SENSORMASTER

Single-channel or multi-channel model for strain gauges, potentiometers, standard signals, Pt 100 and TC

Model 9163

Code:	9163-V3 EN
Delivery:	ex stock / 4 weeks
Warranty:	24 months

CAD data 2D/3D for this device:
Download directly at www.traceparts.com
Info: refer to data sheet 80-CAD-EN

USB

- **For force, pressure or torque measurement using strain gauge sensors**
- **For position or angle measurement using potentiometric or DC/DC sensors**
- **For temperature measurement using Pt100 sensors or thermocouples**
- **Optional multi-channel model**
- **Optional USB or serial interface**
- **0.1 % measurement accuracy plus sensor-specific linearization**
- **Range of mathematical functions (e.g. differential measurement)**
- **OK/NOK feedback on multi color display and via 4 alarm limit outputs**
- **High sampling rate (500/sec.)**

Application

The SENSORMASTER 9163 covers a wide range of applications in which process values need to be measured, displayed, analyzed and transferred to higher-level control systems. Typical applications include measuring geometric values in production, for instance differential measurements, or testing material properties in the laboratory.
The measured values can be transferred via USB, RS232 or analog output.
The multi-channel version can be used with up to four sensors. These sensors can be combined using mathematical functions, so that even complex measurement tasks can be performed with just the one instrument.
Visual alarms on the display make it easier and more convenient to assess when values lie off-limits. Up to four configurable outputs are available as relay or logic outputs.
The excellent measurement accuracy of 0.1% also makes this instrument suitable for high-precision applications. Two digital inputs are provided for controlling various functions such as Reset or HOLD.
Strain gauges, potentiometric sensors, transmitters with process value output, Pt100 and thermocouples can be connected directly to the SENSORMASTER. Thanks to its manual linearization facility, the instrument can handle sensors with a huge range of characteristic curves.

Description

The latest microprocessor technology has been used to pack a huge amount of engineering into the minimum space. Essential device settings can be made via the six-button keypad. Permanent settings such as the choice of excitation voltage are made using jumpers. The large 13 mm high, 7 segment display ensures that measurements and menu parameters can be read clearly.
The integral excitation voltage source supplies the sensors and provides the auxiliary power for any transmitters that are connected. The manual linearization facility with 32 data points means that even non-linear sensor curves can be input.
The indicator also supports memory functions for min, max and peak-to-peak values. The high measurement rate of 500 readings/s also ensures a rapid response by the four built-in alarm limit relays. TTL switched outputs can be provided as an alternative option. The device settings can be configured via the keypad or the optional RS232, RS485 or USB interface.

A powerful software tool for data analysis and documentation is available on request.

9163-V3 EN

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Technical Data

Compatible sensors

Strain gauges

Connection type:	4 wire technology
Bridge resistor:	350 Ω
Bridge voltage:	1.5 ... 4 mV/V
Sensor excitation:	5/10 V/ 60 mA

Potentiometer

Track resistance:	> 100 Ω
Sensor excitation:	2,5 / 5 / 10 V

Standard signals, DC/DC sensors or transmitters

Voltage input:	± 60 mV, ± 100 mV, ± 1V, ± 5 V, ± 10 V
Input impedance:	> 10 M Ω
Current input:	0/4 ... 20 mA
Load impedance:	50 Ω

Transmitters or DC/DC sensors

Excitation:	15/24 V max. 150 mA

Temperature sensor

Type:	Pt 100 to DIN 43750
Max. wire resistance:	20 Ω

Thermocouples

Type:	TC (thermocouple) (ITS90) J, K, R, S, T
Linearization:	64 steps
Compensation error:	0.1 °/°C

Standard functions

Digital inputs

Quantity:	2, opto-isolated
Logic:	choice of PNP/NPN
Response time:	60 ms
Function:	tare, display peak values, HOLD, Display HOLD

General data

Display:	5 digit, dual-color red/green
Height:	13 mm
Display range:	-19999 ... 99999
Decimal point:	user-programmable
Measuring error:	0.1 % of full scale ± 1 digit
Measurement rate:	main channel 500/sec. Auxiliary channel 100/sec.
Supply voltage:	100 - 240 VAC, 11 - 27 VAC/VDC
Dimensions (W x H x D):	150 x 95 x 260 mm

Operating environment

Altitude:	up to 2000 m
Operating temperature:	0 ... 50 °C
Relative humidity:	20 ... 82 %, non-condensing
Protection class:	IP54

Options

Limit switches

4 relay outputs:	250 VAC / 30 VDC 5 A
TTL outputs:	TTL 24 VDC / 20 mA open e. p-switching as direct or inverted alarm signal
Response time:	2 ms

Analog output

Ranges:	0/2 ... 10 V, ± 10 V max. 25 mA, 0/4 ... 20 mA
Load impedance:	max. 500 Ω
Resolution:	better than 0.03 %
Signal response time:	2 ms
Signal referred to:	Input signal Peak value Limit value

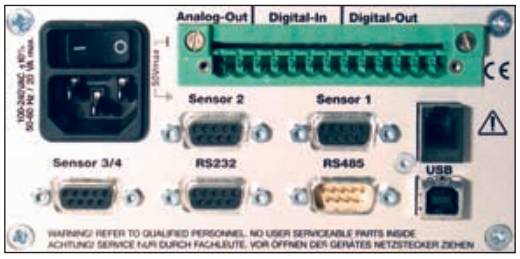
Serial interface

Type of interface:	RS232 or RS485
Protocol:	MODBUS RTU
Baud rate:	1200 ... 115200 bit/s
Max. transmission rate:	30 measurements/s
Networking via RS485 requires converter	model 9180-Z001
Networking via RS232 requires USB adapter	model 9900-K351

USB

Baud rate:	1200 ... 115200 bit/s
Max. transmission rate:	30 measurements/s

Rear side



Order Code

Process value indicator model 9163-V 3 ☐ ☐ ☐ ☐

Standard: 0 0 0 0

Analog output voltage
- None — 0
- 0 - 10 V — 1
- 0 - 20 mA — 2
- 4 - 20 mA — 3
- ±10 V — 4

Interface
- None — 0
- RS232 — 1
- RS485 — 2
- USB — 4

Limit outputs
- 4 x relay — 0
- 4 x transistor (open e. p-switching) — 1

Version
- 1 main channel / 2 auxiliary channels — 0
- 2 main channels / 2 auxiliary channels — 1

Accessories

Instrument calibration for one sensor ordered with the instrument or using sensor data provided by the customer (e.g. sensitivity, display range for correct readings, instrument settings, excitation voltage or sensor test certificate). **Model 91ABG**

Configuration and analysis software for single-channel and multi-channel operation with the single-user license code for the 9163 equipment range **Model 9163-P100**

Cable for connecting bench-top unit to PC **Model 9900-K333**

Adapter cable for bench-top unit model **9163, from sensor socket 1 or 2** to strain-gauge sensors with 5 VDC or 10 VDC excitation voltage with fitted plug 9900-V209 and to potentiometric position sensors with 5 VDC excitation voltage with fitted plug 9900-V209 **99209-609A-0090002**

Adapter cable for bench-top unit model **9163, from sensor socket 1 or 2** to transmitters with 15 VDC or 24 VDC excitation voltage and sensors with fitted plug 9900-V209 **99209-609B-0090002**

Adapter cable for bench-top unit model **9163, from sensor socket 3 or 4** to transmitters with 10 VDC excitation voltage or potentiometric position sensors with 5 VDC excitation voltage and fitted plug 9900-V209 plus sensor connecting cable with 99209-XXXX.... **99208-609B-0090002**

Adapter cable for bench-top unit model **9163, from sensor socket 3 or 4** to transmitters with 15 VDC or 24 VDC excitation voltage and fitted plug 9900-V209 **99208-609A-0090002**

The CAD drawing (3D/2D) for this device can be imported online directly into your CAD system.
Download via www.burster.com or directly at www.traceparts.com. For further information about the burster traceparts cooperation refer to data sheet 80-CAD-EN.

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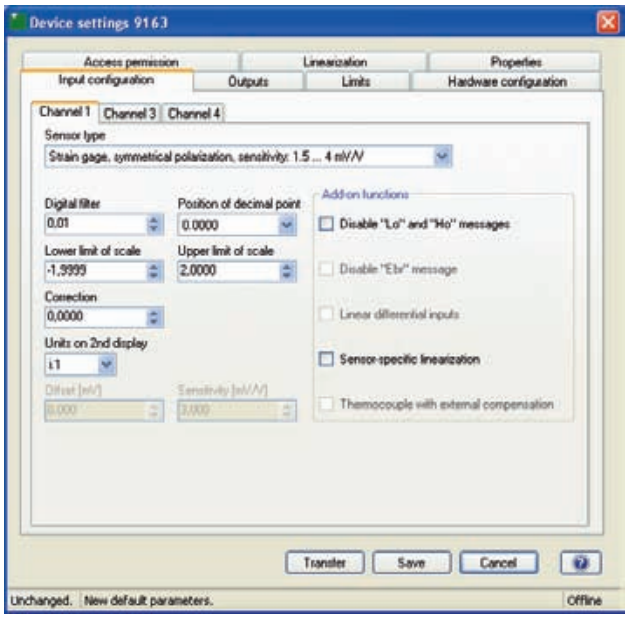
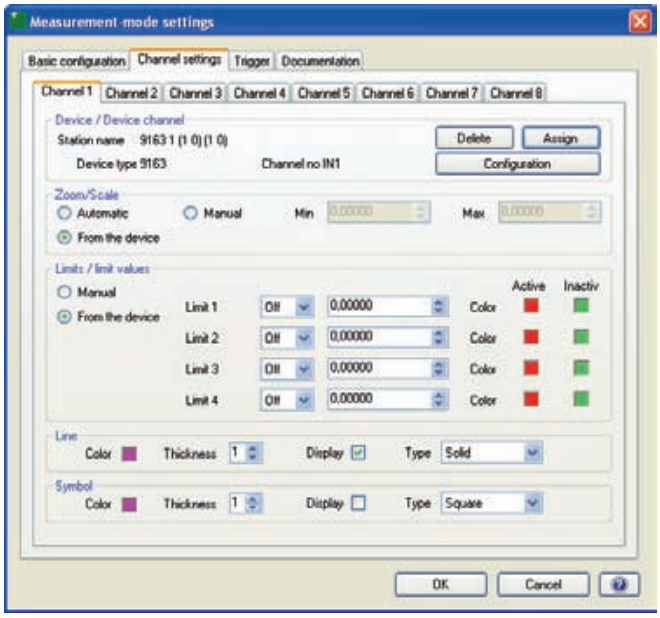
341-9163V3EN-5072-021511

DigiVision 9163-P100 Configuration and Analysis Software

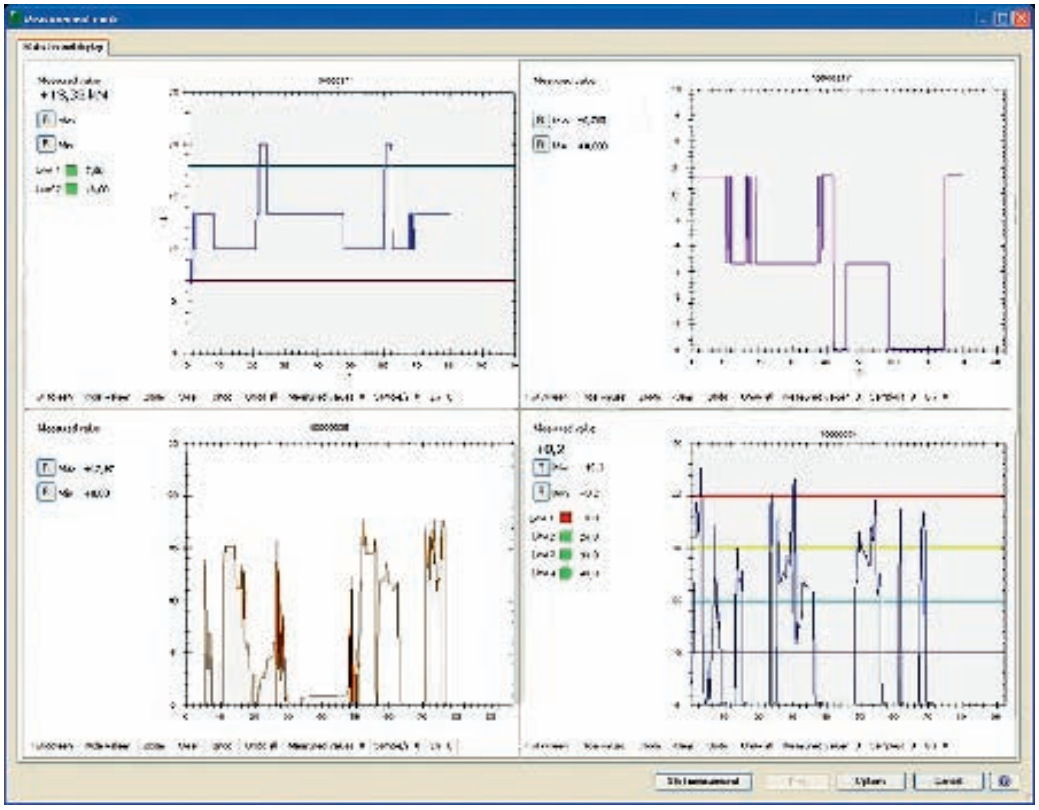
- Convenient device finder
- Instrument parameterization
- Instrument data adopted automatically, e.g. scaling, limit settings
- Back-up function for instrument data
- Simultaneous display of up to 8 measurement curves
- Different measurement rates can be combined
- Different triggers can be set: global or channel-specific
- Creation of instrument groups
- Report finder for locating group reports and individual reports
- Documenting individual measurement curves with various options e.g. serial number, batch counter, day counter
- Export function to Excel
- Communication with a controller unit (PLC etc.) via RS232 or Ethernet



Instrument parameterization



Managing several channels at once



Simultaneous display of up to 8 measurement curves

9163-V3 EN

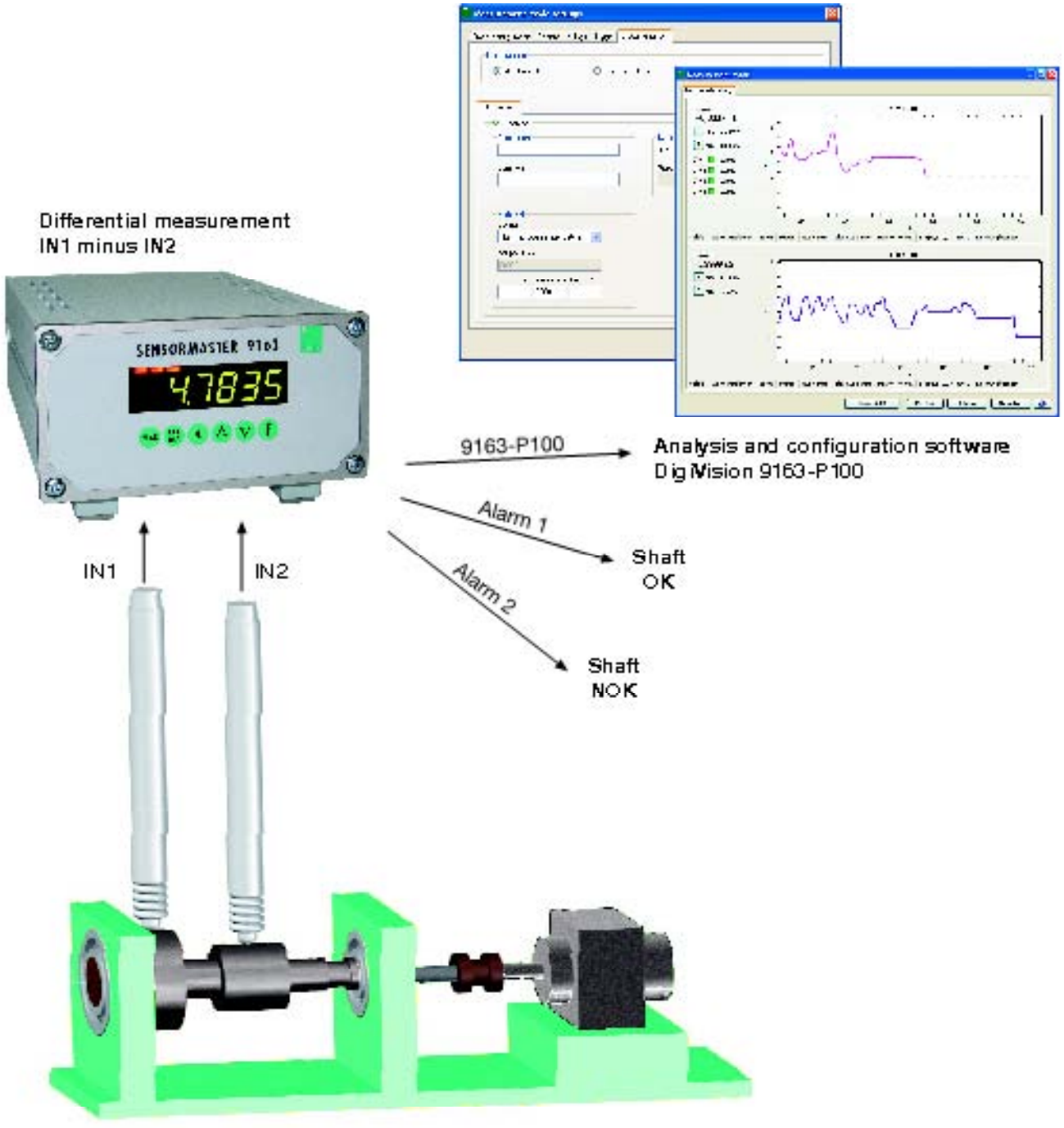
The measurement problem:
If the shaft of an electric motor is not circular, this will produce vibrations at high speeds and hence increased wear. Irregular bearing surfaces may be one cause of a shaft running out of true. A bent shaft or a shaft without strict dimensional tolerances could also be the cause.

The solution:
As part of the quality assurance process, the shaft is tested for true running, bow and concentricity of the bearing surfaces. The test also includes measuring the diameter of the shaft bearings.

In the test, the shaft is clamped in a holder and turned by a motor while being measured by two position sensors. The instrument measures the difference between the signals from these two sensors; this difference is only allowed to vary within a specified tolerance band.

The 9163 performs the difference calculation and assesses the results.
As this process takes just a few seconds, both random sampling and 100% testing are possible.

If the shaft does not lie within the tolerance band, the 9163 outputs an alarm signal.
When used for testing random samples, the 9163 color display provides additional support by changing from green to red if the shaft lies out of tolerance. The operator thus knows immediately whether the shaft is OK.



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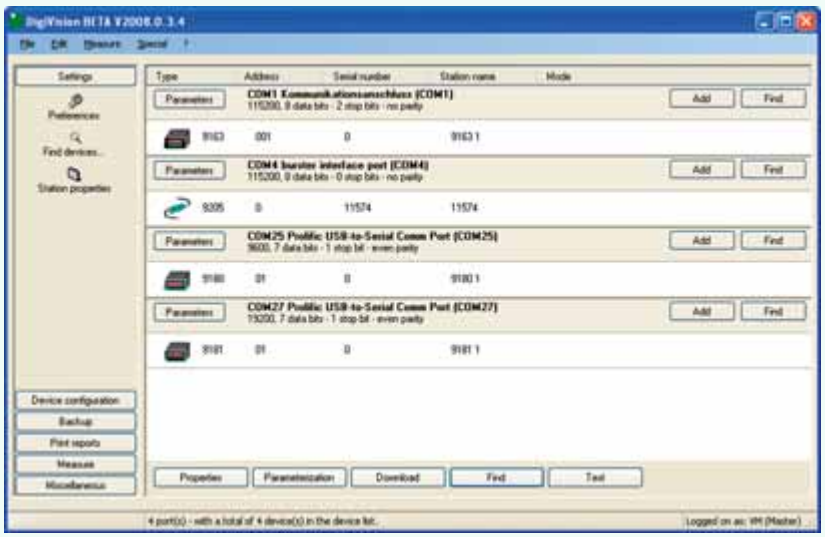
DigiVision - One for All

One PC Software for the acquisition of measuring data supports following instrument series

NEW

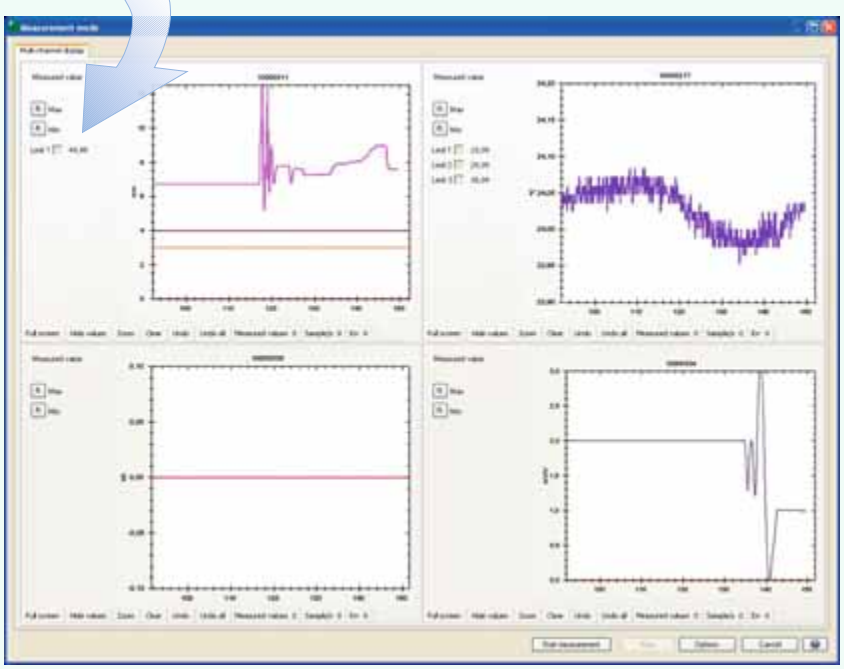
- **Sensor Master 9163**
- **Digital Indicator 9180**
- **DIGIMASTER 9181**
- **USB Sensor Interface 9205**



- Easy-to-handle instrument recognition
- Intuitive handling through evident and clearly structured operator interface
- Parameter setting without license code
- Automatic take-over of instrument parameters

Show whatever you want !

- Up to 8 simultaneous measurements
- Innovative visualization tools for process parameters
- Outline of manifold process and test information



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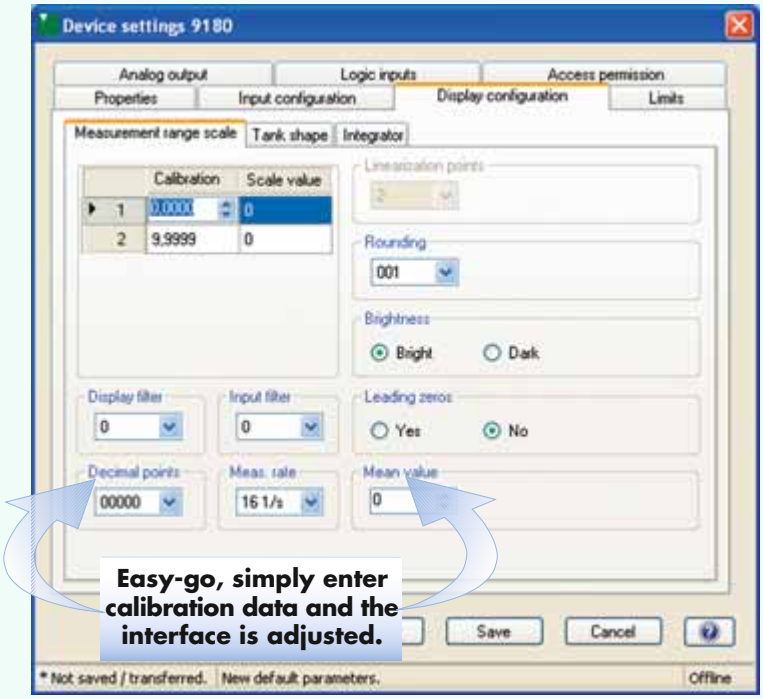
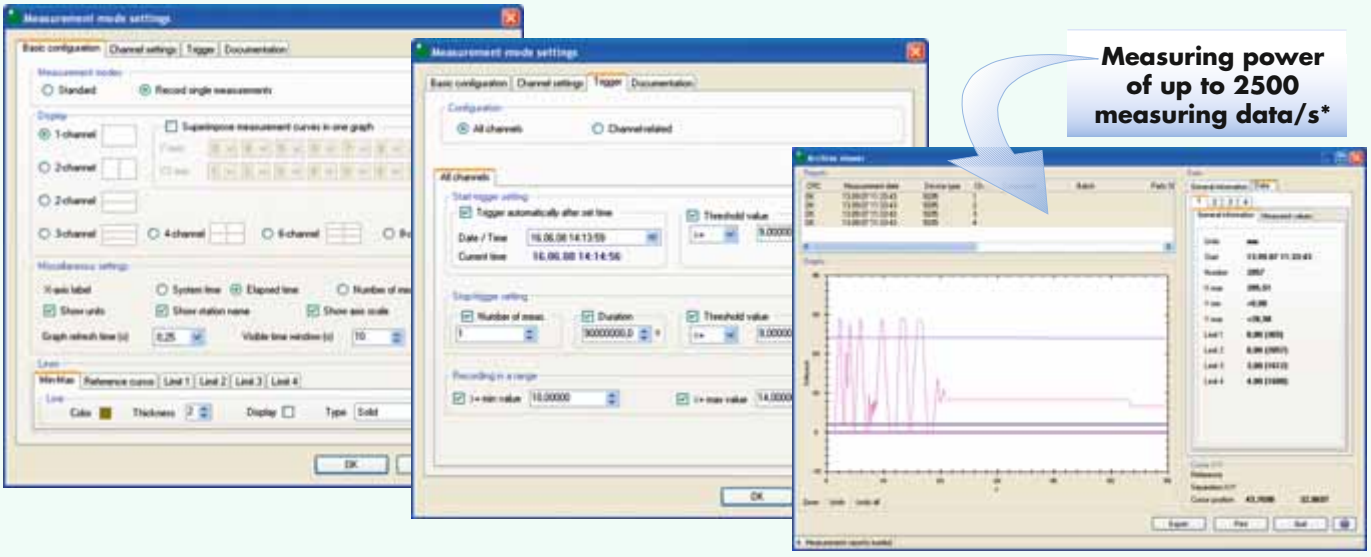
Input mask for configuration towards the affiliated sensor



Easy-go, simply enter calibration data and the interface is adjusted.

- Compilation of a device specific back-up file
- Simple parameter setting of the logic inputs (or interlinking)

Adjustment of different options, as start/stop trigger, measuring rate; storage of the measuring data and access rights

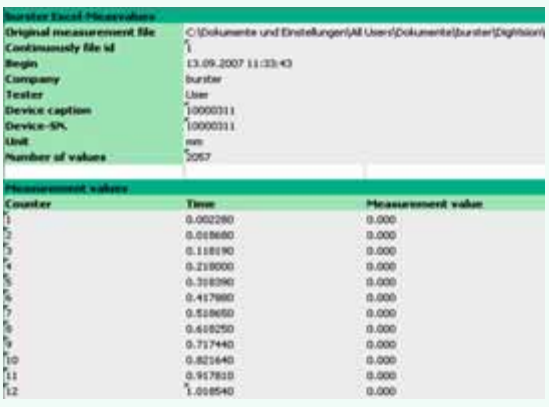


Measuring power of up to 2500 measuring data/s*

* 200 measurements/s for 9205-P001
2500 measurements/s for 9205-P100

Export to Excel file

Trouble-free single channel protocol compilation in Excel



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