Multifunctional Measuring Device with Display
Series MAP4000

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
- input easily selectable by programming
- display projection -99 999...
  ...999 999
- accuracy 0.1%+1Digit of full scale
- Tc 100ppm/°K
- up to 4 programmable limit switches via relays
- analog output interfaces RS 232 or RS 485
- built in measuring data memory, readable using interface
- adjustable supply voltage output (5...24V/max. 1.2W)
- measured unit can be shown in display

Options
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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.

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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.

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

Standard functions:

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<th>Description</th>
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<td>Tare function: Initiate tare</td>
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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).

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. 1.2W.

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.
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 8k 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 PM

Resistance 0... 100 / 1k / 10k / 100 kΩ or 5...105 Ω OHM

Platin temperature sensor Pt 100 / Pt 500 / Pt 1000 RTD

Nickel temperature sensor Ni 1000 / 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 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-1

Dimensions 96 x 48 x 120 mm

Dimensions panel cutout 90.5 x 45 mm

El. connections screw terminals, max. wire size < 2.5mm²

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 s

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 0.2% of range

Temperature coefficient 100ppm/°K

Dynamics Time delay max. 40 ms to input dimension

Range 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 using internal clock (real time)

Speed selectable

Max. memory depth 250 000 entries

FAST Trigger internal (no real time)

Speed 80 measurements/s

Max. memory depth 8 000 entries

Adjustable excitation voltage (optional)

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...55°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 <300V DC supply (Input, output): DC supply (Input, output):
> 300V (2), 250V (3)

*2: 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

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

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

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

Adjustable Excitation voltage (5 ... 24 V/Max. 1.2 W)
0: no excitation
1: excitation present

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

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

Display colour
1: red

Connections

Option A

INPUT - U
GND
GND
GND
INPUT - I

DC, PM
Excitation
RTD, OHM, NC
T/C
DU

Series

MAP 4010 000 001

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