

FTR264 Series

Manual

Introduction

FTR264-TCK is a four-channel wireless thermocouple temperature transmitter. Typical application is temperature measurement from concrete castings. Temperature history of concrete casting can be used to calculate the development of its strength. It can also be used to produce early low temperature warnings from winter concrete castings. It is configured only for thermocouple K.

FTR264 is a four-channel wireless thermocouple temperature transmitter. Typical application is any four-channel thermocouple measurement. It can also be used to measure four millivolt signals.

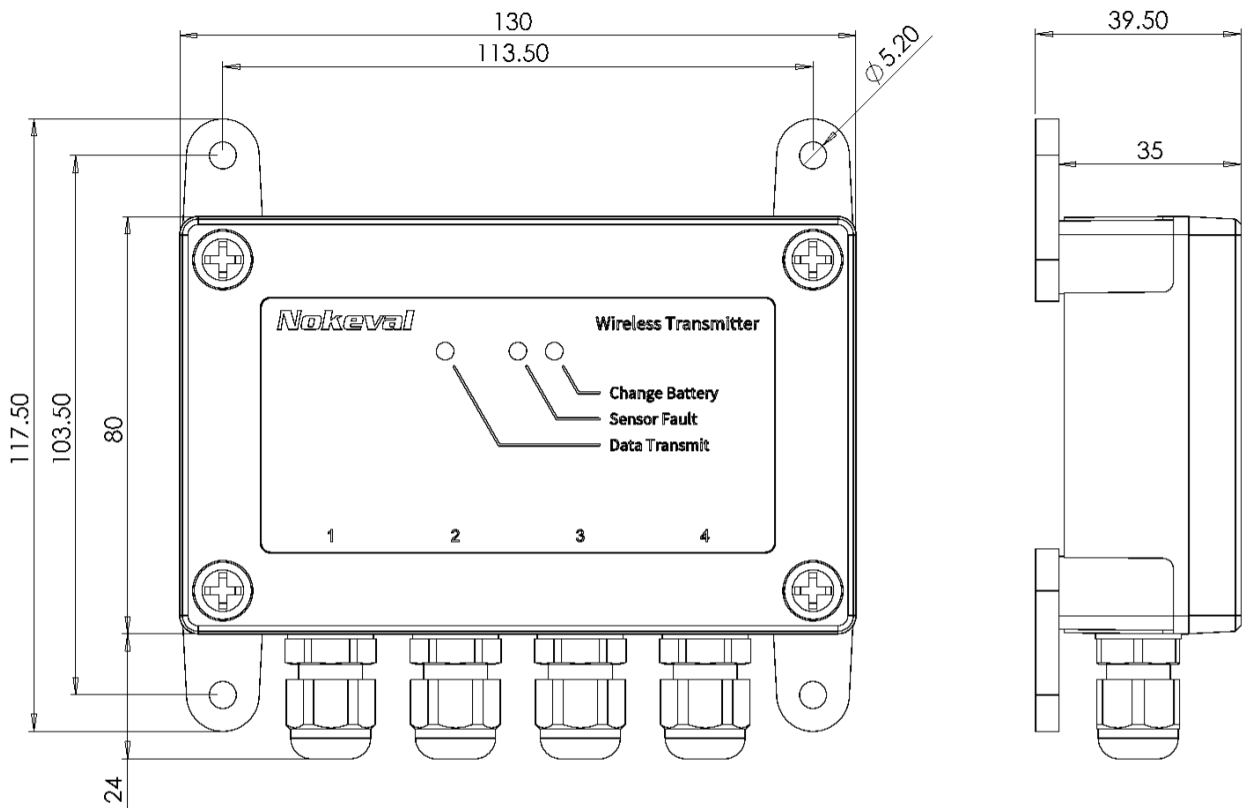
FTR264-OVA2 is a four-channel wireless thermocouple meal box transmitter. The usage of the device is very simple and it is not included in this manual. Read more about OVA-service at <https://www.ova.fi/en/>

FTR264-OVA is a four-channel wireless thermocouple transport transmitter. The usage of the device is very simple and it is not included in this manual. The device is EOL and replaced by the FTR264-OVA2.

Installation

Dimensional drawing

Dimensions in the following drawings are indicated in millimeters:



Preparations

It is a good idea to make an installation plan first. Write down the ID numbers of the transmitters along with their installation places or measurement target names. This will speed up the final software installation and setup of the data acquisition system.

Thermocouple sensors

Thermocouple sensors typically have just 2 meters of connection cable as standard. If this is not enough, a thermocouple sensor can be made by shorting the other end of a longer thermocouple cable by tightly twisting together the peeled wire endings. The connection cable can also be extended by using matching thermocouple extension cable. **Copper cable must not be used.** The most common thermocouple type is Type K, for which a suitable extension cable type is, for example, JHAS-K-7/0.2 when ambient temperature is below 105 °C. In higher temperatures, up to 250 °C, a Teflon cable can be used. More information on sensors is available on our website: www.nokeval.com.

FTR264-TCK Connecting

- Connect K-thermocouple sensor or thermocouple cable equipped with FMTC-K-M type connector to the cables belonging to the device.

FTR264 Connecting

- Thermocouple factory setting is K if you want to change it see the next paragraph.
- Open the FTR264 lid by loosening the four plastic screws with a PH2 screwdriver.
- Place the lid upside down on the table so you can read the connection sticker on it.
- Route the sensor cables through the cable glands.
- Detach the screw-post connector and attach the sensor wires according to the sticker's instructions, fasten the wires by tightening the screws.
- Reattach the screw-post connector securely.
- Test the wire connections by gently pulling the wires to see that they are properly fastened.
- Tighten the cable glands to ensure the sealing of the enclosure.

Changing the settings

If other than type K thermocouples are used or if the default 90 second transmit interval needs to be changed, read this chapter and also chapter [Settings](#), otherwise jump to chapter [Finalizing](#).

- Connect a **DCS772** USB-POL converter to a USB port of a Windows computer. Attach a **POL-3PIN** adapter to the connection cable of the DCS772.
- Connect the POL-3PIN adapter to pin-header **J3** on the FTR264 circuit board.
- Search www.nokeval.com pages with search term **MekuWin** and download the program.
- Install and start MekuWin.
- Select settings Protocol **SCL**, Baud **9600**, Parity **8N1**, Address **0** and click on **Connect Direct**.
- MekuWin connects to the device. Make the necessary changes to settings and save them.
- Detach the cables.

Settings

Period

This setting defines the transmit interval. Allowed range is 5...255 seconds. Actual transmit interval depends on, to a certain degree, the ambient temperature. Default setting is **90 seconds**.

This setting has direct impact on the battery life. Avoid using unnecessarily short transmit intervals as this causes shortened battery life and also limits the number of transmitters that can be used in the same coverage area. For more information on the effect of transmit interval to battery life, refer to chapter **Battery**.

Inputs

This setting defines the sensor type to be used.

Value	Description
TcB	Linearization for Type B thermocouples
TcC	Linearization for Type C thermocouples
TcD	Linearization for Type D thermocouples
TcE	Linearization for Type E thermocouples
TcG	Linearization for Type G thermocouples
TcJ	Linearization for Type J thermocouples
TcK	Linearization for Type K thermocouples
TcL	Linearization for Type L thermocouples
TcN	Linearization for Type N thermocouples
TcR	Linearization for Type R thermocouples
TcS	Linearization for Type S thermocouples
TcT	Linearization for Type T thermocouples
mV	Millivolt measurement, input range -30...2000 mV

Finalizing

- Put the lid back in place and tighten the plastic screws. Do not overtighten!
- Install the sensors' ends to their measurement targets.
- Configure the ID numbers to the data acquisition system and start the system.
- After 90 seconds the measurement results should start appearing.

Operation

FTR264 Cable glands

Cable glands should be used to route the sensor cables inside the enclosure. Only one cable should be routed through each gland. Unused glands must be plugged with supplied plugs to achieve the specified IP 65 rating. All glands must be properly tightened to ensure sealing.

LED indicators

Change Battery indicator blinks when the battery voltage is low and it must be changed to continue use. **Sensor Fault** indicator blinks when a sensor is detached or a sensor wire is broken. **Data Transmit** indicator blinks when data is being transmitted over the wireless link. This light can be used to ensure the device is operating.

J3 pin-header

J3 pin-header is POL connector that can be used to configure the device's settings using Mekuwin software, DCS772 USB-POL converter and a POL-3PIN adapter. POL-3PIN adapter can be connected to the J3 pin-header either way, it is not polarized.

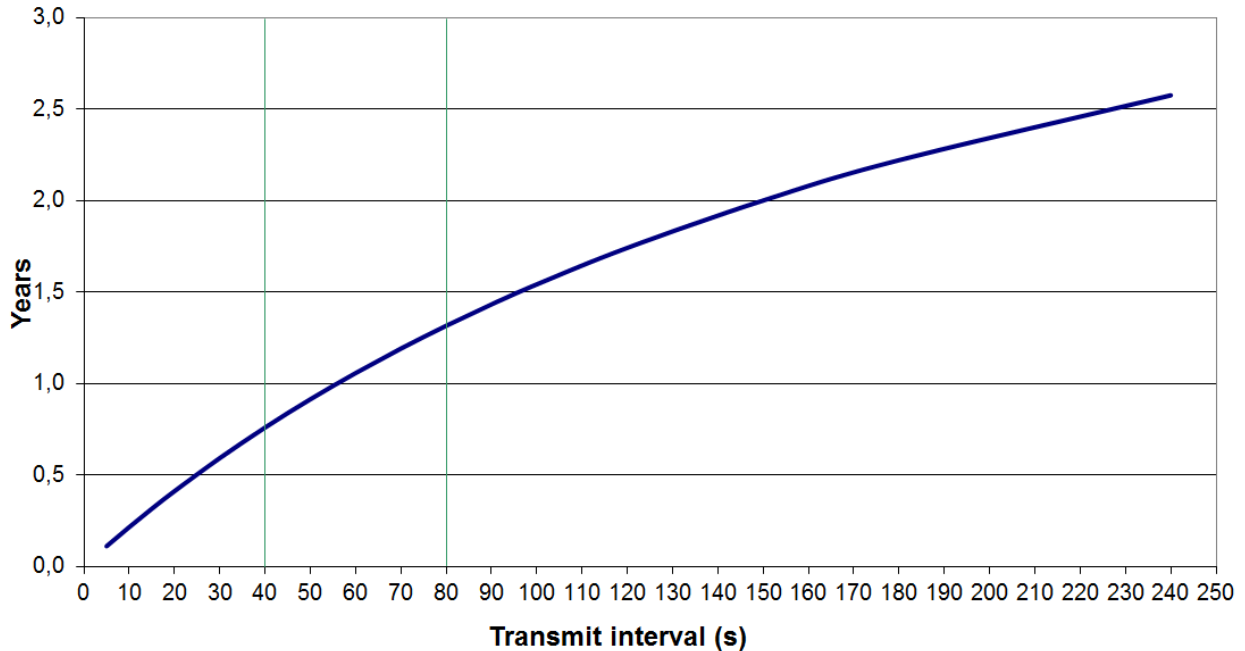
The place of the usage

Take care that the device is covered from direct sunlight, which may result errors in the measured temperatures. Try to choose the place try to choose a place with good radio coverage without bad sources of interference or surrounding metal surfaces.

Maintenance

FTR264 requires no special maintenance, but the battery needs to be changed whenever the **”Change Battery”** indicator starts blinking. Battery life depends on the used transmit interval. Ambient temperature also has an effect on attained battery life, temperature extremes shorten the battery life. The following diagram can be used to estimate battery life with different transmit intervals.

**Estimated battery life time (25°C)
1.5V 2000mAh AA size alkaline cell**



With long transmit intervals the battery life approaches the shelf-life of the battery. Along with ambient temperature the battery life is also affected by the age, quality, brand and manufacturer of the battery.

The enclosure can be cleaned externally by using soft cloth moistened with water and mild detergent or isopropanol.

Troubleshooting

None of the channels give proper readings or no readings at all.

Check that the "Data Transmit" indicator blinks once every 90 seconds (or whatever the transmit interval is). If it's not blinking, check that the battery is properly installed and seated, and that the polarity is correct. Also ensure that the battery is not dead. Check the data acquisition system for correct settings. Verify that correct transmitter ID number is configured to the data acquisition system. Check that at least one sensor is connected.

Some of the channels are not giving proper readings.

Data is not sent for channels that do not have sensor connected to them, or if the sensor cable is detached or cut (in this case also the "Sensor Fault" blinks). Connect working sensor to the channel.

Readings seem wrong or inaccurate.

Make sure that correct thermocouple type is selected in the device settings. Check that the device is not in the direct sunlight.

Specifications

Input	Thermocouples B, C, D, E, G, J, K, L, N, R, S and T or mV signal.
FTR264-TCK Connector	Non-detachable cables for FMTC-K-M type connector and TC-K cable/sensor.
FTR264 Connector	Detachable screw-post connector. Up to 1,5 mm ² connection wires.
Overvoltage protection	Up to 24 VDC.

Environment

Operating temperature	-30...+60 °C
Storage temperature	-40...+70 °C
Relative humidity	0-100 %RH
Protection class	IP65 if all cable glands are properly tightened or plugged

Mechanical

FTR264-TCK Weight	Approx. 352 g without sensors
FTR264 Weight	Approx. 192 g without sensors
External dimensions	Width 102 mm Height 130 mm Depth 35 mm
Cable glands	4 x M12x1.5, allowed cable diameter 1.5...8 mm

Power source

Battery type	1.5 V type LR6 (AA) alkaline battery, "heavy-duty"
Battery life	1.5 years when using 90 s transmit interval in +25 °C ambient temperature

Radio transmitter

Type	License-free 433.92 MHz ERC/REC/70-03 sub-band f
Transmitting frequency	433.92 MHz ISM band
Transmitting power	Up to +10 dBm E.R.P.
Outdoor range	Up to 100 m
Indoor range	50...100 m typical
Antenna	Integrated
Compatible equipment	Nokeval MTR, RTR, FTR, DPR ja FT20 series 433,92 MHz radio receivers

Sensors

Sensor type	Thermocouple sensors or millivolt (mV) signal
Sensor cable length	< 30 m
Measurement range and max. linearization error	mV: -30...2000 mV TcB: 400...1700 °C (0.3 °C) TcC: 0...2300 °C (0.5 °C) TcD: 0...2300 °C (1 °C) TcE: -100...900 °C (0.2 °C) TcG: 1000...2300 °C (2 °C) TcJ: -160...950 °C (1 °C) TcK: -150...1370 °C (0.5 °C) TcL: -150...900 °C (0.5 °C) TcN: 0...1300 °C (0.1 °C) TcR: 0...1700 °C (0.5 °C) TcS: 0...1700 °C (0.5 °C) TcT: -200...400 °C (1 °C)
Accuracy (mV)	0.05% rdg + 0.01 mV
Accuracy (thermocouples)	0.05% rdg + 0.6 °C + linearization error + ambient temperature effect
Ambient temperature effect	0.02 °C/°C ref. +25 °C
Noise (typical, RMS)	mV: 2.7 µV TcK: 0.06 °C
Input loading (mV)	>1 MΩ

Conformity information

EMC immunity	EN 61326
EMC emissions	EN 61326, class B
R&TTE directive	EN 300 220, class 3, transmitter power class 8
	EN 301 489
	EN 300 339
EU 37/2005	EN 13485
	EN 13486
	EN 12830

Warnings

Read this manual carefully before installing or using the product.



Warning. This device contains a license-free ISM band (433.92 MHz) short range radio transmitter (SRD). Always observe local regulations concerning the use of such radio transmitters. Never start or use the device in areas with explosion hazard, or in areas where the use of radio transmitters is limited, such as airplanes, near medical devices, near flammable or explosive substances or close to sites where explosion works are being performed.



The device must not be disposed with household waste. Observe local regulations concerning electronic waste recycling. The device contains a battery.

Only Nokeval Oy and its authorized service partners can service or repair the device. There are no user serviceable parts in the product.

Trademarks

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