IM80

8 Channel Analog Input Module

- 8 analog inputs RTD / TC / I / U / R
- 72 measurement channels
- Display LCD 2x16 characters
- Port USB C on the front panel
- Port RS–485, Modbus RTU Master
- Port RS–485, Modbus RTU Slave
- Internal memory recording
- Configuration software
- Dimensions 90.5 x 142.5 x 62 mm
- Power 24VDC (16-32VDC)

The IM80 is a precision programmable analog input module designed for use in a distributed measurement or control system. Eight measurement channels allow the connection of RTDs, TC thermocouples, or 4-20mA current signals. The input signals are processed in an 18-bit A/D converter. The data received from the transmitter is digitally linearized and processed by the microprocessor system, and then made available to the master system via the COM1 (RS-485 / Modbus RTU) SLAVE communication port. The second COM2 (RS-485 / Modbus RTU) MASTER communication port allows you to connect additional IM80 modules to increase the number of measurement channels.

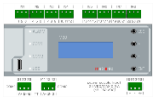
The device is designed to measure and recording process signals in industrial installations and can be used to measure physical quantities converted into a standard signal, such as: temperature, humidity, pressure, flow, level, chemical composition, etc. The device is suitable for measuring slow-changing waveforms, where changes do not occur faster than at intervals of a few seconds.

Simple setup requires no additional programming skills. The device can be configured using the front panel of the device or using a dedicated computer program.

BASIC FEATURES

- Measurement of process variables in 8 channels
- Sensor measurement Pt100, Pt1000, Ni100, Cu50, Cu53, KTY-81
- Thermocouple measurement B, E, J, K, L, N, R, S, T, U
- Resistance measurement 0..400 Ω, 0..4000 Ω
- Voltage measurement -0,2..+0,2 V, -1,3..+1,3 V
- Current measurement 0..20mA / 4..20mA
- Remote readout in 64 channels
- Recording in 2GB memory
- Communication with the superior computer system
- Reading parameters from modules in the local network

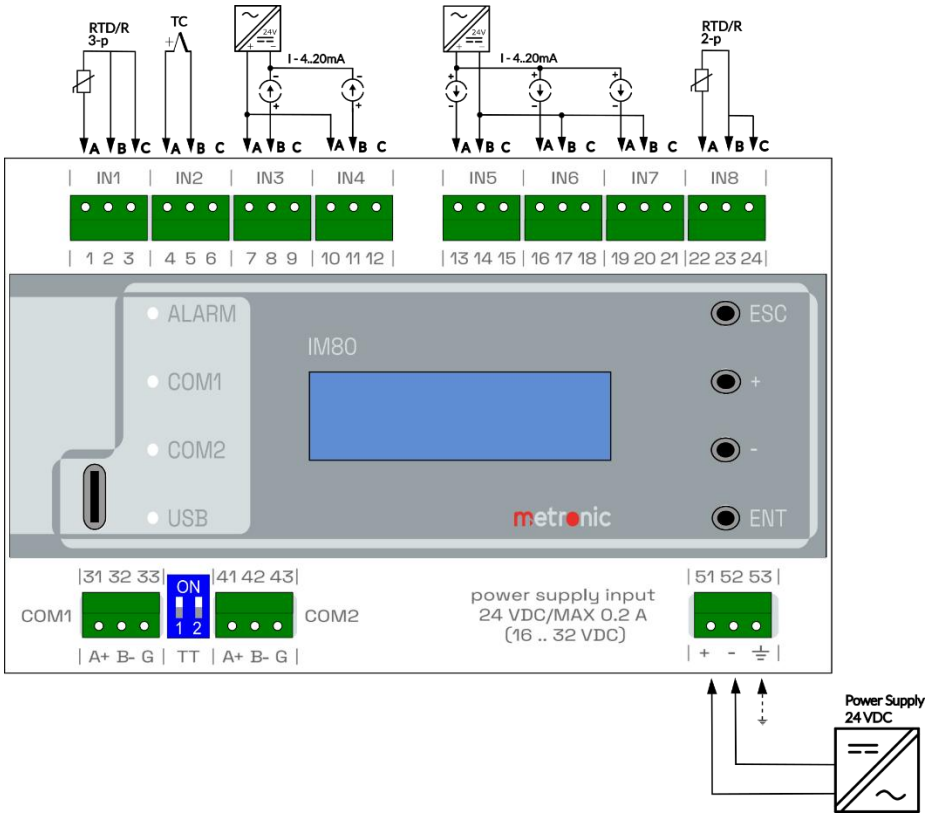
AVAILABLE OPTIONS AND HOW TO ORDER

IM80-XX		00	RS485 Slave
		01	RS485 Slave + RS485 Master
		10	RS485 Slave + recording
		11	RS485 Slave + RS485 Master + recording

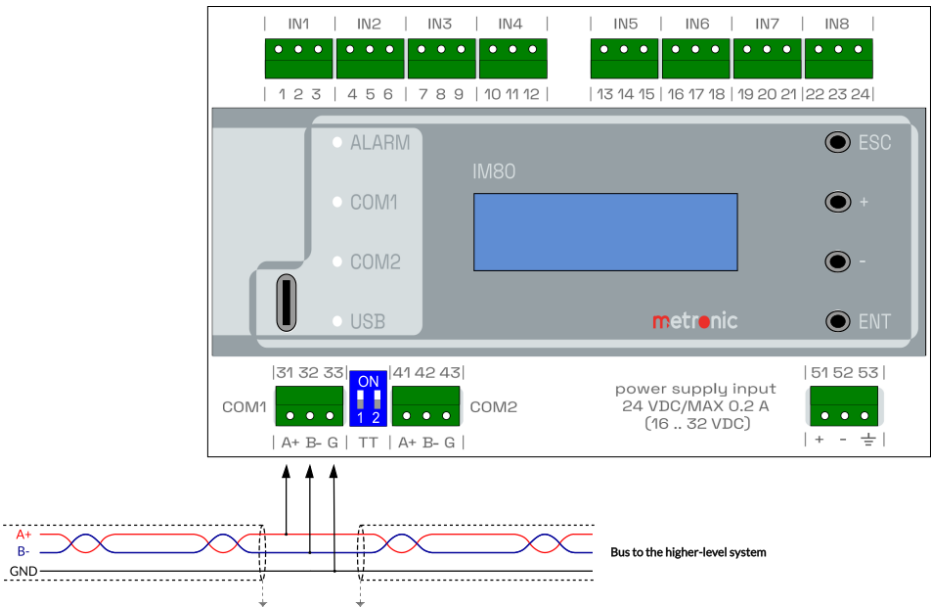
Producer:
Metronic AKP sp. j.
ul. Żmujdzka 3, 31-426 Kraków

T: 12 312 16 80 | metronic@metronic.pl | www.metronic.pl

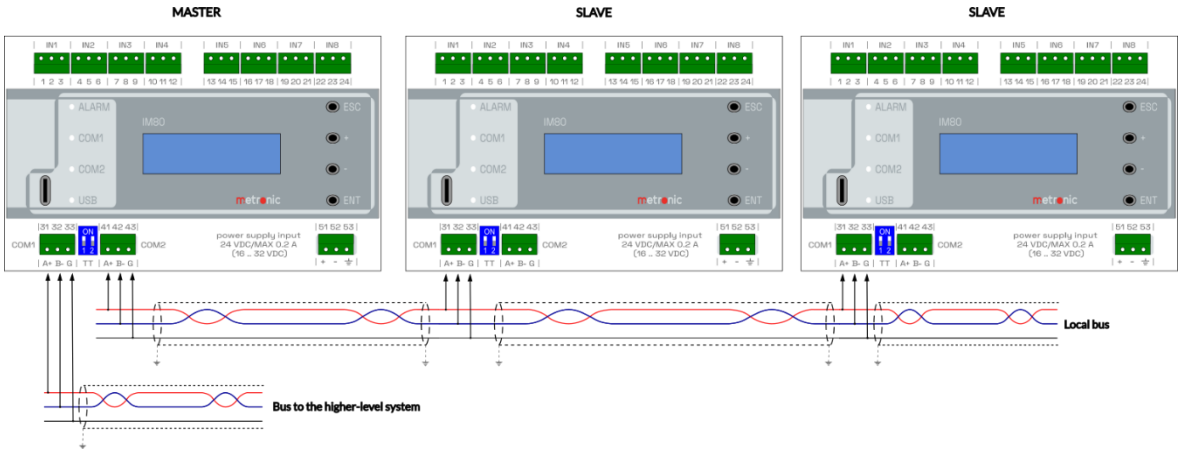
Sample transducers wiring



Wiring to the higher-level system



Sample of extended measurement system



SPECIFICATIONS

Front panel	
Display Type	LCD alphanumeric 2 x16 characters with backlight
Character height	4,5 mm
LEDs	4 tricolour (ALARM, COM1, COM2, USB)
Keyboard	4 push buttons
Port USB	USB-C
Terminal blocks	
Input signals	8 screw three-terminal connectors 1,5mm^2
Communication Ports COM1, COM2	2 screw three-terminal connectors 1,5mm^2
Port COM1 RS-485 - SLAVE	
Signals output on the connector	A(+), B(-), G, G (G - signal ground)
Load	256 receivers/transmitters
Transmission Protocol	Modbus RTU Slave
Baud	9.6, 19.2, 38.4, 57.6, 115.2 kbps
Parity check	Even, Odd, None
Frame	1 start bit, 8 data bits, 1 stop bit
Galvanic isolation	250 VAC; 1500 VAC for 1 min
Maximum Line Length	1200 m
Bus termination	Vcc-A(+)-B(-)-G: 390 Ω - 220 Ω - 390 Ω - DIP SW
Maximum differential voltage A(+), B(-)	-7 V .. +12 V
Minimum transmitter output	1,5 V (at R_L= 54 Ω)
Minimum receiver sensitivity	200 mV / R_{IN}= 12 kΩ
Minimum data line impedance	54 Ω
Short circuit/thermal protection	Yes/Yes
Port COM2 RS-485 - MASTER	
Signals output on the connector	A(+), B(-), G, G (G - signal ground)
Load	256 receivers/transmitters
Transmission Protocol	Modbus RTU Master
Baud	9.6, 19.2, 38.4, 57.6, 115.2 kbps
Parity check	Even, Odd, None
Frame	1 start bit, 8 data bits, 1 stop bit

Producer:
Metronic AKP sp. j.
ul. Żmujdzka 3, 31-426 Kraków
T: 12 312 16 80 | metronic@metronic.pl | www.metronic.pl

Galvanic isolation	250 VAC; 1500 VAC for 1 min
Maximum Line Length	1200 m
Bus termination	Vcc-A(+)-B(-)-G: 390 Ω - 220 Ω - 390 Ω - DIP SW
Maximum differential voltage A(+), B(-)	-7 V .. +12 V
Minimum transmitter output	1,5 V (at R_L= 54 Ω)
Minimum receiver sensitivity	200 mV / R_{IN}= 12 kΩ
Minimum data line impedance	54 Ω
Short circuit/thermal protection	Yes/Yes

Power Supply

Supply voltage	24 VDC (16 .. 32 VDC)
Maximum power consumption	1.5W typically , 4.8W max.

Connecting the wires (screw connectors)

Type	Detachable screw connectors
Wire cross-section	Cable and strand 0.14 .. 1.5 mm^2

Working conditions

Operating Temperature	0 °C .. +50 °C
Humidity	5 .. 90% (non-condensing)
Storage Temperature	-10 °C .. +70 °C

Mechanical dimensions

Enclosure type	For mounting on the TS-35 or wall
Dimensions (height x width x depth)	90.5 x 142.5 x 62 mm (64.5 mm with terminals)
Mass	ok. 0.3 kg
Protection	IP30

Analog inputs

Number of inputs	8 (we1 .. we8)
Galvanic separation between channels	No
Galvanic separation from the supply voltage	250 VAC; 1500 VAC for 1 min
Maximum input voltage	+/-30VDC or 30V_{p-p} between the terminals ABC

RTD inputs

Measuring range	0..4000 Ω
Sensor Type	Pt100, Pt1000, Ni100, Cu50, Cu53, KTY-81
Sensor current	250 µA
Sensor connection	3-wire or 2-wire
2p wire resistance compensation	A fixed adjustment in the range of −10 Ω do 10 Ω

TC Inputs

Measuring range	-140 .. +140mV
Sensor Type	B, E, J, K, L, N, R, S, T, U
Cold junction compensation	Fixed, Internal, External
Cold junction compensation range	-50.0 °C do +100.0 °C
Maximum Conductor Resistance	2 x 300 Ω
Measurement accuracy	According to the table for the sensor type

R inputs

Measuring range	0 .. 400 Ω 0 .. 4000 Ω
Processing characteristics	Linear
Sensor connection	3-wire or 2-wire
Measurement accuracy (T_a=25°C)	<±0.5 Ω (0..400 Ω)

Producer:
Metronic AKP sp. j.
ul. Żmujdzka 3, 31-426 Kraków
T: 12 312 16 80 | metronic@metronic.pl | www.metronic.pl

	<±1.0 Ω (0..3000 Ω) <±8.0 Ω (3000..4000 Ω)

Inputs I

Measuring range	0 .. 20mA 4 .. 20 mA
Processing characteristics	Linear
Sensor connection method	2-wire with external power supply
Basic error (T_a=+25°C)	<±0,1 % of measurement range

U inputs

Measuring range	-0.2 .. +0.2 V -1.3 .. +1.3 V
Processing characteristics	Linear
Sensor connection method	2-wire
Measurement accuracy (T_a=25°C)	<±0.1% of measurement range

Remote inputs

Number of inputs	64 (WE9 .. WE72) Read via COM2 port Modbus protocol RTU
Range of supported registers	30000 .. 39999, 300000 .. 365535 40000 .. 49999, 400000 .. 465535
Supported number format	uint(16b), int(16b), uint(32b), uint(32b)sw, int(32b), int(32b)sw, float(32b), float(32b)sw, int(64b), double(64b)

RTD SENSOR TABLE

Sensor Type	Measurement range	Accuracy
Pt100 (EN 60751+A2:1995)	-50 .. 300°C -200 °C .. -50 °C / +300 °C .. +850 °C	±0.5 °C (typ. ±0.3 °C) ±1.0 °C (typ. ±0.6 °C)
Pt1000 (EN 60751+A2:1995)	-50 .. 300°C -200 °C .. -50 °C / +300 °C .. +650 °C	±0.5 °C (typ. ±0.3 °C) ±1.0 °C (typ. ±0.6 °C)
Ni100 (DIN43760 /08-1985)	-60 °C .. +250 °C	±0.5 °C (typ. ±0.3 °C)
Cu50, Cu53 (GOST6651-2009)	-180 °C .. +200 °C	±0.5 °C (typ. ±0.3 °C)
KTY81 (NXP Rev05-25.04.2008)	-55 °C .. +150 °C	±0.5 °C
Linear resistance 0..400 Ω	0 .. 400 Ω	±0.5 Ω (typ. ±0.3 Ω)
Linear resistance 0..4000 Ω	0 .. 3000 Ω 3000 .. 4000 Ω	±1.0 Ω (typ. ±0.6 Ω) ±8.0 Ω (typ. ±6.0 Ω)

THERMOCOUPLE TABLE (TC)

Sensor Type	Measurement range	Accuracy
J (Fe-CuNi) (EN60584-1:1995)	-210 °C .. +1200 °C (Comp. Range -50 °C .. +100 °C)	±1.0 °C (typ. ±0.5 °C)
K (NiCr-NiAl) (EN60584-1:1995)	-270 °C .. + 1372 °C (Comp. Range -50 °C .. +100 °C)	±1.0 °C (typ. ±0.5 °C)
N (NiCrSi-NiSi) (EN60584-1:1995)	-200 °C .. +1300 °C (Comp. Range -50 °C .. +100 °C)	±2.0 °C (typ. ±1.0 °C)
R (PtRh 13-Pt) (EN60584-1:1995)	-50 °C .. +1768 °C	±2.0 °C (typ. ±1.0 °C)

	(Comp. Range -50 °C .. +100 °C)	
S (PtRh 10-Pt) (EN60584-1:1995)	-50 °C .. +1768 °C (Comp. Range -50 °C .. +100 °C)	±2.0 °C (typ. ±1.0 °C)
T (Cu-CuNi) (EN60584-1:1995)	-200 °C .. +400 °C (Comp. Range -50 °C .. +100 °C)	±1.0 °C (typ. ±0.5 °C)
E (NiCr-CuNi) (EN60584-1:1995)	-200 °C .. +1000 °C (Comp. Range -50 °C .. +100 °C)	±1.0 °C (typ. ±0.5 °C)
B (PtRh30-PtRh6) (EN60584-1:1995)	+250 °C .. +1820 °C (without compensation)	±2.0 °C (typ. ±1.0 °C)
L (Fe-CuNi) (DIN43710)	-200 °C .. +900 °C (Comp. Range -50 °C .. +100 °C)	±1.0 °C (typ. ±0.5 °C)
U (Cu-CuNi) (DIN43710)	-200 °C .. +600 °C (Comp. Range -50 °C .. +100 °C)	±1.0 °C (typ. ±0.5 °C)
Line Voltage	-0.2 .. +0.2 V / -1.3 .. +1.3 V	< ±0.1% of full range

Datasheet version: 250311 EN / Device version: 1.0

Producer:
Metronic AKP sp. j.
ul. Żmujdzka 3, 31-426 Kraków

T: 12 312 16 80 | metronic@metronic.pl | www.metronic.pl