



TEMPERATURE TRACKING WITH BLE SENSORS

INTRO

The temperature tracking and monitoring industry has a multi-billion-dollar economic and environmental impact worldwide. It is constantly changing and adapting to growing consumer demands. But to remain competitive and profitable, **cold chain** logistics fleets have to look for innovative and efficient solutions. **Bluetooth** technology, combined with vehicle GPS trackers and sensors, opens up new possibilities for fleet and cargo monitoring.

CHALLENGE

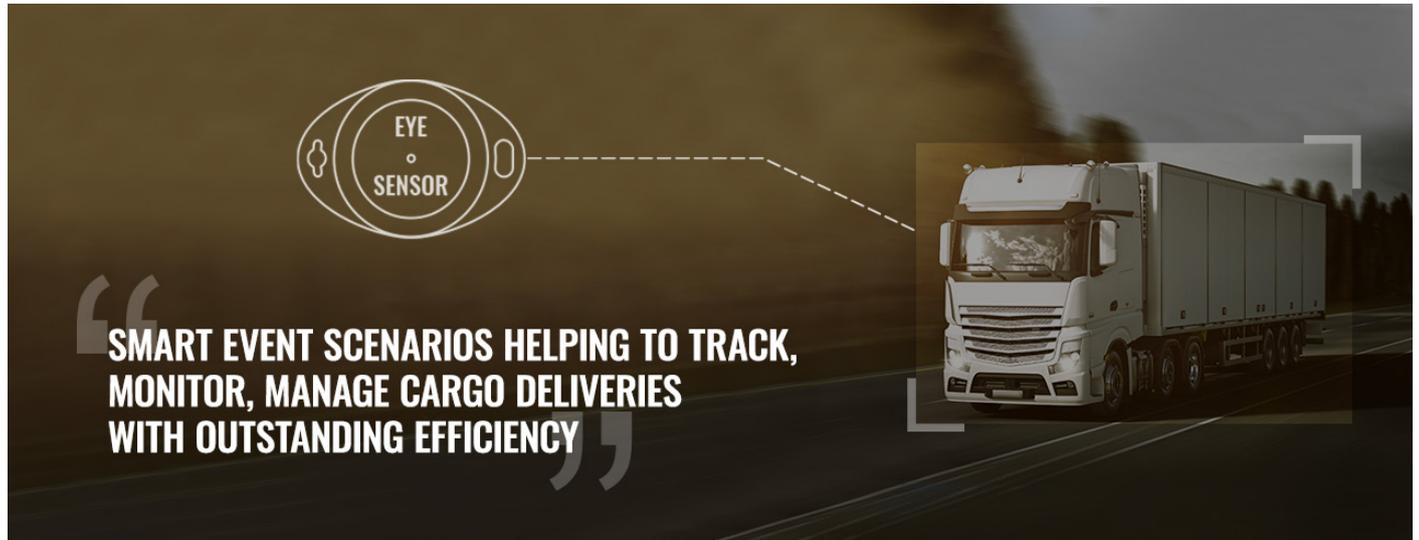
Did you know, according to the **International Institute of Refrigeration**, the lack of a functioning cold chain causes considerable **food loss** - up to almost 20% throughout the world? Going further, in developed countries, food losses account for nearly 9% of total food production, and 23% on average in developing countries.

Meat, poultry, dairy products, seafood, agricultural produce, various chemicals and pharmaceuticals, flowers, and many other daily consumed goods require temperature monitoring during transportation to ensure that they are delivered to end-users in usable condition.

Broken cold chains within specified environmental conditions caused by mechanical breakdowns of transporting vehicles, traffic delays, custom border checks, driver confusion abroad, poor loading practices, inadequate insulation, and similar factors create unwanted temperatures fluctuations that may affect spoilage and safety of perishable cargo. Furthermore, a lack of real-time visibility of goods locations and their status, or even thefts, can be a contributing factor to inefficient business operations and significant losses.

Unquestionably, temperature (and humidity most times) monitoring is critical for the logistics industry in any country around the world. Sometimes, they are crucial to health and safety, in others - to the preservation of priceless items, such as antiques and artefacts.

Luckily, these challenges can be effectively tackled with minimum effort and maximum results utilising Teltonika Telematics wide range of [products portfolio](#), smart features, and wireless Bluetooth technology.



SOLUTION

To solve the challenges mentioned above, we use the SPECIAL category GPS tracker [FMB140](#) with integrated CAN Bus data reading processor and [EYE Sensor](#) - the brand-new BLE based Teltonika accessory with smart features and extensive functionality set including ID signal transmission, temperature, humidity, and internal battery level tracking.

How it works - the FMB140 model is based on the FMB platform and supports wireless Bluetooth LE connectivity, so it can effectively communicate with Bluetooth devices such as sensors. To ensure the best results, the tracker should be installed in a cold chain vehicle and configured the usual way in the spot where its Bluetooth antenna is not covered by bulky metal parts nearby.

The compact and lightweight EYE Sensor has to be attached to temperature-sensitive cargo items to be tracked and monitored - the protective bag, outer corrugated carton, container, barrel, pallet, etc. Vehicle GPS tracker receives readings from each sensor over the air at configurable intervals and sends this data as [iBeacon](#) or [Eddystone](#) profile to a server for analysis combined with the actual temperature, humidity, and its GNSS location details.

Dedicated software developed by a telematics service provider determines and displays all EYE Sensors (thus, tagged items) locations based on proximity to the vehicle tracker and the parameters they track. Because of that, the cargo of cold chain lorry can be monitored via PC, laptop or smartphone in real-time this way notably improving the efficiency of goods management, logistics operations and preventing losses or thefts. But we are not stopping there...

VALUE-ADDING SMART FEATURES

To bring maximum value, the EYE Sensor model has a set of handy FM firmware features and event scenarios helping to sort, monitor, manage, and optimise operations of cold chain logistics with remarkable efficiency. Let's look at some prominent ones.

Based on project requirements, you can set a meaningful temperature range for each sensor (parameters 'Low Level' and 'High Level' shown in the image below). If the actual temperature of the item goes outside the pre-defined range, the FMB140 device will generate the event accordingly and send the relevant data to the dedicated server to inform the persons in charge. It allows to take appropriate action without delay and prevent negative consequences.

IO elements

Input Name	Units	Priority				Low Level	High Level	Event Only		Operand	Send SMS To	SMS Text
Temperature	°C	None	Low	High	Panic	-1	7	Yes	No	On Exit		Temperature 4
Humidity	%	None	Low	High	Panic	0	0	Yes	No	Monitoring		Humidity 4
Magnet		None	Low	High	Panic	0	0	Yes	No	Monitoring		Magnet 4
Movement		None	Low	High	Panic	0	0	Yes	No	Monitoring		Movement 4
Angle		None	Low	High	Panic	0	0	Yes	No	Monitoring		Angle 4
Low Battery		None	Low	High	Panic	0	0	Yes	No	Monitoring		Low Battery 4
Battery Voltage	mV	None	Low	High	Panic	0	0	Yes	No	Monitoring		Battery Voltage 3

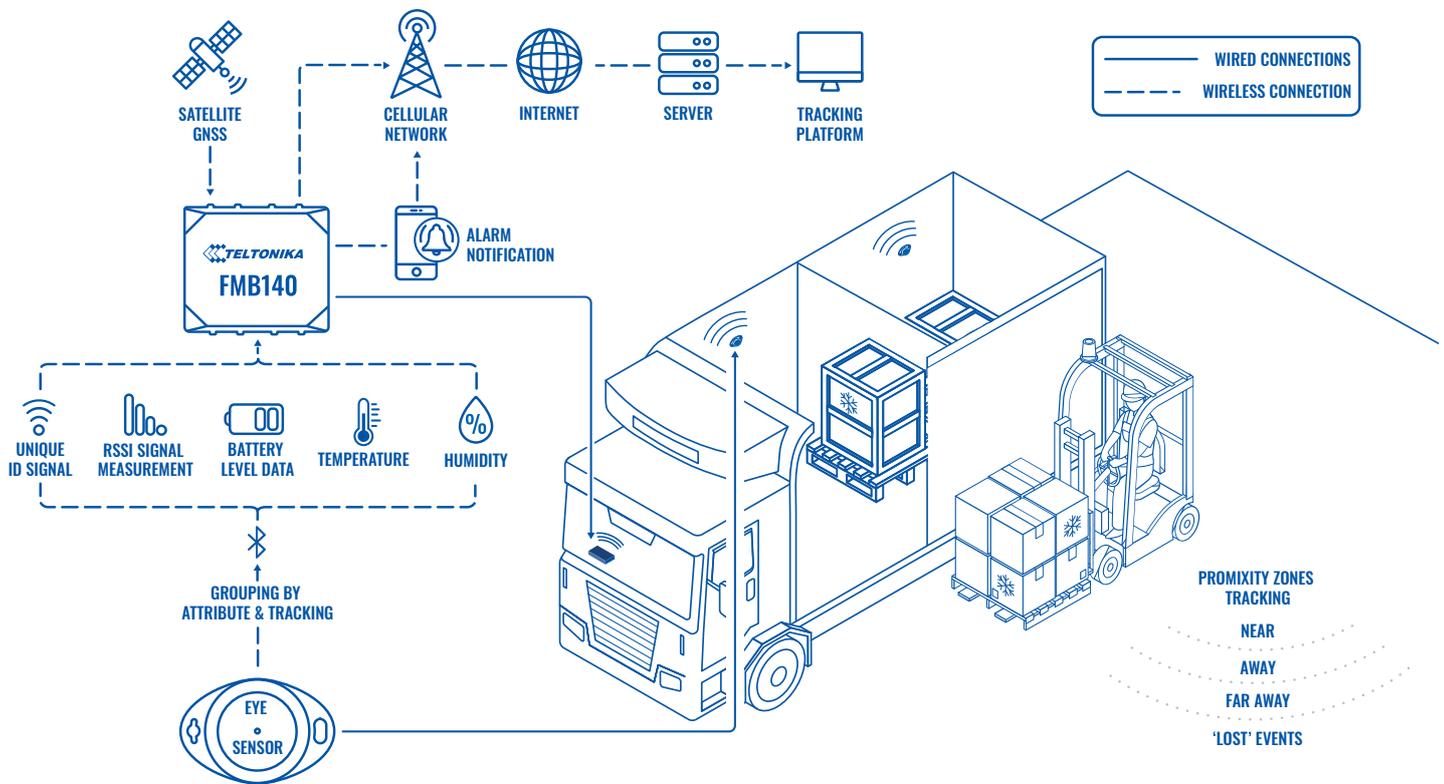
Going further, there are two ways, how to add and set up EYE Sensors in [Teltonika Configurator](#). First one - the commonly used method by adding the [MAC address](#) of each sensor allowing to support up to 4 of them at a time per GPS tracker. The second one is the more innovative and appealing method by adding EYE Sensors only 'By Name'. Here, the vehicle tracker will gather data from each sensor based on its name, not MAC address.

As a result, there is no need to reconfigure MAC addresses again in the Teltonika GPS tracker if sensors (or cold chain trailers with sensors) have been changed. It is sufficient to just type in the names respectively using the configurator tool, this way saving precious time avoiding mistakes. Even more, the method supports up to 50 pieces of EYE Sensors at a time, which makes a significant difference.

Lastly, the 'Signal Level' parameter (so, its strength and transmitting range) of the accessory model can be configured individually. This makes it possible to gather data only from sensors that are nearby, ignoring information from sensors that are far away. Such feature allows to group cold chain items of interest in ways meaningful and helpful to business operations.

In closing, the newly launched Teltonika EYE Sensor, together with the FMB140 tracker, offers an unmatched feature combo to ensure effective cargo tracking, distribution, and corporate fleet management. For greater convenience and practicality, firmware updates and configuration changes of Teltonika vehicle trackers can be swiftly made using the recently renewed [FOTA WEB](#) tool - the software solution, helping to save precious time and manage GPS devices remotely with maximum efficiency. This altogether will result in noticeable cold chain projects profitability, improved business reputation, competitiveness, and investment return.

TOPOLOGY



BENEFITS

- **EYE Sensor settings are customisable for every project** - to get the maximum value out of it, Teltonika BLE sensor signal strength and data transmitting intervals can be configured to exact project application needs and used, practically, in any form and size buildings, vehicles or trailers.
- **Precise cargo temperature and location monitoring** - 100% accountability of everything important to the cold chain logistics - goods, fresh produce, valuable assets, processes, patterns, and staff actions of interest are being tracked, monitored, and optimised.
- **Unique and value-adding FM firmware features** - abundant smart and practical event scenarios helping to track, monitor, manage cargo deliveries with outstanding efficiency.
- **Wireless and affordable** - Bluetooth connectivity ensures fast installation and setup, low interference, power consumption and is inexpensive. If damaged, lost or stolen, the Teltonika BLE sensor can be quickly replaced.
- **Improved profitability and competitiveness** - considerable cost savings because of cutting goods, valuable asset loss expenses, anti-theft protection to boost profits, improved cash-flow and investment opportunities.

WHY TELTONIKA?

To successfully resolve network reliability challenges for prominent automotive projects, we offer a valuable combo from Teltonika - special version firmware with implemented MQTT messaging protocol along with its exceptional features, and a wide range of the most sophisticated vehicle GPS trackers to help your business grow and prosper.

We are the right place to get all you need to succeed - the most abundant variety of top-quality certified GPS trackers, accessories, and solutions for any use case imaginable in vehicle telematics. From the start of the company 23 years ago until today, Teltonika 1,700 strong and growing team has manufactured 16 million IoT devices, helped to succeed thousands of customers and partners in over 160 countries across the globe.

FEATURED PRODUCT

FMB140

RECOMMENDED PRODUCTS

FMC125, FMC130, FMC640, FMM125, FMM130, FMM640, FMU125, FMU126, FMU130, FMB122, FMB125, FMB202, FMB204, FMB208, FMB110, FMB120, FMB130, FMB140

RECOMMENDED ACCESSORIES

EYE SENSOR

