

Product Summary 2005 for Wireless Transmitters





Wireless Data Acquisition Systems

Can data logging be that easy!

Place the transmittersinto the target and start the PromoLog data logger in PC.

Every transmitter has its own ID-number which is sent with measuring message.

Application areas

- Temperature and pressure measuments
- Equipment testing in maintenance
- Testing in the field circumstances
- Cold transportations
- Cold storage room monitoring
- Pharmaceutical stores
- Moving targets



Coverage area can be enlarged by using repeater RTR971. The repeater can receive data from transmitters and repeater and relay (50..200 m) the data to a receiver .

PromoLog data logger can read also wired transmitters (no channel restrictions)



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Temperature control of cold storage rooms in foodstuffs and pharmaceutical stores



Centralized temperature control

- Cold rooms and freezer rooms
- · In-house control of cold storage rooms in catering kitchens
- · Pharmaceutical stores
- · Low-cost to use
- No wiring

Wireless temperature measurement is a low-cost solution to the in-house control of cold storage rooms. The transmitters are placed into the cold rooms and freezes. A receiver is connected to the computer's USB- or serial port and the PromoLog acquisition software is started. The temperatures from the measuring points will have better accuracy than 1°C. If the workstation is connected into network, for example all the kitchens of large cities and hotel chains can be controlled centralized from one workstation





Wireless transmitters



	ture sensor	ture sensor	sensors	thermocouples	420 /10V
Model	MTR260	MTR262	MTR264	MTR265	MTR165
Number of channels	1	1	4	1	1
Input/radio signal	Internal Pt100 sensor, response time 5 minute	Pt100, thermocouples: K, J, T, E, L, N, R, S, mV 0100 V, 0/420 mA	mV, thermocouples: K, J, T, E, L, N, R, S	Pt100, thermocouples: K, J, T, E, L, N, R, S	0/420 mA, mV, 0100V
Output/signal	Frequency 433 MHz	Frequency 433 MHz	Frequency 433 MHz	Frequency 433 MHz	Frequency 433 MHz
Operating temprature	-30+60°C	-30+60°C	-30+60°C	-30+60°C	-30+60°C
Distance from receiver	50300 m	50100 m	50100 m	50200 m	50200 m
Accuracy	±1°C	±0.2°C RTD, TC 040°C: ±0.75°C, -3060°C: ±1.5°C	TC 040°C: ±0.75°C, TC -3060°C: ±0.75°C	±0.2°C RTD, TC 040°C: ±0.75°C, -3060°C: ±1.5°C	±0.05 % of span
Configuration	-	MekuWin or 6790	MekuWin or 6790	MekuWin or 6790	MekuWin or 6790
Interval	4 sec5 min.	4 sec5 min.	4 sec5 min.	4 sec5 min.	4 sec5 min.
Sensor connection	Internal sensor	Screw connection, 1.5 mm ²	Screw connection, 1.5 mm ²	M12 connector	M12 connector
Battery	3V Lithium battery CR2032	3V Lithium battery CR2032	3V Lithium battery CR2032	3V Lithium battery CR2032	3V Lithium battery CR2032
Life of battery	Max. 4 years	Max. 3 years	Max. 3 years	Max. 3 years	Max. 5 years
Dimensions	370 x 31 x 24 mm	78 x 45 x 18 mm	78 x 45 x 18 mm	92 x Ø29 mm + 80 mm	92 x Ø29 mm + 80 mm
Protection class	IP50	IP20	IP20	IP65	IP65
Note	Low cost transmitter for cold rooms and freezer rooms.	A small size transmitter can be taken from case for installing into other devices.	A small size transmitter can be taken from case for installing into other devices.	M12 female connector for Pt100 and thermocouple sensors	M12 connctor with screw terminal, wire size 1,5 mm ² Input resistance 50 Ω for





Wireless receivers



	Desktop receiver	Receiver for DIN-rail	Receiver with memory	Repeater	Analog outputs 420 mA/010 V
Malli	MTR970	RTR970	RTR970-PRO	RTR971	7470
Input/radio signal	Frequency 433 MHz	Frequency 433 MHz	Frequency 433 MHz	Frequency 433 MHz	Serial input RS485
Number of channels	See page 8	See page 8	See page 8	See page 8	4 input channels
Receiver	•	•	•	-	-
Link connection	-	-	-	•	-
Non-volatile memory	-	-	50.000 samples	-	-
Software for PC	PromoLog	PromoLog	Works without PC	-	-
Serial output / analog output	RS485, RS232 SCL Protocol	RS485, RS232, USB SCL Protocol	RS485, RS232, USB, SCL, Modbus protocol	-	4 analog ouputs 0/420 mA, 010V
Operating tempeature	-20+50°C	-20+50°C	-20+50°C	-20+50°C	0+50°C
Accuracy	-	-	-	-	±0.1 % of span
Configuration software	MekuWin or 6790	MekuWin or 6790	MekuWin or 6790	-	MekuWin or 6790
Power supply	924 VDC	930 VDC	930 VDC	930 VDC	930 VDC
Dimensions	75 x 120 x 25 mm WHD	70 x 85 x 60 mm WHD	70 x 85 x 60 mm WHD	70 x 85 x 60 mm WHD	70 x 85 x 60 mm WHD
Protection class	IP20	IP20	IP20	IP20	IP20
Note	Signal handling by PromoLog data acquisition software	Signal handling by PromoLog data acquisition software	The RTR971-PRO runs independently without signal handling in PC.	The RTR971 read receivers, transmitters and links by sending data to the next RTR971 (RTR970).	The 7470 reads four transmitters with RS485, max. distance 1 km.

Wireless data acquisition network





Data Acquisition Systems

Configuration examples Usually the coverage areas overlap to prevent dead spots. In these cases it is not possible to accurately give the maximum number of transmitters in a coverage area. Therefore in these examples we have assumed that the coverage areas do not overlap. 1. One receiver - One minute transmission interval PromoLog Workstation Max 261 transmitters remote sofware Ethernet network, RTR970 reads Internet wireless transmitters Note: Number of transmitters depend on used PromoLog data USB port transmission interval, all examples are acquisition software shown with one minute transmission interval

2. Multiple receivers - One minute transmission interval







4. Two repeaters and one receiver- One minute transmission interval

(maximum number of repeaters)





Data Acquisition Systems

Number of transmitters

The maximum number of radio transmitters in a coverage area is limited by radio standards. 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						
	MTR970 RTR970		RTR971	RTR971						
	Maxir	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.



Both of receivers can read more than 100 transmitters, but radio standards limit the number of transmitters to 130 when one minute transmission interval is used. The use of repeaters decreases number of transmitters as it also transmits data.

40.80 m Room 50.200 m RTR971 RTR970 RTR971 Coverage area

How to place receivers and repeaters in large room

One RTR970 or MTR970 receiver and two RTR971 repeaters cover large room as shown in the picture.

The receiver must be placed to the coverage area of a repeater.

Use wireless transmitters only for non critical applications

The collision probability of radio data packets increases when the number of transmitters in a coverage area increases or the transmission interval decreases.

For example, if a system with one receiver has a transmission interval of 30 seconds and the number of MTR262 transmitters is 70 the probability of a collision is about 5 %. Therefore, the probability that at least one of two consecutive transmission gets through is over 99.8 % (further details in manual of transmitters).





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Transmitters

Configuration of transmitters by MekuWin Software

- Sensor type selection
- Scaling of mA/V-inputs
- Transmission interval

Every transmitter has unit identification number so you need only to set sensor type, scaling of input for analog signal and transmission interval. All setting are easy to make by MekuWin software which is delivered together with a receiver. Transmitters can be delivered for ordered sensor type and measuring range.

Basic receivers do not need any configuration, only baud rate need to set if other than default setting.



Battery Life





Dimensions of transmitters



Wall mounting bracket for MTR165/265





MTR262/264



Socket for configuration cable

MTR-IP65 field enclosure for MTR262/264



MTR260





PromoLog Data Acquisition systems for wireless and wired transmitters

- Unlimited number of wireless channels
- Digital and bar displays
- Single and multi-trend displays
- Several data loggers
- Mathematical functions on channels
- Alarms to remote devices or mobile phones
- Remote reading from other PromoLog software (Ethernet)
- DDE Server for Excel connectivity
- OPC DA Server
- Nokeval SCL, Modbus RTU and Modbus TCP rotocols

Description of the PromoLog Software

You can create an user interface of your own by picking up modules from the library and dragging them on the screen. You can insert your own ground plant as background, drawing or photo. You can create several window sheets individually and select them quickly by clicking a mouse. Several data loggers can be used at the same time. One of them can save data by transactions and the other one by timing. There are unlimited number of channels. You can collect data from thousands of channels.

Connections

The PromoLog software accepts all Nokeval wireless and wired transmitters and indicators with serial output RS-485/232, using Nokeval SCL or Modbus RTU/TCP protocols. Transmitters and indicators are directly connected to the USB/ serial port of the host computer. For remote use, only the IP address and port number of the server are needed to be entered to access the remote channels. PromoLog saves data in ASCII format which is easy to read on spread sheet software like Excel.

Requirements

Windows NT, 2000 or XP control program and speed minimum 500 Mhz, serial or USB port.



PromoLog modules

Design your user interface easily!

Functions of PromoLog	Lite	Work- station	Server
Modules			
Input channels (SCL, Modbus RTU)	Х	Х	Х
Data recording to file	Х	Х	Х
Digital/Bar displays	Х	Х	Х
Trend displays	Х	Х	Х
Multi-trend displays		Х	Х
Alarm module/Discrete outputs		Х	Х
Mathematical module		Х	Х
Script files		Х	Х
DDE Server		Х	Х
Analog outputs			Х
OPC Server			Х
Remote Interface Server			Х
Remote Access Server			Х



1. Lite









Build your own application according to your requirements by PromoLog software

Using PromoLog it is easy to build your own application for process monitoring and data logging. Just drag and drop the needed modules from module library to the workspace and configure the basic settings.

PromoLog also has modules for data recording and surveillance reports so data logging is easy.



Pick up modules from the library and drop them on the screen.

You can insert drawings or photos on the screen

You just give the address of the transmitter for the chosen modules or pick the address from the list that PromoLog has found automatically



Data Acquisition Systems

Write your own mathematical functions



from the module library and drag it on the screen.

The result of functions on the output channel can be displayed, drawn as a trend on the screen or sent to the field instrument 7470 (4 x output 4-20 mA) by serial bus RS485. The number of functions is not limited.

Surveillance reports

Using PromoLog software you can easily create surveillance reports for multiple purposes. Measured data and alarms are automatically stored to the report. User can also comment alarms, sign report or add other information to reports.

Printing	reports
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Printing reports is simple and reports are easy to read. The report data is also stored to a text file in ASCII format and therefore it can be easily imported to spreadsheet programs if needed. The picture below shows the print layout of a report.

Surveillar	ice Log				<u> </u>
Sign	K 1	Print! Ter	np. transmitters		
6.10.200	15	 100 report ev 	ents.	Ascending order	•
Time	ID	Event	Reading		
10:00	100	MTR262 ID-100	24,8°C		
📣 10:00	864	MTR265 ID-864	24,2°C		
📣 10:00	201	MTR261 ID-201	24,0°C		
📣 10:00	757	MTR262 ID-757	0,0°C		
🛋 10:00	984	MTR264 ID-984	0,4°C		
📣 10:00	985	MTR264 ID-985	0,4°C		
📣 10:00	865	MTR265 ID-865	24,4°C		
📣 10:00	760	MTR265 ID-760	22,2°C		
📣 10:00	192	CSR260 ID-192	22,8°C		
🛋 10:30	201	MTR261 ID-201	24,3°C		
📣 10:30	982	MTR264 ID-982	0,1°C		
🛋 10:30	983	MTR264 ID-983	0,3°C		
📣 10:30	984	MTR264 ID-984	0,4°C		
📣 10:30	985	MTR264 ID-985	0,4°C		
📣 10:30	865	MTR265 ID-865	24,5°C		
📣 10:30	760	MTR265 ID-760	22,2°C		
🛋 10:30	755	MTR262 ID-755	0,0°C		_
J &					

Surve	eillance	Log (6.10.2005	Page 1/1
Time	ID	Event /Tra	nsmitter	Reading
🦂 10:00	100	MTR262 ID	-100	24,8°C
🦂 10:00	864	MTR265 ID	-864	24,2°C
📣 10:00	201	MTR261 ID	-201	24,0°C
📣 10:00	757	MTR262 ID	-757	0,0°C
📣 10:00	984	MTR264 ID	-984	0,4°C
📣 10:00	985	MTR264 ID	-985	0,4°C
🦂 10:00	865	MTR265 ID	-865	24 ,4 °C
📣 10:00	760	MTR265 ID	-760	22,2°C
📣 10:00	192	CSR260 ID	192	22,8°C
📣 10:00	247	CSR260 ID	247	10,7°C
📣 10:00	293	CSR260 ID	293	24,3°C
📣 10:00	885	MTR260 ID	-885	24,3°C
📣 10:00	886	MTR260 ID	-886	24,2°C
📣 10:00	74	CSR260 ID	-74	5,8°C
📣 10:00	109	CSR260 ID	109	28,6°C
📣 10:00	290	CSR260 ID	290	24,7°C



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Applications





Temperature sensors



TRE Serie	s for Pt100	PT100-sensor	Length	Ø	Type Code		ø	Type Code	
			L=mm	mm			mm		
M12S-KO	Connector								
Connector	_ /	Pt100-sensor with M12	100	3	TRE-100-3.0-A		6	TRE-100-6.0-A	
	male connector can be	150	3	TRE-150-3.0-A		6	TRE-150-6.0-A		
	connected directly to	250	3	TRE-250-3.0-A		6	TRE-250-6.0-A		
	or using cable to MTR165 and MTR262	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		
<u>i</u>									
		Removable M12	Famala	onnostoro	M12K-NA	Angle type	Angle type with screw terminals, 4-pole, IP67		
Ų		connector (optional)	Female connectors		M12S-NA	Straight ty	be screw te	erminals, 4-pole, IP67	
TWCP		Sensor element	Pt100, Cl	ass A ±0,15°	°C, optional Class B ±0	,3°C, IEC 75	51		
		Temperature range	Class A -3	30+350°C,	optional Class B -50	+500°C			
	Sensor material	AISI 316							
U									

TCSM Thermocouple Sensors	Sensor	Lenght mm	Ø mm	Type Code		Ø mm	Type Code	
	K-thermocouple							
雪 雪	max. 1150°C	250	3.0	TCSM12-K-250-3.0		6.0	TCSM12-K-250-6.0	
M12S-NA	Sensor material Inconel,	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	
	M12 connector	1500	3.0	TCSM12-K-1500-3.0		6.0	TCSM12-K-1500-6.0	
	M12 Connectors for sensors and transmitters (MTR165/265)							
ITTT	M12 Connectors M12K-NA			Angle type with screw terminals, 4-pole female, IP67				
	with screw	M12S-NA	Straight type with scre	ew termir	als, 4-pole	female, IP67		
	terminals	M12K-KO		Straight type with scre	ninals, 4-pole male, IP67			
	-							
	Extension Cables with M12	Extension cables with moulded M12 connector at the other end of cable						
	ousies with with	M12TC-K-5	m	Extension cable, leng	ht 5 m, ty	vpe K with i	moulded M12 connector	
	M12S-NA M12K-KO TCSM-K K-type extension Cable, lenght 5 n K type extension cable have to use					ht 5 m		
	Connectors for e	for extension cables						

TWCP Protection tubes		Length	Ø	Type Code	ø	Type Code	
		mm	mm	R1/4"	mm	R1/2"	
Compression fitting	Thermowells with	50	3	TWCP-50-3-R1/4"	3	TWCP-50-3-R1/2"	
	fixing compression	100	3	TWCP-100-3-R1/4"	3	TWCP-100-3-R1/2"	
	fitting	150	3	TWCP-150-3-R1/4"	3	TWCP-150-3-R1/2"	
	Thermowell diameter	200	3	TWCP-200-3-R1/4"	3	TWCP-200-3-R1/2"	
	Ø 5 mm	300	3	TWCP-300-3-R1/4"	3	TWCP-300-3-R1/2"	
		400	3	TWCP-400-3-R1/4"	3	TWCP-400-3-R1/2"	
		mm	Ømm	R1/2"			
	Thermowells with	50	6	TWCP-50-6-R1/2"	Process	connection R1/4" or R1/2	'. 00 h = =
	fixing compression	100	6	TWCP-100-6-R1/2"	(350°C)	AISI 316. Max. pressure 10	JU bar
		150	6	TWCP-150-6-R1/2"	(330 C).		
	Thermowell diameter	200	6	TWCP-200-6-R1/2"	Thermowells will be delivered		
	9 mm	300	6	TWCP-300-6-R1/2"	without		
		400	6	TWCP-400-6-R1/2"			



Temperature sensors

Cable sensors

TCR Thermocouple with Silikone Cable	Sensor	Lenght mm	Ø mm	Type Code	Ø mm	Type Code	
		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	
Round Silikone Cable,	K. max. 1100°C	250	1.0	TCR-K-250-1.0	1.5	TCR-K-250-1.5	
lenght 2 m	10, 1100 0	500	1.0	TCR-K-500-1.0	1.5	TCR-K-500-1.5	
	Material	1000	1.0	TCR-K-1000-1.0	1.5	TCR-K-1000-1.5	
	Inconel 600	50	3.0	TCR-K-50-3.0	6.0	TCR-K-50-6.0	
	Round Silicone	100	3.0	TCR-K-100-3.0	6.0	TCR-K-100-6.0	
Bending angle 3 x sensor	cable,	150	3.0	TCR-K-150-3.0	6.0	TCR-K-150-6.0	
uanietei	111dX. 100 C	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	
		1000	3.0	TCR-K-1000-3.0	6.0	TCR-K-1000-6.0	

TCT Thermocou	uple with TFT cable	Sensor	Lenght mm	Ø mm	Type Code	Ø mm	Type Code	
			50	1.0	TCT-K-50-1.0	1.5	TCT-K-50-1.5	
6			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	
		K. max. 1100°C	250	1.0	TCT-K-250-1.0	1.5	TCT-K-250-1.5	
	Elat Taflan Cabla	10, max. 1100 0	500	1.0	TCT-K-500-1.0	1.5	TCT-K-500-1.5	
	lenght 2 m	Material m Inconel 600 Flat Teflon cable, max. 250°C	1000	1.0	TCT-K-1000-1.0	1.5	TCT-K-1000-1.5	
			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	
	Deading angle 2		150	3.0	TCT-K-150-3.0	6.0	TCT-K-150-6.0	
	Bending angle 3 x sensor		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	
			1000	3.0	TCT-K-1000-3.0	6.0	TCT-K-1000-6.0	

TREP Pt100 sensor (Ø 3 mm)		Type Code	Lenght	Ømm		
Pt100 sensor with 2-wire cable		TREP-100-3.0-3m	100 mm	3.0		
		TREP-150-3.0-3m	150 mm	3.0		
Bending angle 3 x sensor diameter		TREP-250-3.0-3m	250 mm	3.0		
	Sensor	Pt100, Class B ±0.3°C, sensor material AISI 316				
	Temperature range	-50+500°C				
	Cable	Slilicone, 2-wire cable, max. temperature 120 °C				

TLC Pt100 sensor ((Ø 6 mm)		Type Code	Sensor	Lenght	Ømm	
Pt100 sensor -50+180°C (2-wire connector)	Low cost resistance	TLC-100-50-6.0-2m	Pt100	50 mm	6.0		
	sensors	TLC-1000-50-6.0-2m	Pt1000	50 11111			
	Sensor	Pt100, Class B ±0.3°C, material AISI 316					
	Temperature range	-50+180°C					
		Cable	Silicone, 2-wire cable, max. temperature +180°C				

IKES Pt100 sensor (Ø 6 mm)		Type Code	Lenght	Ømm	Cable		
Pt100 with double isolation, rubber isolation + thin steel protection tube	-	IKES-50-6.0-2m/2	50 mm	6.0	Lenght 2 m, 2-wire		
		IKES-50-6.0-2m/4			Lenght 2 m, 4-wire		
		IKES-50-6.0-5m/4			Lenght 5 m, 4-wire.		
		IKES-100-6.0-2m/2	100 mm	6.0	Lenght 2 m, 2-wire		
		IKES-100-6.0-5m/4			Lenght 5 m, 4-wire		
	Sensor	Pt100, Class B ±0.3°C, optional Class A					
	Temperature range	-50+105°C					
	Protection tube	AISI 316, Ø 6 mm, thin protection tube					







Wireless Transmitters..

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Loop Powered Panelmeters	Large Displays	Panel Meters	
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Head Mounted Transmitters	Data Acquisition Softwares	Small Field Displays	
Temperature Transmitters	Multichannel Transmitters	2-Channel Transmitters	

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