User manual

Firmware version V1.0
19.10.05

MTR264

4 channel wireless transmitter
mV and TC inputs

Nokeval

DESCRIPTION

MTR264 is a battery powered, 4 channel wireless transmitter. It is housed in a compact plastic enclosure and equipped with a 6-terminal detachable screw post connector. It has an internal circuit board antenna for a radio coverage area of up to 100 meters in free space.

The wireless concept allows easy implementation, installation and expansion of a measuring system even in difficult locations and installation sites. The transmitter is programmable for transmission intervals from 5 seconds to 5 minutes and for millivolt and thermocouple inputs. If thermocouple input is used, the result is sent in millivolts. In addition, the device measures and sends the cold junction temperature. The result is linearized in the receiving system (for example, PromoLog or RTR970PRO).

SPECIFICATIONS

Inputs

Thermocouples

Accuracy	Cold junction
	0...40 °C ±0.75 °C
	-30...60 °C ±1.5 °C
	Thermocouple
	See mV

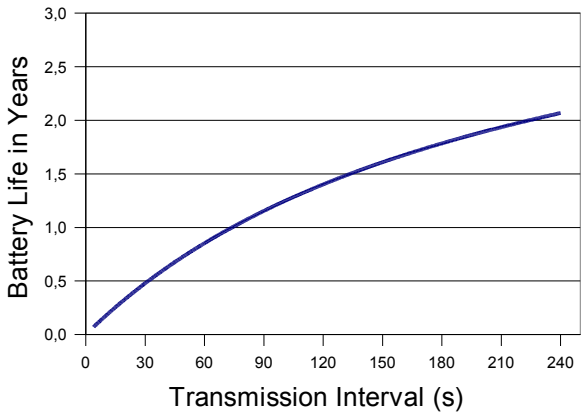
mV

Range	-30...2000 mV
Accuracy	0.05 % rdg + 0.01 mV
Thermal Drift	50 ppm/°C
Load	>1 MΩ

Supply voltage

Voltage	2.5...3.5 V
Battery	3 V CR 2032

MTR264 + CR 2032 235 mAh

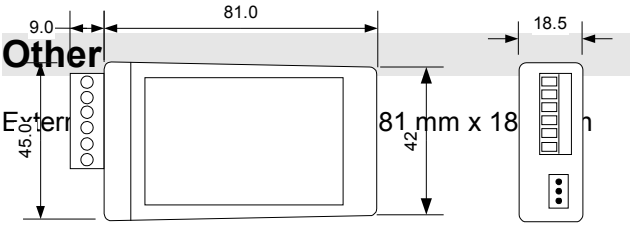


Compatible radio devices

Nokeval MTR and RTR series devices.

Environment

Oper. temperature	-30...+60 °C
Protection class	IP20



Other

Extern 81 mm x 18 h

Weight	36 g
Connectors	1.5 mm², detachable
Frequency	license free 433.92MHz subband e according to ERC/REC 70-03
Transmission Range	
open space	up to 100 m
indoors	10...50 m

Regulations

EMC directive

- EMC immunity EN 61326
- EMC emissions EN 61326, class B

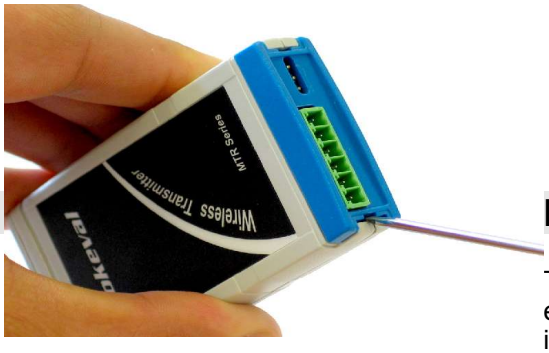
R&TTE directive

- EN 300 220 class 3, Transmitter power class 8 (10 mW)
- EN 301 489
- EN 300 339

INSTALLING

Installing/replacing the battery

Open the back plate using a small flat-bladed screwdriver. Remove the back plate and the top part of the case and install the battery (CR 2032 3V) to the slot plus side upwards. Close the case and attach the back plate.



1. Open the case
2. Install the battery to the slot

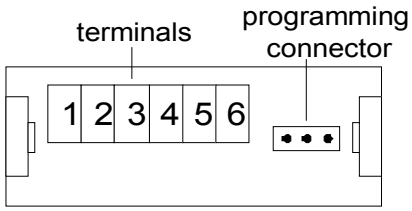
Installation to a field enclosure (option)

The device can be installed into an optional plastic (ABS) field enclosure. The field enclosure's protection class is IP65 and it has a PG9 gland for sensor cable. The external dimensions of the enclosure are 130 mm x 80 mm x 35 mm.

Connections

MTR264 connectors

The device has a 6-terminal detachable screw post connector and a programming connector.



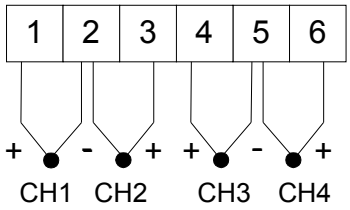
TC/mV

CH1
1 = measurement +
2 = measurement - / com

CH2
3 = measurement +
2 = measurement - / com

CH3
4 = measurement +
5 = measurement - / com

CH4
6 = measurement +
5 = measurement - / com



4 x -30...2000 mV

MTR264 has own ID number for each channel. The smallest ID number is assigned to the first channel, next ID to the second channel and etc.

Programming connector

Use RS232-POL or POL cable and POL – pin header adaptor to connect the device to PC's serial port or Nokeval 6790 hand held programmer.

SETTINGS

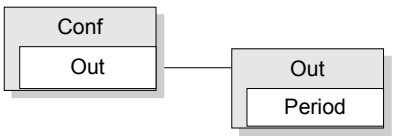
Connection settings

Use Mekuwin program or Nokeval 6790 hand held programmer to configure the device. You can download Mekuwin from Nokeval's web site for free.

Communication settings for configuration:
- Baud rate 9600
- protocol SCL
- address 0

Menu

Menu of MTR264



Out submenu

Output submenu contains the output settings.

Period
Number of periods between consecutive transmissions. The minimum value for this setting is two and maximum value is 127. One period is approximately 2.7 seconds (25 °C). The duration of a period depends on temperature and varies from 1.5 to 3 seconds. It is not recommended to set the period value smaller than necessary because it has a significant effect on battery life (see graph on page 2).

Period	Nominal Transmission Interval
2	5 s
11	30 s
22	1 min
67	3 min
127	5 min 40 s

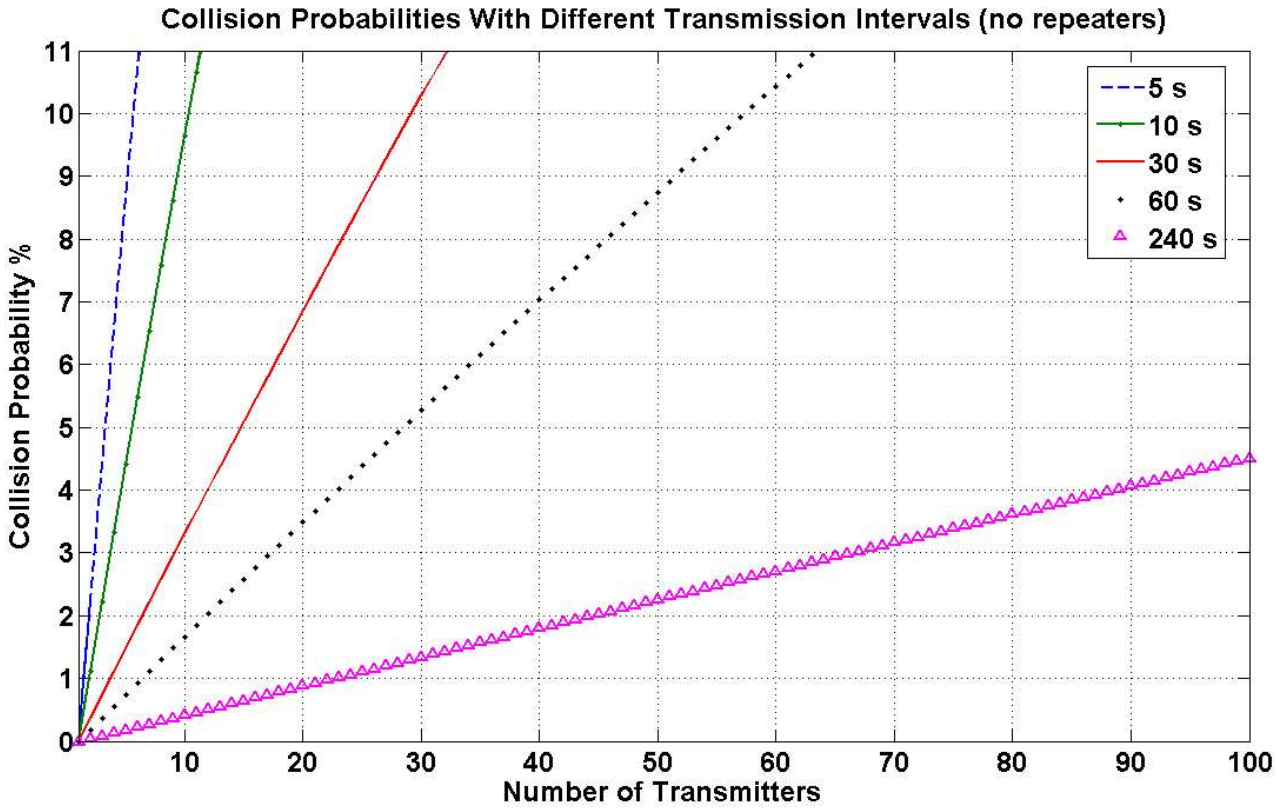
The maximum number of radio transmitters in a coverage area is limited by radio standards. The use of repeaters reduces the maximum number of transmitters because repeaters use the same frequency channel as transmitters. The following table shows the maximum number of allowed radio transmitters in a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

Transmission Interval (s)	Receiver	Receiver and 1 repeater	Receiver and 2 repeaters
	Maximum number of transmitters		
5	5	3	2
10	11	5	4
20	22	11	7
30	33	16	11
40	43	22	14
50	54	27	18
60	65	33*	22
70	76	38	25
80	87	43	29
90	98	49	33
120	130	65	43
240	261	130	87

For example, if you have transmission interval of 60 seconds and one repeater, the maximum number of transmitters is 33*.

The collision probability of radio data packets increases when the number of transmitters in a coverage area increases or the transmission interval decreases. The following picture shows how the collision probability raises as the number of transmitters increases.

For example, if a system has a transmission interval of 60 seconds and the number of transmitters is 40 the probability of a collision is about 7 %. Therefore, the probability that at least one of two consecutive transmission gets through is over 99.5 %.



Nokeval

Yrittäjäkatu 12
37100 Nokia
Finland

Tel +358 3 3424800
Fax +358 3 3422066
www.nokeval.com