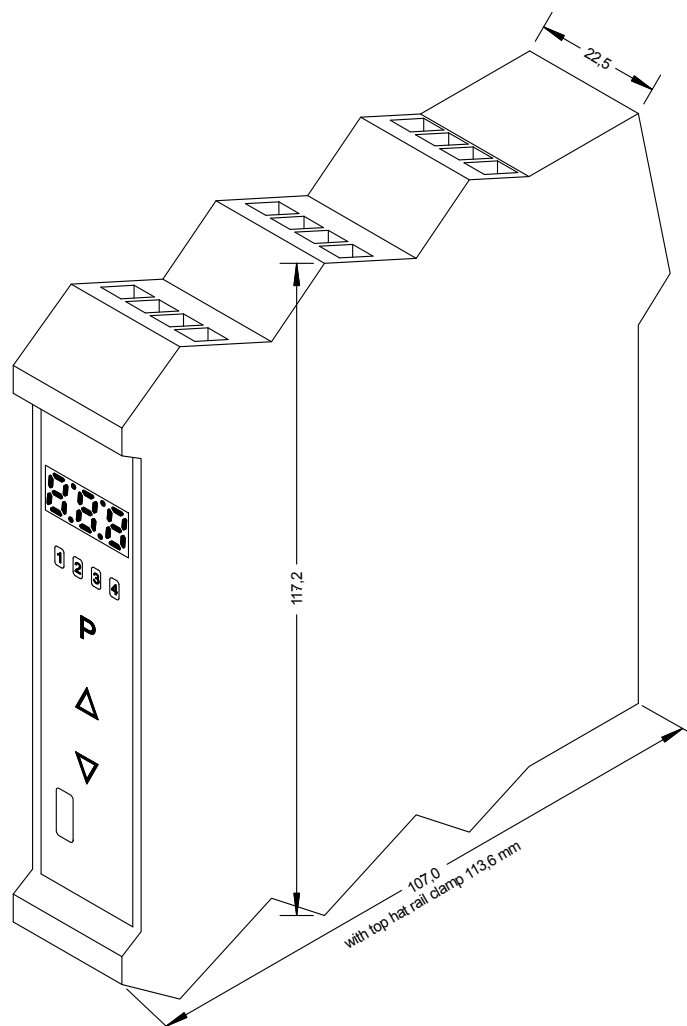
|             |                                        |                                    |
|-------------|----------------------------------------|------------------------------------|
| Pulse input | TTL / Low <2 V / High >3 V             | HTL/PNP / Low <6 V / High >8 V     |
|             | NPN / Low <0.8 V / High via resistance | Namur / Low <1.5 mA / High >2.5 mA |

|             |               |
|-------------|---------------|
| Reset input | active <0.8 V |
|-------------|---------------|

|                 |                |                                   |
|-----------------|----------------|-----------------------------------|
| Measuring error | Standard       | 0.2% of measuring range ± 1 Digit |
|                 | Pt100 / Pt1000 | 0.5% of measuring range ± 1 Digit |
|                 | Thermocouple   | 0.3% of measuring range ± 1 Digit |

|                           |                                                                                     |                                                                                                                                                                                                     |
|---------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Accuracy</b>           | Reference junction                                                                  | $\pm 1^{\circ}\text{C}$                                                                                                                                                                             |
|                           | Drift of temperature                                                                | 100 ppm/K                                                                                                                                                                                           |
|                           | Measuring time                                                                      | 0.01...2.0 seconds                                                                                                                                                                                  |
|                           | Measuring rate                                                                      | approx. 1/s with temperature sensor, approx. 100/s with standard signals                                                                                                                            |
|                           | Measuring principle                                                                 | U/F-conversion                                                                                                                                                                                      |
|                           | Resolution                                                                          | approx. 14 Bit at 1s measuring time                                                                                                                                                                 |
| <b>Output</b>             | Sensor supply                                                                       | 24 VDC / 50 mA incl. digital input, < 2.4V OFF, > 10V ON, max. 30 VDC / $R_i \sim 14\text{ k}\Omega$                                                                                                |
| <b>Switching points</b>   | 2x relay outputs<br>with nomally open contact                                       | Switching voltage 30 VDC/AC, max. 2 A resistive load<br>operating life < 30 mV/< 10 mA – min. $2,5 \times 10^6$<br>30 VDC / 1 A – minimum $5 \times 10^5$<br>30 VDC / 2 A – minimum $1 \times 10^5$ |
|                           | 2 PhotoMos-outputs<br>with nomally open contact                                     | Switching voltage 30 VDC/AC, max. 0,4 A                                                                                                                                                             |
| <b>Analog output</b>      | 0-10 VDC / load min. 10 k $\Omega$ ,<br>0/4-20 mA / load max. 500 $\Omega$ , 12 Bit |                                                                                                                                                                                                     |
| <b>Interface</b>          | Modbus with ASCII or RTU protocol                                                   |                                                                                                                                                                                                     |
|                           | USB                                                                                 | 11520 Baud, no parity, 8 data bit, 1 stop bit, flow control (none)                                                                                                                                  |
|                           | Bluetooth                                                                           | 9.600 Baud, no parity, 8 data bit, 1 stop bit, flow control (none)                                                                                                                                  |
|                           | RS323                                                                               | 9.600 Baud, no parity, 8 data bit, 1 stop bit, wire length max. 3 m                                                                                                                                 |
|                           | RS485                                                                               | 9.600 Baud, no parity, 8 data bit, 1 stop bit, wire length max. 1.000 m                                                                                                                             |
| <b>Power pack</b>         | Supply                                                                              | 24 VDC $\pm 10\%$ galvanic isolated, $\leq 5\text{ VA}$<br>100-240 VAC 50/60 Hz DC $\pm 10\%$ , $\leq 15\text{ VA}$<br>15-40 VDC galvanic isolated / 20-30 VAC 50/60 Hz, $\leq 10\text{ VA}$        |
|                           |                                                                                     |                                                                                                                                                                                                     |
|                           |                                                                                     |                                                                                                                                                                                                     |
| <b>Memory</b>             | EEPROM                                                                              | Data preservation $\geq 100$ years at $25^{\circ}\text{C}$                                                                                                                                          |
| <b>Ambient conditions</b> | Working temperature                                                                 | $-20$ to $+50^{\circ}\text{C}$                                                                                                                                                                      |
|                           | Storing temperature                                                                 | $-30$ to $+70^{\circ}\text{C}$                                                                                                                                                                      |
|                           | Weathering resistance                                                               | relative humidity 0-85% on years average without dew                                                                                                                                                |
| <b>EMV</b>                | EN 61326                                                                            |                                                                                                                                                                                                     |
| <b>CE-identification</b>  | conformity according to directive 2014/30/EU                                        |                                                                                                                                                                                                     |
| <b>Safety regulations</b> | according to low voltage directive 2014/35/EU;<br>EN 61010; EN 60664-1              |                                                                                                                                                                                                     |

#### Housing:



- **Purchase order key**

|                                                                                               |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
|-----------------------------------------------------------------------------------------------|---|----|---|---|---|---|----|---|---|---|----|---|---|---|---|--|
|                                                                                               | M | H- | 1 | U | R | 3 | A. | 0 | 0 | 0 | X. | S | 6 | 0 | A |  |
|                                                                                               |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Standard type M-Line                                                                          |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Top hat rail housing                                                                          |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Housing size                                                                                  |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| 22.5 x 117.2 x 107 mm (WxHxD)                                                                 |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Type of display                                                                               |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Multifunction                                                                                 |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Display colour                                                                                |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Red                                                                                           |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Number of digits                                                                              |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| 3-digit                                                                                       |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Digit height                                                                                  |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| 7 mm                                                                                          |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Digital input                                                                                 |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Without                                                                                       |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Interface RS232                                                                               |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Interface RS485                                                                               |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Bluetooth interface                                                                           |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Data logger                                                                                   |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Sensor supply                                                                                 |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Without                                                                                       |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| 24 VDC / 50 mA incl. digital input                                                            |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Version                                                                                       |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| A                                                                                             |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Switching points                                                                              |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| 0 No switching points                                                                         |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| 2 2 relay outputs                                                                             |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| 3 2 PhotoMos outputs                                                                          |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| 5 2 PhotoMos and 2 relay outputs                                                              |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Protection class                                                                              |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| 6 IP20 / pluggable terminal                                                                   |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Supply                                                                                        |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| 7 24 VDC, galv. isolated                                                                      |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| S 100-240 VAC, DC ±10%                                                                        |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| W 15-40 VDC, 20-30 VAC                                                                        |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Measuring input                                                                               |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| X Direct voltage, direct current, Shunt, Resistance, Pt100(0), Thermocouple Frequency Counter |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| Analog output                                                                                 |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |
| X 1x 0-10 VDC, 0/4-20 mA (without interface)                                                  |   |    |   |   |   |   |    |   |   |   |    |   |   |   |   |  |