

Trailer Tracker

Trailer Tracker is based on the FM-Pro3 device with modified hardware and firmware. The main goal for the Trailer Tracker is to serve as a tracking device for trailers, where long lasting autonomous operating time is required (low power consumption, larger battery, periodic awake and data sending times) as well as different interface with user (signaling LED).

Trailer Tracker LED states

When Trailer Tracker in sleep state, only watchdog and timers (data gather and data send) are active. GPS, GSM and other peripherals are turned off, processor is in sleep mode.

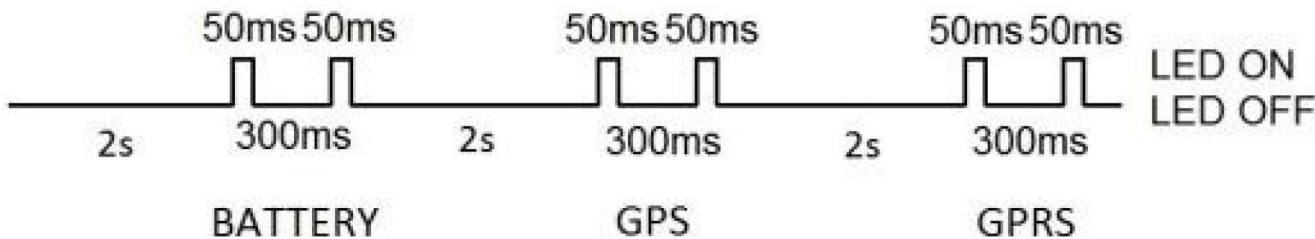
LED's: LED is activated only when pushbutton is pressed and held for 1 second (DIN3).

Green LED indicator (Instead of the GPS green LED) indicates three parameters in time gapes of 2s:

- ❖ **Battery** - If battery's charge level is below 10%, then the indicator will blink twice in battery time frame. If battery's charge level is higher than 10%, the indicator will blink once.
- ❖ **GPS** - When the GPS signal is not received or GPS signal is not accurate, the indicator blinks twice in GPS time frame. When accurate GPS signal is received, the indicator blinks once.
- ❖ **GPRS** - When GSM signal is not received, indicator LED blinks twice in GSM time frame, and when the device acquires a good GSM signal and is connected to the GPRS, then the LED blinks once.

Summary:

- ❖ Blinking once - OK. For example, all parameters indicates an OK state:



- ❖ Blinking twice - FAIL. An example when all parameters indicates FAILURE:



When indication is done, the device returns to the sleep state. If necessary, push the button again, to see the indication.



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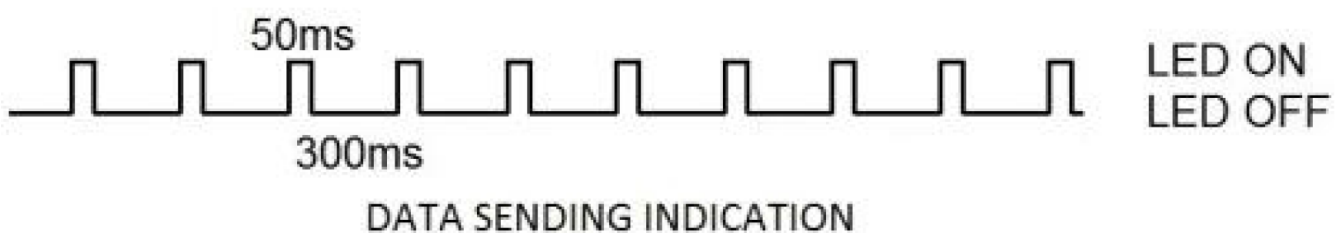
Pushbutton (DIN3)

When pressed and held for 1 second, the LED blinks and display the Battery, GPS and GPRS states.

When pressed and held for 5 seconds, Trailer Tracked sends following data to server (this has to be selected when configuring the device):

- ❖ Battery voltage, Battery current, Power supply voltage, PCB temperature
- ❖ GSM operator, GSM cell id, GSM signal strength
- ❖ Modem temperature
- ❖ GPS speed
- ❖ Virtual odometer
- ❖ Movement sensor
- ❖ Current profile

Device indicates that it is sending data with 10 blinks of the LED each lasting 50 ms and separated by 300 ms.



Movement sensor

Movement sensor, when activated, is able to wake up the processor, but it doesn't wake up the device completely. If during the preconfigured time period (Movement sensor timeout) the device doesn't detect any movement, it enters the sleep mode. If during this time period movement is detected repeatedly, the device wakes up completely and starts unscheduled data gathering and sending session.

Periodic awakening and data sending

When device is in sleep mode, it must consume as little power as possible. So during the device configuration there are four parameters to consider:



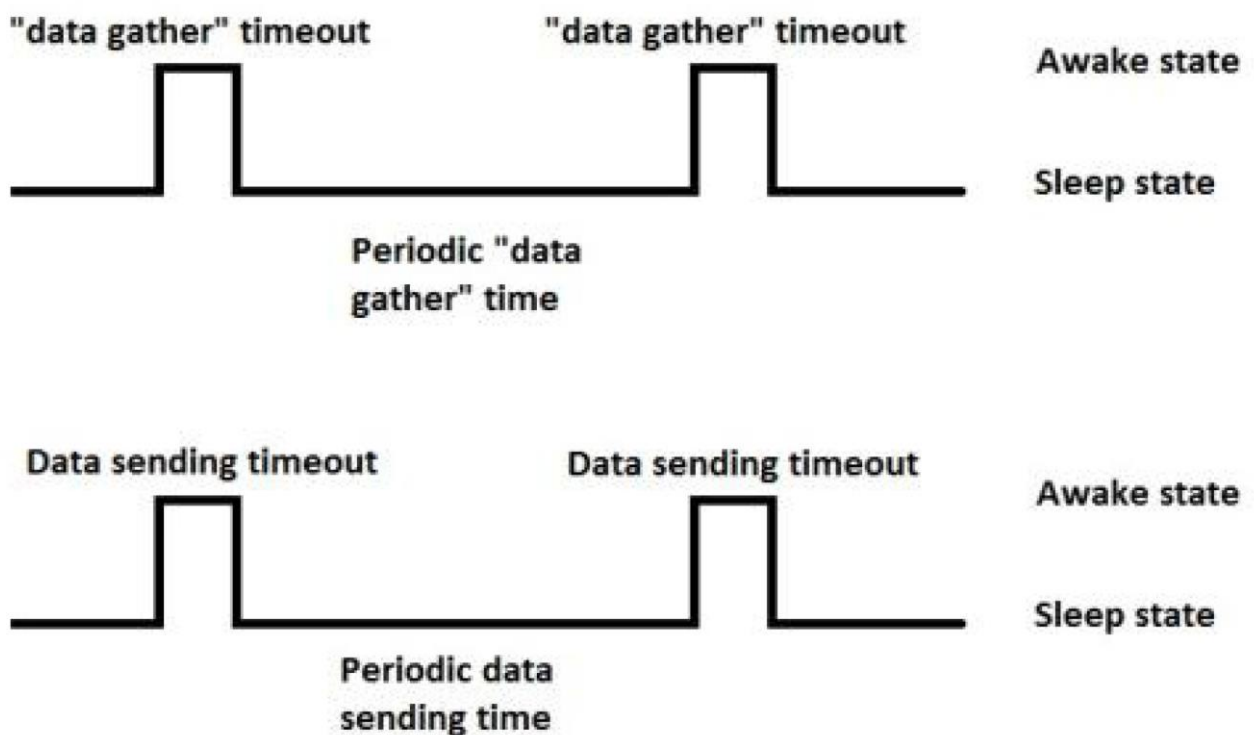
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- ❖ Periodic data gather time - defines time intervals, when the device wakes up and gathers the GPS and other data).
- ❖ Data gather timeout - defines the maximum time period, in which the device has to connect to the GPS and gather other data.
- ❖ Periodic data sending time - defines the time intervals for data sending via GPRS.
- ❖ Data sending timeout - defines the maximum time period for the device to send data via GPRS.



Device wakes up from the sleep state when it is time to gather data, or when it is time to send the data. If during "data gather" timeout, the device doesn't receive any data (fails to connect to the GPS), it makes a record, which indicates that the connection to the GPS was unsuccessful, so given coordinates cannot be trusted. These records are stored (can be stored up to 10 thousand individual records) and send, when "data sending" session is initiated.

Watchdog timer wakes up the device independently, to ensure stabile device operation.



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Mounting and connecting information

PIN10 and PIN12 connectors are not soldered. Wires are soldered directly to the PCB board.

1. Power (J3 pin1) - red
2. GND (J3 pin6) - black
3. Din3 (J3 pin4) - white
4. Din4 (J3 pin5) - purple
5. Dout2 (J3 pin10) - brown
6. RS232 Tx2 (J75 pin2)* - yellow
7. RS232 Rx2 (J75 pin1)* - green
8. 1-Wire +5 (J75 pin8) - grey
9. 1 Wire data (J75 pin9) - blue



Dry freight trailer

When installing Trailer Tracker device on the dry freight trailer it is recommended to mount it on the front wall, behind the sockets and wiring holder as shown in the pictures below.

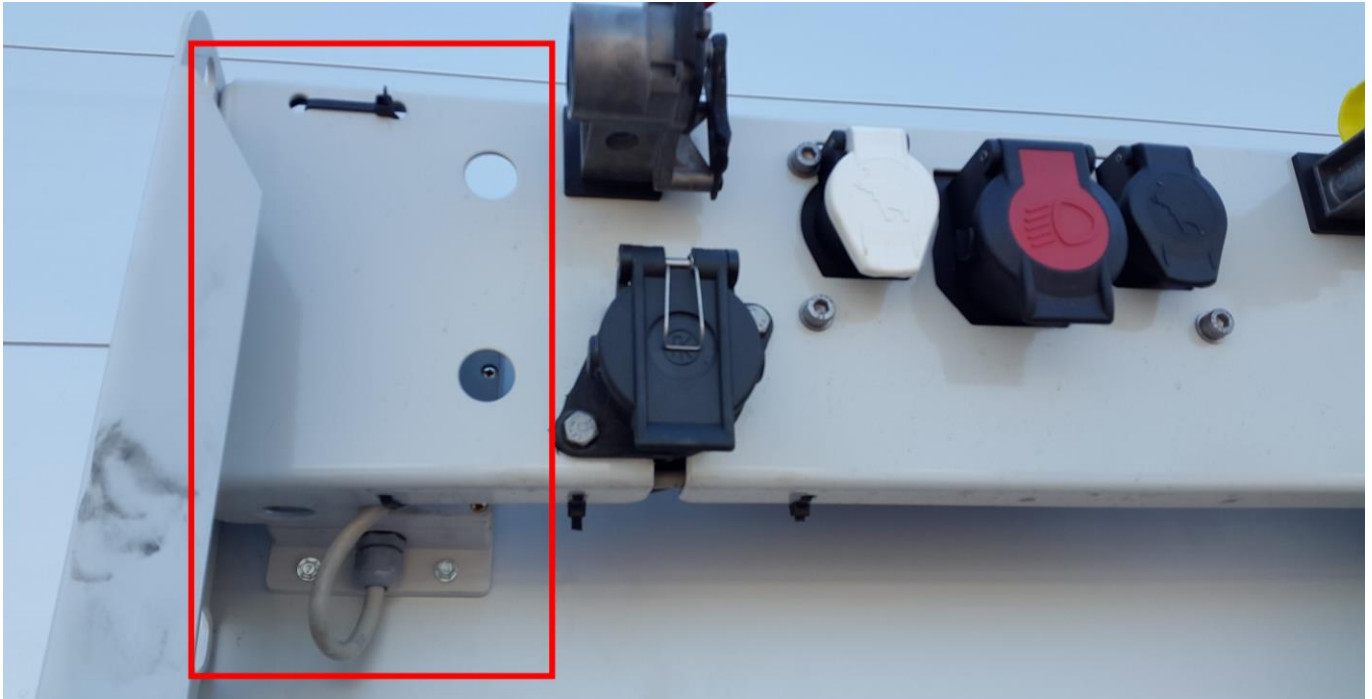


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Fix the device to the wall with the bolts. Use various technological holes of the vehicle to strap any loose or excess wires and cables. Antenna should be facing up towards clear sky.



Wires of the trailer and the Trailer Tracker device should be joined together inside the socket. This is important since connections made outside the socket are subjected to the environment. Changing environmental conditions tend to damage the seal over time.

Refrigerated dry freight trailer

In the refrigerated dry freight trailer the Trailer Tracker device can be installed in various places. This depends on the exact refrigerator that is being used. Few simple rules to remember is that it should be placed as far as possible from the heat emitting surfaces, but close to the power supply location.



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