



## Universal digital indicator MV31

MV31 is a universal high precision process digital indicator designed for a wide range of input sensors and signals. Five digits LED with 20mm height, allows to read the measurement values from big distant.

### Characteristic:

- Compact 150x139,60x34 mm in ABS housing
- Large 5 digit LED display with 20mm height
- Status indication by LED's at front panel
- 85...264VAC or 10...36VDC power supply
- Full configurable via function keys on front panel or by PC via RS232 interface
- Max working and storage temperature 70 °C

### Standard input/output:

- One universal analog input
- One contact digital input,
- Two Relay digital outputs with 230Vac / 3A

### Flexible digital outputs function:

- Alarm-comparing value with Hysteresis
- Limit comparing with acknowledge signal
- One shot impulse with defined width
- Time before accept comparison.

### Additional Optional modules:

- Galvanically isolated universal analog output
- Additional analog input
- RS485 Modbus RTU interface
- Two Relay digital outputs with 230Vac / 3A
- Digital isolated input module
- Sensor supply module

### Measurement Functions:

- Wide range of input signal types software configurable, 24bit resolution and high accuracy
- User defined scaling of analog inputs in two points
- Correction algorithm of measurement in one or two points
- Advance Linearization table up to 10 points, with spline interpolation in between.
- Hold function
- Tare function
- Min/max memorizing function
- Hardware and software filtering
- Special working with one or two electrochemical sensor in auto calibration mode.

### Optional Mathematic function

- Dew point [°C] in range -30°C...+30°C
- O<sub>2</sub> concentration [%] in range 10<sup>-29</sup>...100%
- Lambda value calculation function

### Optional PC configuration software:

- "MV31-Settings" - PC based Windows 7/Vista/XP software for easy configuration and testing of MV31 device.
- Delivered with Isolated USB to RS232 converter to connect with MV31.

## Technical Data:

- **Analog inputs** (one standard and one optional)

### 1. Thermocouple input

Type	Measuring range	Measuring accuracy	resolution*
B	PtRh-Pt6%	250...1820°C	<1,5°C
C	W5%Re-W26%Re	0...2315°C	<1°C
E	NiCr-CuNi	-200...1000°C	<1°C
J	Fe-CuNi	-210...1200°C	<1°C
K	NiCr-Ni	-200...1350°C	<1°C
L	Fe-CuNi DIN	-200...900°C	<1°C
M	NiMo/NiCo	-50...1410°C	<1°C
N	Nicrosil-Nisil	-200...1300°C	<1°C
R	PtRh-Pt13%	-50...1760°C	<1°C
S	PtRh-Pt10%	-50...1760°C	<1°C
T	Cu-CuNi	-200...400°C	<1°C
Cold junction sensor		-25°C...+85°C	1,5°C
Temp. of ext. ambient sensor if TC is selected		-100°C...+200°C	-

In accordance with ASTM E230-98e1, E 988-96, DIN 43710-1985, ASTM E1751

Ambient temperature sensor is included

\*Resolution is defined with 5 digits display. Real resolution is much greater.

### 2. RTD input (three or four wire connection)

Type	Measuring range	Measuring accuracy	resolution*
PT100, 3 or 4-wire	-200.0 ... 850.0 °C	0.5°C	0.01°C
PT1000, 3 or 4-wire	-200.0 ... 850.0 °C	0.5°C	0.01°C
KTY11-6	-50..150 °C	0.5°C	0.01°C
Potentiometer	0...630□	0.1%	0.001%
Potentiometer	0...5000□	0.1%	0.001%

In accordance with EN 60751

### 3. Additional analog inputs

Type	Measuring range	Measuring accuracy	resolution*
Voltage	-0.5V...+10V**	0.05%	0.1mV
Voltage	+2V	0.05%	0.1mV
Voltage	+125mV	0.05%	10µV
Voltage	+30mV	0.2%	1µV
Current	-5mA...+25mA	0.05%	1µA
O <sub>2</sub> [%] L or O <sub>2</sub> probe	10 <sup>-29</sup> ...0.21%	1% of reading	Float point
Dew point	-30°C...+30°C	1%	0.02°C
Lambda value	0.6...10.0	0.3%	0.001°C

\*\* Range of +20V on demand

### - Analog inputs, process value

ADC Analog input resolution	24 bit
Sample period	0.5...1s
Input noise rejection (50/60Hz)	87dB
Digital filter	0...100s
Measurement correction	One or two point correction
Input impedance analog inputs	30MΩ
Input impedance analog input 10V range	100KΩ
Electrical isolation (analog output, RS-485, digital input, coil-contact of Relay outputs)	3000V

• **Digital inputs**

One unisolated as standard, and two isolated optional. Those inputs can be used as control signal for special functions as Hold, Tare, Min/Max.

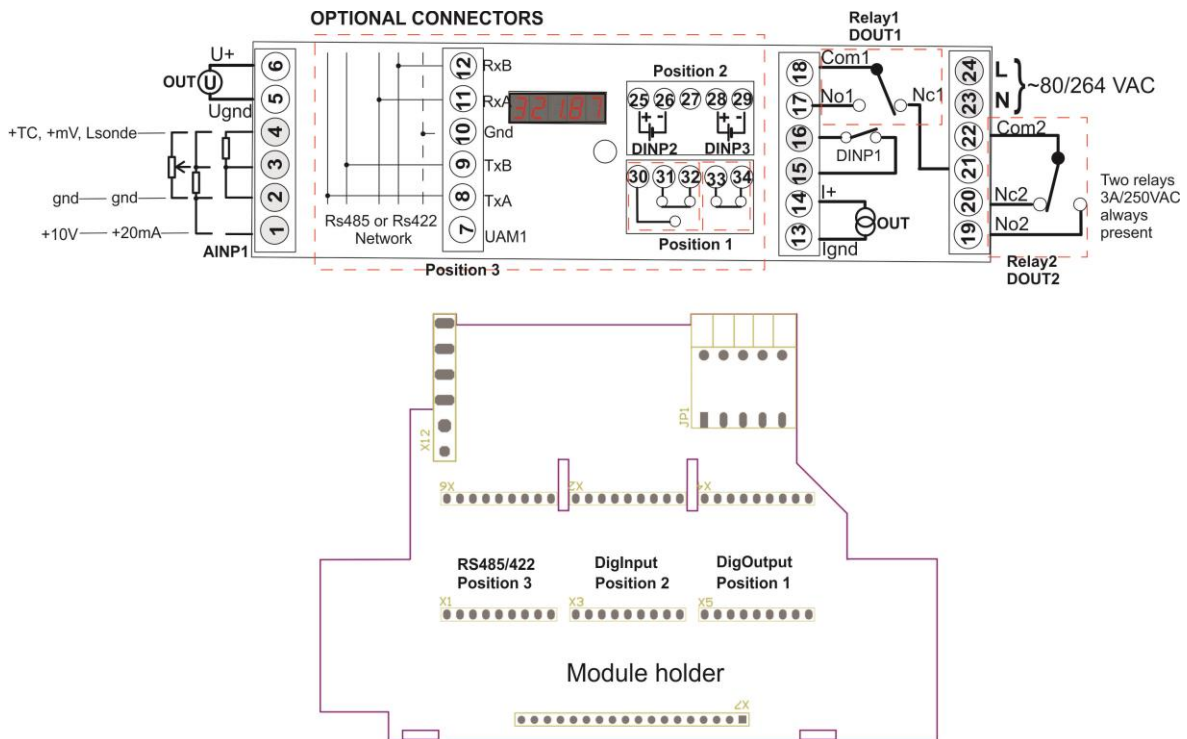
• **Outputs**

Type	Standard / option	Ratings	Max. Load	Resolution	Accuracy
Relay SPST-NO	2 standard + 2 optional	3A/250V	-	-	-
Current output	option	0mA...20mA 4mA...20mA	<400Ω	16 bit	0.2%
Voltage output	option	0V...+10V 2V...+10V	>2kΩ	16 bit	0.2%
Voltage output	option*	-10V...+10V	>2kΩ	16 bit	0.2%
Voltage output	option*	-1V...+1V	>200Ω	16 bit	0.2%
Voltage output	option*	-100mV...+100mV	>100Ω	16 bit	0.2%
Voltage output	option*	-25mV...+25mV	>100Ω	16 bit	0.2%
Sensor supply voltage	option	non-regulated 15V/30mA	>500Ω	-	-

\*Possible with analog output module AOM2

**Electrical connection:**

Screw type terminal blocks.



**Positions of optional Modules:**

- Digital Output module -> position 1
- Digital input module -> position 2
- RS485 module ->position 3
- Sensor supply module -> any position
- Analog Input module -> any position

**Interface:**

- RS232 available at the front side for connecting the device with PC.  
Needed additional accessories include:  
Isolated USB/RS232 converter, USB 2.0 Full Speed compatible, isolation voltage 2500V
- RS485/RS422 as option. Isolated interface for Modbus RTU protocol, available at the back side for connecting the device into network.

**Power supply:**

AC 85VAC...264VAC, 50-60Hz  
OR  
DC 10VDC...36VDC  
Power consumption 10VA

**Housing:**

ABS housing for front panel mounting.

Dimensions 48x96x107

Protection:

Front IP 60

IP 65 with optional protection cab

Back IP20

**Product coding:**

Maximal three optional modules can be chosen from Module1 to 5. Each module can be selected only one time. Order Code is in the form: **MV31-A-B-C-D-E-F**

where code A, B and C define optional module at position 1, 2 and 3. Code D defines ordering of isolated analog output module (AOM), E is for ordering Dew Point/O<sub>2</sub> software option, and F defines type of power supply.

A	B	C	D	E	F	Possible codes
0,1,4,5	0,2,4,5	0,3a,3b,3c,4,5	0, 1	0, 1,2	1, 2	
0	0	0	0	0		None
1						<b>Module1: "Two relays module"</b> two additional relay outputs (220V/3A)
	2					<b>Module2: "Two digital inputs"</b> two isolated +24VDC digital inputs
		3a				<b>Module3: "RS-485 module"</b> Isolated RS-485 communication interface for Modbus RTU protocol <b>2-wires</b>
		3b				<b>Module3: "RS-485 module"</b> Isolated RS-485/RS-422 communication interface for Modbus RTU protocol <b>4-wires</b>
		3c				<b>Module3: "RS-232 module"</b> Non-isolated RS-232 communication interface for Modbus RTU or Internal Mesa protocol
4	4	4				<b>Module4: "input 2"</b> additional isolated analog TC input for furnace (dew point and O <sub>2</sub> conc.) measurement
5	5	5				<b>Module5: "Sensor Power Supply"</b> Non regulated power supply for sensor 15V/30mA
			1			<b>Module6: "AOM1"</b> Isolated analog output with software configurable ranges 0(2)..10V, 0(4)..20mA
			2			<b>Module7: "AOM2"</b> Isolated analog output with software configurable ranges as AOM1 and +-10V, +-1V, +-100mV, +-25mV
				1		Software option for dew point/O <sub>2</sub> /Lambda calculation
				2		Software option for Electro chemical sensor auto calibration
					1	Universal AC 115VAC/230VAC Power supply
					2	+24VDC Power supply

**Ordering code example:**

**MV31-0-0-0-1-0-1** to order AOM module and AC 115VAC/230VAC power supply.

**MV31-0-0-3a-1-0-2** to order RS-485 2 wire, AOM module +24VDC power supply.

**MV31-5-2-3b-0-0-1** to order Sensor power supply module, two digital inputs module, RS-485 4 wire, and AC 115VAC/230VAC power supply.

**MV31-1-4-5-0-1-2** to order the Two relays module, input2 module, Sensor power supply, Dew point/O<sub>2</sub>/Lambda software option and +24VDC power supply.

**MV31-Settings** Optional PC Windows 7 /Vista/XP configuration software with Isolated USB to RS232 converter