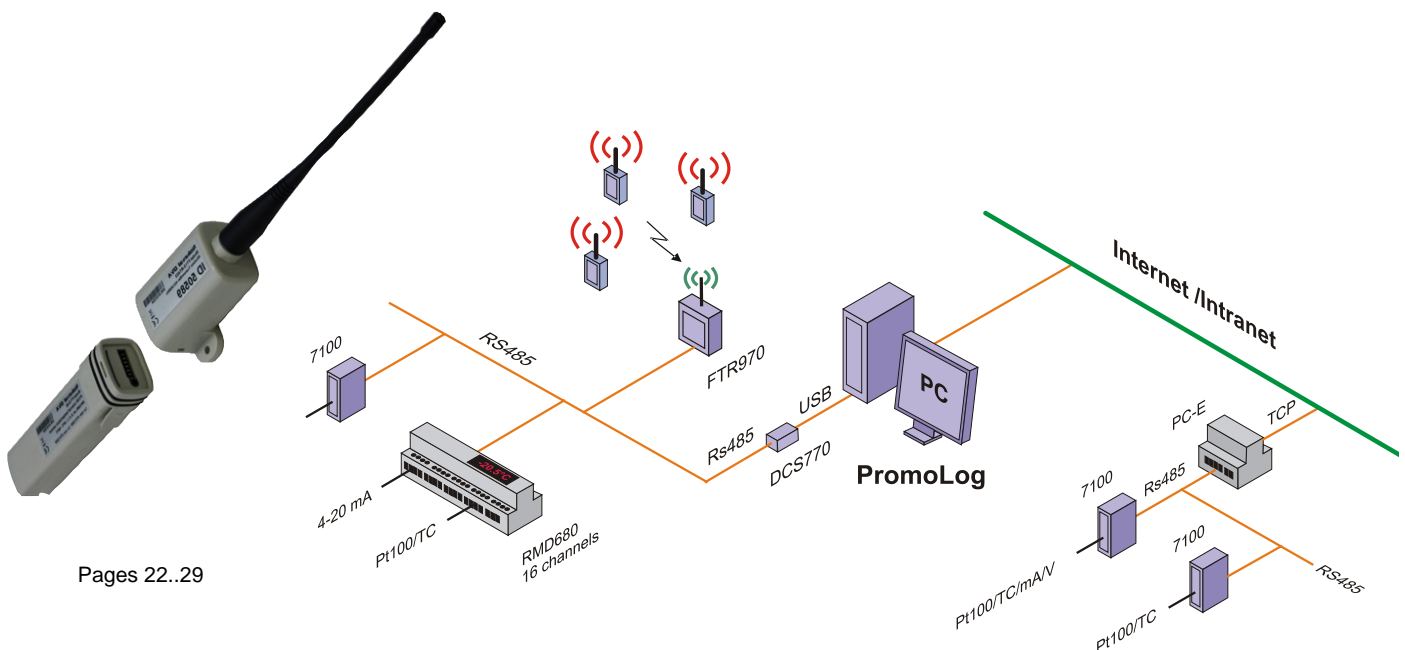


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New products for data acquisition systems



Displays

Displays

Large Displays

Transmitters

Converters

Wireless Transmitters

Software

Sensors

Loop Powered panel meter Series

Input Loop powered	Model	Page	Installation	Loop powered panel and field displays
	201, 202 301, 302 305	5	Panel Field case Field case	Loop powered displays take operating energy from 4-20 mA loop. Models 202, 302, and 306 have two alarm relays.

201, 211



2 wire output loop powered	Model	Page	Installation	2 wire 4-20 mA field displays
	211, 212 311, 312	5	Panel Field display	2 wire displays take operating energy from 2 wire output loop 4..20 mA. Models 212 and 312 have two alarm relays.

301, 311



Panel and Small Field displays

	Model	Pages	Field model	Page	Description
Modular panel meter series 2000	2012	6,7	2800-2011	11	Process inputs 0/4..20 mA, 0..5/10 V
	2021	6,7	2800-2021	11	Temperature and mA/V inputs
	2026	6,7	2800-2026	11	Totalizer for mA/V inputs
	2028	6,7	2800-2028	11	Signal speed display mA/V inputs
	2041	6,8	2800-2041	11	Strain gauge sensors
	2051	6,8	2800-2051	11	Frequency display for pulse sensors
	2251	6,8	2800-2251	11	Difference display for pulse sensors
	2061	6,8	2800-2061	11	Counter
	2064	6,8	2800-2064	11	Incremental sensors (moving sensors)
	2066	6,9	2800-2066	11	Timer
Field display 2800	2067	6,9	2800-2067	11	Clock
	2071	6,9	2800-2071	11	Serial input display
	2071WMM	10	2800-2071WMM	11	Serial input display
	2081	6,9	2800-2081	11	BCD, binary, Gray code
	2022SETP	11	2800-2022SETP	11	Setpoint transmitter for mA/V outputs
	2022TANK	10	2800-2022TANK	11	Tank indicator
	541	10	-	11	Setpoint transmitter for mA/V outputs

2000 series



2800 series



2212
2078



Multichannel displays

2..8 channel displays	Model	Page	Description
	2212	11	2 channel panel display for mA/V-input, digit size 14.5 mm
	2072	9	9 channel display for transmitters with serial RS485
	538-8SC	10	8 channel display

538-8SC



Large panel and field displays, digit size 57-180 mm

	Panel display	Page	Field display	Pages	Description
Modular field displays	X-2012	15	X-2011	12-13	Process inputs 0/4..20 mA, 0..5/10 V
	X-2021	15	X-2021	12-13	Temperature and mA/V inputs
	X-2026	15	X-2026	12-13	Totalizer for mA/V inputs
	X-2028	15	X-2028	12-13	Signal speed display mA/V inputs
	X-2051	15	X-2051	12-13	Frequency display for pulse sensors
	X-2251	15	X-2251	12-13	Difference display for pulse sensors
Modular large panel meters	X-2061	15	X-2061	12-13	Counter
	X-2064	15	X-2064	12-13	Incremental sensors (position sensors)
	X-2066	15	X-2066	12-13	Timer
	X-2067	15	X-2067	12-13	Clock
	X-2071	15	X-2071	12-13	Serial input display
	X-2081	15	X-2081	12-13	BCD, binary, Gray code

541



575F, 1000F, 1100F, 1800F

1

Loop Powered Displays

Displays

Large Displays

Transmitters

Converters

Wireless Transmitters

Software

Sensors

201/202/211/212

301/302/311/312

Loop powered displays do not need external power supply

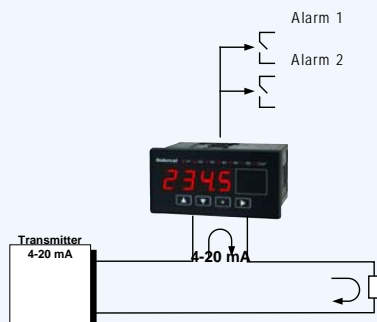


Depth of the case is only 70 mm

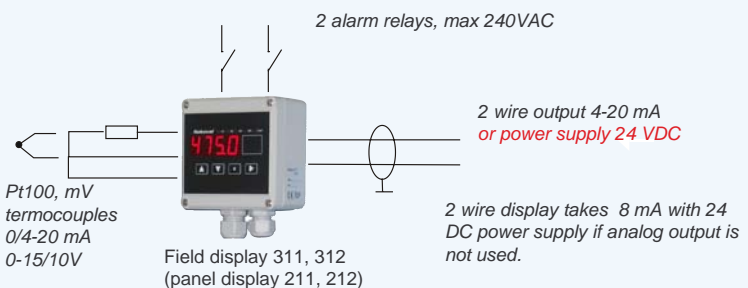


	Loop Powered Displays		Loop Powered Displays		Loop Powered Display	2 wire Panel Meters		2 wire Field Displays	
Model	201	202	301	302	305	211	212	311	312
Manufacturer	Nokeval		Nokeval		Nokeval	Nokeval		Nokeval	
Enclosure	96 x 48 x 70 mm WHD		100 x 100 x 57 mm WHD		80 x 80 x 57 mm WHD	96 x 48 x 70 mm WHD		100 x 100 x 57 mm WHD	
Digit size	14.5 mm		14.5 mm		14.5 mm	14.5 mm		14.5 mm	
Number of digits	4 digits		4 digits		4 digits	4 digits		4 digits	
Display color	Red LED		Red LED		Red LED	Red LED		Red LED	
Inputs	4-20 mA (Loop powered) Operating energy from input loop		4-20 mA (Loop powered) Operating energy from input loop		4-20 mA (Loop powered) Operating energy from input loop	Thermocouples: T type max. 400°C K, N 1200°C J,J/DIN, E 900°C S,R,B,G 1700°C C,D 2200°C Pt100 -200...+700°C 4..20 mA/0..10V, 0..100 mV		Thermocouples: T type max. 400°C K, N 1200°C J,J/DIN, E 900°C S,R,B,G 1700°C C,D 2200°C Pt100 -200...+700°C 4..20 mA/0..10V, 0..100 mV	
Accuracy	0.05% of span		0.05% of span		0.05% of span	0.05% of span		0.05% of span	
Resolution	1 / 32 000, 15 bit		1 / 32 000, 15 bit		1 / 32 000, 15 bit	1 / 32 000, 15 bit		1 / 64 000, 16 bit	
Galvanic isolation						Input isolation >1000 V		Input isolation >1000 V	
Scaling of display	By front keys		By front keys		By front keys	By front keys		By front keys	
Special functions	Square root		Square root		Square root	6 points XY linearization		6 points XY linearization	
Alarms: 2 relays, 240 VAC, 150 mA		Low or high		Low or high	-		Low or high		Low or high
Protection class	Front panel IP65		IP65		IP65	Front panel IP65		IP65	
Power supply or voltage drop	Max. voltage drop in current loop < 5 V For model 202 < 7.5 V		Max. voltage drop in current loop < 5 V For model 302 < 7.5 V		Max. voltage drop in current loop < 5 V	Power supply range 10..32 VDC (211) or 12.5..32 V (212)		Power supply range 10..32 VDC (311) or 12.5..32 V (312)	
Note	Low cost solution for current loop 4-20 mA. Easy installation without external power supply.		Low cost solution for current loop 4-20 mA. Easy installation without external power supply.		Low cost solution for current loop 4-20 mA. Easy installation without external power supply.	2 wire display can be also used without current output by connecting 13..24 VDC to output terminal.		2 wire display can be also used without current output by connecting 13..24 VDC to output terminal.	
Model	201	202	301	302	305	211	212	311	312

Loop powered display 201 and 202



2 wire display 311 and 312 with galvanic isolated output 4-20 mA



Panel Meters

Displays

Large Displays

Transmitters

Converters

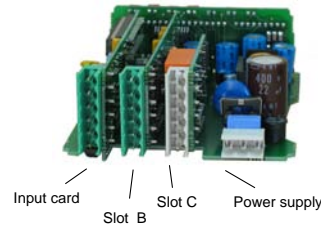
Wireless Transmitters

Software

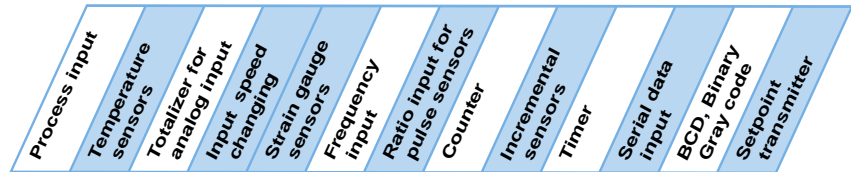
Sensors

Panel meter series 2000

- Over 200 combinations by changing input and output cards
- Sensor power supply 24 VDC, max 150 mA
- No calibration needed after changing cards



Input and output cards can be used with other display series as 2800, 575F, 910, 920, 1000F, 1100F and 1800F



Inputs		2012	2021	2026	2028	2041	2051	2251	2061	2064	2066	2071	2081	2022
Process input 0/4..20 mA, 0..5/10V		•	•	•	•									•
0..25, 55, 100, 1000, 2500 mV			•	•	•									
Potentiometer 100Ω..10 kΩ		•												
Potentiometer 100Ω...5 kΩ			•											
Thermocouples, J,K,L,T,N,R,S,C,D,B,G			•											
Pt100 sensor (3 or 4 wire)			•											
Pt1000 sensor (3 or 4 wire)			•											
Ni100 sensor (3 or 4 wire)			•											
Weighing sensors, strain gauge						•								
Frequency PNP/NPN, Namur, relay, pickup							•	•						
Counter, PNP/NPN, Namur, relay, pickup									•					
Binary and Gray code													•	
BCD inputs 3..5 digits													•	
Serial input RS232 and RS-485												•		
Incremental sensors										•				
Timer /clock											•			
24 VDC sensor supply, max. 150 mA		•	•	•	•	10 V	•	•	•	•	•		•	•
Input cards (slot A)	Type code													
Process inputs, mA/V	2012-IN	•												
Temperature sensors and process input	2021-MU		•											
Process inputs, mA/V	2022-SP													•
Totalizer/input signal speed, mA/V inputs	2026-TO			•	•									
Weighing sensors (strain gauge)	2041-SG					•								
Frequency input (pulse)	2051-PU						•	•						
Counter (pulse)	2061-CO								•					
Incremental sensors A/B lines	2064-IE									•				
Serial inputs RS232/485	2071-RS											•		
BCD, Gray and Binary inputs	2081-BCD												•	
Output (slot B and C)														
0/4..20 mA, 0..5/10V, galvanic isolation	2000-OUT	•	•			•	•	•						•
Serial input RS-485/232	2000-RS	•	•			•	•	•	•	•				•
Relay card, 2 relays	2000-REL2	•	•	•	•	•	•	•	•	•				•
Relay card, 3 relays	2000-REL3	•	•			•				•				•
4 relays: 2 relay cards to B and C	2 x REL2	•	•		•									
I/O card, 4 alarm cards, semiconductor	2000-I/O		•			•	•		•					
Special functions														
Display hold, external contact		•	•	•	•									
Display reset/tare, external contact	2000-I/O	▲		•	•				▲	▲	▲			
Start/stop by external contact	2000-I/O										•			
Min/max memory			•											
Display memory (one week)	2000-MEM			•					•					
Output control by front keys														•
Counter/totalizer				•					•					
Two mA/V outputs at same time			•											•
Special inputs >10V (e.g. input 0-48 V)		•												
2 input channels		•						•						
Basic meter without input card														
Power supply 85..260 VAC	2000-230VAC													
Power supply 12..30 VDC (24 VDC or AC)	2000-24VAC													•
Power supply 85..260 VAC	2000GR-230VAC													
Power supply 12..30VDC (24 VDC or AC)	2000GR-230VAC													•

▲ Included in input card

Panel Meters

Displays

Large Displays

Transmitters

Converters

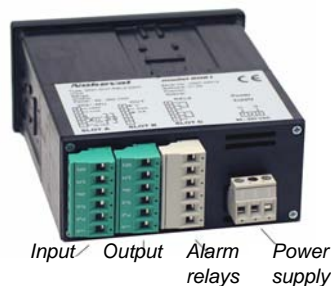
Wireless Transmitters

Software

Sensors

Displays include color coded terminals: gray terminals for power supply 230 VAC and alarm relays. Green terminals for other voltages.

See also loop powered displays on the page 5



	Process inputs mA/V	2 channel panelmeter	Temperature sensors	Totalizer mA/V inputs	Input signal changing speed
Model	2012	2212	2021	2026	2028
Manufacturer	Nokeval	Nokeval	Nokeval	Nokeval	Nokeval
Case	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD
Digit size	14.5 mm	14.5 mm	14.5 mm	14.5 mm	14.5 mm
Number of digits	6 digits	4 digits	6 digits	6 digits	6 digits
Display color	Red or green LED	Red LED	Red or green LED	Red or green LED	Red or green LED
Inputs	0/4..20 mA 0..5/10 V Potentiometer 100Ω ..10 kΩ Special input 0..100 VDC on request	2 input channels 0/4..20 mA 0..5/10 V Potentiometer 100Ω ..10 kΩ	±0..25/2500mV ±0..5/10V, 0/4..20mA Pt100, Pt1000, Ni100 Thermocouple K, J, L, T, E, B, N, R, S, C, D, G, Chr-C Resistance 100Ω ..5 kΩ	0/4..20 mA 0..5/10 V	0/4..20 mA 0..5/10 V
Accuracy	0.05% of span	± 0.05% +1 dig.	0.02..0.05% of span		
Resolution	1 / 64 000, 16 bit	1 / 64 000, 16 bit	1 / 64 000, 16 bit	1 / 64 000, 16 bit	1 / 64 000, 16 bit
Settings	By front keys	By front keys	By front keys	By front keys	By front keys
Special functions	Tare or hold by external contact		Min. and max. memory, square root (mA/V-input)		Min. and max. memory, square root (mA/V-input)
Alarms (optional)	2..4 relays, 240 VAC, 2A	2..3 relays	2..4 relays, 240 VAC, 2A	2 relays, 240 VAC, 2A	2..4 relays, 240 VAC, 2A
Output (optional)	0/4..20 mA, 0..5/10V	0/4..20 mA, 0..5/10V	0/4..20 mA, 0..5/10V		
Serial input (optional)	RS-232 and RS-485, Nokeval SCL protocol	RS-485 or RS232 Nokeval SCL protocol	RS-232 and RS-485, Nokeval SCL protocol		
Sensor supply	24 VDC, max. 150 mA	-	24 VDC, max. 150 mA	24 VDC, max. 150 mA	24 VDC, max. 150 mA
Protection class	Front panel IP65	Front plate IP65	Front panel IP65	Front panel IP65	Front panel IP65
Power supply	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC
Note	The model 2012 replaces the model 2011.	First digit displays channel number Inputs are not isolated	Option cards: Output, serial and alarm cards can be installed into slot B or slot C.	Totalizer or rate value can be displayed, selection by front keys One week display memory without power supply.	Signal speed display is used e.g. in pressure chamber applications where pressure need to decreased at fix speed.
Included cards	2012-IN	2 x 2012-IN	2021-MU	2026-TO, 2000-MEM	2026-TO
Model	2012	2212	2021	2026	2028
Options:					
Power supply	12..32 VDC or 85..260 VAC Power supply needs to be mentioned in order				
Note	Two option cards can be installed at the same time				
Ordering code	Optional cards are added after basic type + power supply, e.g. 2021-OUT-REL2-230 VAC (leave out series type 2000, see page 6)				
Options	Option cards can also be installed afterwards. Mention the type of the series when ordering cards separately e.g. REL2 = 2000-REL2				

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Panel Meters

Displays

Large Displays

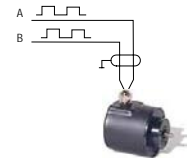
Transmitters

Converters

Wireless Transmitters

Software

Sensors



1

	Strain gauge sensors	Frequency input	Ratio/difference display	Counter for pulse input	Incremental sensors
Model	2041	2051	2251	2061	2064
Manufacturer	Nokeval	Nokeval	Nokeval	Nokeval	Nokeval
Dimensions	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD
Digit size	14.5 mm	14.5 mm	14.5 mm	14.5 mm	14.5 mm
Number of digits	6 digits	6 digits	6 digits	6 digits	6 digits
Display color	Red or green LED	Red or green LED	Red or green LED	Red or green LED	Red or green LED
Inputs	Strain gauge 4 x 350 Ω. 4 or 6 wires Input 25..50 mV	Namur, NPN/PNP, contact, pick-up Frequency range 0.0001..5000 Hz	Two channel display for two pulse sensors. Namur, NPN/PNP, contact, pick-up Frequency range 0.0001..5000 Hz	Namur, NPN/PNP, contact, pick-up Input frequency 0..5 kHz. Up/down function by external contact	Direction selection by A and B lines from sensors. Frequency range 0..25 kHz
Accuracy	0.05..0.1% of span	0.01 % of reading	0.01 % of reading	-	-
Resolution	1 / 64000, 16 bit	-	-	-	-
Settings	By front keys	By front keys	By front keys	By front keys	By front keys
Special functions		Pulse divider 1..64000	2 channels	Pulse output divider selectable 1..64000	
Alarms (optional)	2..3 relays, 240 VAC, 2A	2..4 relays, 240 VAC, 2A	2 relays, 240 VAC, 2A	2 relays, 240 VAC, 2A	2..3 relays, 240 VAC, 2A
Outputs (optional)	0/4..20 mA, 0..5/10V	0/4..20 mA, 0..5/10V	0/4..20 mA, 0..5/10V	-	-
Serial signal (optional)	RS-232 and RS-485, Nokeval SCL protocol	RS-232 and RS-485, Nokeval SCL protocol	RS-232 and RS-485, Nokeval SCL protocol	RS-232 and RS-485, Nokeval SCL protocol	RS-232 and RS-485, Nokeval SCL protocol
Sensor supply	10 V, max. 150 mA	24 VDC, max. 150 mA	24 VDC, max. 150 mA	24 VDC, max. 150 mA	24 VDC, max. 150 mA
Protection class	Front panel IP65	Front panel IP65	Front panel IP65	Front panel IP65	Front panel IP65
Power supply	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC
Note	6 wire sensors connection adds measuring accuracy. Sensors can be connected in series by using serial connection unit 20SA4.	Measuring range starts from exceptional low frequency range, hours up to 5kHz.	Typical application is ratio display (%) for two flow meters. Can be also used as difference display for two flow meters	Can be used as batch controller (with alarms). Display scaling can be set for floating point value e.g. 1 pulse=15.2 digits	Moving direction is selected by lines A and B of sensors. Reset by external contact.
Included card	2041-SG	2051-PU	2 x 2051-PU	2061-CO	2064-IE
Model	2041	2051	2251	2061	2064
Options					
Power supply	12..32 VDC or 85..260 VAC Power supply needs to be mentioned in order				
Ordering code	Optional cards are added after basic type + power supply, e.g. 2021-OUT-REL2-230 VAC (leave out series type 2000, see page 6)				
Options	Option cards can also be installed afterwards. Mention the type of the series when ordering cards separately e.g. REL2 = 2000-REL2				

Panel Meters

Displays

Large Displays

Transmitters

Converters

Wireless Transmitters

Software

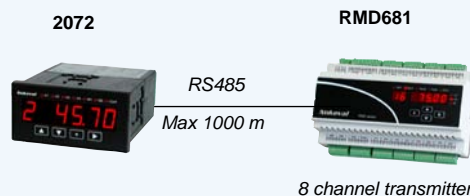
Sensors



	Timer	Clock	Serial signal RS232/485	9 channel display for transmitters	BCD, Binary and Gray code
Model	2066	2067	2071	2072	2081
Manufacturer	Nokeval	Nokeval	Nokeval	Nokeval	Nokeval
Dimensions	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD
Digit size	14.5 mm	14.5 mm	14.5 mm	14,5 mm	14.5 mm
Number of digits	6 digits	6 digits	6 digits	4 digits	6 digits
Display color	Red or green LED	Red or green LED	Red or green LED	Red or green LED	Red or green LED
Inputs	Start, stop and pause by external contact. Time is displayed by using dots as 23.59.59 (h.min.s).	Time is displayed by using dots as 23.59.59 (h.min.s).	RS485, RS232, Nokeval SCL protocol	RS485, Nokeval SCL protocol	5 digits BCD code 5 digits Gray code 5 digits binary Logic level '1' 5...30 VDC
Accuracy	30 ppm	30 ppm			
Resolution	1 second	1 second			
Settings	By front panel	By front panel	By front panel	By front panel	By front panel
Special functions				9 channels	
Alarms (optional)					
Output (optional)					
Serial signal (optional)		RS232 and RS-485, Nokeval SCL protocol			
Sensor supply protection class	Front panel IP65	Front panel IP65	Front panel IP65	Front panel IP65	24 VDC, max. 150 mA Front panel IP65
Power supply	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC
Note	Time range 99.59.59 (h.min.s) Available also in resolution of 0.01s	Display range 23.59.59 (h.min.s) Hours, minute and seconds are separated in dots. Several remote displays are possible by using serial RS485 output	Front keys can be read by serial signal. Display can be set to a buffer mode without sending returning marks.	2072 can display 9 channels from transmitters connected with serial bus RS485 e.g. RMD681.	Display range -65535...+65535. Basic display includes 3 BCD inputs (3 x 4 lines). Option card adds 2 inputs (5 inputs).
Included cards	2066	2067, 2000-MEM	2071-RS	2072-RS	2081-BCD, 2000-BCD
Model	2066	2067	2071	2072	2081
Options					
Power supply	12..32 VDC or 85..260 VAC	Power supply needs to be mentioned in order			

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9 channel display can read several one or multichannel transmitters with RS485 output. Channel selection by arrow keys or automatic scanning



Field enclosures are available for 1-3 panel meters.



Panel Meters

Displays

Large Displays

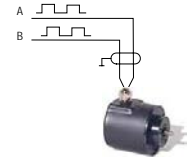
Transmitters

Converters

Wireless Transmitters

Software

Sensors



1

	Strain gauge sensors	Frequency input	Ratio/difference display	Counter for pulse input	Incremental sensors
Model	2041	2051	2251	2061	2064
Manufacturer	Nokeval	Nokeval	Nokeval	Nokeval	Nokeval
Dimensions	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD
Digit size	14.5 mm	14.5 mm	14.5 mm	14.5 mm	14.5 mm
Number of digits	6 digits	6 digits	6 digits	6 digits	6 digits
Display color	Red or green LED	Red or green LED	Red or green LED	Red or green LED	Red or green LED
Inputs	Strain gauge 4 x 350 Ω. 4 or 6 wires Input 25..50 mV	Namur, NPN/PNP, contact, pick-up Frequency range 0.0001..5000 Hz	Two channel display for two pulse sensors. Namur, NPN/PNP, contact, pick-up Frequency range 0.0001..5000 Hz	Namur, NPN/PNP, contact, pick-up Input frequency 0..5 kHz. Up/down function by external contact	Direction selection by A and B lines from sensors. Frequency range 0..25 kHz
Accuracy	0.05..0.1% of span	0.01 % of reading	0.01 % of reading	-	-
Resolution	1 / 64000, 16 bit	-	-	-	-
Settings	By front keys	By front keys	By front keys	By front keys	By front keys
Special functions		Pulse divider 1..64000	2 channels	Pulse output divider selectable 1..64000	
Alarms (optional)	2..3 relays, 240 VAC, 2A	2..4 relays, 240 VAC, 2A	2 relays, 240 VAC, 2A	2 relays, 240 VAC, 2A	2..3 relays, 240 VAC, 2A
Outputs (optional)	0/4..20 mA, 0..5/10V	0/4..20 mA, 0..5/10V	0/4..20 mA, 0..5/10V	-	-
Serial signal (optional)	RS-232 and RS-485, Nokeval SCL protocol	RS-232 and RS-485, Nokeval SCL protocol	RS-232 and RS-485, Nokeval SCL protocol	RS-232 and RS-485, Nokeval SCL protocol	RS-232 and RS-485, Nokeval SCL protocol
Sensor supply	10 V, max. 150 mA	24 VDC, max. 150 mA	24 VDC, max. 150 mA	24 VDC, max. 150 mA	24 VDC, max. 150 mA
Protection class	Front panel IP65	Front panel IP65	Front panel IP65	Front panel IP65	Front panel IP65
Power supply	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC
Note	6 wire sensors connection adds measuring accuracy. Sensors can be connected in series by using serial connection unit 20SA4.	Measuring range starts from exceptional low frequency range, hours up to 5kHz.	Typical application is ratio display (%) for two flow meters. Can be also used as difference display for two flow meters	Can be used as batch controller (with alarms). Display scaling can be set for floating point value e.g. 1 pulse=15.2 digits	Moving direction is selected by lines A and B of sensors. Reset by external contact.
Included card	2041-SG	2051-PU	2 x 2051-PU	2061-CO	2064-IE
Model	2041	2051	2251	2061	2064
Options					
Power supply	12..32 VDC or 85..260 VAC Power supply needs to be mentioned in order				
Ordering code	Optional cards are added after basic type + power supply, e.g. 2021-OUT-REL2-230 VAC (leave out series type 2000, see page 6)				
Options	Option cards can also be installed afterwards. Mention the type of the series when ordering cards separately e.g. REL2 = 2000-REL2				

Panel Meters

Displays

Large Displays

Transmitters

Converters

Wireless Transmitters

Software

Sensors



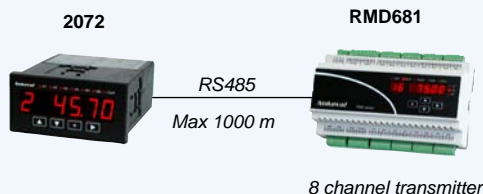
Input Output Alarm relays Power supply



	Timer	Clock	Serial signal RS232/485	9 channel display for transmitters	BCD, Binary and Gray code
Model	2066	2067	2071	2072	2081
Manufacturer	Nokeval	Nokeval	Nokeval	Nokeval	Nokeval
Dimensions	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD	96 x 48 x 115 mm WHD
Digit size	14.5 mm	14.5 mm	14.5 mm	14,5 mm	14.5 mm
Number of digits	6 digits	6 digits	6 digits	4 digits	6 digits
Display color	Red or green LED	Red or green LED	Red or green LED	Red or green LED	Red or green LED
Inputs	Start, stop and pause by external contact. Time is displayed by using dots as 23.59.59 (h.min.s).	Time is displayed by using dots as 23.59.59 (h.min.s).	RS485, RS232, Nokeval SCL protocol	RS485, Nokeval SCL protocol	5 digits BCD code 5 digits Gray code 5 digits binary Logic level '1' 5...30 VDC
Accuracy	30 ppm	30 ppm			
Resolution	1 second	1 second			
Settings	By front panel	By front panel	By front panel	By front panel	By front panel
Special functions				9 channels	
Alarms (optional)					
Output (optional)					
Serial signal (optional)		RS232 and RS-485, Nokeval SCL protocol			
Sensor supply protection class	Front panel IP65	Front panel IP65	Front panel IP65	Front panel IP65	24 VDC, max. 150 mA Front panel IP65
Power supply	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC	85..240 VAC, 12..32 VDC / 24 VAC
Note	Time range 99.59.59 (h.min.s) Available also in resolution of 0.01s	Display range 23.59.59 (h.min.s) Hours, minute and seconds are separated in dots. Several remote displays are possible by using serial RS485 output	Front keys can be read by serial signal. Display can be set to a buffer mode without sending returning marks.	2072 can display 9 channels from transmitters connected with serial bus RS485 e.g. RMD681.	Display range -65535...+65535. Basic display includes 3 BCD inputs (3 x 4 lines). Option card adds 2 inputs (5 inputs).
Included cards	2066	2067, 2000-MEM	2071-RS	2072-RS	2081-BCD, 2000-BCD
Model	2066	2067	2071	2072	2081
Options					
2 alarms (REL2)					
BCD input, 2 digits (BCD)					
Serial output RS485					
Power supply	12..32 VDC or 85..260 VAC Power supply needs to be mentioned in order				

1

9 channel display can read several one or multichannel transmitters with RS485 output. Channel selection by arrow keys or automatic scanning



Field enclosures are available for 1-3 panel meters.



Large Field Displays

Displays

Large Displays

Transmitters

Converters

Wireless Transmitters

Software

Sensors

Miniature display on the backside of the display helps scaling. Electronics



All input and output cards of panel meter series 2000 are available. Only common types are shown on this page.



2

	Process input mA/V	Frequency inputs	Counter for pulse sensors	Serial signal	BCD, binary and Gray code
Model	-2012 (input card)	-2051 (input card)	-2061 (input card)	-2071 input card)	-2081 (input card)
Manufacturer	Nokeval	Nokeval	Nokeval	Nokeval	Nokeval
575F5-(input)	Size 57 mm (digit size)	57 mm	57 mm	57 mm	57 mm
	Digits 5 digits	5 digits	5 digits	5 digits	6 digits
	Case 280 x 140 x 100mm WHD	280 x 140 x 100mm WHD	280 x 140 x 100mm WHD	280 x 140 x 100mm WHD	280 x 140 x 100mm WHD
1000F4-(input)	Size 100 mm	100 mm	100 mm	100 mm	100 mm
	Digits 4 digits	4 digits	4 digits	4 digits	4 digits
	Case 460 x190 x 110mm WHD	460 x190 x 110mm WHD	460 x190 x 110mm WHD	460 x190 x 110mm WHD	460 x190 x 110mm WHD
1100F6-(input)	Size 100 mm	100 mm	100 mm	100 mm	100 mm
	Digits 6 digits	6 digits	6 digits	6 digits	6 digits
	Case 625 x250 x 130mm WHD	625 x250 x 130mm WHD	625 x250 x 130mm WHD	625 x250 x 130mm WHD	625 x250 x 130mm WHD
1800F4-(input)	Size 180 mm	180 mm	180 mm	180 mm	180 mm
	Digits 2-5 digits	2-5 digits	2-5 digits	2-5 digits	2-5 digits
	Case 1030 x 375 x 210mm	1030 x 375 x 210 mm	1030 x 375 x 210 mm	1030 x 375 x 210 mm	1030 x 375 x 210 mm
Display color	Red LED	Red LED	Red LED	Red LED	Red LED
Inputs	0/4..20 mA 0..5/10 V Potentiometer 100 Ω ..10 kΩ	Namur, NPN/PNP, contact, pickup Frequency display 0.0001..5000 Hz	Namur, NPN/PNP, contact, pickup Frequency range 0.0001..5000 Hz. Up/down function by external contact	RS232 and RS-485, Nokeval SCL protocol	5 digits BCD code 5 digits Gray code 5 digits Binary code Logic level '1' 5...30 VDC
Accuracy	0.05% of span	0.01% of span	-	-	-
Resolution	1 / 32 000, 15 bit	-	-	-	-
Settings	By keys inside of case	By keys inside of case	By keys inside of case	By keys inside of case	By keys inside of case
Special functions	Tare or hold	Pulse divider	Pulse divider	-	-
Alarms (optional)	2 relays, 240 VAC, 2A	2..4 relays, 240 VAC, 2A	2 relays, 240 VAC, 2A	-	-
Output (optional)	-	0/4..20 mA, 0..5/10V	-	-	-
Serial signal (optional)	-	RS232 and RS-485, Nokeval SCL protocol	RS232 and RS-485, Nokeval SCL protocol	-	-
Sensor supply	24 VDC, max.50 mA	24 VDC, max.50 mA	24 VDC, max.50 mA	24 VDC, max.50 mA	24 VDC, max.50 mA
Protection class	IP65	IP65	IP65	IP65	IP65
Power supply	85..240 VAC, 24 VDC / 24 VAC	85..240 VAC, 24 VDC / 24 VAC	85..240 VAC, 24 VDC / 24 VAC	85..240 VAC, 24 VDC / 24 VAC	85..240 VAC, 24 VDC / 24 VAC
Power	10 ..20 W	10 ..20 W	15 ..20 W	15 ..20 W	15 ..20 W
Note	Basic display for process inputs.	Measuring range starts from exceptional low frequency range, hours up to 5 kHz.	Can be used as batch controller (with alarms). Display scaling can be set for floating point value e.g. 1 pulse=15.2	Front keys can be read by serial signal. Display can be set to a buffer mode without sending returning marks.	Display range -65535...+65535. 2000-BCD cards included.
Input card	-2012	-2051	-2061	-2071	-2081
1000F4-, 4 digits, 100 mm					
1100F6-, 6 digits, 100 mm					
1800F3-, 3 digits, 180 mm					
1800F4-, 4 digits, 180 mm					
1800F5-, 5 digits, 180 mm					
Ordering information	Optional cards are added after basic type + power supply, e.g. 1000F4-2012-OUT-REL2-230 VAC (leave out series type 2000) Option cards can also be installed afterwards. Mention the type of the series when ordering cards separately e.g. REL2 = 2000-REL2 All input and output cards of panel meter series 2000 are available.				

All input and output cards of panel meter series 2000 are available.
Only common types are shown on this page.

Large Panel Meters

Displays

Large Displays

Transmitters

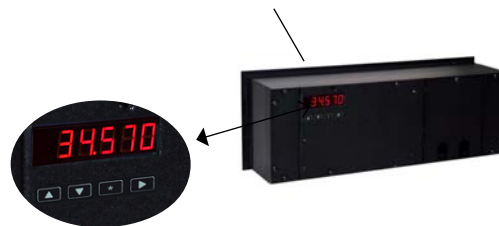
Converters

Wireless Transmitters

Software

Sensors

Miniature display on the backside of the display helps scaling.



	Process input mA/V		Frequency input		Counter for pulse sensors		Serial data input		BCD, binary and Gray input		
Input card	-2012 (input card)		-2051 (input card)		-2061 (input card)		-2071 (input card)		-2081 (input card)		
Manufacturer	Nokeval		Nokeval		Nokeval		Nokeval		Nokeval		
Model	910	920	910	920	910	920	910	920	910	920	
Digit size	57 mm	100 mm	57 mm	100 mm	57 mm	100 mm	57 mm	100 mm	57 mm	100 mm	
Number of digits	5	4	5	4	5	4	5	4	5	4	
Case	910	303 x 111 x 80 mm WHD		303 x 111 x 80 mm WHD		303 x 111 x 80 mm WHD		303 x 111 x 80 mm WHD		303 x 111 x 80 mm WHD	
	920	417 x 161 x 80 mm WHD		417 x 161 x 80 mm WHD		417 x 161 x 80 mm WHD		417 x 161 x 80 mm WHD		417 x 161 x 80 mm WHD	
Display color	Red LED		Red LED		Red LED		Red LED		Red LED		
Inputs	0/4..20 mA 0..5/10 V Potentiometer 100Ω ..10 kΩ		Namur, NPN/PNP, contact, pickup Frequency range 0.0001..5000 Hz		Namur, NPN/PNP, contact, pickup Frequency range 0.0001..5000 Hz. External contact for counting direction		RS232 and RS-485, Nokeval SCL protocol		5 digits BCD code 5 digits Gray code 5 digits binary code Logic level '1' 5...30 VDC		
Accuracy	0.05% of span		0.05% of span		0.01% of span						
Resolution	1 / 32 000 (15 bit)										
Settings	By backside keys		By backside keys		By backside keys		By backside keys		By backside keys		
Special functions	tare or hold		Pulse divider for output		Pulse divider for output		-		-		
Alarms (optional)	2 relays, 240 VAC, 2A		2..4 relays, 240 VAC, 2A		2 relays, 240 VAC, 2A		-		-		
Outputs (optional)	-		0/4..20 mA, 0..5/10V		-		-		-		
Serial signal (optional)	-		RS232 and RS-485, Nokeval SCL protocol		RS232 and RS-485, Nokeval SCL protocol		-		-		
Sensor supply	24 VDC, max.50 mA		24 VDC, max.50 mA		24 VDC, max.50 mA		24 VDC, max.50 mA		24 VDC, max.50 mA		
Front plate	IP54		IP54		IP54		IP54		IP54		
Power supply	24 VDC		24 VDC		24 VDC		24 VDC		24 VDC		
Power demand	10..20 W		10..20 W		15..20 W		15..20 W		15..20 W		
Note	Basic display for process inputs (mA/V).		Measuring range starts exceptionally low. Frequency range from hours up to 5kHz.		Can be used as batch controller (with alarms). Display scaling can be set for floating point value e.g. 1 pulse=15.2		Front keys can be read by serial signal. Display can be set to a buffer mode without sending returning marks.		Display range -65535...+65535. 2000-BCD cards included. 2 inputs. 5 digits need two option cards		
Model	-2012		-2051		-2061		-2071		-2081		
Ordering code	Optional cards are added after basic type + power supply, e.g. 910-2011-REL2-230 VAC										
	All input and option cards of 200 series are available, see combination table of 2000 series on the page 6.										

Transmitters

Displays

Large Displays

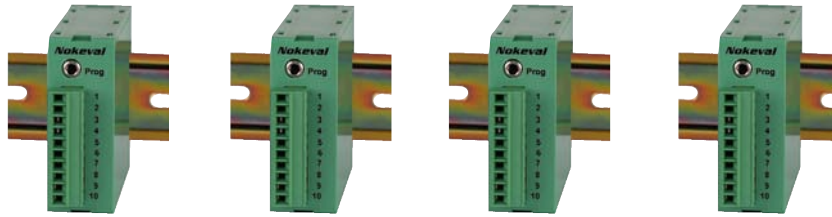
Transmitters

Converters



Wireless Transmitters

Software

Sensors



3

	2 wire 4-20 transmitter	Transmitter with mA/V outputs	Transmitter with frequency output	Transmitter with RS485 output	
Model	6720	6740	6746	7100	
Manufacturer	Nokeval	Nokeval	Nokeval	Nokeval	
All transmitters have same inputs					Hand held programmer 6790 for field use  Easy to use in field conditions Dimensions 50 x 80 x 20 mm DCS772 converter for configurations  DCS772 converter for USB port can be used for configuration of devices that have a socket in the front panel. POL-cable and MekuWin software are included. POL-3PIN adapter cable can be used for all devices that have 3 pin connector for configuration as wireless transmitters together with POL-232 cable or DCS772.
Thermocouples: E -100...900°C J -150...900°C K -150...1300°C L -100...900°C T -150... 400°C N 0...1300°C R 0...1700°C S 0...1700°C C 0...2200°C D 0...2200°C B 400...1700°C G 1000... 2200°C					
Resistance sensors: Pt100 -200..700°C Pt500 -200..700°C Pt1000 -200..300°C Ni100 -60..175°C Res. 0..1000 Ω					
mA and mV/V inputs: -100..+100 mV 0..5 V 0..10 V 0..20 mA 4..20 mA -20..+20 mA -10 V..+10 V					
Infrared sensors: K type IR sensors IR sensor IRT/c-K-140F (Exergen) is linearized on range -30..+350 °C Emissivity settings by MekuWin software or hand held programmer 6790					
Output	2 wire 4..20 mA	0..20 mA, 4..20 mA, 0..5, 10V	Frequency output selectable on range 0..2500 Hz (NPN/PNP/TTL)	Serial data RS485 SCL protocol	
Programming	MekuWin (PC) or 6790 hand held programmer	MekuWin (PC) or 6790 hand held programmer	MekuWin (PC) or 6790 hand held programmer	MekuWin (PC) or 6790 hand held programmer	
Isolation voltage	>2 kV	>1 kV, three way	>1 kV, three way	>1 kV, three way	
Power supply	2 wire 4-20 mA, 10..32 VDC	24 VDC ±15%	24 VDC, ±15%	24 VDC, ±15%	
Current consumption	Max. 22 mA	40 mA, with mA output	Max. 40 mA	Max. 40 mA	
Accuracy	Pt100 0.05 % of span TC 0.1 % of span mV 0.05 % of span	Pt100 0.05 % of span TC 0.1 % of span mV 0.05 % of span	Pt100 0.05 % of span TC 0.1 % of span mV 0.05 % of span	Pt100 0.05 % of span TC 0.1 % of span mV 0.05 % of span	
Input resistance	5 Ω for mA input 1 MΩ for voltage input	5 Ω for mA input 1 MΩ for voltage input	5 Ω for mA input 1 MΩ for voltage input	5 Ω for mA input 1 MΩ for voltage input	
Output load	Depend on power supply	Max. 600 Ω	-	-	
Sample time	4 samples/s	4 samples/s	4 samples/s	4 samples/s	
Operating temperature	-10..60°C	-10..60°C	-10..60°C	-10..60°C	
Installation	DIN rail, 35 mm	DIN rail, 35 mm	DIN rail, 35 mm	DIN rail, 35 mm	
Terminals	1,5 mm ²	1,5 mm ²	1,5 mm ²	1,5 mm ²	
Case dimensions	22,5 x 60 x 75 mm WHD	22,5 x 60 x 75 mm WHD	22,5 x 60 x 75 mm WHD	22,5 x 60 x 75 mm WHD	
Note		Transmitter can be used as galvanic isolator for process signals mA/V.	Low cost way to transfer analog signals to PLC when analog inputs are not available.	Suitable for data acquisition software as WinX and PromoLog	
Model	6720	6740	6746	7100	
P					



POL-RS232 cable (free MekuWin software)

MekuWin configuration software for PC

MekuWin is exceptionally flexible configuration software supporting new and old transmitters. MekuWin loads the structure and the contents of the configuration menu from the target device, so the same MekuWin version can be used with past and forthcoming products. There is no need to update this software every time a new product or product version is released.

You can also write mathematical and logical functions by using simple Elo language for those transmitters that support special functions, for example 6821.

Transmitters

Displays

Large Displays

Transmitters

Converters

Wireless Transmitters

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	f/I converter mA/V output	Analog based 2 wire transmitter	1 and 2 channels 2 wire transmitter		Head mounting transmitter	Programmer for 2 wire transm.
Model	6420	620S	RTB231	RTB232	HTB230	HTB-Prog
Manufacturer	Nokeval	Nokeval	Nokeval		Nokeval	Nokeval
Inputs	Frequency range 0.00025 Hz..20 kHz NPN / PNP sensors contact, pickup, push-pull or Namur sensors	Pt100, 3 wire connection Temperature range -100..+650 °C, Minimum range 10°C Standard ranges -50..+50°C, 0..50°C 0..100°C, 0..150°C 0..200°C	Pt100, 2, 3 or 4 wire, -200..+700 °C, min. range 10°C Other sensors: Ni100, Cu10, 0..2 kΩ		Pt100, 2, 3 or 4 wire, -200..+700 °C, min. range 10°C Other sensors: Ni100, Cu10, 0..2 kΩ,	Programmer for 2 wire transmitters Connected with two clips to transmitter
Input channels	1	1	1	2	1	-
Output	0/4..20 mA, 0..5/10 V and pulse divider	2 wire 4..20 mA	2 wire 4..20 mA	2 wire 4-20 mA	2 wire 4..20 mA	USB
Alarm	Semiconductor relay	-	-		-	-
Programming	MekuWin (PC) / DCS772 USB converter	Factory settings	HTB-Prog programmer/ MekuWin software		HTB-Prog programmer/ MekuWin software	By MekuWin software
Power supply	19..28 VDC	10..32 VDC (2 wire)	6.5..30 VDC		6.5..30 VDC	From USB port
Accuracy	0.05 % of span	0.05% of span	<0.05% of span		<0.05% of span	-
Linearity	0.05 % of span	0.05% of span				-
Output load (mA)	650 Ω (24 VDC)	Depends on power supply	870 Ω (24 VDC)		870 Ω (24 VDC)	-
Output changing time	300 ms	200 ms				
Operating temperature	0..60°C	0..60°C	-40..+85°C		-40..+85°C	-40..+60°C
Installation	DIN rail, 35 mm	DIN rail, 35 mm	DIN rail, 35 mm		B- or Buz-head	-
Connectors	2.5 mm ²	2.5 mm ²	2.5 mm ²		1.5 mm ²	-
Dimensions	22.5 x 75 x 98 mm WHD	22.5 x 75 x 98 mm WHD	22.5 x 100 x 120 mm WHD		Ø 44 x 22 mm WHD	60 x 62 x 20 mm WHD
Note	Also ramp type output alternatively available. Sensor supply 15 VDC, max. 50 mA	Factory settings for measuring ranges.	Channels are isolated from each other. Removable screw terminals.			Programmer gives power to transmitter so it is very handy in use.
Model	6420	620S	RTB231	RTB232	HTB230	HTB-Prog

3

HTB230



RTB231
RTB232



2 wire transmitter HTB and RTB series
are easy to configure with HTB-Prog

MekuWin configuration
software

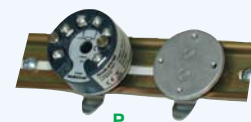
Transmitter

HTB-PROG



Programmer takes it's power from USB port from PC.
No additional power supply needed.

DIN rail bracket for HTB230



Suitable for small size field enclosures

Transmitters

Displays

Large Displays

Transmitters

Converters

Wireless Transmitters

Software

Sensors



3

	8 /16 channel transmitter		32 channel transmitter	2 channel transmitter	Transmitter for strain gauges	2 wire transmitter in field enclosure	
Model	RMD680	RMD681	RTS270	6821	6841	311	312
Manufacturer	Nokeval		Nokeval	Nokeval	Nokeval	Nokeval	
Number of channels	16	8	32	2	1	1	
Inputs	Thermocouples, Pt100, Pt1000, 0..4/20mA, ±1V, ±2.5V, ±10V, 0..40 kΩ		Thermocouple K, mV-input	Thermocouples, Pt100, Pt1000, 0..4/20mA, ±1V, ±2.5V, ±10V,	Strain gauge sensors 4- or 6 wire connection	Thermocouples, Pt100, 0/4..20 mA, 0..5/10 V, mV, IR, potentiometer	
Ranges	B 400..1800°C C (W5) 0..2300°C D (W3) 400..1800°C E -100..900°C G (W) 1000..2300°C J -160..950°C K -150..1370°C L -150..900°C N 0..1300°C R 0..1700°C S 0..1700°C T -200..400°C Pt100 -200..700°C Pt1000 -200..300°C Cu10 or Cuxxx KTY 83 -55..+175°C 0..400Ω / 4 kΩ / 40 kΩ ±55, ±100mV		K -150..1370°C mV -3..150 mV	B 400..1800°C C (W5) 0..2300°C D (W3) 400..1800°C E -100..900°C G (W) 1000..2300°C J -160..950°C K -150..1370°C L -150..900°C N 0..1300°C R 0..1700°C S 0..1700°C T -200..400°C Pt100 -200..700°C Pt1000 -200..300°C Cu10 or Cuxxx KTY 83 -55..+175°C 0..400Ω / 4 kΩ / 40 kΩ ±55, ±100mV	Measuring range -40..+100 mV Sensor voltage 10 VDC, max 150 mA (68 Ω) Includes several ways of calibration for weighing sensors. Can be used also together with summing unit 20SA-4.	E -100...900°C J -150...900°C K -150...1300°C L -100...900°C T -150... 400°C N 0...1300°C R 0...1700°C S 0...1700°C C 0...2200°C D 0...2200°C B 400...1700°C G 1000... 2200°C Pt100 -200..700°C Pt500 -200..700°C Pt1000 -200..300°C Ni100 -60..175°C mV -100..+100 mV Res. 0..1000 Ω	
Number of outputs	1		-	2	1	1	
Outputs	0/4..20 mA RS-485 Modbus RTU protocol Nokeval SCL protocol		Serial RS-485 Modbus RTU protocol Nokeval SCL protocol	0/4..20 mA , 0..5/10 V RS-485 Modbus RTU protocol Nokeval SCL protocol	0/4..20 mA , 0..5/10 V RS-485 Modbus RTU protocol Nokeval SCL protocol	2 wire 4..20 mA	
Programming	By front panel or MekuWin software		MekuWin software	By front panel or MekuWin software	By front panel or MekuWin software	By front panel or MekuWin software	
Isolation voltage	>1 kV		250 VAC	>2 kV	>1 kV	>1 kV	
Accuracy	Pt100	0.05 % of rdg +0.25°C	-	0.05 % of rdg +0.2°C	<0.05 % of span	0.05 % of span or 0.2°C	
	TC	0.05 % of rdg +1°C	0.05 % of rdg +0.6°C	0.05 % of rdg +1°C		0.1 % of span or 1°C	
	mV	0.1% of rdg +0.01mV	0.05 % of rdg +0.01mV	0.1% of rdg +0.01mV		0.05% of span +0.01mV	
Alarms	2 relays, 260 VAC 1A		-	2 relays, 260 VAC 1A	2 relays, 260 VAC 1A	2 relays, 260 VAC	
Input resistance	50 Ω with mA >1 MΩ with voltage		>1 MΩ with voltage	50 Ω with mA > 1 MΩ with voltage	-	5 Ω with mA 1 MΩ with voltage	
Sampling speed	100 ms/channel		125 ms/channel	100 ms	250 ms	300 ms	
Operating temperature	-10...+60°C		-20...+70°C	-10...+60°C	-10...+60°C	-10...+60°C	
Power supply	24 VDC, ±15 %		16..28 VDC	24 VDC, ±15 % 85..260 VAC	24 VDC, ±15 % 85..260 VAC	Loop voltages 10..32 V 12.5..32 V	
Installation	DIN rail, 35 mm		DIN rail, 35 mm	DIN rail, 35 mm	DIN rail, 35 mm	Wall mounting case	
Terminals	1,5 mm ²		1,5 mm ²	2,5 mm ²	2,5 mm ²	2,5 mm ²	
Dimensions	150 x 100 x 60 mm WHD		150 x 100 x 60 mm WHD	45 x 100 x 110 mm WHD	45 x 100 x 110 mm WHD	100 x 100 x 57 mm WHD	
Note	One of 16 channels can be selected by 4 digital inputs to mA/V output. Serial output is available at the same time.		Inputs isolated from power supply but not from each other. Input channels share a common ground.	You can write your own mathematical and logical functions on channels.	Several ways for sensor calibration: entering mV values, teaching or giving known weighing values.		
Model	RMD680	RMD681	RTS270	6821	6841	311	312

Signal Converters/Isolators

Displays

Large Displays

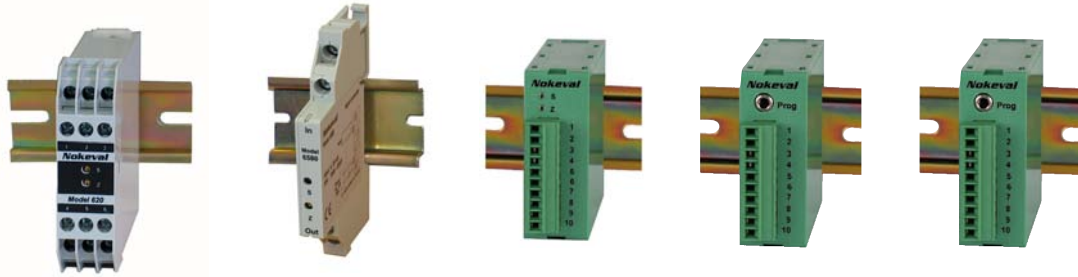
Transmitters

Converters

Wireless Transmitters

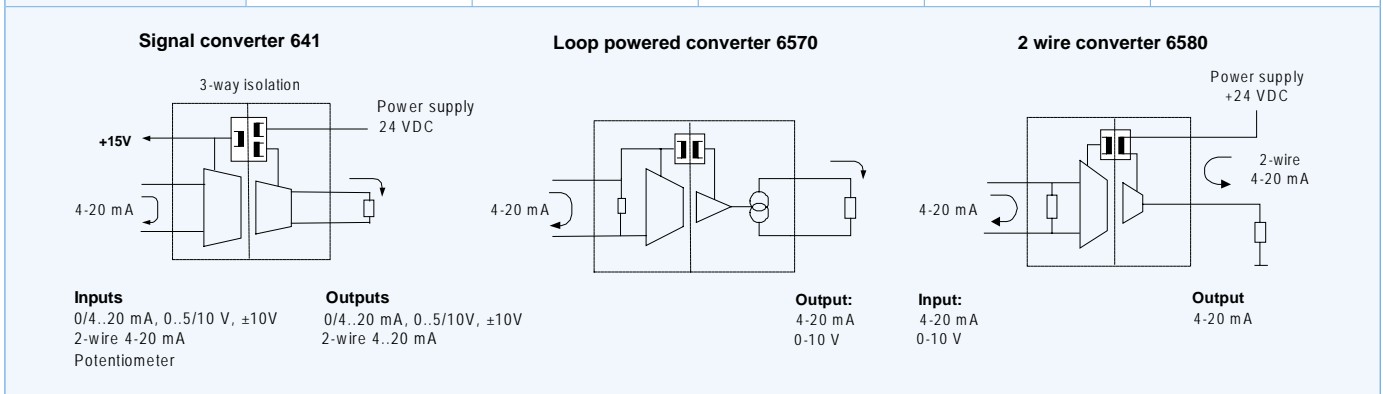
Software

Sensors



4

	Isolator and signal converter	2 wire isolator	Loop powered isolator	Universal isolator and converter	4 channel I/O-unit
Model	641	6580	6570	6740	7181
Manufacturer	Nokeval	Nokeval	Nokeval	Nokeval	Nokeval
Inputs	0/4..20 mA, 20..4 mA 0..5/10 V, 10..0 V ±10 V 2 wire 4..20 mA Potentiometer 100Ω..1MΩ	0..20 mA 4..20 mA 0..10 V	4..20 mA Operating energy is taken from input current loop	0..20 mA, -20..+20 mA 4..20 mA 0..5 V 0..10 V, -10 V..+10 V 0..100 mV, -100..+100 mV Pot. 0..1 kΩ	4 digital inputs or outputs
Outputs	0..20 mA, 4..20 mA 20..4 mA (reverse) 0.5 V, 0..10 V 10/5..0 V (reverse) ±10 V 2 wire 4..20 mA	2 wire 4-20 mA Operating energy is taken from output current loop	0..20 mA 4..20 mA 0..10 V	0..20 mA 4..20 mA 0..5 V 0..10 V	Serial output RS485 /RS232
Programming	DIP switches or factory settings	Factory settings	Factory settings	MekuWin (PC) or 6790 programmer	MekuWin (PC) or 6790 programmer
Galvanic isolation	>1 kV, three way isolation	>1 kV	>2 kV	>2 kV, three way isolation	>2 kV
Power supply	22..30 VDC	2 wire (10-32 VDC)	From input loop	22..30 VDC	24 VDC
Current consumption	40 mA for V output 60 mA for mA output 80 mA with sensor supply		Voltage drop 7 V + output current voltage drop *	40 mA V output 60 mA mA output	80 mA
Accuracy	<0.05% of span	<0.05% of span	<0.05% of span	<0.05% of span	
Linearity	<0.05% of span	<0.05% of span	<0.03% of span	<0.05% of span	
Input resistance	50 Ω for mA input 1 MΩ for V input	50 Ω for mA input 1 MΩ for V input	350 Ω	5 Ω for mA input 1 MΩ for V input	
Output load	600 Ω, mA output	2 wire output*	max 300 Ω *	600 Ω mA output	
Damping	1, 250 500, 700 ms	100 ms	100 ms	200 ms	
Operating temperature	0..60°C	0..60°C	0..60°C	-10..60°C	-10..60°C
Installation	DIN rail, 35 mm	DIN rail, 35 mm	DIN rail, 35 mm	DIN rail, 35 mm	DIN rail, 35 mm
Terminals	2.5 mm ²	2.5 mm ²	2.5 mm ²	1.5 mm ²	1.5 mm ²
Dimensions	22.5 x 82 x 99 mm WHD	9.5 x 81 x 58 mm WHD	22,5 x 60 x 75 mm WHD	22,5 x 60 x 75 mm WHD	22,5 x 60 x 75 mm WHD
Note	All ranges can be selected by DIP switches, but calibration is needed after selection.	*Loading depends on power supply voltage, e.g. (24V-10V)/20mA=700 Ω		Supports also temperature sensors. All ranges are calibrated after selection.	Suitable for software that needs digital inputs and outputs.
Model	641	6580	6570	6740	7181



Serial Data Converters

Displays

Large Displays

Transmitters

Converters

Wireless Transmitters

Software

Sensors



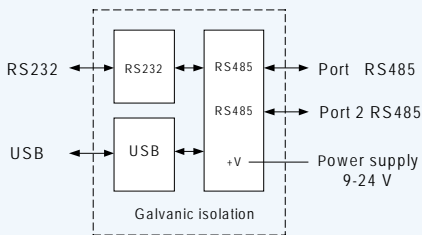
4

	Serial to Ethernet converter	4 channel RS232/485 - mA/V	USB-RS485 Serial Converter	USB-RS485 Serial Converter	USB-RS485-RS232 Serial Converter
Model	PC-E	7470	DCS770	DCS771	RCS770
Manufacturer		Nokeval	Nokeval	Nokeval	Nokeval
Input	RS485 Modbus RTU	RS485/232	USB	USB	USB / RS232 / RS-485*
Output	Modbus TC/IP	4 x 0/4-20 mA, 0-10V	RS485	RS485 + power supply*	RS485/422 / RS232*
Baud rate	300..115200ud	300..19200 baud	300..115200 baud	300..115200 baud	1200..115200 baud
Settings	PC software	MekuWin (PC) or 6790	-	-	By jumpers
Power supply	24 VDC ±15%	24 VDC ±15 %	From USB	From USB	9..24 VDC or from USB
Galvanic isolation	-	>1 kV (RS485)	-	-	>1 kV
Terminals	RS-485	Terminals 1.5 mm ²	Terminals 1.5 mm ²	Terminals 1.5 mm ²	Terminals 1.5 mm ²
	RS232	-	-	-	9 pin. D conn. (female)
	USB	-	USB/ B (female)	USB/ B (female)	USB/ B (female)
Indicators	-	-	3 LED lamps	3 LED lamps	3 LED lamps
Installations	35 mm DIN rail	35 mm DIN rail / desktop	Desktop	Desktop	35 mm DIN rail / desktop
Dimensions	22,5 x 60 x 75 mm WHD	70 x 85 x 60 mm WHD	31 x 24 x 56 mm WHD	66 x 28 x 66 mm WHD	70 x 85 x 60 mm WHD
Note	Supports PromoLog software and transmitters with serial output RS485 Typical application is remote temperature measurement over Internet.	4 analog outputs for serial input RS232/485 Modbus RTU, Nokeval SCL protocol or ASCII Output accuracy 0.1% of span	DCS770 has removable terminals for RS485.	*Converter can power transmitters: 10 V, max.120 mA or 24 V, max. 50 mA. Option: External power supply (91705) 230 VAC/9 VDC	* Conversions: USB-485, USB-422, USB-232, 485-232, 422-232, 485-485 (repeater). USB, 232 and 485/422 are galvanically isolated
Model	PC-E	7470	DCS770	DCS771	RCS770

6 serial conversions by signal converter RCS770



RS485 is isolated from USB and RS232 port



Signal conversions

- USB ↔ RS232
- USB ↔ RS485
- USB ↔ RS422
- RS485 ↔ RS232
- RS422 ↔ RS232
- RS485 ↔ RS485

Conversions are selected by jumpers

DCS772 converter for configurations



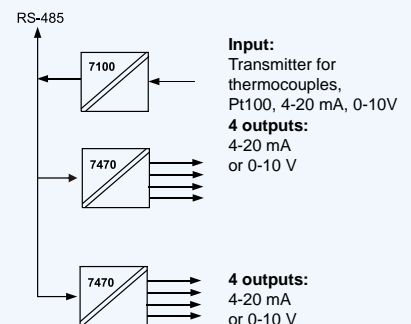
DCS772 converter for USB port can be used for configuration of devices that have a socket in the front panel. POL-cable and MekuWin software are included.

POL-3PIN adapter cable can be used for all devices that have 3 pin connector for configuration as wireless transmitters together with POL-232 cable or DCS772.

P

Analog outputs for serial bus using 4 channel serial converter 7470

Analog outputs from software



Input: Transmitter for thermocouples, Pt100, 4-20 mA, 0-10V
4 outputs: 4-20 mA or 0-10 V

4 outputs: 4-20 mA or 0-10 V

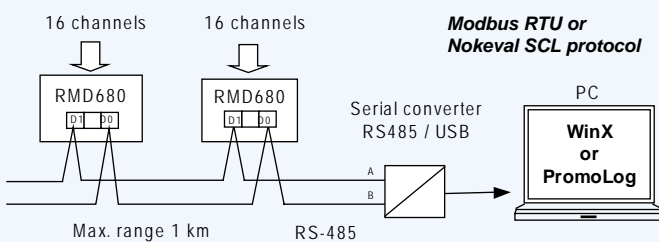
RMD680 16 channel transmitter with RS-485 serial interface and one 4-20 mA output



RMD680

- Universal inputs
- 1 analog output 0/4..20 mA or 0.5/10V, channel selection with digital inputs
- 2 alarm relays, with common alarms
- Display on front panel
- Programming with front panel keys or with RS-485 serial interface
- Modbus RTU and Nokeval SCL serial protocols
- Power supply 24 VDC, galvanically isolated from inputs

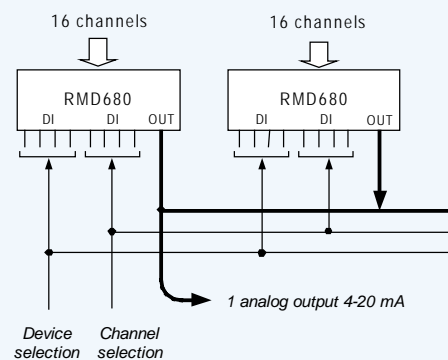
Serial interface RS-485



Getting measurements from transmitters using serial communication is simple using either Nokeval SCL protocol or Modbus RTU, which is the only totally open de facto solution for industry.

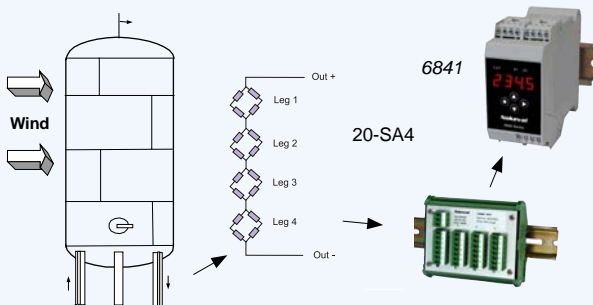
Multiplexing channels is an economical way to get measurement data for systems where it is not possible to get more analog inputs or serial communication. Several mA outputs can be connected in

Analog outputs by digital inputs



parallel and only one device at a time is active. Active device/channel is selected by digital inputs. 1 analog output from any of the 256 channels (16 channels x 16 devices = 256 channels).

Weighing sensor summing unit 20-SA4 for precision measurements



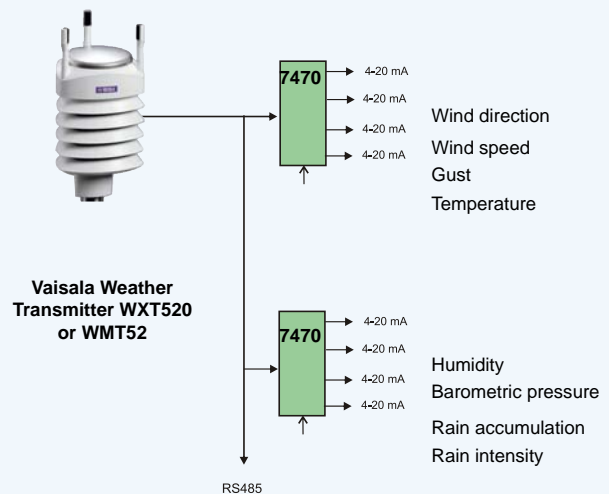
In tank applications accuracy increases when sensors are connected in series.

The serial connection of sensors gives exact sum in all load conditions. Furthermore sensor signals are multiplied by number of cells giving stronger signal.

Features to use summing unit 20SA-4

- Serial connection of strain gauge sensors prevents the nonlinearity caused by the imbalance loading between sensors
- Lead wire resistance compensation for each sensors
- Larger output signal (80 mV for 350 ohm sensors)
- Suitable for transmitter 6841 and panel meter 2041

Analog Outputs for Weather Transmitters by using serial converter 7470



Several 7470 units can be connected in parallel on a serial bus RS485.

6821 Dual-channel transmitter

- 2 analog inputs, 0/4..20 mA or 0..5/10V, mV, Pt100, thermocouples
- 2 analog outputs 0/4..20 mA or 0..5/10V
- 2 alarm relays
- Mathematical and conditional operations using easy logic language (ELO)
- Serial communication RS-485
- Modbus RTU and Nokeval SCL protocols
- Power supply 90..240 VAC or 24 VDC
- Configuration using MekuWin PC program or using front panel buttons



6821 is a rail-mounted two-channel measurement unit for temperature sensors and other electrical inputs. The unit has two analog outputs or alternatively one analog and one serial output.

4 The serial output can accept Nokeval SCL and Modbus RTU commands. Up to four logical alarms can control two common alarm relays. The inputs are galvanically isolated from the outputs and the supply voltage, but not from each other.

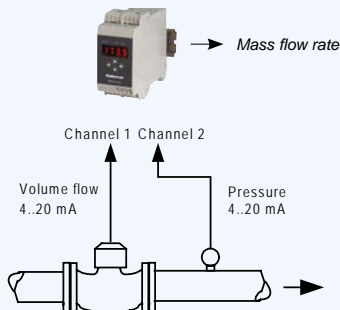
Mathematical and conditional operations may be realized with a simple programming language. There is a four-digit display and four push buttons, that can be used to monitor the readings and to change the settings. The settings can also be edited from a personal computer using the RS-485 serial connection.

Schematic drawing of transmitter 6821

Inputs:

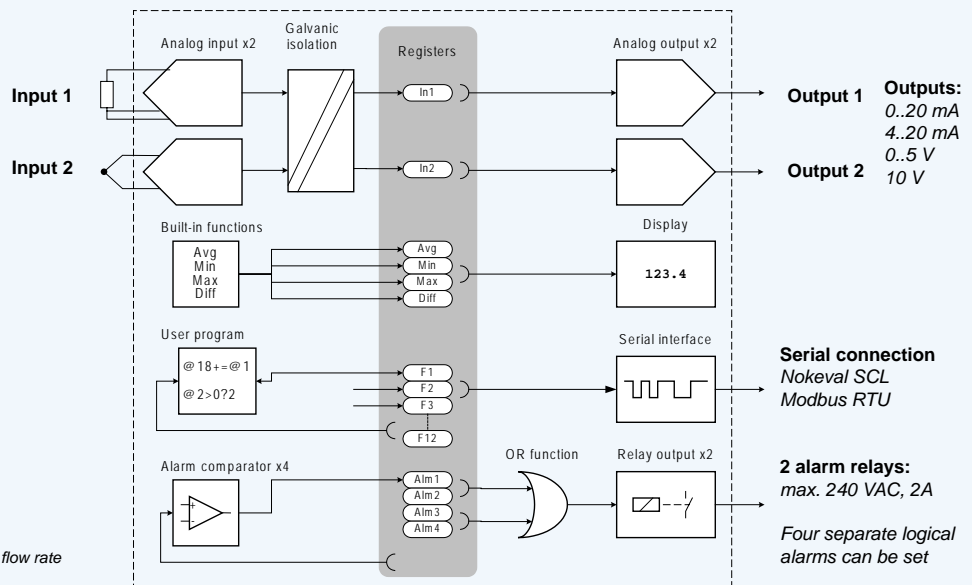
- **Resistance measurement:**
- Pt100, Pt1000, Ni100, KTY83, Cu10
- 0..400, 0..4 kΩ, 0..40 kΩ
- **Thermocouples:**
- B, C, D, E, G, J, K, L, N, R, S, T
- mV inputs: ±55 mV, ±100 mV
- 0..20 mA, 4..20 mA, ±20 mA
- 0..1 V, ±1 V, 0..10 V, ±10 V
- 0..400, 0..4 kΩ, 0..40 kΩ

Flow sensor pressure compensation example



Mass flow rate can be easily calculated using 6821 transmitter.

Use channel 1 to measure the flow, channel 2 to measure the pressure and write a small program using ELo language. For example, the program for the equation "Out1=(Ch1 x Ch2) x1.12/1000" is found from programming examples.

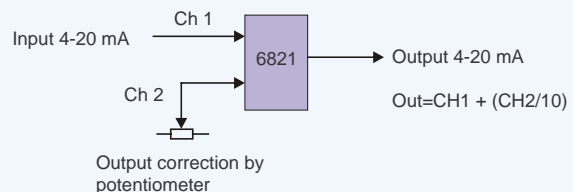


Special functions are easy to create by Nokeval's ELo language. You need only MekuWin configuration software in PC (free).

Writing your own functions

Measurement results and alarm states are written into registers. Users can easily write simple programs to modify registers F1-F12 using Nokeval's ELo language and MekuWin configuration program. Any register can be used in the programs and used as an output source. .

Simply formula can be written within a few minutes by using MekuWin configuration software



Power Supplies

Displays

Large Displays

Transmitters

Converters

Wireless Transmitters

Software

Sensors

Power suppliers

DSP Series

Wide 18 mm



DRA Series



	Power 10 W	Power 18 W		Power 30 W		Power 60 W		Power 120 W	
Model	DSP10-24	DRA18		DRA30		DRA60		DRA120	
Manufacturer	Lambda	Chinfa		Chinfa		Chinfa		Chinfa	
Output voltage	24 VDC	12 VDC	24 VDC	12 VDC	24 VDC	12 VDC	24 VDC	12 VDC	24 VDC
Current	0,42 A	1.5 A	0.75 A	2.5 A	1.25 A	5 A	2.5 A	10 A	5 A
Short circuit protection	Yes	Yes		Yes		Yes		Yes	
Efficiency (typical)	80%	77%		82%		86%		85%	
Input voltage range	90..264 VAC	90..265 VAC		90..265 VAC		90..265 VAC		90..265 VAC	
Frequency	47..63 Hz	47..63 Hz		47..63 Hz		47..63 Hz		47..63 Hz	
Dimensions	18 x 51 x 91 mm (WHD)	22.5 x 90 x 115 mm WHD		40.5 x 90 x 115 mm WHD		40.5 x 90 x 115 mm WHD		63 x 125 x 116 mm WHD	
Case material	Plastic	Plastic		Plastic		Plastic		Plastic	
Terminals	2.5 mm ² 0.2..2.0 mm ²	2.5 mm ² 0.2..2.0 mm ²		2.5 mm ² 0.2..2.0 mm ²		2.5 mm ² 0.2..2.0 mm ²		2.5 mm ² 0.2..2.5 mm ²	
Installation	DIN rail 35 mm	DIN rail 35 mm		DIN rail 35 mm		DIN rail 35 mm		DIN rail 35 mm	
Lamps in front panel	On and low voltage	On and low voltage		On and low voltage		On and low voltage		On and low voltage	
Approvals	UL1310 Class 2 /CE	UL/cUL/TUV/CE		UL/cUL/TUV/CE		UL/cUL/TUV/CE		UL/cUL/TUV/CE	
Operating temperature	-25 to +71°C	-10..+50 °C		-10..+50 °C		-10..+50 °C		-10..+50 °C	
Switching frequency		> 100 kHz		> 50 kHz		> 50 kHz		> 80 kHz	
Isolation (In/Out)	3kVAC for 1 min.	Min. 3000 VAC		Min. 3000 VAC		Min. 3000 VAC		Min. 3000 VAC	
Isolation resistance	>100M (500VDC)	100 MΩ (500VDC)		100 MΩ (500VDC)		100 MΩ (500VDC)		100 MΩ (500VDC)	
M.T.B.F MIL-HDBK-217F;GF40		195.000 hours		200.000 hours		167.000 hours		200.000 hours	
Humidity		20..95 %		20..95 %		20..95 %		20..95 %	
Inrush current 115 VAC	15A	Max. 10 A		Max. 16 A		Max. 21A		Max. 24 A	
230VAC	30 A	Max. 18 A		Max. 32 A		Max. 42 A		Max. 48 A	
EMC, CE (EMI)	EN55022 Class B;	EN50081-I/EN55022		EN50081-I/EN55022		EN50081-I/EN55022		EN50081-I/EN55022	
Output voltage accuracy	1%	±1 %		±2 %		±2 %		±0.5 %	
Minimum load		0 %		0 %		0 %		5 %	
Load regulation	1%	±2 %		±2 %		±2 %		±1 %	
Temperature coefficient	±0.02%/°C	±0.02 % / °C		±0.02 % / °C		±0.02 % / °C		±0.3 % / °C	
Ripple & noise (BW=20 Hz)	50mV	50 mV		50 mV		50 mV		50 mV	
Voltage trim range		11..14 V	22..28 V	12..14 V	24..28 V	12..14 V	24..28 V	11..14 V	23..30 V
Rated over rate protection	145%	135 %		125 %		125 %		125 %	
Model	DSP10-24	DRA18		DRA30		DRA60		DRA120	
P									

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Voltage reference unit 20SA-4

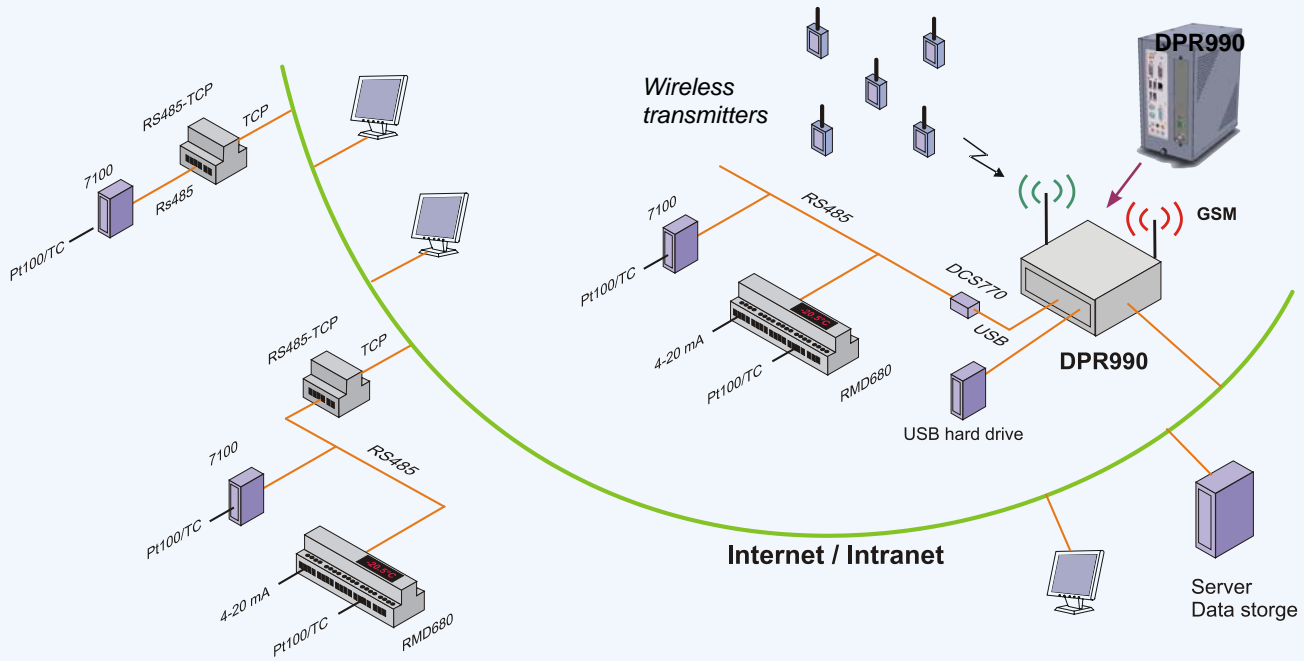
- Four 10.00 VDC voltage referencies
- Max. load 25 mA per channel
- Galvanically isolated between channel and power supply
- Voltage adjustment ±1%
- Sense wires for sensor (4 wire connection)
- Output voltages can be connected in series (4 x 10 V)
- Power supply 24 VDC



Typical application is strain gauge sensors where four sensors are connected in serial connections. All four sensors have 10.00V reference voltage with 2 or 4 wire connections.

Surveillance Unit DPR990 for data acquisition applications

5



Features:

- DPR990 replaces a computer for data acquisition**
- PromoLog data acquisition software preinstalled**
- Web Server software package preinstalled**
- PromoLog software starts automatically**
- Simple installation, no software to install**
- No need for frequent updates**

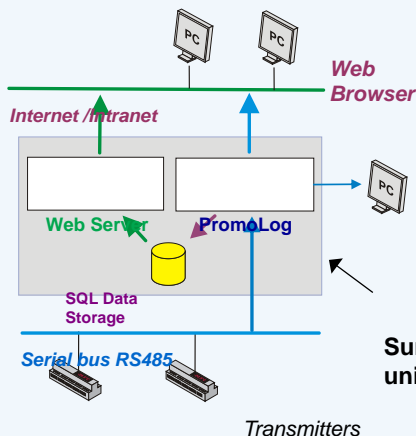
Hardware:

- **Integrated radio receiver** for wireless transmitters
- **Integrated GSM modem** for SMS alarms
- Hard disk replaced with a Solid State Disk (SSD)
- Two digital I/O connections, one input and one output
- Gigabit Ethernet network connection
- 4 external USB ports for expandability
- Dimensions 115 x 210 x 190 mm
- Power supply 12 VDC/transformer 90..240 VAC
- Protection class IP20
- Connections for keyboard, mouse and display

DPR990 Surveillance Unit

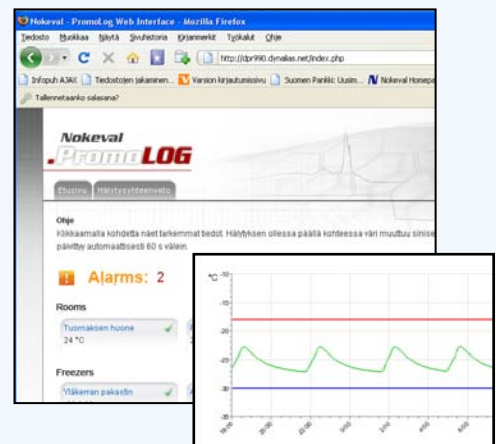
DPR990 Surveillance Unit is ready for action straight out of the box, no need for time consuming software installations. The unit contains all the necessary hardware and software for receiving and recording data from wireless transmitters. External display and keyboard are not required but can be attached for local display and use, if needed.

PromoLog and **Web Server software package** are preinstalled at the factory. The unit can also be supplied as a complete package with the transmitters already configured for use. Measuring can start right after the power is switched on and the unit has booted up. Measurement results are immediately available for remote reviewing thru the web interface.



Web Browser, remote access

No software installation on local computer



Type	Number of transmitters	
	Wired	Wireless
DPR990-32		
DPR990-512		

Wireless Transmitters

Displays

Large Displays

Transmitters

Converters

Wireless Transmitters

Software

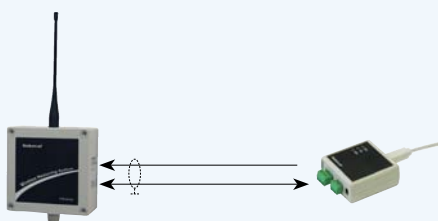
Sensors



	Receiver	Receiver with memory	Repeater	Receiver for DIN rail	Receiver with memory
Model	FTR970	FTR970-PRO	FTR960	RTR970	RTR970-PRO
Manufacturer	Nokeval	Nokeval	Nokeval	Nokeval	Nokeval
Input / Radio signal	Frequency 433.92 MHz	Frequency 433.92 MHz	Frequency 433.92 MHz	Frequency 433.92 MHz	Frequency 433.92 MHz
Number of channels	up to 1000 *	up to 1000 *	up to 500 *	up to 1000 *	up to 1000 *
Receiver	•	•	-	•	•
Repeater	-	-	•	-	-
Non-volatile memory	-	150.000 samples	-	-	150.000 samples
Data processing	PromoLog software (PC)	Readable by customer	-	PromoLog software (PC)	Readable by customer
Serial data / Ouput	RS485, RS232, USB	RS485, RS232, USB	-	RS485, RS232, USB	RS485, RS232, USB
Protocol	Nokeval SCL	SCL and Modbus RTU	-	Nokeval SCL	SCL and Modbus RTU
Operating temperature	-30..+60°C	-30..+60°C	-30..+60°C	-30..+60°C	-30..+60°C
Configuration software	MekuWin	MekuWin	-	MekuWin	MekuWin
Power supply	8..30 VDC	8..28 VDC	8..30 VDC	8..30 VDC	8..28 VDC
Installation	Field enclosure	Field enclosure	Field enclosure	DIN rail, 35 mm	DIN rail, 35 mm
Dimensions	130 x 130 x 60 mm WHD	130 x 130 x 60 mm WHD	180 x 130 x 60 mm WHD	70 x 85 x 60 mm WHD	70 x 85 x 60 mm WHD
Protection class	IP65	IP65	IP65	IP20	IP20
Note	Data processing by PromoLog data acquisition software or user's software.	The FTR970-PRO works independently without realtime data processing in PC.	The FTR960 listens to transmitters and retransmits data to a receiver or repeater.	Data processing by PromoLog data acquisition software or user's software.	The RTR970-PRO works independently without realtime data processing in PC.
* depends on transmission interval					
	FTR970	FTR970-PRO	FTR960	RTR970	RTR970-PRO

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Desktop receiver MTR970



FTR960 has separate antennas for receiving and transmitting data. Repeaters do not need any configuration and can be also added afterwards if the installation environment of the wireless measuring system changes. Only 8...30 VDC power supply is required.

The use of repeaters reduces the maximum number of transmitters because repeaters use the same frequency channel as transmitters. The maximum amount of transmitters is determined by the transmission interval.

Features:
Frequency 433.92 MHz

Serial connection:
RS485, RS232,
Nokeval SCL protocol

Operating environment:
0..+60°C, indoors

Power supply:
9..30 VDC

Dimensions:
75 x 120 25 mm WHD

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Wireless measurement system is the low-cost solution for quality control in production plants.

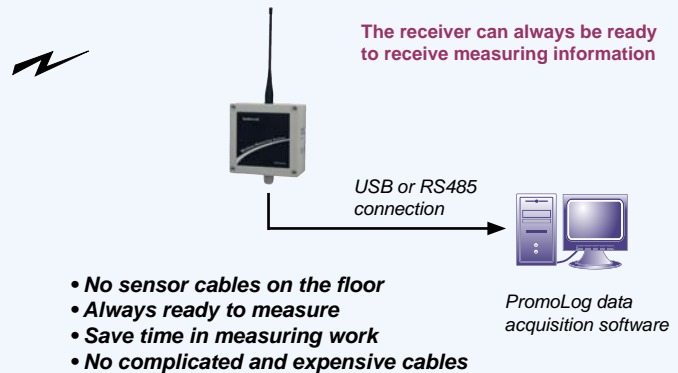
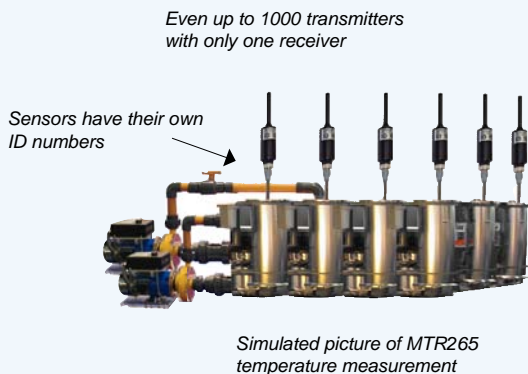
Quality control is easier than ever!

Application areas

- Temperature and mA/V- measurements
- Testing and monitoring in field circumstances
- Cold transportation monitoring
- Cold storage room monitoring
- Moving and rotating targets
- Equipment testing and maintenance

5

Wireless data logging is now simple



Build a large data logging network easily by using repeaters

Low-cost solution for quality control!

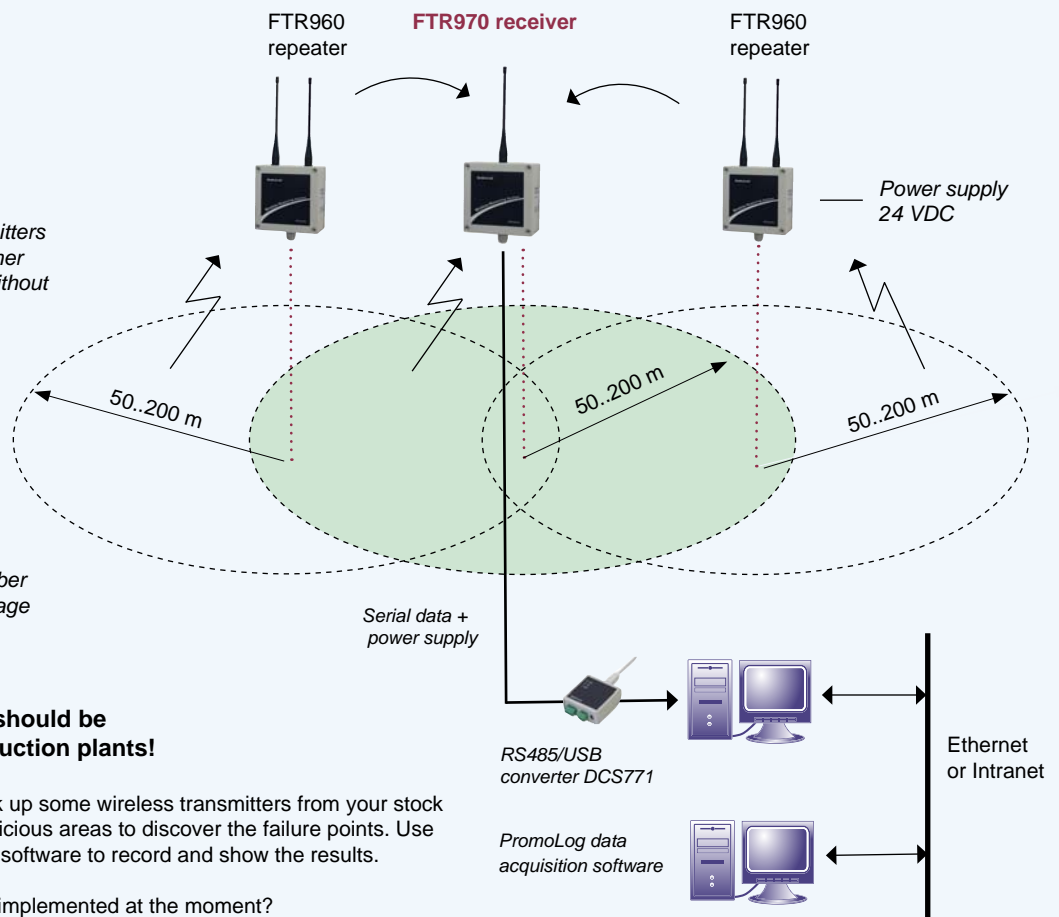
Repeater listens to transmitters and retransmits data to other repeaters and receivers without any configuration

You can place a large number of transmitters in the coverage area of repeaters

Wireless transmitters should be as standard in all production plants!

If the process fails, just pick up some wireless transmitters from your stock and place them to the suspicious areas to discover the failure points. Use PromoLog data acquisition software to record and show the results.

How is your quality control implemented at the moment?



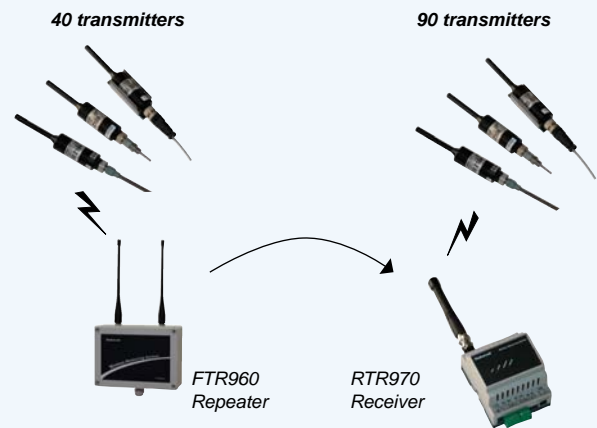
Number of transmitters

The maximum number of radio transmitters in a coverage area is limited by radio regulations. The use of repeaters reduces the maximum number of transmitters because repeaters use the same frequency channel as transmitters. The following table shows the maximum number of allowed radio transmitters in a coverage area.

Transmission Interval (s)	One Receiver	Receiver + 1 repeater	Receiver + 2 repeaters
	FTR970 RTR970	FTR960	FTR960
Maximum number of transmitters			
5	22	11	7
10	43	22	14
20	87	43	29
30	130	65	43
40	174	87	58
50	217	109	72
60	261	130	87
70	304	152	101
80	348	174	116
90	391	196	130
120	522	261	174
240	1043	522	348

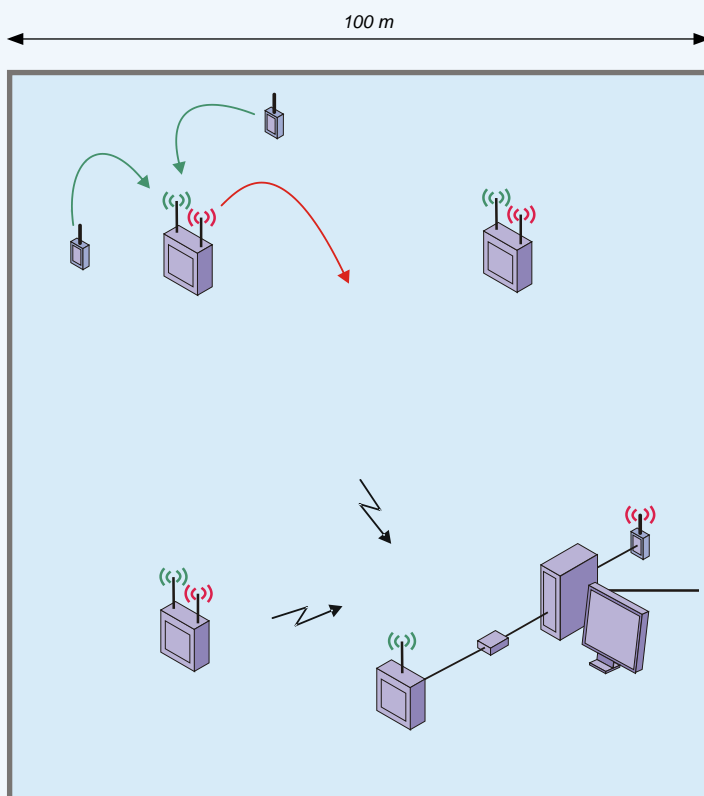
For example, if you have transmission interval of 60 seconds and one repeater and one receiver, the maximum number of transmitters is 130. Without repeaters you can use 261 transmitters. Four-channel model MTR264 counts as 4 transmitters. Number of receivers do not limit number of transmitters.

Example case of overlapping coverage areas with one minute transmission interval.



Both receivers can listen to an unlimited number of transmitters, but radio regulations limit the number of transmitters to 130 when one minute transmission interval is used. The use of repeaters decreases the maximum number of transmitters as it also transmits data on the same channel.

How to place receivers and repeaters in large rooms



Wireless transmitters are the easy way to solve quality control problems in your production.

One receiver FTR970 + 3 repeaters. FTR960 can cover very large rooms as shown in the picture. Repeaters do not need any settings, only a power supply.

Wireless Transmitters

Displays

Large Displays

Transmitters

Converters

Wireless Transmitters

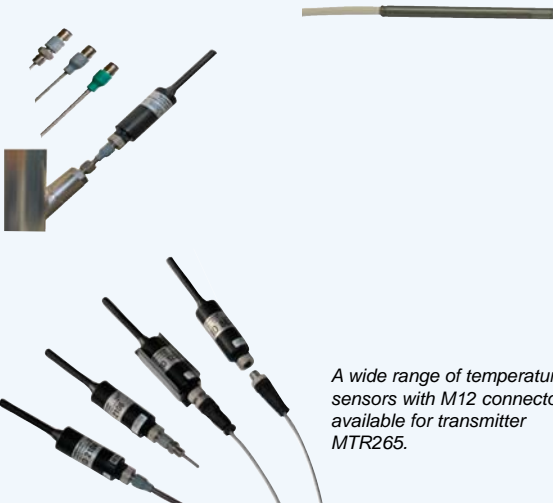
Software

Sensors



	Internal temperature sensor	External temperature sensor	Replacement measuring modules	Transmitter for 4..20 mA, 0..10V	Transmitter for temp. sensors
Model	FT10-RT433-IS	FT10-RT433-CS	FT10-IS / F10-CS	MTR165	MTR265
Manufacturer	Nokeval	Nokeval	Nokeval	Nokeval	Nokeval
Number of channels	1	1	1	1	1
Input	Internal Pt100 sensor inside the replaceable measuring module	External Pt100 cable sensor with the replaceable measuring module	Internal or external Pt100 sensor. Factory calibrated replacement measuring module. User replaceable.	0..20 mA, 4..20 mA, 0..2000 mV, 0..10V, 0..100 V	Pt100, thermocouple K, J, T, E, L, N
Radio signal	Frequency 433.92 MHz	Frequency 433.92 MHz		Frequency 433.92 MHz	Frequency 433.92 MHz
Operating temperature	-30..+60°C	-30..+60°C	-30..+60°C	-30..+70°C	-30..+70°C
Maximum range	50..500 m	50..500 m	-	50..300 m	50..300 m
Accuracy	< ±0.5°C	< ±0.5°C	< ±0.5°C	±0.05% of span	±0.2°C Pt100 ±0.75°C thermocouple
Configuration	MekuWin or 6790	MekuWin or 6790	MekuWin or 6790	MekuWin or 6790	MekuWin or 6790
Transmitting interval	5 s..5 min	5 s..5 min		5 s..5 min	5 s..5 min
Sensor connection	Internal sensor	Fixed external sensor	Designed for regular calibration demands.	M12 connector	M12 connector
Power supply	1.5V alkaline battery size LR6 (AA)	1.5V alkaline battery size LR6 (AA)	FT10-IS Internal Pt100 sensor	3V Lithium battery size CR2032	3V Lithium battery size CR2032
Battery life	Typically > 3 years *	Typically > 3 years *		Typically 1 year *	Typically 1 year *
Dimensions	60 x 352 x 33 mm WHD	60 x 352 x 33 mm WHD	FT10-CS for external Pt100 cable sensor.	92 x Ø29 mm + 80 mm	92 x Ø29 mm + 80 mm
Protection class	IP67 (watertight)	IP67 (watertight)	Cable sensor is not included.	IP66	IP66
Note	Developed for regular calibration demands in cold rooms and freezers. Response time 15 min. EN 13485 certified.	Cable sensor is easily removable by quick connector. Sensor types (Pt100) on the page page 31		Includes wall mounting bracket and M12 connector with screw terminals for input wires. Input resistance 50 Ω for current inputs.	Includes wall mounting bracket and M12 connector (with screw terminals) for temperature sensor.
	Meas. module included	Meas. module included			
		Without Cable sensor			

MTR165 and MTR265 transmitterX. +358-3-3422 066



A wide range of temperature sensors with M12 connector are available for transmitter MTR265.

FTR262

FTR262 transmitter can be powered using either batteries (2 x standard AA) or external 9..24 VDC power supply. This transmitter is specially suitable for measurements with short transmission intervals (5..30 s) and has long battery life time.



FTR860

2 channel transmitter FTR860 is designed for wide supply voltage range 24..240 VAC or VDC.

FTR860 has two digital inputs that can be used, for example, to control when to send measurement data. This transmitter always requires an external supply voltage.



Wireless Transmitters

Displays

Large Displays

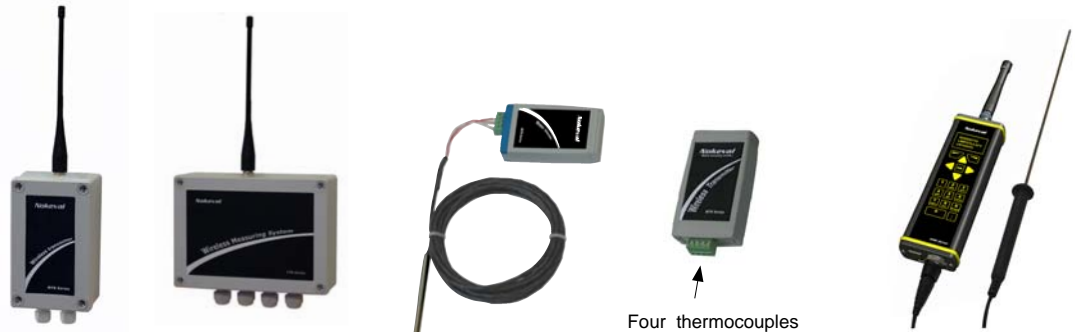
Transmitters

Converters

Wireless Transmitters

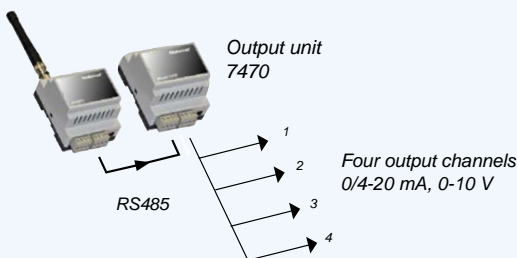
Software

Sensors



	Universal input	2 channel transmitter	Laboratory transmitter	Laboratory transmitter	Wireless portable meter
Model	FTR262	FTR860	MTR262	MTR264	KMR260
Manufacturer	Nokeval	Nokeval	Nokeval	Nokeval	Nokeval
Number of channels	1	2	1	4	1
Inputs	Pt100, thermocouple K, J, T, E, L, N, 0..2000 mV, 0..10 V, 0..100 V, 0/4..20 mA	Pt100, thermocouple K, J, T, E, L, N, mV and 0/4..20 mA	Pt100, thermocouples K, J, T, E, L, N, mV, 0..10 V, 0..100 V, 0/4..20 mA 0..2000 mV	Thermocouples K, J, T, E, L, N and 0..2000 mV	Automatic sensor type detection between Pt100 and thermocouple K. Other sensors J and T.
Radio signal	Frequency 433.92 MHz	Frequency 433.92 MHz	Frequency 433.92 MHz	Frequency 433.92 MHz	Frequency 433.92 MHz
Operating temperature	-30..+60°C	-30..+60°C	0..+60°C	0..+60°C	0..+40°C
Maximum range	50..300 m	50..300 m	20..100 m	20..100 m	50..300 m
Accuracy	±0.2°C Pt100 sensor ±0.75°C or ±1.5°C TC **	±0.2°C Pt100 sensor ±0.75°C thermocouple	±0.2°C Pt100 sensor ±0.75°C or ±1.5°C TC **	±0.75°C or ±1.5°C **	±0.2°C Pt100 ±0.75°C thermocouple
Configuration	MekuWin or 6790	MekuWin or 6790	MekuWin or 6790	MekuWin or 6790	PromoLog or keypad
Transmitting interval	5 s..5 min	5 s..5 min	5 s..5 min	5 s..5 min	-
Sensor connection	Screw terminal 1,5 mm ²	Screw terminal 1,5 mm ²	Screw terminal, 1,5 mm ²	Screw terminal, 1,5 mm ²	Quick connector
Power supply	2 x 1.5 V AA battery or external 9-24 VDC	External power supply 24...240 VDC/VAC	3V Lithium battery size CR2032	3V Lithium battery size CR2032	LiPo battery, recharging using USB port
Battery life	Typically > 3 years *	-	Typically 1 year *	Typically 9 months *	10 h in continuous use
Dimensions	80 x 130 x 60 mm WHD	180 x 130 x 60 mm WHD	78 x 45 x 18 mm WHD	78 x 45 x 18 mm WHD	57 x 191 x 32 mm WHD
Protection class	IP65	IP65	IP20	IP20	IP64
Note	Sensor type is easy to change by configuration software Mekuwin. Battery or external power supply selectable by jumper.	Suitable only for external power supply. Digital inputs: 2 digital inputs, 240 VDC/VAC max.	Field enclosure to IP65 as an option.	Field enclosure to IP65 as an option.	128 x 64 pixel self-luminous OLED display. Data transmitted wirelessly or through USB connection. See sensors on page 30
	FTR262	FTR860	MTR262	MTR264	KMR260

RTR970-PRO or FTR970-PRO receiver



Several output units 7470 can be connected to serial bus RS485 (max. 8 units = 32 channels).



Unbeatably cost-effective recalibration with FT10 transmitters

5

The most cost-effective solution for keeping your transmitters certifiably calibrated!

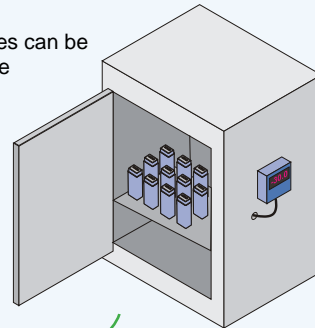
Radio transmitter



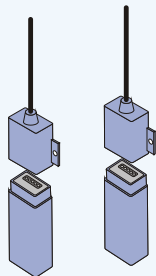
Measuring module

- Developed for high accuracy and easy recalibration
- Measuring modules can be replaced very easily without tools
- Radio transmitters' ID numbers do not change
- Calibration certificates can be downloaded from our website
- Very low-cost calibration system

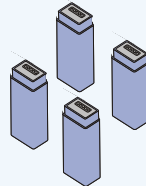
Several measuring modules can be calibrated at the same time in a calibration chamber.



Replacement modules can be sent to customers in advance, thus avoiding breaks in measurements.



Plug & play measuring modules are very easy to replace in site without altering any settings!



All measuring modules are calibrated at three points: -30°C, 0°C and +30°C

Replaced measuring modules are returned to Nokeval. Reusable packing material from replacement module shipment can be used.



Measuring unit FT10-IS
with internal Pt100 sensor

Nokeval can make an agreement with customer on regular calibration upon which recalibrated replacement units are sent in advance when it is time to recalibrate the transmitters.

Measuring modules are calibrated in three points: -30°C, 0°C and +30°C.

Includes on-line calibration certificate.



Measuring unit FT10-CS
with Pt100 cable sensor

Same as above but calibrated without the cable sensor. Pt100 (Platinum) sensor is very stable element and do not need regular checking for accuracy. If sensor is broken, measuring module FT10-CS finds it out and therefore only measuring module needs regular checking.

Includes on-line calibration certificate.

Wireless Transmitters

Displays

Large Displays

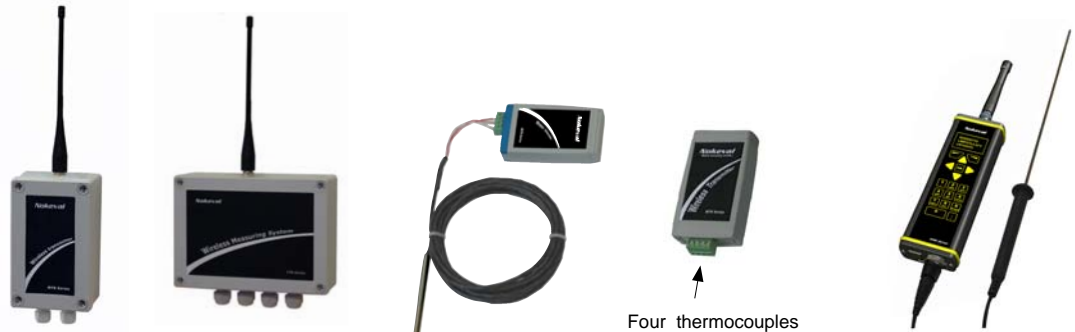
Transmitters

Converters

Wireless Transmitters

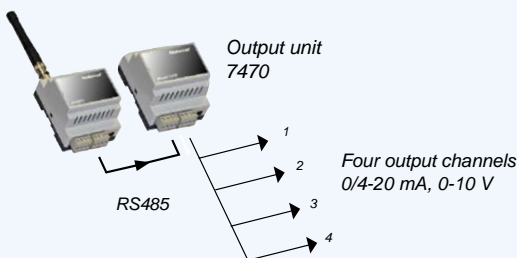
Software

Sensors



	Universal input	2 channel transmitter	Laboratory transmitter	Laboratory transmitter	Wireless portable meter
Model	FTR262	FTR860	MTR262	MTR264	KMR260
Manufacturer	Nokeval	Nokeval	Nokeval	Nokeval	Nokeval
Number of channels	1	2	1	4	1
Inputs	Pt100, thermocouple K, J, T, E, L, N, 0..2000 mV, 0..10 V, 0..100 V, 0/4..20 mA	Pt100, thermocouple K, J, T, E, L, N, mV and 0/4..20 mA	Pt100, thermocouples K, J, T, E, L, N, mV, 0..10 V, 0..100 V, 0/4..20 mA 0..2000 mV	Thermocouples K, J, T, E, L, N and 0..2000 mV	Automatic sensor type detection between Pt100 and thermocouple K. Other sensors J and T.
Radio signal	Frequency 433.92 MHz	Frequency 433.92 MHz	Frequency 433.92 MHz	Frequency 433.92 MHz	Frequency 433.92 MHz
Operating temperature	-30..+60°C	-30..+60°C	0..+60°C	0..+60°C	0..+40°C
Maximum range	50..300 m	50..300 m	20..100 m	20..100 m	50..300 m
Accuracy	±0.2°C Pt100 sensor ±0.75°C or ±1.5°C TC **	±0.2°C Pt100 sensor ±0.75°C thermocouple	±0.2°C Pt100 sensor ±0.75°C or ±1.5°C TC **	±0.75°C or ±1.5°C **	±0.2°C Pt100 ±0.75°C thermocouple
Configuration	MekuWin or 6790	MekuWin or 6790	MekuWin or 6790	MekuWin or 6790	PromoLog or keypad
Transmitting interval	5 s..5 min	5 s..5 min	5 s..5 min	5 s..5 min	-
Sensor connection	Screw terminal 1,5 mm ²	Screw terminal 1,5 mm ²	Screw terminal, 1,5 mm ²	Screw terminal, 1,5 mm ²	Quick connector
Power supply	2 x 1.5 V AA battery or external 9-24 VDC	External power supply 24...240 VDC/VAC	3V Lithium battery size CR2032	3V Lithium battery size CR2032	LiPo battery, recharging using USB port
Battery life	Typically > 3 years *	-	Typically 1 year *	Typically 9 months *	10 h in continuous use
Dimensions	80 x 130 x 60 mm WHD	180 x 130 x 60 mm WHD	78 x 45 x 18 mm WHD	78 x 45 x 18 mm WHD	57 x 191 x 32 mm WHD
Protection class	IP65	IP65	IP20	IP20	IP64
Note	Sensor type is easy to change by configuration software Mekuwin. Battery or external power supply selectable by jumper.	Suitable only for external power supply. Digital inputs: 2 digital inputs, 240 VDC/VAC max.	Field enclosure to IP65 as an option.	Field enclosure to IP65 as an option.	128 x 64 pixel self-luminous OLED display. Data transmitted wirelessly or through USB connection. See sensors on page 30
	FTR262	FTR860	MTR262	MTR264	KMR260

RTR970-PRO or FTR970-PRO receiver





Several output units 7470 can be connected to serial bus RS485 (max. 8 units = 32 channels).

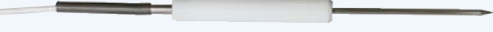


Temperature Sensors


nokeval




 <p>Fast hand held probe \varnothing 1.5 mm</p> <p>Probe max. 700 °C</p>	Thermocouple K Suitable for KMR260 wireless hand held meter	Length	\varnothing	Type Code KMR-K-130-1.5
		mm	mm	
		130	1.5	

 <p>Hand held penetration probe \varnothing 3 mm</p> <p>Probe max. 400°C</p>	Pt100 sensor Suitable for KMR260 wireless hand held meter	Length	\varnothing	Type Code KMR-Pt100-200-3
		mm	mm	
		200	3.0	

 <p>Hand held penetration probe \varnothing 4 mm</p> <p>Without connector Teflon handle max. 280°C Probe max. 400°C</p>	Pt100 sensor Suitable for oven applications with wireless transmitters Teflon cable, 3 wire	Length	\varnothing	Type Code TRP-Pt100-100-4
		mm	mm	
		100	3.0	
		3 m		

7

TRE Series for Pt100	PT100 sensor	Length	\varnothing	Type Code	\varnothing	Type Code
 <p>M12S-KO Connector M12K-KO Connector</p> <p>Pt100 sensor with M12 male connector can be connected directly to transmitter MTR265 or using cable to MTR165 and MTR262</p> <p>Removable M12 connector (optional)</p> <p>Sensor element</p> <p>Temperature range</p> <p>Sensor material</p> <p>TWCP</p> <p>L</p>		L=mm	mm		mm	
		100	3	TRE-100-3.0-A	6	TRE-100-6.0-A
		150	3	TRE-150-3.0-A	6	TRE-150-6.0-A
		250	3	TRE-250-3.0-A	6	TRE-250-6.0-A
		350	3	TRE-350-3.0-A	6	TRE-350-6.0-A
		500	3	TRE-500-3.0-A	6	TRE-500-6.0-A
		750	3	TRE-750-3.0-A	6	TRE-750-6.0-A
	Female connectors	M12K-NA	Angle type with screw terminals, 4 pole, IP67			
		M12S-NA	Straight type screw terminals, 4 pole, IP67			
		Pt100, Class A $\pm 0,15^\circ\text{C}$, optional Class B $\pm 0,3^\circ\text{C}$, IEC 751				
		Class A -30..+350°C, optional Class B -50..+500°C				
		AISI 316				

TCSM Thermocouple Sensors	Sensor	Length mm	\varnothing mm	Type Code	\varnothing mm	Type Code	
 <p>M12S-NA connector</p> <p>M12S-NA M12K-KO</p> <p>Connectors for extension cables</p>	K thermocouple max. 1150°C Sensor material Inconel, M12 connector	250	3.0	TCSM12-K-250-3.0	6.0	TCSM12-K-250-6.0	
		500	3.0	TCSM12-K-500-3.0	6.0	TCSM12-K-500-6.0	
		1000	3.0	TCSM12-K-1000-3.0	6.0	TCSM12-K-1000-6.0	
		1500	3.0	TCSM12-K-1500-3.0	6.0	TCSM12-K-1500-6.0	
	M12 Connectors for sensors and transmitters (MTR165/265)						
	M12 Connectors with screw terminals	M12K-NA	Angle type with screw terminals, 4 pole female, IP67				
		M12S-NA	Straight type with screw terminals, 4 pole female, IP67				
Extension Cables with M12	Extension cables with moulded M12 connector at the other end of cable						
	M12TC-K-5m	Extension cable, length 5 m, type K with moulded M12 connector					
				 <p>TCSM-K K type extension Cable, length 5 m</p> <p>K type extension cable have to be used between sensors and transmitters</p>			

TWCP Protection tubes	Length	\varnothing	Type Code	
 <p>Thermowells with fixing compression fitting</p> <p>Sensor is adjustable by compression fitting</p> <p>Thermowell diameter \varnothing 5 mm</p>	mm	mm	G1/4"	Process connection G1/4" or G1/2". Material AISI 316. Max. pressure 100 bar (350°C). Thermowells will be delivered without sensors
	50	3	TWCP-50-3-G1/4"	
	100	3	TWCP-100-3-G1/4"	
	150	3	TWCP-150-3-G1/4"	
	200	3	TWCP-200-3-G1/4"	
	300	3	TWCP-300-3-G1/4"	

Temperature Sensors

Displays

Large Displays

Transmitters

Converters

Wireless Transmitters

Software

Sensors

PT series Pt100 sensor		Type Code	Sensor	Length	Ø mm
<p>Cable diameter only $\varnothing 1.8$ mm</p> <p>PT3 $\varnothing 3$ mm</p> <p>PT2 $\varnothing 3$ mm</p> <p>Cable $\varnothing 3.5$ mm</p> <p>PT4, PT5 $\varnothing 6$ mm</p>	Cable sensor with steel probe	PT4T-Pt100-50-6.0-3m/3	Pt100	50 mm	6.0
		PT4T-Pt100-100-6.0-3m/3	Pt100	100 mm	
		PT4T-Pt100-100-6.0-8m/3	Cable 8 m	100 mm	
	For deep freezers	PT5T-Pt100-50-6.0-3m/3 (-200°C)	Pt100	50 mm	6.0
		PT2T-Pt100-100-3.0-3m/3	Pt100	100 mm	3.0
		PT2T-Pt100-150-3.0-3m/3	Pt100	150 mm	3.0
	Very thin cable	PT3T-Pt100-50-3.0-3m/3	Pt100	50 mm	3.0
		PT3T-Pt100-100-3.0-3m/3	Pt100	100 mm	3.0
Sensor		Pt100, class B $\pm 0.3^\circ\text{C}$, 3 wire, material AISI 316, (class A optional)			
Cable		Teflon, 3 wire, length 3 m, temperature range $-50..+250^\circ\text{C}$			
Temperature range		PT3T, PT4T: $-50..+300^\circ\text{C}$ PT5T: Temperature range $-150..+100^\circ\text{C}$			

IKES Pt100 sensor ($\varnothing 6$ mm)		Type Code	Length	Ø mm	Cable
<p>Pt100 with double isolation, rubber cable + thin steel protection tube</p>	Pt100 probe with rubber cable	IKES-50-6.0-2m/4	50 mm	6.0	Length 2 m, 4 wire
		IKES-50-6.0-5m/4			Length 5 m, 4 wire.
		IKES-100-6.0-2m/2	100 mm	6.0	Length 2 m, 2 wire
		IKES-100-6.0-5m/4			Length 5 m, 4 wire
Sensor		Pt100, Class B $\pm 0.3^\circ\text{C}$, optional Class A			
Temperature range		$-50..+105^\circ\text{C}$			
Protection tube		AISI 316, $\varnothing 6$ mm, thin protection tube			

WTN Pt100 surface sensor		Type Code	Sensor	Size
<p>Size 4 x 5 x 40 mm with fixing hole $\varnothing 4.5$</p>		WTN-Pt100-2.5m/3	Pt100	4 x 5 x 40 mm
	Sensor		Pt100, Class B $\pm 0.3^\circ\text{C}$, 3 wire material AISI 316	
	Temperature range		$-50..+250^\circ\text{C}$	
	Cable		Teflon, 3 wire cable, max. temperature $+250^\circ\text{C}$	

IKE Pt100 rubber sensor		Type Code	Type Code	Cable /wires
<p>Sensor tip $\varnothing 4.5 \times 20$ mm</p>		IKE-20-2m/2		Length 2 m, 2 wire
		IKE-20-2m/4		Length 2 m, 4 wire
		IKE-20-5m/4		Length 5 m, 4 wire.
	Sensor		Pt100, Class B $\pm 0.3^\circ\text{C}$, protection IP68	
Temperature range		$-50..+105^\circ\text{C}$		
Suitable for applications in which metal surface may be a problem as acid liquid Sensor tip + cable are molded together, water tight structure.				

TCR Thermocouple with Silicone Cable		Sensor	Length mm	Ø mm	Type Code	Ø mm	Type Code
<p>Round Silikone Cable, length 2 m</p> <p>Bending angle 3 x sensor diameter</p>	Thermocouple K, max. 1100°C	Material Inconel 600	50	1.0	TCR-K-50-1.0	1.5	TCR-K-50-1.5
			100	1.0	TCR-K-100-1.0	1.5	TCR-K-100-1.5
			150	1.0	TCR-K-150-1.0	1.5	TCR-K-150-1.5
			250	1.0	TCR-K-250-1.0	1.5	TCR-K-250-1.5
			500	1.0	TCR-K-500-1.0	1.5	TCR-K-500-1.5
			1000	1.0	TCR-K-1000-1.0	1.5	TCR-K-1000-1.5
	Round Silicone cable, max. 180°C	50	3.0	TCR-K-50-3.0	6.0	TCR-K-50-6.0	
		100	3.0	TCR-K-100-3.0	6.0	TCR-K-100-6.0	
		150	3.0	TCR-K-150-3.0	6.0	TCR-K-150-6.0	
		250	3.0	TCR-K-250-3.0	6.0	TCR-K-250-6.0	
		500	3.0	TCR-K-500-3.0	6.0	TCR-K-500-6.0	

TCT Thermocouple with TFT cable		Sensor	Length mm	Ø mm	Type Code	Ø mm	Type Code
<p>Round Teflon Cable, length 2 m</p> <p>Bending angle 3 x sensor diameter</p>	Thermocouple K, max. 1100°C	Material Inconel 600	50	1.0	TCT-K-50-1.0	1.5	TCT-K-50-1.5
			100	1.0	TCT-K-100-1.0	1.5	TCT-K-100-1.5
			150	1.0	TCT-K-150-1.0	1.5	TCT-K-150-1.5
			250	1.0	TCT-K-250-1.0	1.5	TCT-K-250-1.5
			500	1.0	TCT-K-500-1.0	1.5	TCT-K-500-1.5
			1000	1.0	TCT-K-1000-1.0	1.5	TCT-K-1000-1.5
	Flat Teflon cable, max. 250°C	50	3.0	TCT-K-50-3.0	6.0	TCT-K-50-6.0	
		100	3.0	TCT-K-100-3.0	6.0	TCT-K-100-6.0	
		150	3.0	TCT-K-150-3.0	6.0	TCT-K-150-6.0	
		250	3.0	TCT-K-250-3.0	6.0	TCT-K-250-6.0	
		500	3.0	TCT-K-500-3.0	6.0	TCT-K-500-6.0	

Nokeval

Made to measure

*Innovative products
from Nokeval!*



Panel meter series 2000



301/311 field displays



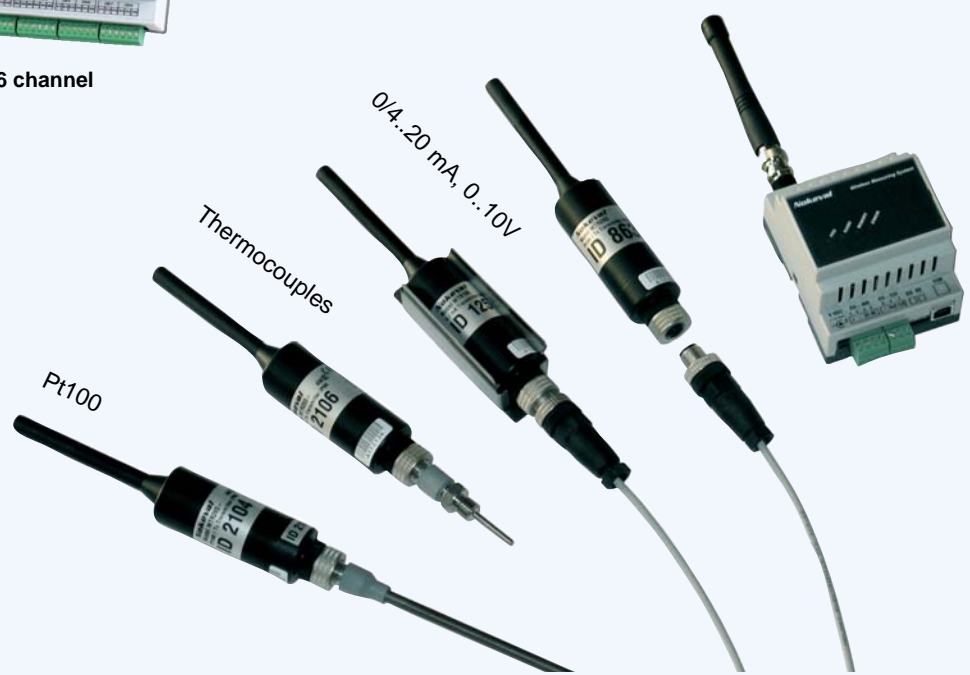
RMD680 8/16 channel transmitters



6821 2 channel transmitters



HTB230 Pt100 2-wire transmitters



*Quality control of process is easy
with wireless transmitters!*