

- Precise measurement of analog variables
- 20 inputs
10 input modules
- 20bits A/D converter
- Exchangeable input modules
- Communication RS232, RS485
- High stability of parameters
- Power supply 24V



Basic characteristic

MA10 is a distributed unit for analog signals connection to a control system. Input analog signals are connected through input modules, where they are changed onto normalised unipolar voltage. Analog input parameters depend on concrete input modules fitting (e.g. for thermocouple, Pt100, Ni1000, U, I, R). The basic unit available is MA10/ZT01 input module for thermocouple. Range of modules is variable according to the request of the customer. Input modules can have up to 2 channels. For modules used to thermocouple connection is the second channel standardly used for input terminal temperature measurement (cold end of thermocouple) with an inbuilt sensor.

MA10 unit is designed with 20bit A/D converter sigma-delta. Normalized input power supplies (3V) are connected through analog multiplexer. The highest measured value bit is the 20-th bit and it is a sign bit. Even though the inputs are unipolar, it is possible to measure even small negative voltage (up to -0.3V). The processor controls the operation. There is two-level device calibration. In MA10 unit are stored its own calibration constants in EEPROM. Input modules also include EEPROM, which stores their calibration constants. Due to EEPROM is possible to exchange the modules without any need to calibrate them again. The whole built-up unit is calibrated to provide especially precise measurements. The input modules are not exchangeable after this calibration. The conversion of measured values according to calibration constants is by SW. The communication with superior system provides a serial communication line. This can be variably RS232 or network RS485. Communication is according to a protocol, which is described in the documentation. Measurement is cyclical through all the channels. In the inner memory are constantly actual values of all inputs, which can be read anytime by the superior system. Filtration is serviced by averaging of measured values. Details are named in the documentation.

For power supply can be used also non-stabilized 24V direct supply. Power supply, analog inputs, communication line and the unit frame are galvanic separate. Analog inputs have common minus pole.

The unit is built on a PCB. On the PCB are connectors for inserting up to 10 input modules. Input clips on the longer side of the unit are a part of the input modules. On the opposite side are supply and communication connector and 4 LED. On the bottom and on top of the unit is a metal cover with clips for input cables. Input clips on the thermocouples modules are covered with an isolating cover, which provides constant temperature.

During installation is necessary to bear in mind, that in some application is worked with microvolt supply and high resolution. Here is the accuracy highly influenced by temperature, clip-contact resistance and disturbance. Shielded cables are recommended. Shields can be mounted on the bottom cover of the unit with clips.

Technical data (without input modules)

Power supply	24V _{DC} ±30%	Averaging	1 .. 16
Supply current	80mA	Speed of measurement	26 .. 90ms
Nr. of input modules	10	Communication	RS485, RS232 *)
Nr. of inputs	20	Baud rate	9600Bd
Input supply max.	-1 .. 5,5V	Ambient temperature	0 - +50°C
Measuring range	-0,3 .. 0 .. 3V	for guarantied accuracy	20 - 30°C
Resolution	±19 bits (524288dig/3V)	Dimensions	max 270x153x38mm
Accuracy	0,02% from range		
Input resistance	>5MΩ		

*) Alternative parameters need to be specified in order.

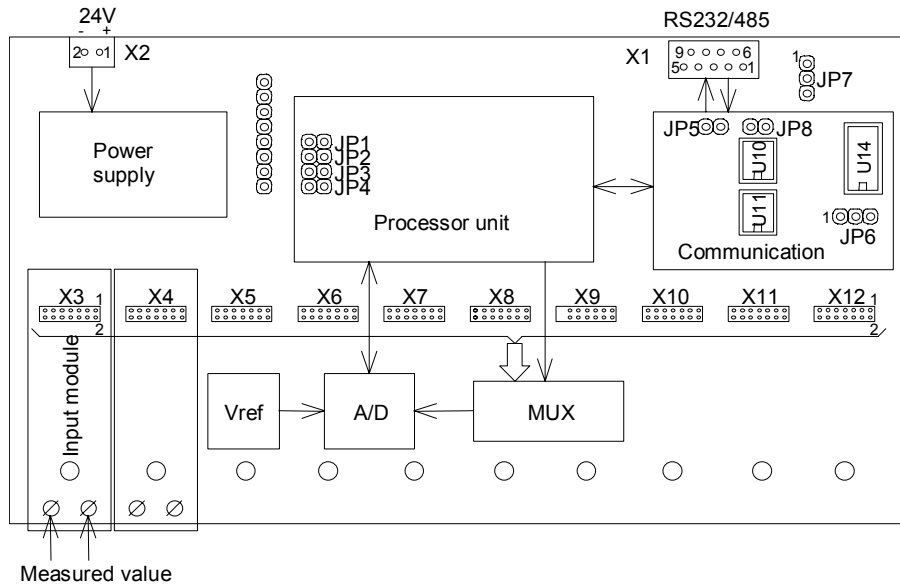
Order data

MA10 can be ordered separately or as a kit with input and output modules (Input modules have their own leaflet)

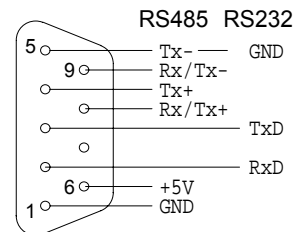
Communication interface specification RS232, RS485.

As accessory can be ordered supply and communication connector.

Clips and connection layout



Connector connection X1



Configuration

Just one communication interface is set.

Line driver fit:

RS232 U14 (MAX232)

RS485 U10, U11 (2x SN75176)

For RS485:

2wire/4wire,
terminators connection
at the ends of line,
unit address in network

JP7/1-2 RS232

JP7/2-3 RS485

JP6/1-2 RS485 2wire

JP6/2-3 RS485 4wire

JP5, JP8 terminators

OFF disconnected

ON connected

addr. JP4 JP3 JP2 JP1 0 = OFF

1 = ON

32 0 0 0 0

33 0 0 0 1

34 0 0 1 0

35 0 0 1 1

36 0 1 0 0

37 0 1 0 1

38 0 1 1 0

39 0 1 1 1

40 1 0 0 0

41 1 0 0 1

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47 1 1 1 1

Mounting dimensions and mounting holes

