

# DIGIMASTER

Fast and precise digital indicator for strain gauge, potentiometric, DC/DC sensors and standard signals

## Model 9181

Code:	9181 EN
Delivery:	ex stock
Warranty:	24 months

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



Desktop version



Panel-mounted version

- For force, pressure or torque measurements using strain gauge sensors
- For distance or angle measurements with potentiometer or DC/DC sensors
- Sensor-specific linearization across up to 30 measurement points
- Processing of standard signals  $\pm 1$  V/5 V/10 V or 0 (4) ... 20 mA
- Peak value memory for MIN, MAX and peak-to-peak value
- Generation of up to 4 limit signals (optional)
- Fast analog output (optional)
- Transfer of up to 200 measurement values/s via RS232 (optional)
- Fast response times (typically 3 ms) upon exceeding limit values
- Measurement accuracy 0.1%
- High sample rate (550/sec.)
- Convenient configuration and evaluation software DigIVision

### Application

The DIGIMASTER accepts signals from load cells, pressure and torque transducers based on a strain gauge as well as displacement or angle transducers in potentiometer or DC/DC version. Moreover, process signals  $\pm 1$  V/5 V/10 V or 0 (4) ... 20 mA can be measured. In addition to the display of the current measured value, the MIN, MAX and peak-to-peak value can be shown by pressing a button.

The high measuring accuracy paired with a very fast processing of measurement values makes this a perfect instrument not only for laboratory and test system applications with high accuracy requirements, but also for use in industrial environments.

The limit values that can be generated optionally allow production focused classification and control tasks due to short response times.

A variety of logical inputs (sample & hold, tare, reset, etc.) enable use in process-oriented systems. The response time for signals of only 5 ms makes control tasks possible with the help of the optional analog output.

The optional serial interface can be used to transfer measured values and perform device settings. We can offer users powerful software for this purpose. Up to 200 measuring value/s can be read-out in "fast mode" using simply structured interface configuration software and configurable logical input.

### Description

State-of-the-art microprocessor technology has allowed the realization of numerous special functions for practical use. Menu guidance of device setup is standard. Self-explanatory abbreviations greatly facilitate this process so that even inexperienced users can manage without operating instructions. First, the user specifies the type of input signal or sensor. Then the calibration process is selected. The user can choose between teach-in, calibration according to sensor protocol or a combination of the two.

User-friendly linearization of up to 30 measurement points makes an exact recording of the corresponding sensor curve possible. Internal analog/digital conversion of up to 550 measuring values per sec. with subsequent averaging ensures stable and high-precision measurements. The position of the decimal point can be set as needed. The excitation voltage mentioned in the technical data can be selected, depending on the set sensor type. Complete electrical isolation of the measurement channel prevents measurement values from being falsified by ground loops.

## Technical Data

### Connectable sensors

#### Strain gauge

Connection system:	4 wire
Bridge resistance:	120 ... 1000 Ω
Bridge voltage:	30/ 60/ 120/300/500 mV, selection via menu
Sensor excitation:	5 V/ 120 mA* 10 V/ 120 mA ** selectable

#### Potentiometer

Input impedance:	> 10 MΩ
Track resistance:	120 Ω ... 10 kΩ
Sensor excitation:	2.2 V/30 mA

### Standard signals, DC/DC sensors and transmitter

Voltage input:	± 1 V/ 5V/ 10 V
Resolution:	0.1 mV resp. 1 mV
Input impedance:	100 MΩ/1 MΩ
Current input:	± 0 (4) ... 20 mA
Resolution:	1 μA
Load:	11.8 Ω
Transmitters and DC/DC sensors:	10 V/ 120 mA
Excitation:	24 V/ 30 mA 5 V/ 120 mA*

Transmitters can be connected in 2, 3, or 4 wire configuration.

\* \*if the jumper is set (default setting)

### Standard functions

#### Peak-value memory

MIN, MAX or PEAK-to-PEAK value, deletion with RESET via a keyboard or digital control input.

#### SAMPLE & HOLD

Freezing of the MIN, MAX, PEAK-to-PEAK and limit value and of the measured value on the analog and digital output (RS232) possible.  
Active: via ext. SAMPLE & HOLD signal

#### HOLD function display

Freezing of the measured value on the main display.  
via ext. HOLD signal

#### HOLD function analog output

Freezing of the analog output value on the optional analog output.  
Active: via ext. HOLD signal

#### TARE

Balancing out an offset. The balanced-out value can also be shown on the auxiliary display.  
Active: via button or ext. TARE signal

#### Linearization

Sensor-specific linearization: 2 ... 30 scale values

#### Digital control inputs

RESET, SAMPLE & HOLD, TARE, MIN/MAX (optoelectrically isolated) an others  
Active: 24 V (pnp- or npn-switching)

### General specifications

#### Accuracy

Resolution:	± 15 Bit
Measurement error (at 23°C ± 5 °C)::	0.1 % F.S. ± 2 Digit
(measurement of position with potentiometer)	0.25 % F.S. ± 2 Digit
Temperature coefficient:	50 ppm/K
Warm-up period:	10 minutes

#### Display

Display (LED):	- 9999 ... + 9999	height 14 mm
Sign indication:		automatically
Status indication of the alarm outputs:		over LED's
Decimal point:		programmable
Measurement rate		max. 550/sec.

### Environmental conditions

Operating temperature:	0 ... 50 °C
Relative humidity:	< 95 % up to 40 °C
Protection class:	Front panel IP 65

### Dimensions/weight

Panel-mounted version	Dimensions (W x H x D): 96 x 48 x 120 mm
	Cut-out in front panel: 92 x 45 mm
	Weight: 600 g
	Housing material: plastic
Desktop version	Dimensions (W x H x D): 155 x 90 x 210 mm
	Weight: 1.2 kg
	Housing material: metal/plastic

### Electrical connection

Panel-mounted version:	snap-in plug connection
Desktop version:	jacks on the rear panel

### Power supply

Desktop version:	115/230 <sup>1)</sup> VAC	50-60 Hz
Panel-mounted version:	115/230 <sup>1)</sup> VAC	50-60 Hz
	or 24/ 48 <sup>1)</sup> VAC	50-60 Hz
	or 10 - 30 VDC	

<sup>1)</sup> Switch over by means of a jumper

Capacity:	5 VA	without options
	10 VA	with all options

### Options

#### Digital set point alarm outputs

2 relay contacts	250 VAC/ 150 VDC/ 8 A, for 2 limiting values or
4 relay contacts	50 VAC/ DC/ 0.2 A, for 4 limiting values or
4 transistors	o.C. n-switched or o.E. p-switched, 50 V/ 50 mA 4 limiting values, optoelectrically isolated

Response time (relay):	≤ 6 ms (typ.)
Response time (transistors):	≤ 3 ms (typ.)

#### Analog output

Range:	Voltage	0 ... 10 V
	Load	> 500 Ω
	Drift	0.2 mV/K
	or Current	4 ... 20 mA
	Load	< 800 Ω
	Drift	0.5 μA/K

(Selection between 0 ... 10 V and 4 ... 20 mA by menu)

Response time:	5 ms
Cut-off frequency:	160 Hz (- 3 dB)
Resolution:	12 Bit
Accuracy:	0.1 % F.S. ± 1 bit
Response time of logic inputs:	≤ 10 ms
A potential separation exists to the signal input.	

#### Serial interface

RS232 (V.24) or RS485 (half duplex), fully controllable	
Baud rate:	1200 ... 19200
Data transmission rate:	up to 200 values/s with 19200 baud
Format:	1 start bit; 8 data bits; 1 stop bit
Networking via RS485 by means of a converter (model 9180-Z001)	

#### Calibration adjustment

Two methods are available. Two input values are put in relation to one display value each for both methods (two point calibration).  
With the teach-in mode the two input values are put physically and in sequence on the input as measurement signal. The corresponding display values are assigned via buttons.  
With the calibration acc. to sensor protocol the two signals are not measured but taken from the protocol and entered via buttons.  
A mix of both methods, i.e. the measurement of the zero point and entering of the end value is also supported.

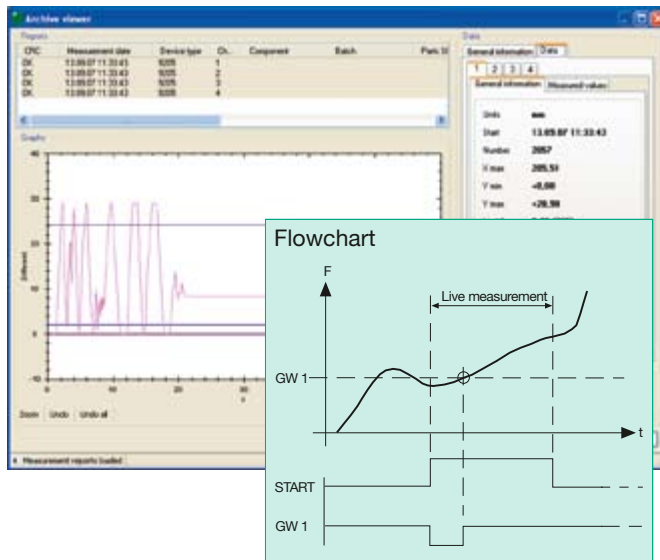
#### The CAD drawing (3D/2D) for this device can be imported online directly into your CAD system.

Download via [www.burster.com](http://www.burster.com) or directly at [www.traceparts.com](http://www.traceparts.com).  
For further information about the burster traceparts cooperation refer to data sheet 80-CAD-EN.

## Application Example

**Task** The press-fitting of two shucks has to be controlled. It is sufficient to capture and evaluate the peak force. Load peaks which arise in the threading and block phase should be faded out.

**Solution** A load cell is installed upside down in the press' stamp. It captures the press force in the shuck and transfers it to the DIGIMASTER. The instrument's configuration causes the sending of a set point signal when the required peak value is passed. This signal stays active until it is RESET by a new START. The active measuring range is marked by a proximity switch. Results before and beyond are not recorded.



↑ Configuration and measurement data logging per PC  
e.g. via RS232 interface

GW 1 →  
START ←

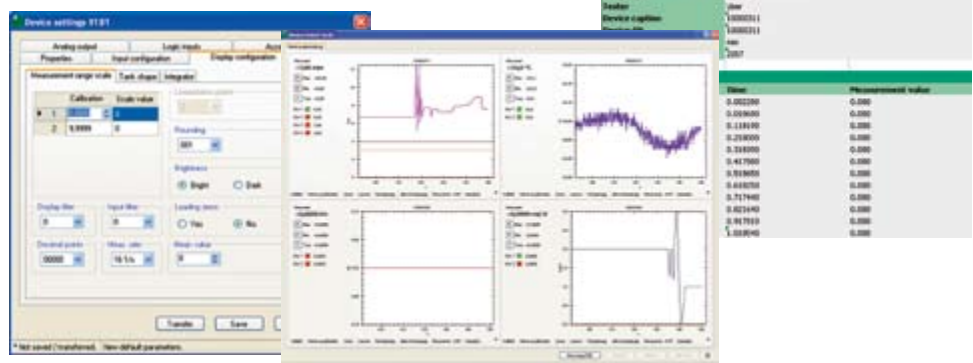
DIGIMASTER  
Model 9181

Load cell  
Model 8451



## DigiVision 9181-P100 Configuration and Analysis Software

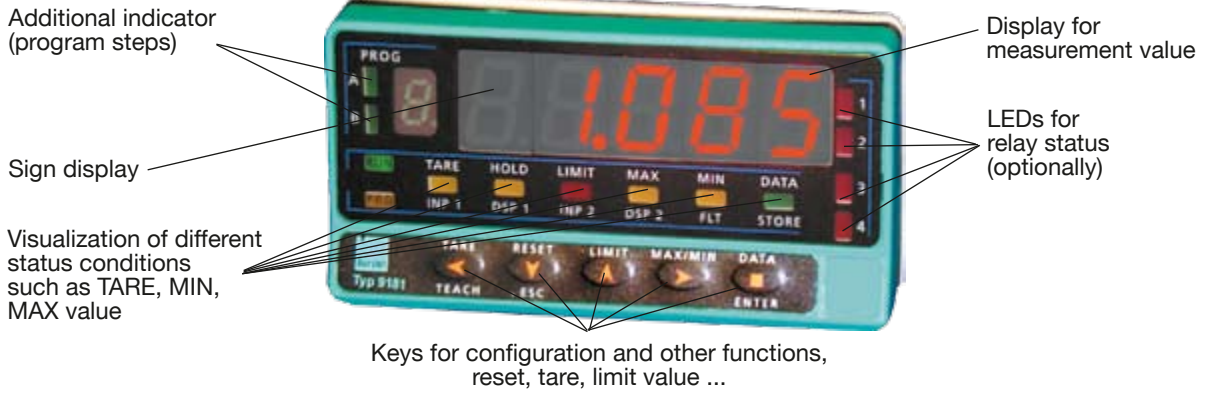
- ▶ Intuitive operation
- ▶ Easy-go-configuration of the indicator
- ▶ Up to 8 measurement values display able the same time
- ▶ Measurement data storage
- ▶ Data export to Excel



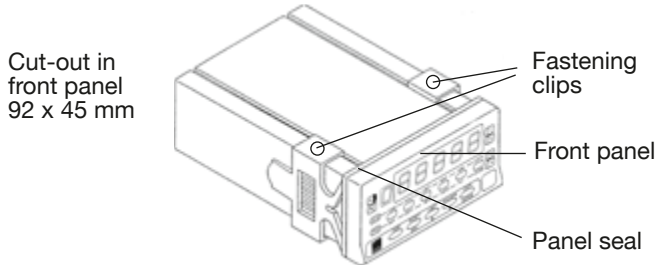
9181 EN



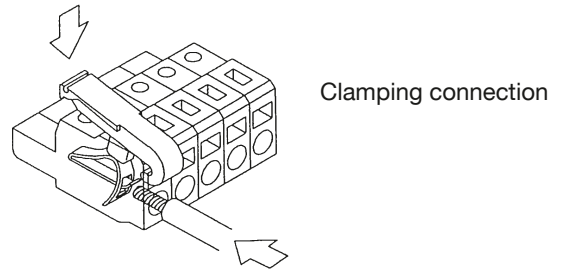
### Display and Keys



### Dimensions Mounting



### Rear Connection



### Multichannel System with Arbitrary Channel in Desktop Version (on request)



**Front view:**  
Up to panel meters in one common 19"-84TE-housing possible.



**Back view:**  
All sockets for sensors, control signals and serial interfaces are completely installed.

### Order Code

#### DIGIMASTER

**Version**      **model 9181 - V**      0 0 0 0

Extra charge for options:

<b>Housing and power supply</b>	
Panel-mounted version 115/230* VAC	0
Panel-mounted version 24V*/48 VAC	1
Panel-mounted version 10-30 VDC	2
Desktop version 115/230* VAC	3
Desktop version 10-30 VDC	4
<b>Analog output</b>	
without	0
0 ... 10 V / 4 ... 20 mA	1
<b>Interface</b>	
without	0
RS232	1
RS485	2
<b>Set points alarm output</b>	
without	0
2 relay	1
4 relay	2
4 transistor open C. n-switched	3
4 transistor open E. p-switched	4

\*Delivery status

### Accessories

Instrument calibration for one sensor ordered with the instrument or using sensor data provided by the customer (e.g. sensitivity, display range of correct reading, excitation voltage or sensor test certificate)

**Model 91ABG**

If calibration data is not communicated, it will be calibrated like the standard sensor specified.

#### Strain gauge simulator

See data sheet 76-9405 in section 7 of the Sensors and Process Instruments catalog.



**Model 9405**

#### DigiVision 9180-P100 configuration and analysis software for device series 9181

enables an easy storage of device data, graphical visualization, storage and logging of measurement data

**Model 9180-P100**

#### Converter RS232/RS485

(plug module) incl. power pack for maximally 32 participants

**Model 9180-Z001**

#### Interface cable

Cable for connection of desktop version and PC **Model 9900-K333**  
Cable for connection of panel version and PC **Model 9180-K001**  
Interface adapter USB-RS232 **Model 9900-K351**

# DigiVision - One for All

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

**NEW**

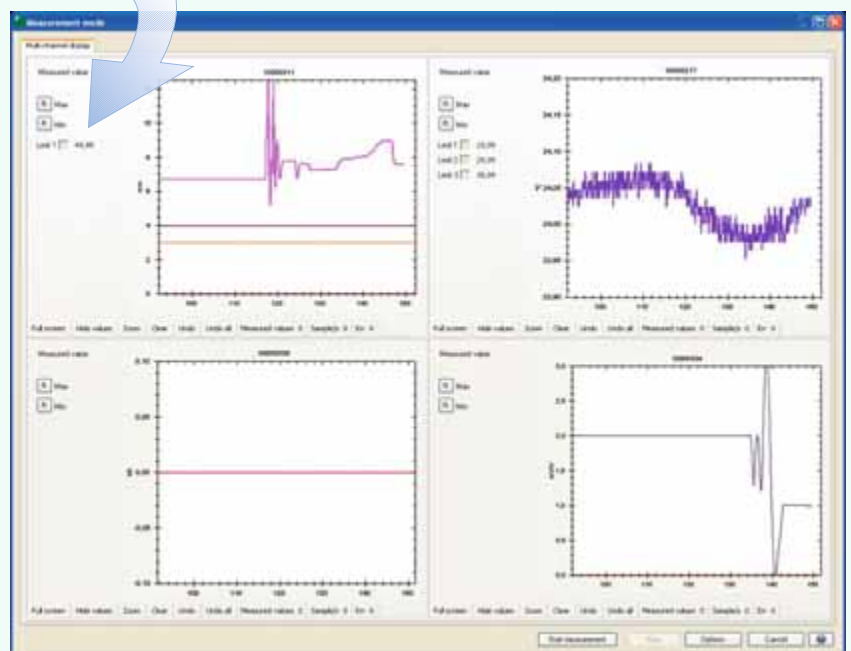
- ▶ **Sensor Master 9163**
- ▶ **DIGIMASTER 9181**
- ▶ **Digital Indicator 9180**
- ▶ **USB Sensor Interface 9205**



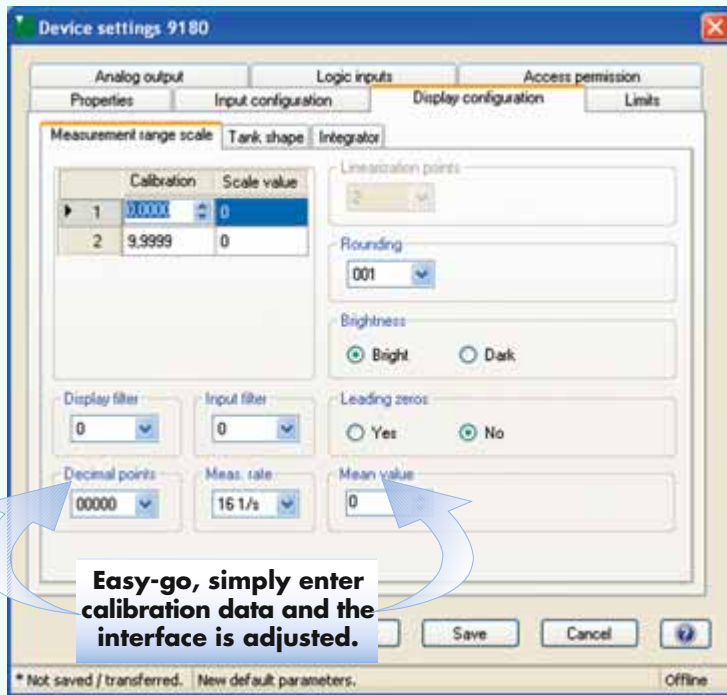
- Easy-to-handle instrument recognition
- Intuitive handling through evident and clearly structured operator interface
- Parameter setting without license code
- Automatic take-over of instrument parameters

## Show whatever you want !

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



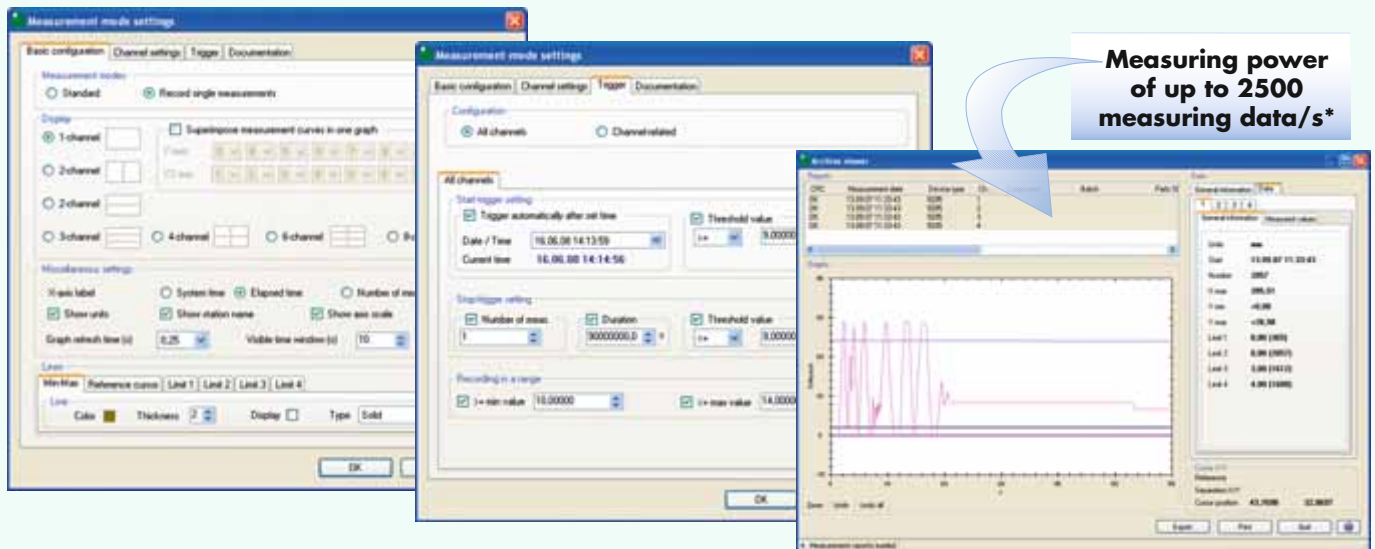
## Input mask for configuration towards the affiliated sensor



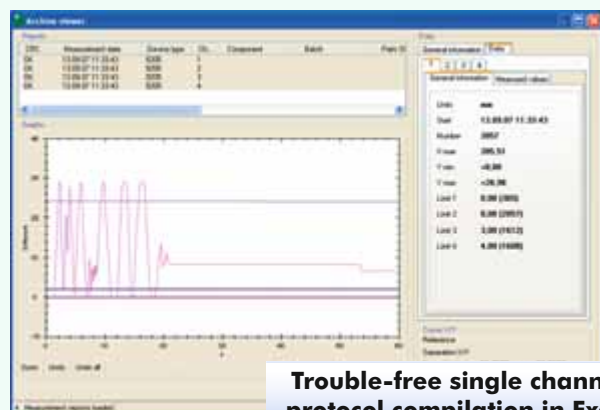
Compilation of a device specific back-up file

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



## Export to Excel file



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

burster Excel Messwerte		
Original measurement file		
Continuously file id		
Begin	13.09.2007 11:33:43	
Company	burster	
Tester	User	
Device caption	10000311	
Device-SPN	10000311	
Unit	mm	
Number of values	2057	
Counter	Time	Measurement value
1	0.002280	0.0000
2	0.015680	0.0000
3	0.118190	0.0000
4	0.218000	0.0000
5	0.318390	0.0000
6	0.417980	0.0000
7	0.518650	0.0000
8	0.618250	0.0000
9	0.717440	0.0000
10	0.821640	0.0000
11	0.917810	0.0000
12	1.018540	0.0000