Multifunctional Measuring Device with Display

Series MAP4000

The micro processor controlled process meters of the MAP4000 series show a high accuracy at a very good cost/value ratio. They enable the direct adaption of potentiometric sensors as well as of sensors with normalized analog output signals.

Due to the programming capability, the desired input variable can be flexibly adjusted.

Precision and safety

The high accuracy of up to 0.1% is achieved by using selected components, as for example the 24 bit Sigma-Delta converter.

2 programming levels are available: One code protected configuration menu and a user menu with the option to apply restrictions there to exclude end user errors. The programming is stored in a non volatile EEPROM memory.

Designed for your needs

Even the standard version offers a depth of functions (projection, digital filters, mathematic functions etc.). With optional extensions (limit switches, analog output, interfaces etc.), this functionality may be considerably expanded.

Adjustable supply voltage

This supply is adequate for connected Sensors. It is adjustable by means of a trimming potentiometer between 5...24V, the output power is max. 1.2 W.

Operation

The instrument is operated using 5 buttons on the front panel or via serial interface.

Special Features

- processor controlled measuring device with digital display
- 24 bit Sigma-Delta converter for high accuracy and stability
- good cost/value ratio
- multifunctional: inputs for
  – potentiometer
  – DC voltage
  – current / voltage
  – resistance
  – temperature sensors
- adjustable supply voltage output (5...24 V/max. 1.2 W)
- input easily selectable by programming
- display projection -99 999 ...999 999
- accuracy 0.1 % +1Digit of full scale
- Tc 100 ppm/°K
- up tp 40 measurements/s
- 2 different supply ranges: 10..30 V or 80..250 V DC or AC
- measured unit can be shown in display

Options

- up to 4 programmable limit switches via relays
- analog output interfaces RS 232 or RS 485
- built in measuring data memory, readable using interface

Functional description

Standard functions:

Adaption input to output	Measuring input	Input unit and measuring range (coarse)
	Measuring range	Fixed or with automatic measuring range change-over
	Adaption	In configuration menu optional adaption of measured signals to display content, for example 0.1...4.9V -> 0..250 (mm)
	Display projection	-99 999...999 999
Digital Filters	Exponential Average Value	Across 2...100 measurements
	Rounding	Adjustment of increment of display
Mathematic functions	Min/Max value	Storage of Min/Max value during the measurement
	Tare function	Zeroing of an arbitrary displayed value
	Peak value	Display shows either Max/Min value or actual measured value
	Math. Operations	Polynominal, 1/x, Logarithm, exponential, Exponent, Square root, sin x
Operation Options (using front panel buttons)	Lock	Blocking of buttons
	Hold	Blocking of measurement
	Tare function	Initate tare
	Reset	Reset of stored peak value

Optional Functions

Comparators

A value may be assigned to each comparator. The user may choose between various limit functions: Limit/ Dosing/ From-To.
The limit values have both an adjustable hysteresis und and activation delay. The exceeding of a limit value is displayed on a LED on the front panel of the device and is put out by a relay.

Analog Output

This option may be used in Applications where a secondary computing unit (PLC) uses the information of the same sensor than this device. The output can transmit either a voltage or a current signal (selectable via menu).

Interface RS 232 or RS 485

This Interface is suited to transmit measured data to a remote unit and to use those directly in the customers system. We offer both isolated RS232 and RS485.

Data Logger (only available/ useable with interface)

The built in measurement data storage executes a measurement and storage of data in a time triggered mode after start of measurement. So the device works as a data logger.

2 Modes are available::
- FAST: for a fast measurement and storage of 80 measurements per second. The memory depth is up to 8 000 Values.
- RTC: the data storage is being triggered by the internal (Real Time) clock. The memory depth is up to 250 000 Values.
The stored data can be read out via serial interface RS232 or RS485.

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Technical data

Accuracy of the device

Accuracy	±0.1% of range + 1 digit ±0.15% of range + 1 Digit (RTD, T/C) The values are given for a measurement rate of 5 /s
Temperature coefficient	100ppm/°K
Measurement rate	0.1 ... 40 measurements/s
Overload capacity	10x (max. 30ms); bei >400V, 5A: 2x
Input filtering	Exponential average, rounding
Functions	Offset, min/max. value, tare, peak value, mathematical functions
External control during measurement	HOLD, LOCK, Store
Memory depth RTC mode	up to 250k entries (Format: time/date/measured value)
Memory depth FAST mode	up to 8 k entries (Format: only measured value)
Watchdog	Reset of the device after 1.2 s

Input ranges

Voltage	0...60 / 150 / 300 mV	DC
Process dimensions	Current: 0..5mA or 0/4..20mA Voltage: ±2V, ±5V, ±10V / 0...40V	PM
Resistance	0... 100 / 1k / 10k / 100 kΩ or 5...105Ω	OHM
Platin temperature sensor	Pt 100 / Pt 500 / Pt 1 000	RTD
Nickel temperature sensor	Ni 1 000 / Ni10 000	Ni
Thermo element	J/K/T/E/B/S/R/N	T/C
Potentiometer	Min. 500 Ω track resistance	DU

Adaption input to output

Display projection	-99 999...999 999, red LED display, display height 14mm
Unit display	The last two symbols on display may be used for description of measured units (adjustable in menu)
Decimal point	Adjustable in menu
Display brightness	Adjustable in menu

Supply voltage ranges

Type 1	10..30V AC/DC ±10%, 10VA (MAP 4000 ...)
Type 2	80..250V AC/ DC ±10%, 10VA (MAP 4010 ...)
The voltage supply is internally fused.	

Mechanical properties

Housing material	Noryl GFN2 SE 1, non flammable according to UL94 V-I
Dimensions	96 x 48 x 120 mm
Dimensions panel cutout	90.5 x 45 mm
El. connections	screw terminals, max. wire size < 2.5mm^2

Comparators (optional)

Type	Digital, adjustable in menu, switching delay max. 30 ms
Range for comparator values	-99 999...999 999
Hysteresis	0...999 999
Programmable delay	0..99.9s
Output	Relays 1 and 2 with ON function (250VAC/30VDC, 3A) Relays 3 and 4 with SWITCH function (250VAC/50VDC,3A)

Analog output (optional)

Type	Isolated, programmable with a resolution of max. 10 000 increments. Analog output corresponds with the displayed data
Selection signal type (current / voltage)	In configuration menu
Nonlinearity Temperature coefficient Dynamics Range	0.2% of range 100ppm/°K Time delay max. 40 ms to input dimension Voltage: 0..2 / 5 / 10V Current: 0..5mA oder 0/4..20mA* *: Load resistor < 500 Ω

Serial interface (optional)

Data format	8 bit / no parity / 1 stop bit
speed	600 ... 115 200 Baud
RS232	Isolated
RS485	Isoliert, adressable (to max. 31 devices)

Data storage (only with serial interface)

RTC	Trigger Speed Max. memory depth	using internal clock (real time) selectable 250 000 entries
FAST	Trigger Speed Max. memory depth	internal (no real time) 80 measurements/s 8 000 entries

Adjustable excitation voltage

Adjustment range	5...24V DC
Max. output power	1.2 W
Adjustment process	Trimming potentiometer at the back side of device

Environmental conditions

Stabilisation time	To max. 15 minutes after switch on
Working temperature	0°C...60°C
Storage temperature	-10°C...85°C
Protection class	IP65 (front panel only, properly built in)
Electrical safety	EN 61 010-1, A2
Insulations resistance	Für Verschmutzungsgrad II, Messung CAT III AC supply >600V (ZI)*, 300V (DI)* DC supply (Input, output): > 300V (ZI), 250V (DI) *(ZI: Primary isolation, DI: double isolation)
EMC Compatibility	EN61 000-3-2 +A12 EN61 000-4-2, -3, -4, -5, -8, -11 EN 550 222, A1, A2

Ordering specifications

Number comparator relays
0: none
2: 2 relays (2 x ON)
4: 4 relays (2 x ON, 2 x switch)

Analog output
0: no analog output
1: analog output present

Interface
0: no interface
1: RS 232
2: RS 485

M	A	P		4	0	1	0		0	0	0		1	0	1

Series

Display colour
1: red

Data storage (only with interface)
0: no storage
1: RTC storage
2: FAST storage

Supply voltage
00: 10...30 V AC/DC
10: 80...250 V AC

Adjustable Excitation voltage (5...24 V/Max. 1.2 W)
1: excitation present

Connections