Quality control is easier than ever!

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

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**

Wireless data logging is now simple

Even up to 1000 transmitters with only one receiver

Sensors have their own ID numbers

Simulated picture of MTR265 temperature measurement

The receiver can always be ready to receive measuring information

USB or RS485 connection

PromoLog data acquisition software

PC or Surveilance Unit DPR991

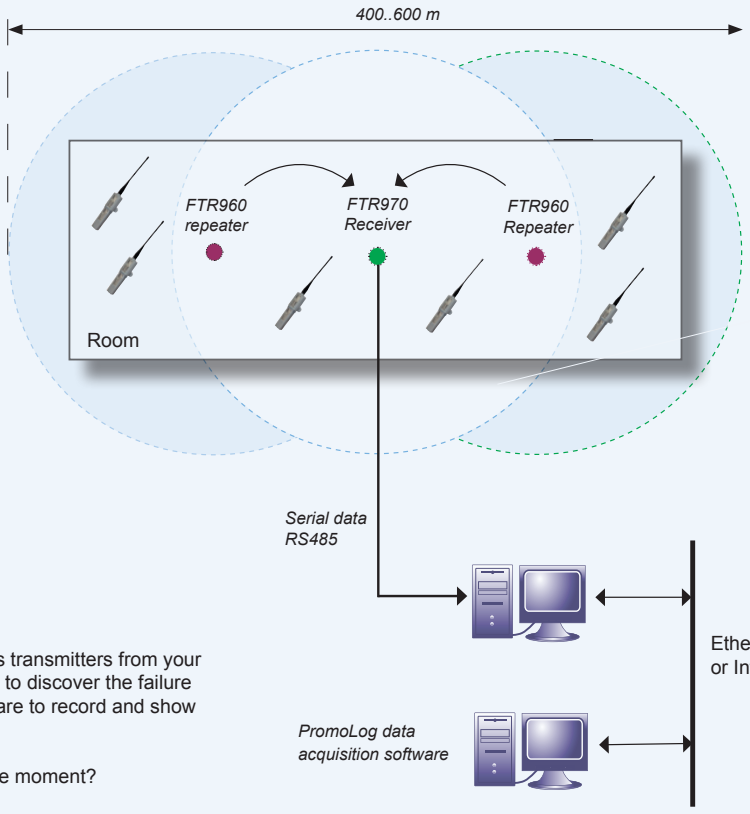
- ***No sensor cables on the floor***
- ***Always ready to measure***
- ***Save time in measuring work***
- ***No complicated and expensive cables***

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!

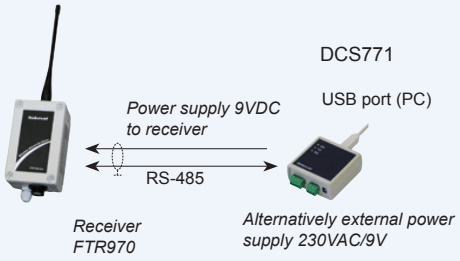
If the process fails, just pick up some wireless transmitters from your stock and place them to the suspicious areas to discover the failure points. Use PromoLog data acquisition software to record and show the results.

How is your quality control implemented at the moment?

Receivers

	Receiver	Receiver with memory	Receiver for DIN rail	Receiver with memory	Repeater Receiver
Model	**FTR970**	**FTR970-PRO**	**RTR970**	**RTR970-PRO**	**FT20-Receiver**
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 1000 *	up to 1000 *	up to 500 *
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..30 VDC	8..30 VDC	8..30 VDC	12..30 VDC
Installation	Field enclosure	Field enclosure	DIN rail, 35 mm	DIN rail, 35 mm	Field enclosure
Dimensions	70 x 130 x 60 mm WHD	70 x 130 x 60 mm WHD	70 x 85 x 60 mm WHD	70 x 85 x 60 mm WHD	180 x 130 x 60 mm WHD
Protection class	IP65	IP65	IP20	IP20	IP65
Note * depends on transmission interval	Data processing by PromoLog data acquisition software or user's software.	The FTR970-PRO works independently without realtime data processing in PC. Suitable to Modbus RTU devices as PLC.	Data processing by PromoLog data acquisition software or user's software.	The RTR970-PRO works independently without realtime data processing in PC. Suitable to Modbus RTU devices as PLC.	The FTR960 listens to transmitters and retrans-mits data to a receiver or repeater.

Versatile USB-RS485 converter



DCS771 serial converter is powered from USB port and can provide supply voltage to one receiver. More than one receivers can be powered through DCS771 if a 9 VDC external power supply is used.

Computer can be shut down without losing any measurement data if an external power supply is used with FTR970-PRO or RTR970-PRO receivers. Receivers have a memory of 150.000 samples.

FT20-Receiver

Available in August 2011

Frequency 433.92 MHz
Serial data: RS485
Protocol: SCL and Modbus RTU
Configuration software: Mekuwin
Operating temperature: -30..+60°C
Power supply: 12-30VDC
Dimensions: 60 x 352 x 33 mm WHD
Protection class: IP66

Data processing by PromoLog data acquisition software or user's software.
The FT20-Receiver works independently without realtime data processing in PC.
Suitable to Modbus RTU devices as PLC.

FT20-Repeater

Available in August 2011

Frequency 433.92 MHz
Operating temperature: -30..+60°C
Power supply: 90-230VAC
with transformer (including) or 24 VDC
Dimensions: 60 x 352 x 33 mm WHD
Protection class: IP66

Repeater does not need any configuration and can be also added afterwards if the installation environment of the wireless measuring system changes.
Several Repeaters can be used in the same system.

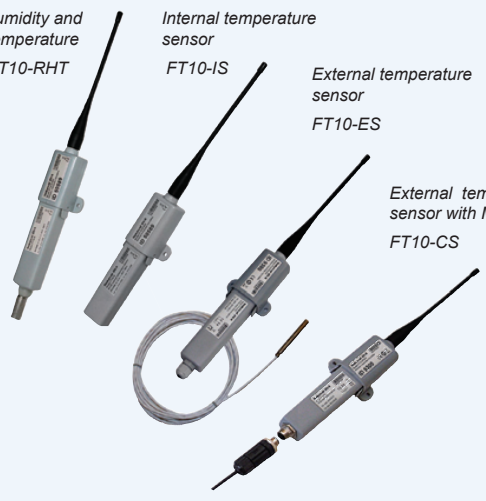
	Internal temperature sensor	External temperature sensor	External temperature sensor	Humidity and Temperature	Replacement measuring modules
Model	**FT10-RT433-IS**	**FT10-RT433-ES**	**FT10-RT433-CS**	**FT10-RT433-RHT**	**FT10-IS / F10-CS**
Manufacturer	Nokeval	Nokeval	Nokeval	Nokeval	Nokeval
Number of channels	1	1	1	1	1
Input	Internal Pt100 sensor inside the replaceable measuring module	Exterrnal Pt100 cable sensor with the replaceable measuring module	External Pt100 cable sensor with the replaceable measuring module	Internal Pt100 sensor and Humidty sensor with replacement filter	Internal or external Pt100 sensor. Factory calibrated replacement measuring module. User replaceable.
Radio signal	Frequency 433.92 MHz	Frequency 433.92 MHz	Frequency 433.92 MHz	Frequency 433.92 MHz	
Operating range	-30..+60°C	-30..+60°C	-30..+60°C	-30..+60°C	-30..+60°C
Humidity range				0-100% Rh	
Maximum range	50..500 m	50..500 m	50..500 m	50..500 m	-
Accuracy Temp. Humidity	< ±0.5°C	< ±0.5°C	< ±0.5°C	< ±0.5°C ±3% on the range	< ±0.5°C
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	Designed for regular calibration demands. **FT10-IS** Internal Pt100 sensor **FT10-CS** for external Pt100 cable sensor. Cable sensor is not included.
Sensor connection	Internal sensor	Fixed external sensor	Fixed external sensor	Fixed external sensor	
Power supply	1.5V alkaline battery size LR6 (AA)	1.5V alkaline battery size LR6 (AA)	1.5V alkaline battery size LR6 (AA)	1.5V alkaline battery size LR6 (AA)	
Battery life	Typically > 3 years *	Typically > 3 years *	Typically > 3 years *	Typically > 3 years *	
Dimensions	60 x 352 x 33 mm WHD	60 x 352 x 33 mm WHD	60 x 352 x 33 mm WHD	60 x 352 x 33 mm WHD	
Protection class	IP67 (watertight)	IP67 (watertight)	IP67 (watertight)	IP67 (watertight)	
Note **Battery life with one minute transmitting interval at 25°C.*	Developed for regular calibration demands in cold rooms and freezers. Response time 15 min. **EN 13485 certified.**	Cable sensor is optional. 4-wire Pt100 sensor need to be used. Screw terminal block for sensor.	Cable sensor is easily removable by quick connector. Sensor types (Pt100) on the page page 31	Delivered with sintrated filter.Other types as option.	
		Without Cable sensor	**Without Cable sensor**		

Humidity and Temperature
FT10-RHT

Internal temperature sensor
FT10-IS

External temperature sensor
FT10-ES

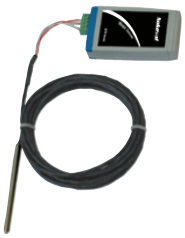
External temperature sensor with M12 connector
FT10-CS



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

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

Unbeatably cost-effective recalibration, see page 27

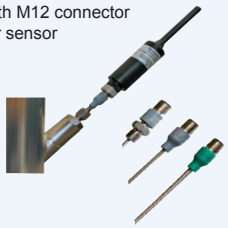


Four thermocouples

	Transmitters, universal input	Transmitter for temp. sensors	Laboratory transmitter	Laboratory transmitter	Wireless portable meter
Model	**FTR262**	**MTR265**	**MTR262**	**MTR264**	**KMR260**
Manufacturer	Nokeval	Nokeval	Nokeval	Nokeval	Nokeval
Number of channels	1	1	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	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..+70°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 ±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 mm²	M12 connector	Screw terminal, 1,5 mm²	Screw terminal, 1,5 mm²	Quick connector
Power supply	2 x 1.5 V AA battery or external 9-24 VDC	3V Lithium battery size CR2032	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 1 year *	Typically 9 months *	10 h in continuous use
Dimensions	80 x 130 x 60 mm WHD	92 x Ø29 mm + 80 mm	78 x 45 x 18 mm WHD	78 x 45 x 18 mm WHD	57 x 191 x 32 mm WHD
Protection class	IP65	IP66	IP20	IP20	IP64
Note ** Battery life with one minute transmitting interval at 25°C.* *** TC accuracy in operating temperature 0..40°C (±0.75°C) and -30..+60°C (±1.5°C).*	Sensor type is easy to change by configuration software Mekuwin. Battery or external power supply selectable by jumper.	Includes wall mounting bracket and M12 connector (with screw terminals) for temperature sensor.	Field enclosure to IP65 as an option.	Field enclosure to IP65 as an option.	128 x 64 pixel self-luminescent OLED display. Data transmitted wirelessly or through USB connection. See sensors on page 30

FTR860

MTR265 transmitter with M12 connector for sensor



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.*

KMR260 was developed for routine measurement needs.

No more writing down lists of measuring values by hand. Just select an operator, a location and a target quickly and easily from user programmable lists and your selections are sent wirelessly, together with the measuring value, to PromoLog data acquisition software. This rugged high-accuracy instrument can also be used without utilizing the wireless transmitter by using the USB connection to transfer the lists and results.

Graphic display:
- **Temperature value**
- **Operator**
- **Location**
- **Target name**

Typical applications include food processing and distribution.

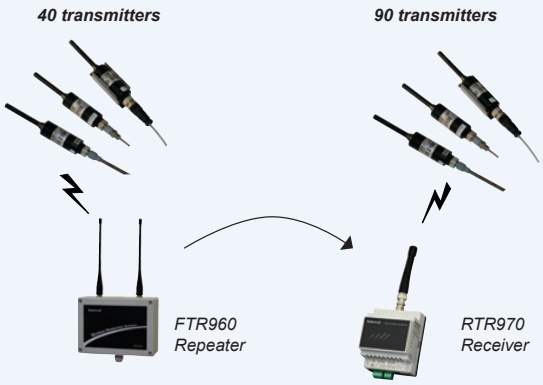
Number of transmitters

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

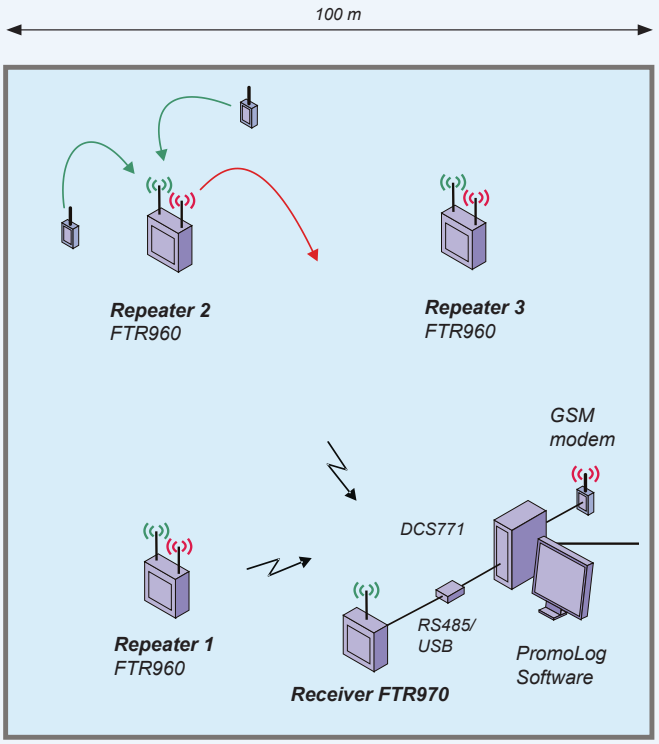
For example, if you have transmission interval of 60 seconds and one repeater and one receiver, the maximum number of transmitters is 130. Without repeaters you can use 261 transmitters. Four-channel model MTR264 counts as 4 transmitters.
Number of receivers do not limit number of transmitters.

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

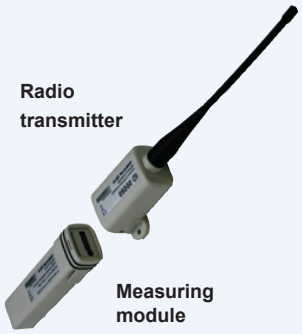


Wireless transmitters are the easy way to solve quality control problems in your production.

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.

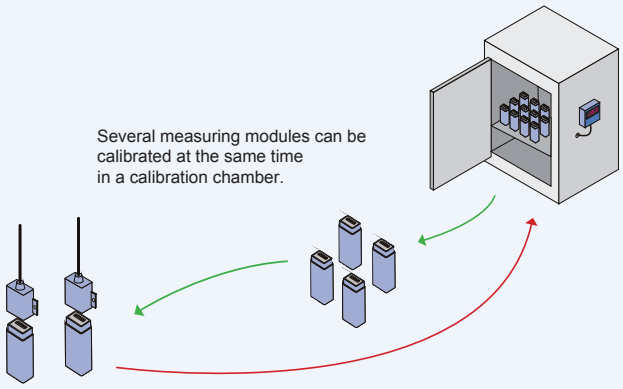
Typical applications are large cold storages.

Unbeatably cost-effective recalibration with FT10 transmitters



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

- **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.

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

Calibrated replacement units

FT10-IS-Module
-internal temperature sensor

FT10-CS-Module
-terminal block for temperature sensor (without sensor)

FT10-ES-Module
-terminal block for temperature sensor (without sensor)

FT10-RHT-Module
-humidity and temperature 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. Price level is about 45 €/unit for customers that have replacement agreement.

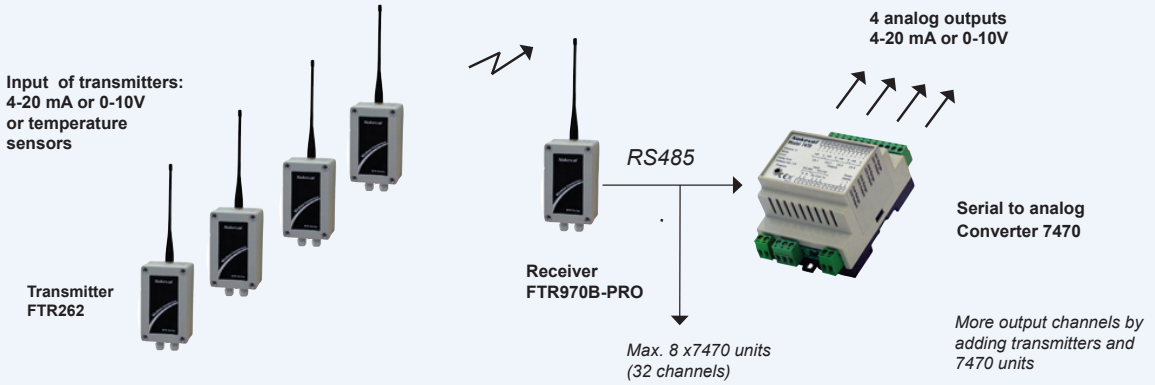
Measuring modules are calibrated in three points: -30°C, 0°C and +30°C. Includes on-line calibration certificate that is loadable from our website.

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

5

The system is suitable only for slowly changing signals like temperature measurements (updating time >5 seconds)

Transfer of analog signals using wireless transmitters



Surveillance Unit DPR991 for data acquisition applications

DPR991 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.

Features:

DPR991 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

DPR991 In-house control includes:

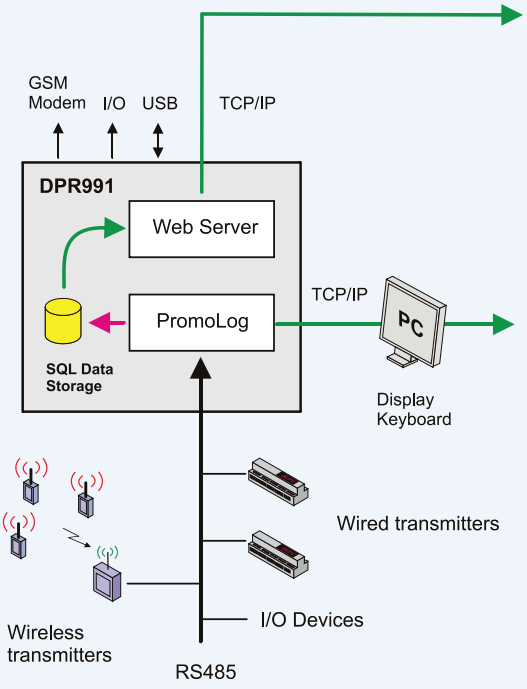
Radioreceiver for wireless transmitters
GSM-modeem for alarms and resets
PromoLog software installed
Webserver software installed
Two digital outputs
2 x ethernet connection
4 USB-ports for transmitters or backup
DVI- and VGA connections
2 x serial port
SSD hard drive 40 GB for backup (data)
Power supply 12 VDC/transformer 90..240 VAC

DPR991

Small size 20 x 20 x 9 cm

Web Browser, remote access

No software installation on local computer



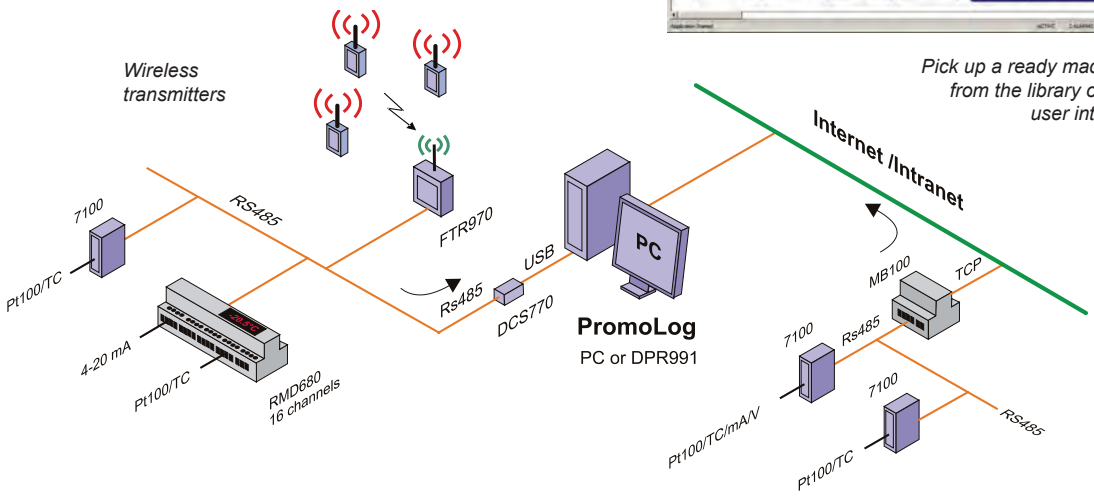
Web Bowser on workstations

PromoLog software on local workstation or via network

PromoLog Data Acquisition software for wireless and wired transmitters with RS485

- **Unlimited number of wireless channels**
- **Analog, digital, bar graph and trend graph displays**
- **Several data loggers and easy surveillance reporting**
- **Mathematical functions between channels**
- **Alarms to remote devices or mobile phones via SMS**
- **Network connectivity for distributed systems**
- **Nokeval SCL, Modbus RTU and Modbus TCP protocols**

Pick up a ready made application from the library or design your user interface easily!



Product highlights

You can create a user interface of your own by picking up modules from the library and dragging them on the screen.

You can create several different views on individual sheets and switch between them quickly by clicking with a mouse. On each sheet you can insert your own ground plan drawing or photographs as a background.

Several data loggers can be used at the same time. For example, one of them can save data only when triggered to and the other one by timing. Data logger channels are not limited. PromoLog saves data in ASCII format which is easy to read into spreadsheet software like Excel. Data can also be saved in SQL database.

Connections

This software supports all Nokeval wireless and wired transmitters and indicators with serial output RS-485/RS-232/USB, using Nokeval SCL or Modbus RTU/TCP protocols. Transmitters, indicators and radio receivers are directly connected to the USB or serial port of the host computer. For remote use, only the IP address and port number of the server need to be entered to access the remote channels.

Computer requirements

Windows XP or Vista operating system, 500 MHz CPU minimum, at least 512 MB of RAM and available serial or USB port.

Features			
Product	**Wireless**	**Lite**	**Server**
Modules			
Wireless transmitters and receivers	X	X	X
Analog/Digital/Bar/Trend graph displays	X	X	X
Data recording to files, reviewing of records	X	X	X
Basic user interface components	X	X	X
Surveillance reporting	X	X	X
SMS alarm service	X	X	X
Remote access client	X	X	X
Wired inputs (SCL, Modbus RTU/TCP)		X	X
Multi-trend displays			X
Extended user interface components			X
Mathematical and statistical analysis modules			X
Analog and digital outputs, external displays			X
Vaisala weather station support			X
Remote access server, remote interface server			X
SQL database support, OPC Server			X

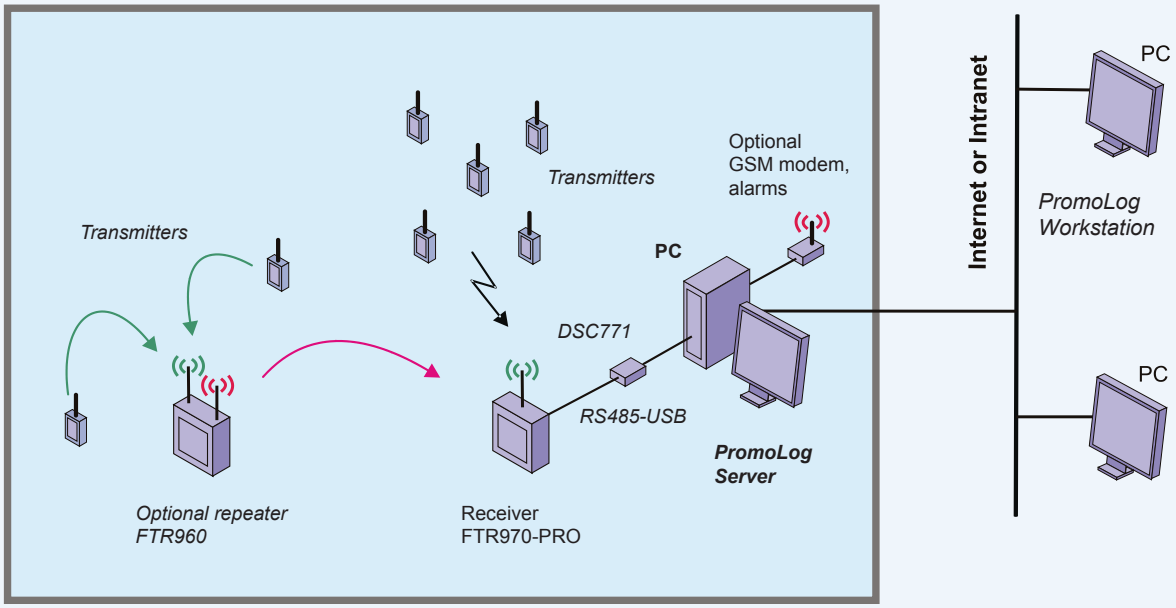
	Transmitter type			
Product	**Wired channels**	**Wireless**	**Network**	
PromoLog-Wireless	-	X	*	
PromoLog-Lite 16	16	X	*	
PromoLog-Server Wireless	-	X	X	
PromoLog Server 32	32	X	X	
PromoLog-Server 512	512	X	X	

** PromoLog-Wireless and -Lite 16 have limited network functions, they can only read via network from other PromoLogs, but not act as a server.*

Basic wireless data acquisition system

1

Typical installation with one receiver, several transmitters and an optional repeater.



Repeater is installed closer to the transmitters to better collect the attenuated signals from them and to retransmit the data to the receiver. Repeaters do not need any configuration, just a power supply.

Entry-level wireless data acquisition system

PromoLog Data Acquisition Software collects the measurement data from the radio receiver FTR970-PRO. This receiver always keeps 150000 most recent readings in its Flash-memory and this data can be read when the measuring PC and PromoLog is started. This way the PC is not required to be powered on all the time. If this feature is not required then an FTR970 receiver can be used.

The receiver is connected to the measuring PC with an RS485-USB converter DCS771. This converter also supplies power to the receiver from the USB port. The receiver can be located up to 1 km away from the PC when using RS485 bus.

PromoLog saves the measurement data to disk, plots trends, monitors transmitter battery voltages and sends remote alarms as SMS messages.

PromoLog Workstation version can be used to remotely access the readings of PromoLog Server if both computers are connected to network.

Remotely accessing the measurement data with a web browser requires the DPR990 Surveillance Unit.

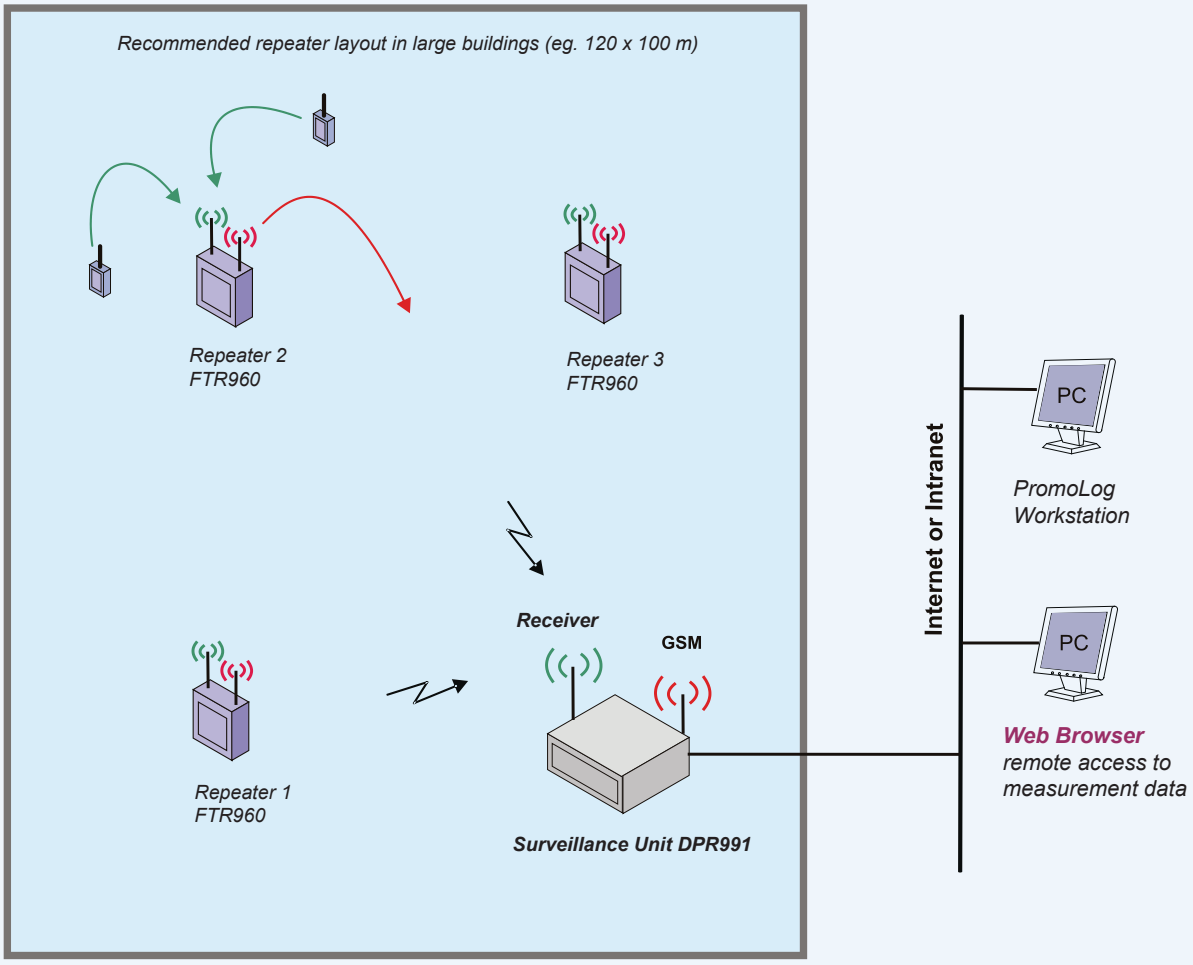
List of needed equipment:

FT10-IS Transmitters for example
FTR970-PRO or FTR970 Receiver
DCS771 USB-RS485 Converter
PromoLog Data Acquisition Software

FTR960 Repeater, optional
GSM Modem for SMS alarms, optional

Using DPR990 Surveillance Unit in large facilities

2



In large buildings FTR960 repeaters (1...3) are placed according to the above picture. Repeaters are installed closer to the transmitters to better collect the attenuated signals from them and to retransmit the data to the receiver. Repeaters do not need any configuration, just a power supply.

Wireless data acquisition system with DPR990 Surveillance Unit

DPR990 Surveillance Unit can be rapidly deployed and taken into use without any software installation. The unit contains all necessary hardware and software for collecting and recording data from wireless transmitters. External display, keyboard and mouse can be installed if needed, but they are not required.

PromoLog Data Acquisition Software and **Web Server software package** have been preinstalled at the factory. The DPR990 can also be ordered as a complete package with pre-configured transmitters. Measuring can be started right after powering up the DPR990 and wireless transmitters. Measurement results can be viewed remotely over the network with the Web Interface that comes as standard with the DPR990 Unit.

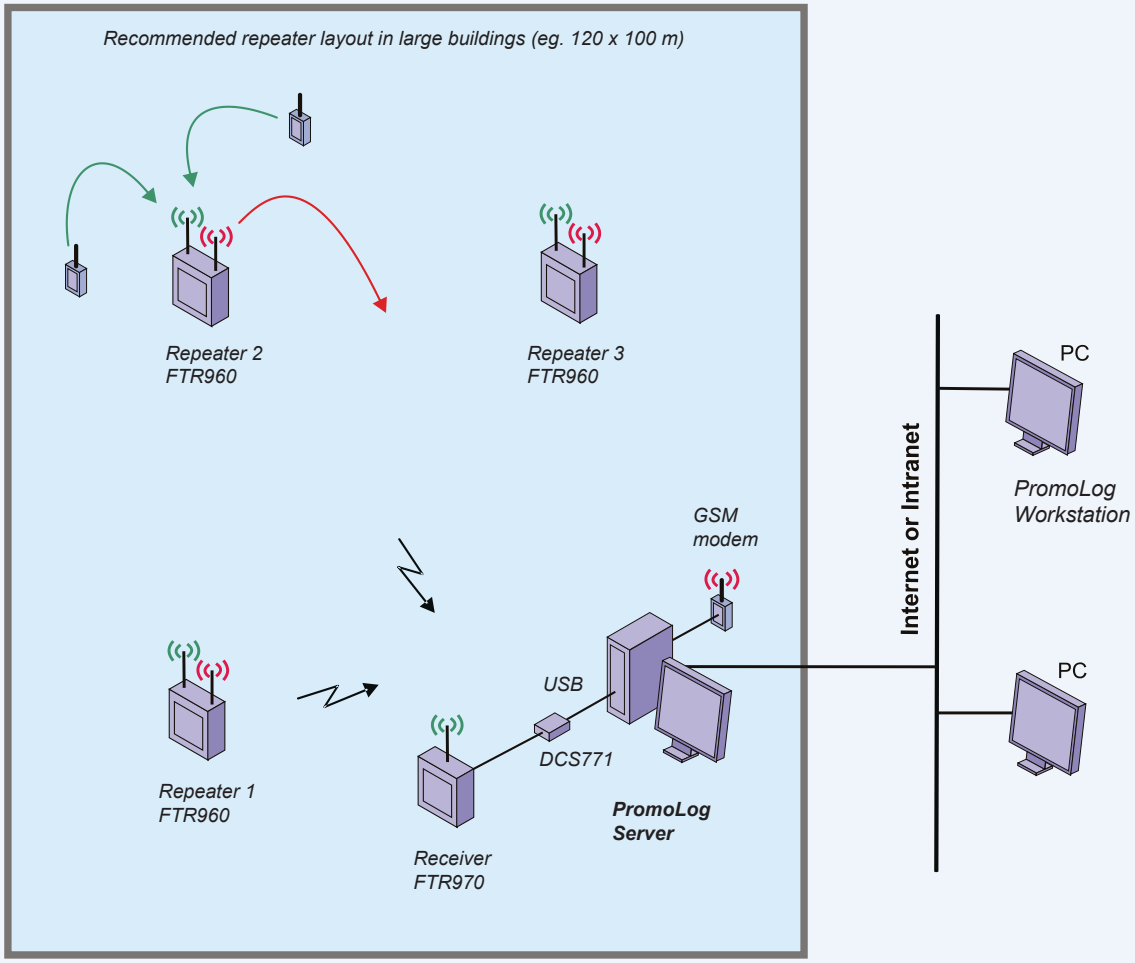
List of needed equipment:

MTR260C Transmitters for example FTR960 Repeaters

DPR990 Surveillane Unit
- PromoLog Data Acquisition Software
- Web Server Software Package
- Radio Receiver
- GSM Modem

Wireless temperature surveillance in large facilities

3



In large buildings FTR960 repeaters (1...3) are placed according to the above picture. Repeaters are installed closer to the transmitters to better collect the attenuated signals from them and to retransmit the data to the receiver. Repeaters do not need any configuration, just a power supply.

Wireless data acquisition system with PromoLog running on a PC

PromoLog Data Acquisition Software collects the measurement data from the radio receiver FTR970. The receiver is connected to the measuring PC with an RS485-USB converter DCS771. This converter also supplies power to the receiver from the USB port. The receiver can be located up to 1 km away from the PC when using RS485 bus.

PromoLog saves the measurement data to disk, plots trends, monitors transmitter battery voltages and sends remote alarms as SMS messages.

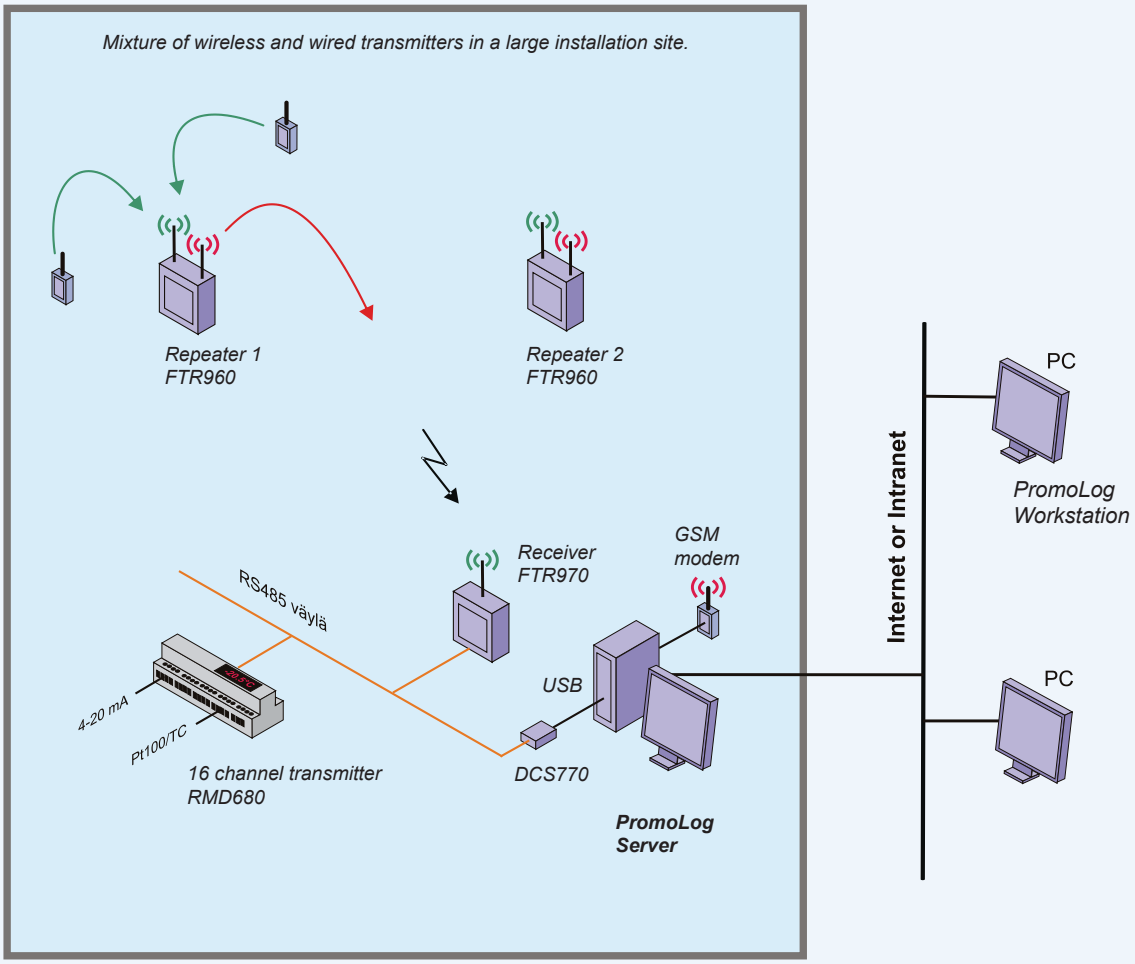
The PC must be on all the time for the system to work.

List of needed equipment:

MTR260C Transmitters
FTR960 Repeaters
FTR970 Receiver
DCS771 USB-RS485 Converter
PromoLog Data Acquisition Software
GSM Modem for SMS Alarms

Using wireless and wired transmitters in the same system

4



In large installations, any part of the measurements can also be done with wired transmitters together with wireless ones. Repeaters are installed closer to the wireless transmitters to better collect the attenuated signals from them and to retransmit the data to the receiver. Repeaters do not need any configuration, just a power supply.

Mixing wireless and wired transmitters in a data acquisition system

PromoLog Data Acquisition Software collects the measurement data from all wireless and wired transmitters. The radio receiver(s) and the wired transmitter(s) are connected to the PC with RS485 bus. One or several separate buses can be used. The PC is connected to the RS485 bus with an RS485-USB converter DCS770. RS485 bus can be up to 1 km in length.

PromoLog saves the measurement data to disk, plots trends, monitors transmitter battery voltages and sends remote alarms as SMS messages.

The PC must be on all the time for the system to work.

List of needed equipment:

FT10-ISTransmitters for example
FTR960 Repeaters
FTR970 Receiver
DCS770 USB-RS485 Converter
PromoLog Data Acquisition Software
GSM Modem for SMS Alarms

RMD680 16 channel transmitters
24 VDC Power supply

Using DPR990 with both wireless and wired transmitters

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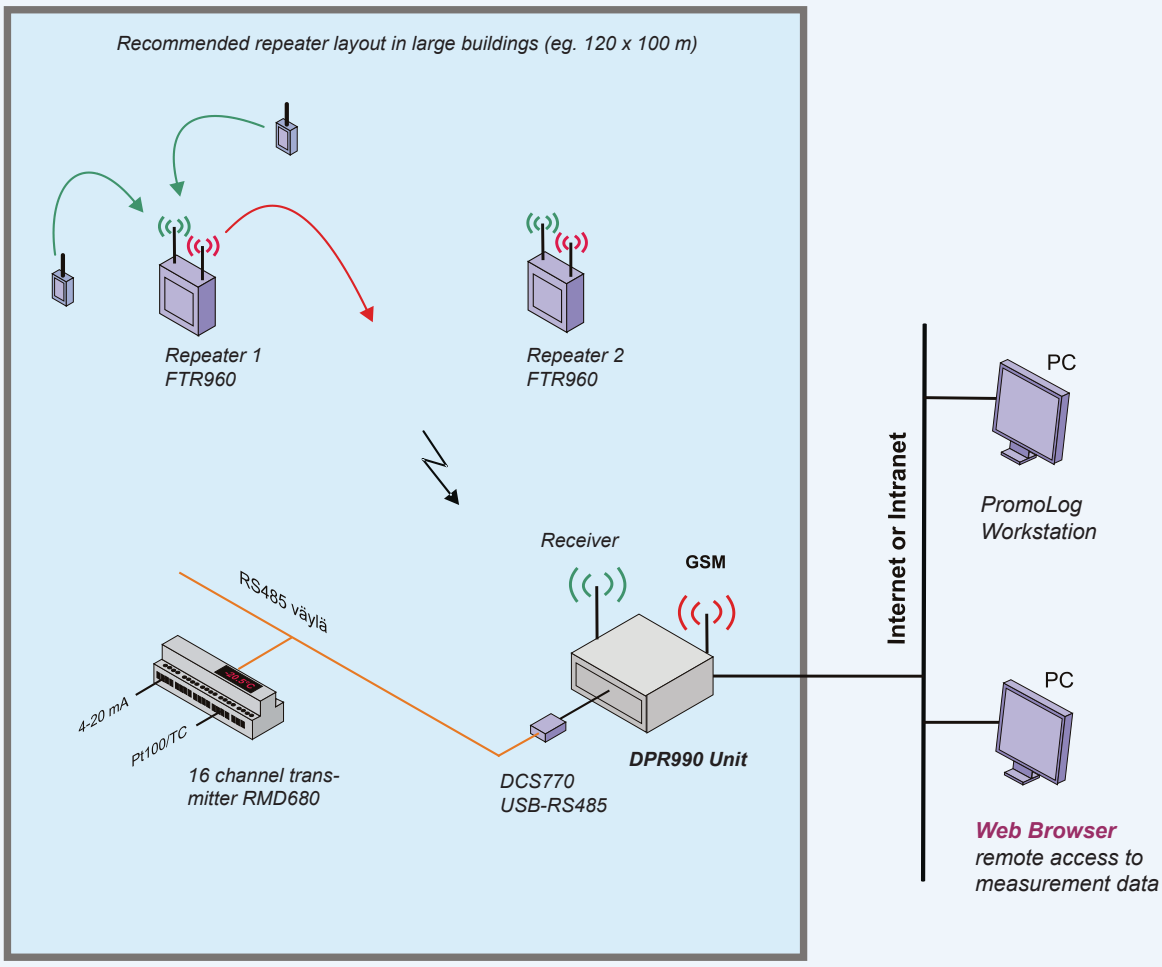

In large installations, any part of the measurements can also be done with wired transmitters in combination with wireless ones. Repeaters are installed closer to the wireless transmitters to better collect the attenuated signals from them and to retransmit the data to the receiver. Repeaters do not need any configuration, just a power supply.

Mixed wireless and wired data acquisition system with DPR990

The DPR990 Surveillance Unit operates independently and replaces a separate PC. PromoLog Data Acquisition Software and Web Server software package have been preinstalled at the factory. The unit contains a radio receiver as standard for collecting data from wireless transmitters but an external DCS770 USB-RS485 converter is required to connect the wired transmitters to the DPR990.

External display, keyboard and mouse can also be installed if needed, but they are not required. DPR990 is a more flexible and more reliable solution than a normal PC for data acquisition purposes.

List of needed equipment:

FT10-IS Transmitters for example
FTR960 Repeaters
FTR970 Receiver
DCS770 USB-RS485 Converter
DPR990 Surveillance Unit

RMD680 16 channel transmitters
24 VDC Power supply

Wireless surveillance using multiple receivers instead of repeaters

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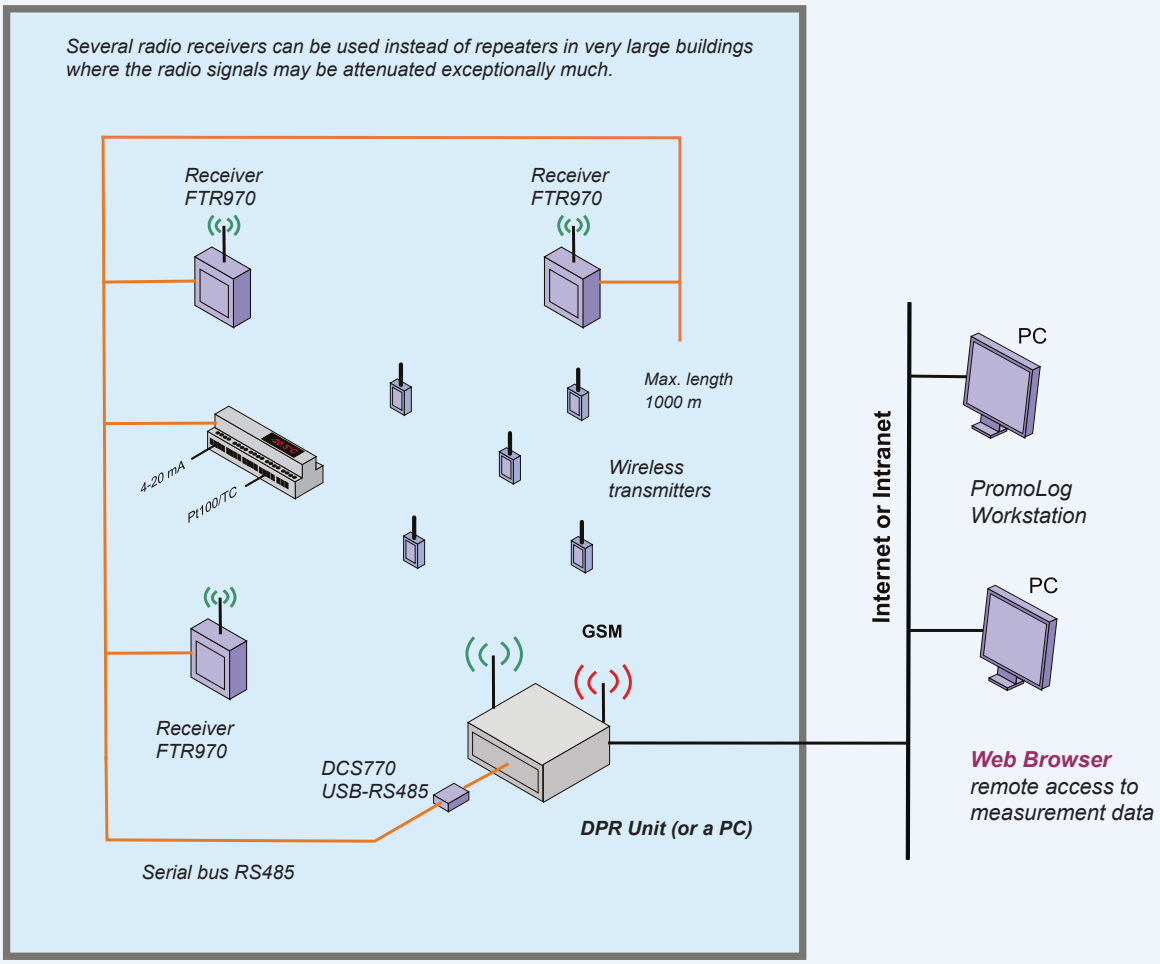


If cabling for RS485 serial bus is available the receivers can be directly connected to it. This type of wireless system can cover very large areas even in very difficult conditions. The same serial bus can also be used to connect wired transmitters, like RMD680s. An RS485 bus can use existing but unused phone or network cabling, for example.

Mixed wireless and wired system in very demanding environments

The DPR990 Surveillance Unit operates independently and replaces a separate PC. PromoLog Data Acquisition Software and Web Server software package have been preinstalled at the factory. The unit contains a radio receiver as standard for collecting data from wireless transmitters but an external DCS770 USB-RS485 converter is required to connect the extra radio receivers and wired transmitters to the DPR990.

External display, keyboard and mouse can also be installed if needed, but they are not required. DPR990 is a more flexible and more reliable solution than a normal PC for data acquisition purposes.

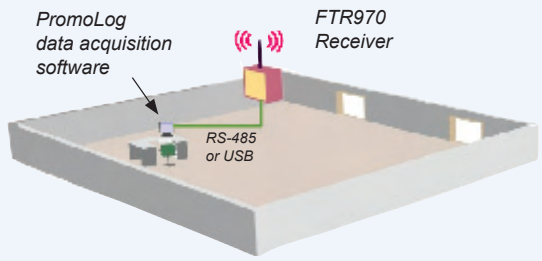
List of needed equipment:

FT10-IS Transmitters for example
FTR970 Receivers
DCS770 USB-RS485 Converter
DPR990 Surveillance Unit

RMD680 16 channel transmitters
24 VDC Power supply

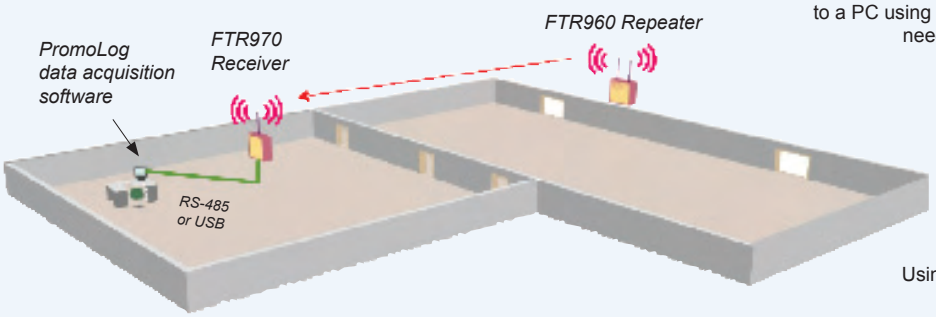
Installing Wireless Receivers

1. Using single receiver



A receiver covers approximately 50...200 m radius circular area around it. If the receiver is close to a computer it can be connected and powered using USB bus. A longer distance from a computer can be achieved using RS-485 bus, for example, if the receiver needs to be installed to the center of a building. The length of a RS-485 bus can be up to 1 km.

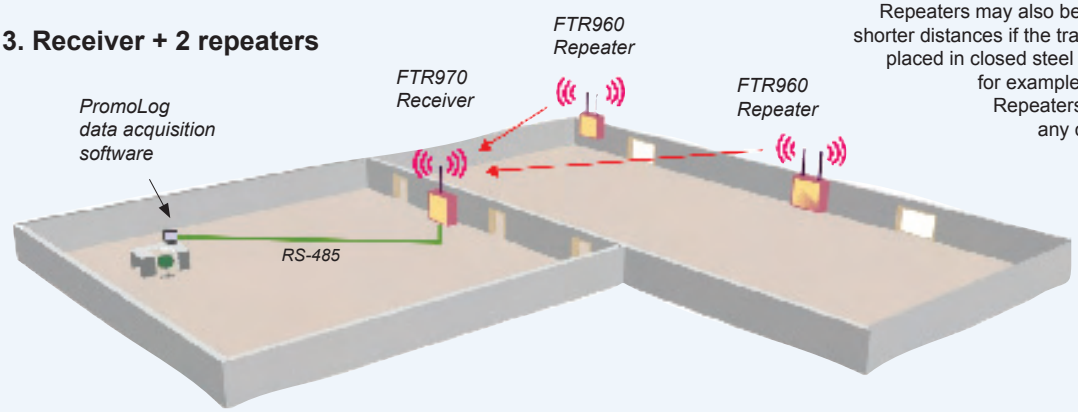
2. Expanding coverage area using repeaters



Repeaters eliminate the need for cabling even in large buildings. The receiver can be connected to a PC using USB bus and a repeater only needs a 9...30 V power supply to be connected. Repeaters do not need any configuration.

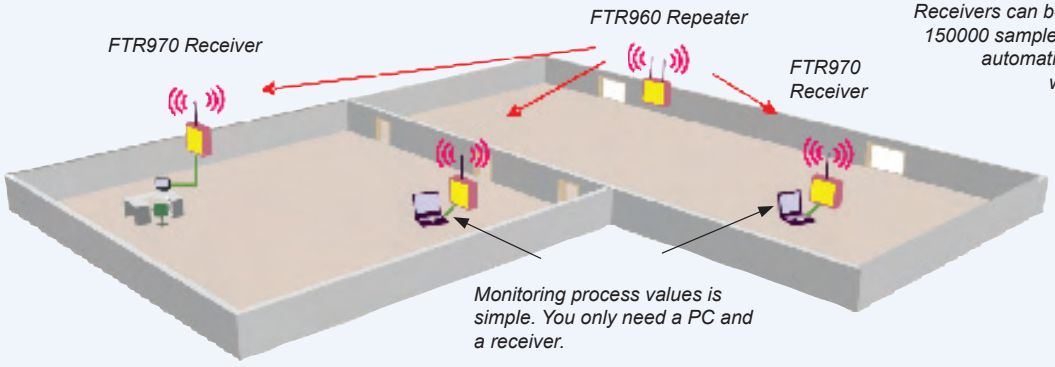
Using two repeaters expands the coverage area even more.

3. Receiver + 2 repeaters



Repeaters may also be needed with shorter distances if the transmitters are placed in closed steel cabinets like, for example, cold rooms. Repeaters do not need any configuration.

4. Temporary measurements using multiple receivers



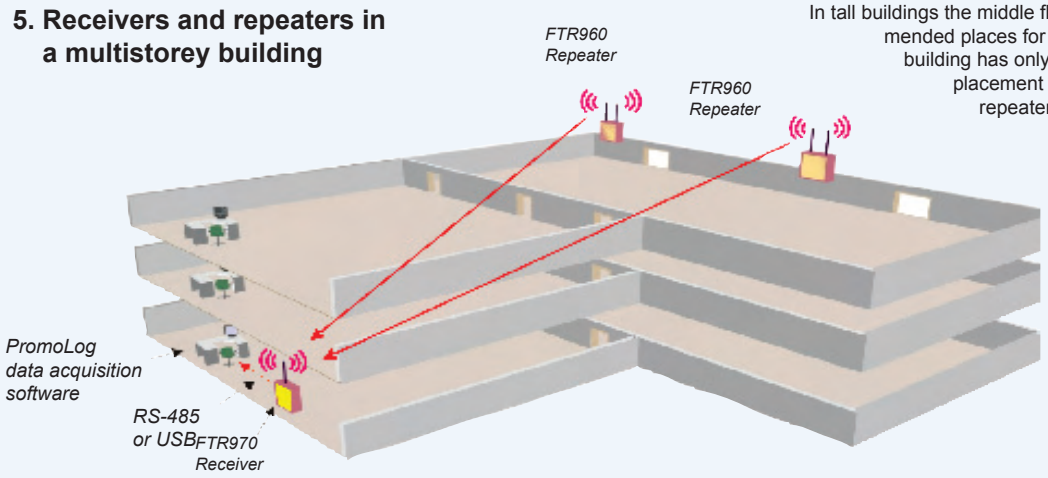
Multiple receivers can be used to listen transmitters and repeaters in the same coverage area. The number of the receivers is not limited. Receivers can be powered using USB bus or external power supply.

Receivers can be equipped with 150000 sample memory that is automatically processed when PromoLog application is started.

Installing Wireless Receivers

5. Receivers and repeaters in a multistorey building

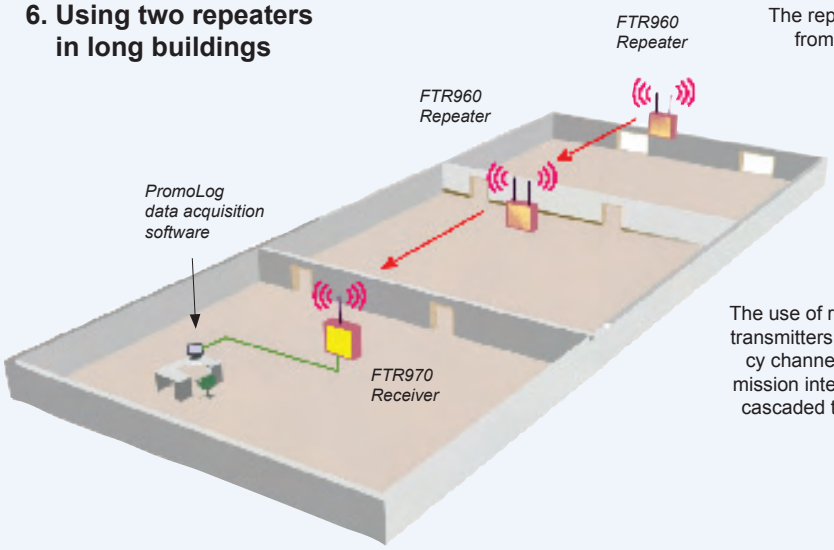
In tall buildings the middle floors are recommended places for repeaters. If the building has only a few floors the placement of receivers and repeaters is less critical.



In long buildings the repeaters can be daisy chained to extend the coverage area.

6. Using two repeaters in long buildings

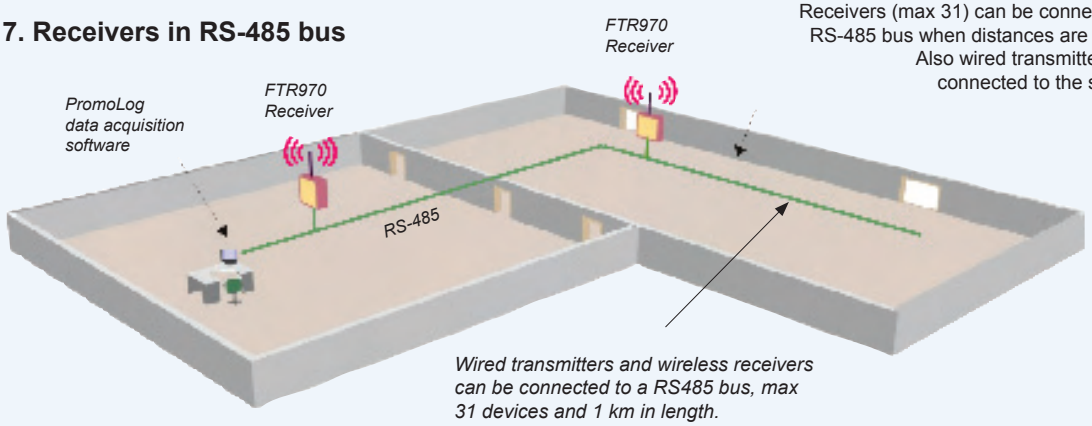
The repeater in the middle receives transmissions from transmitters in its coverage area and from the other repeater. Received data is then retransmitted to the FTR970 receiver.



The use of repeaters reduces the maximum number of transmitters because repeaters use the same frequency channel as transmitters. For example, if the transmission interval is one minute and the transmitters are cascaded the maximum number of transmitters is 87.

7. Receivers in RS-485 bus

Receivers (max 31) can be connected to an RS-485 bus when distances are very long. Also wired transmitters can be connected to the same bus.



Wired transmitters and wireless receivers can be connected to a RS485 bus, max 31 devices and 1 km in length.