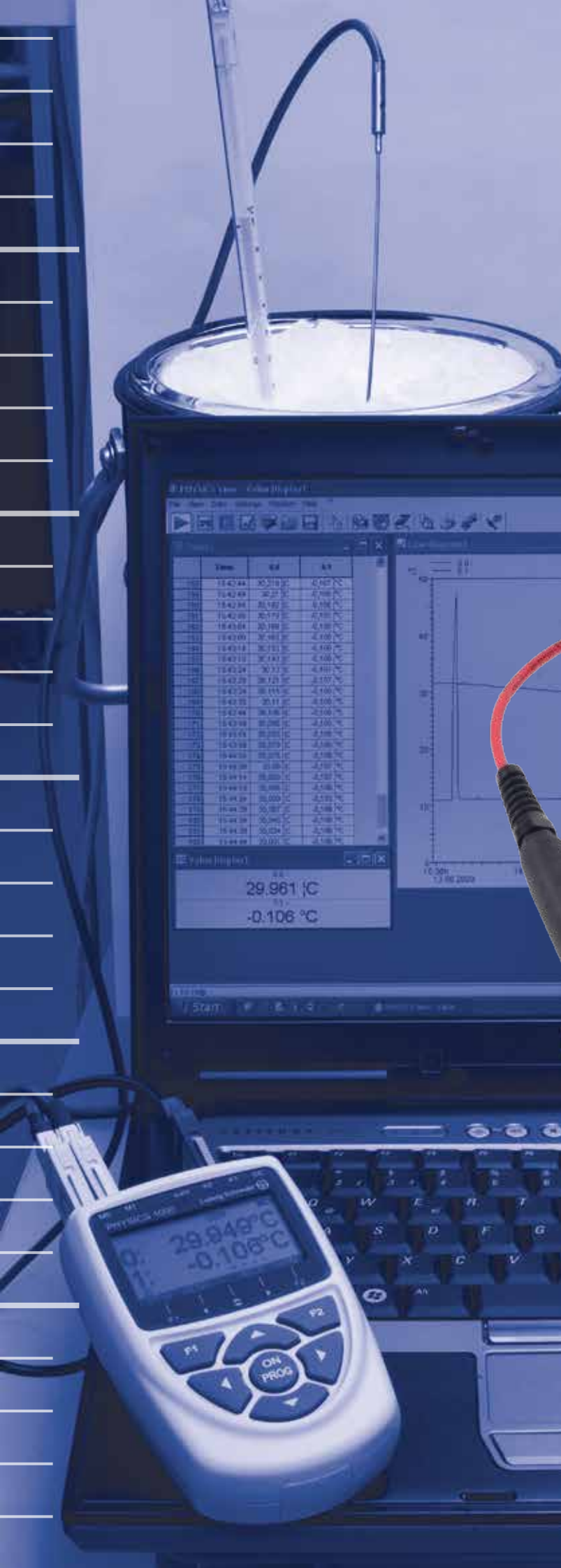# PHYSICS Digital Measuring Devices

For precise measurements in meteorology, chemical, pharmaceutical and food industries, biotechnology, water analytics, science and research as well as industrial quality management.

Ludwig Schneider

High-precision measuring instruments for temperature and density

Precision digital measuring device PHYSICS 51

Digital measuring device for thermocouples, NTC resistance thermometers, infrared temperature probes, capacitive humidity probes.

Technical data PHYSICS 51

Sensors:	thermocouples, humidity, NTC
Measuring input:	1 input channel
Measuring range:	see sensor list
Galvanic isolation:	Semiconductor relais (50 V)
Channels:	4 function channels e.g. for dual probes
AD converter:	Delta-Sigma 15 bit, 2.5 M/s
Resolution:	max. 0,01 K
Output:	2 output channels
Display graphic:	2 lines, statical 7/16 segments
Display illumination:	2 LEDs, white
Keyboard:	7 silicone keys
Batteries:	3 Mignon Alkaline
Casing:	ABS (max. 70 °C), light grey
Degree of protection:	IP54
Dimensions and weight:	L 127 x W 83 x H 42 mm, 290 g
Ref-No.:	**59235**

Product features

- Compact shape and ergonomic design
- Measuring functions: measuring value, zero-setting, max.-/min. value documentation, 2-step adjustment, scaling (optional: multi-point calibration for temperature values)
- Test functions: segment monitoring, range monitoring, sensor error check, battery check
- Interfaces: USB, RS232, Ethernet, Bluetooth, analog
- Language selection: German, English, French

Additional order-no.:

......./03 with works certificate (for the measuring unit temperature)
......./04 with DAkkS certificate (for the measuring unit temperature)

Variable precision digital measuring device PHYSICS 100

Digital measuring device for precise measurements with a wide range of measuring units and sensor technologies, e.g. temperature (Pt100, thermocouples, NTC, infrared), air humidity, air flow, pressure, flow rate, electrical values etc.

Beside the PHYSICS 100-1 type with one input channel we offer also type 100-2 with 2 input channels (both input channels or measuring points can be covered simultaneously.

Technical data PHYSICS 100

Sensors:	Thermocouples, resistance thermometers, humidity, pressure, NTC, conductivity, pH, Redox, CO, optical radiation and more
Measuring input:	100-1: 1 input channel 100-2: 2 input channels
Input channels for more than 65 measuring ranges	
Galvanic isolation:	Semiconductor relais (50 V)
Channels:	4 function channels e.g. for dual probes 4 internal functions (e.g. difference)
AD converter:	Delta-Sigma 16 bit, 2.5 or 10 M/s
Probe voltage:	Battery operation: 9 V, max. 150 mA Mains operation: 12 V, max. 150 mA
Resolution:	max. 0.01 K
Output:	2 output channels for all output modules (analogue, data, trigger, relays cable, memory etc.)
Display graphic:	2 lines, statical 7/16 segments
Display illumination:	2 LEDs, white
Keyboard:	7 silicone keys
Internal RAM memory:	99 measuring values
Memory plug:	optional external memory for up to 25,000 values
Batteries:	3 Mignon Alkaline
Casing:	ABS (max. 70 °C), light grey
Degree of protection:	IP54
Dimensions and weight:	L 127 x W 83 x H 42 mm, 290 g
Bestell-Nr.:	**63731** 100-1 (1 input channel) **63874** 100-2 (2 input channels)

Product features

- Compact shape and ergonomic design
- Intelligent probe display with probe specific functions (cold-junction compensation etc.)
- Measuring functions: measuring value, zero-setting, max.-/min. value documentation, 2-step adjustment, scaling (optional: multi-point calibration for temperature values)
- Test functions: segment monitoring, range monitoring, sensor error check, battery check
- Interfaces: USB, RS232, Ethernet, Bluetooth, analog
- Language selection: German, English, French

Additional order-no.:

......./03 with works certificate (for the measuring unit temperature)

......./04 with DAkkS certificate (for the measuring unit temperature)

Highly variable precision digital measuring device PHYSICS 300

Complex digital measuring device with data logger function* for precise measurements with a wide range of measuring units and sensor technologies, e.g. temperature (Pt100, thermocouples, NTC, infrared), air humidity, air flow, pressure, flow rate, electrical values etc.

Measurement units PHYSICS 300

mbar, Pa, lux, °C, °F, Hz, kJ/kg, %H, ppm, mA, V, min, W/m², mS, bar, g/Kg, m/s, pH

Subject to type of probe 2, 3 or 4 input channels or measuring points can be covered simultaneously

Technical data PHYSICS 300

Sensors:	Thermocouples, resistance thermometers, humidity, pressure, NTC, conductivity, pH, Redox, CO, optical radiation and more
Measuring input:	300-2: 2 input channels **New!** 300-3: 3 input channels * 300-4: 4 input channels * **New!**
Input channels for more than 65 measuring ranges	
Galvanic isolation:	Semiconductor relais (50 V)
Channels:	4 function channels e.g. for dual probes 4 internal functions (e.g. difference)
AD converter:	Delta-Sigma 16 bit, 2.5 or 10 M/s
Probe voltage:	Battery operation: 9 V, max. 150 mA Mains operation: 12 V, max. 150 mA
Resolution:	max. 0.01 K
Output:	2 output channels for all output modules (analogue, data, trigger, relays cable, memory etc.)
Display graphic:	128 x 64 pixel, 8 lines
Display illumination:	2 LEDs, white
Keyboard:	7 silicone keys
Internal memory:	*only types 300-3 and 300-4: 59 kB EEPROM (ca. 12,000 values)
Batteries:	3 Mignon Alkaline
Casing:	ABS (max. 70 °C), light grey
Degree of protection:	IP54
Dimensions and weight:	L 127 x W 83 x H 42 mm, 290 g
Ref.-no.:	**63884** 300-2 (2 input channels) **63885** 300-4 (4 input channels + datalogger function

Product features

- Compact shape and ergonomic design
- Intelligent probe display with probe specific functions (cold-junction compensation etc.)
- Measuring functions: measuring value, zero-setting, max.-/min. value documentation, 2-step adjustment, scaling (optional: multi-point calibration for temperature values)
- Test functions: segment monitoring, range monitoring, sensor error check, battery check
- Interfaces: USB, RS232, Ethernet, Bluetooth, analog
- Display free configurable (numeric or graphic design)
- Sleep mode for long-term documentations
- Language selection: German, English, French

Additional order-no.:

......./03 with works certificate (for the measuring unit temperature)

......./04 with DAkkS certificate (for the measuring unit temperature)

High-precise digital temperature measuring device PHYSICS 1000

Ludwig Schneider's high-precise digital measuring device PHYSICS 1000 offers highest resolution, accuracy and linearity for mains independent measurements.

Resolution: 0,001 K

With its ultra high resolution of 0.001 K this digital measuring device provides dependable and reproducible results of mobile temperature measurements in quality assurance, process monitoring and production control in the chemical, pharmaceutical and food industries as well as for research and development.

Technical data PHYSICS 1000

Sensors:	only resistance thermometers Pt100
Measuring input:	2 input channels
Galvanic isolation:	Semiconductor relais (50 V)
Measuring range:	-200 up to +400 °C
Self calibration:	Zero point, measuring current
Genauigkeit:	0,01 % of value ±3 digits
Temperature drift:	0,003 %/°C
AD converter:	Delta-Sigma 16 bit, 2.5 M/s
Resolution:	0,001 K / 0,01 K
Output:	2 Ausgangsbuchsen USB, V24, Ethernet, Bluetooth
Display graphic:	128 x 64 pixel, 8 lines
Display illumination:	2 LEDs, white
Keyboard:	7 silicone keys
Internal RAM memory:	99 values
Memory plug:	optional external memory for up to 25,000 values
Batteries:	3 Mignon Alkaline
Casing:	ABS (max. 70 °C), light grey
Degree of protection:	IP54
Dimensions and weight:	L 127 x W 83 x H 42 mm, 290 g
Ref.-No.:	**66637**

Product features

■ Compact shape and ergonomic design

■ Measuring functions: measuring value, zero-setting, max.-/min. value documentation, 2-step adjustment, scaling (optional: multi-point calibration for temperature values)

■ Test functions: segment monitoring, range monitoring, sensor error check, battery check

■ Interfaces: USB, RS232, Ethernet, Bluetooth, analog

■ Language selection: German, English, French

Additional order-no.:

......./03 with works certificate (for the measuring unit temperature)

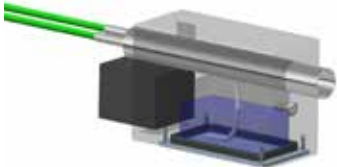......./04 with DAkkS certificate (for the measuring unit temperature)

Sensors for PHYSICS digital measuring devices

Technical data PHYSICS sensors	Ref. No.	For PHYSICS device type			
		51	100	300	1000
Immersion resistance thermometer Pt100 Dia. 3 x 250 mm, cable length: 2 m, class A, temperature range: -90...+350 °C / 0.01 °C	**59954**	—	✓	✓	—
Insertion resistance thermometer Pt100 Dia. 4 x 150 mm, cable length: 2 m, class A, temperature range: -50...+200 °C / 0.01 °C	**59966**	—	✓	✓	—
Immersion thermocouple type K Dia. 1,5 x 250 mm, cable length: 2 m, class 2, temperature range: -100…+600 °C / 0.1 °C	**59961**	✓	✓	✓	—
Immersion thermocouple type K Dia. 3 x 250 mm, cable length: 2 m, class 2, ttemperature range: -100…+600 °C / 0.1 °C	**59962**	✓	✓	✓	—
Insertion thermocouple type K Dia. 3 x 150 mm, cable length: 2 m, class 2, temperature range: -50…+200 °C / 0.1 °C	**59963**	✓	✓	✓	—
Immersion resistance thermometer Pt100 Dia. 3 x 250 mm, cable length: 2 m, class 1/10B, temperature range: -90…+400 °C / 0.001 °C	**67053**	—	—	—	✓
Immersion resistance thermometer Pt100 Dia. 3 x 400 mm, cable length: 2 m, class A, temperature range: -90…+400 °C / 0.001 °C	**67050**	—	—	—	✓
Immersion resistance thermometer Pt100 in glass Dia. 3/6 x 250 mm, cable length: 2 m, class A, temperature range: -90…+310 °C / 0.001 °C	**67056**	—	—	—	✓
Surface sensor type K Dia. 15 x 170 mm, with thin-line thermocouple, cable length: 1,5 m, temperature range: -50…+400 °C / 0.1 °C	**64106**	✓	✓	✓	—
Humidity sensor, capacitive Dia. 12 x 160 mm, cable length: 1,5 m, measuring ranges: 5...98 %r.H. / -20...+80 °C	**59644**	✓	✓	✓	—
Humidity/atmospheric pressure sensor, digital Dia. 9 x 65 mm, cable length: 2 m, measuring ranges: 5…98 %r.H. / -20...60 °C / 700…1100 mbar, non-condensing	**63953**	✓	✓	✓	—

Sensors for PHYSICS
digital measuring devices

	Technical data PHYSICS sensors	Ref. No.	For PHYSICS device type			
			51	100	300	1000
	Humidity psychrometer, digital Case/box L 175 x W 50 x H 75 mm, for long-term and high-temperature mesurements, cable length: 5 m, meas. range: 10...100 %r.H. / 0...90 °C / 700…1100 mbar, non-condensing	**59937**	✓	✓	✓	—
	Humidity psychrometer Hand-held device, dia. 50 x 245 mm, weight: approx. 300 g, cable length: 1.5 m, measuring ranges: 10...100 %r.H. / 0...60 °C, non-condensing	**59638**	✓	✓	✓	—
	CO_2/atmospheric pressure sensor, digital Dia. 18 x 250 mm, cable length: 1.5 m, measuring ranges: 0...10.000 ppm, -40...60 °C, 700...1100 mbar, non-condensing	**64143**	✓	✓	✓	—
	Room climate sensor/globe thermometer Dia. approx. 150 mm, Wet Bulb Globe Temperature measuring (WBGT), cable length: 3 m, meas. range: -30...150 °C	**59639**	—	✓	✓	—
	Sensor for barometric pressure Hose connector: dia. 5 mm, L 90 x W 20 x H 7.6 mm, meas. range: 700...1050 mbar (0...1050 mbar)	**59645**	✓	✓	✓	—
	Sensor for barometric pressure, digital owithout connector, L 90 x W 20 x H 7.6 mm, meas. range: 700...1100 mbar (300...1100 mbar)	**64063**	✓	✓	✓	—
	Redox electrode for manual measurements and pressure-free operation, Dia. 12 x 125 mm, operating range: 0…60 °C, conductivity: >150 µS/cm, cable length: 1.2 m, platinum electrode	**64103 + 63864**	—	✓	✓	—
	pH electrode for manual measurements and pressure-free operation, Dia. 12 x 125 mm, measuring range: 1…12, operating range: 0…60 °C, conductivity: >150 µS/cm, cable length: 1.2 m	**64104 + 64105**	—	✓	✓	—

Additional order-no.: ..../03 with works certificate (for the unit temperature), .../04 with DAkkS certificate (for the unit temperature)

Accessories for PHYSICS digital measuring devices

Lieferbares Zubehör	Best-Nr.
Mains adapter 230 V, 200 mA	**57090**
Mains adapter 115 V, 300 mA (US)	**58802**
USB cable (galvanically isolated, max. 115.2 kB)	**57091**
RS232 cable (galvanically isolated, max. 115.2 kB)	**55855**
Ethernet cable (galvanically isolated, max. 115.2 kB)	**57512**
Bluetooth adapter plug, class 2	**58321**
Memory plug with MM card for further measuring values	**57733**
Software PHYSICS View	**58306**
Case	**61972**
Holster	**58804**

Holster for digital mesuring device
Stable protective cover (grey) with combi-bracket for standing/hanging
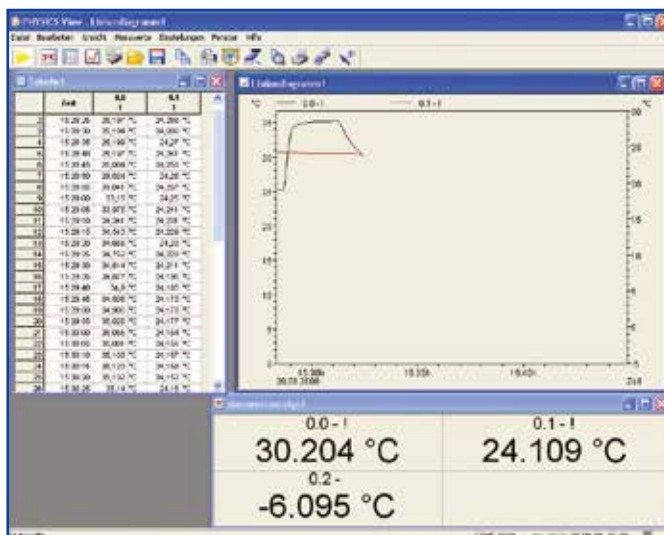
Software PHYSICS View

PHYSICS View is a software package that can be used to evaluate and display measured data on PHYSICS devices (with 2 measuring inputs). PHYSICS View runs under MS-Windows and can be used to drive a PHYSICS device with up to four measuring points. As soon as the connection between the computer and the measuring instrument has been established the program detects and lists these measuring points automatically. The measured values are then read at a sampling rate selected by the user.

Case for PHYSICS device and accessories (without content)
hard protective case with foam inserts (picture may differ from original product)

Ludwig Schneider

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