

TCA/TMA Level 2 Assurance

Device, Configuration & Software Integration Guidelines

**FMC650 (SPEC
03.00.16.Rev.303_1059)**

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Abstract

The document explains how providers can integrate Teltonika's TCA approved devices with their platform. Device data sending protocol is still the same with some slight changes made to comply with TMA Level 2 requirements.

The purpose of this document is to provide TCA and ASPs the necessary guidance on how to implement the TCA compliant solution with FMC650.

Device: FMC650

Firmware: 03.00.16.Rev.303_1059

Protocol: Teltonika Codec8 Extended

Firmware changelog

Previous firmware: 03.00.16.Rev.302_1059

New firmware: 03.00.16.Rev.303_1059

Changelog:

- Added fixes where device was generating data at 28th second instead of the configured 30th (Min Period).
- Added fixes to log timestamp received from GNSS rather than the MCU timestamp to eliminate time-drift over a certain duration.

Identification of lost GPS Fix

The base protocol remains the same as of Teltonika's proprietary CODEC 8 EXTENDED. Changes specific to TCA in SPEC ID 1059 are described below.

Via longitude & Latitude values

After the device's GNSS Fix is lost, the device sends the following values as latitude and longitude instead of the last known location or 0/0.

Latitude: 0xFFFFFFFF

Longitude: 0xFFFFFFFF

The values are not plottable on the map and integrators can identify and discard these values.

Via GNSS Status Flag (AVL ID 71)

GNSS Status Flag (AVL ID 71) can be used to identify a lost GNSS Fix. Refer to the table below for more details:

GNSS Status (71)	Value	Status
	0	GNSS OFF
	1	GNSS ON, no GPS antenna
	2	GNSS ON, without fix
	3	GNSS ON, with fix
	4	GNSS SLEEP
	5	GNSS Overcurrent/protect state

As mentioned in the table above, GNSS Fix is only valid when the value for AVL ID 71 is "3". If the GNSS status value (71) not 3, value of longitude and longitude can be discarded.

Device configuration guide

Device configuration can be changed according to the described guidelines. Note that any changes should comply with the TCA guidelines.

Key:

- Must not be changed
- Can be changed but change should comply with TCA guidelines or as instructed.
- Can be changed.
- *Any other changes to the config that are not covered below should be consulted with Teltonika & TCA.*

Note: Any changes made to the config must not impact the data acquisition settings and settings related to base parameters (time (data sending time), longitude, latitude & speed).

Config sections that can be reconfigured as needed by the ASPs:

Status
Security
System
GPRS
Data Acquisition
SMS \ Call Settings
SMS events
GSM Operators
Features
Accelerometer Features
Auto Geofence
Manual Geofence Settings
Manual Geofence Zones
Trip \ Odometer
Bluetooth 4.0
Beacon List
Authorization ID List
I/O
LVCAN
FMS IO
EV FMS IO
Manual CAN
Tachograph data
RS232 \ RS485
CAN \ Tachograph
ContiPressureCheck
Custom scenarios
Mobileye
Reefer IO
TK Transcan IO
Transcan Advance
Euroscan IO
TK Touchprint IO

Security configuration:

SIM 1
SIM status Initializing Attempts Left:

SIM 2 [Active]
SIM status Ready Attempts Left: 3 Toggle

Enable PIN

Current PIN

Enable

Keyword Settings

Set keyword

New Keyword

Repeat Keyword

Set

System configuration:

Sleep Mode 1
Sleep Settings

Disable	GNSS sleep
Deep sleep	Online deep sleep

Timeout (min)

System Settings 1
Movement Source

Ignition	Movement
GNSS	CAN speed

GNSS Source

GPS	GLONASS
GALILEO	BEIDOU

Battery Charge Mode

On need	After ignition ON
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Analog Input Value Range

Range 10V	Range 30V
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AIN4/DOUT4 Mode

Ain4	DOUT4
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Analog Input Value Range 3-4

Range 10V	Range 30V
-----------	-----------

Odometer Source settings

GPS	LVCAN
FMS	KLINE

Speed Source settings

GPS	LVCAN
FMS	KLINE

IO Global settings 1
IO Send Mode

Dont Send	Send Zero
Send Last Known Value	Send 0xFF

Protocol Settings 1
Data Protocol

Codec 8	Codec 8 extended
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Records Settings 1
Records Saving/Sending Without TS

After Position Fix	Always
After Time Sync	

Open Link Timeout (s)
Response Timeout (s)
Sort By

Newest	Oldest
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Save records to

Internal memory	SD card
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Ping mode

Disabled	Empty Codec.12
0xFF	

Network Ping Timeout (min)

Ignition settings 1
Ignition Source

DIN 1	DIN 2
DIN 3	DIN 4
Movement	Power Voltage
Engine RPM	

High Voltage (mV)
Low Voltage (mV)
Movement Start Delay (s)
Movement Stop Delay (s)

Time Synchronization 1
Synchronization Settings

Disable (GNSS only)	NITZ+NTP
NTP	NITZ

NTP sync. timeout
NTP Server 1
NTP Server 2

Static Navigation Settings 1
Static Navigation

Disable	Enable
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Static Navigation Deactivation Source

Movement OR Ignition	Movement
Ignition	Movement AND Ignition

GPRS configuration:

GPRS Limits

GPRS Limits

Disable	Enable
---------	--------

Home Limit (MB)

Roaming Limit (MB)

SIM1 GPRS Settings

GPRS Context

Disable	Enable
---------	--------

APN

APN Username

APN Password

GPRS authentication

Disable	Normal (PAP)
Secured (CHAP)	

SIM2 GPRS Settings

GPRS Context

Disable	Enable
---------	--------

APN

APN Username

APN Password

GPRS authentication

Disable	Normal (PAP)
Secured (CHAP)	

FOTA WEB settings

Status

Disable	Enable
---------	--------

Main Server Domain

Main Server Port

Period (min)

Server #1 Settings

Domain

Port

Protocol

TCP	UDP
-----	-----

Server #2 Settings

Backup Server Mode

Disabled	Backup
Duplicate	EGTS

Backup Server Protocol

TCP	UDP
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Backup Server Domain

Backup Server Port

Data Acquisition configuration:

On stop

	Home	Roaming	Unknown
Min Period	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Min Saved Records	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
Send Period	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

Moving

	Home	Roaming	Unknown
Min Period	<input type="text" value="30"/>	<input type="text" value="30"/>	<input type="text" value="30"/>
Min Distance	<input type="text" value="0"/>	<input type="text" value="100"/>	<input type="text" value="100"/>
Min Angle	<input type="text" value="0"/>	<input type="text" value="10"/>	<input type="text" value="10"/>
Min Speed Delta	<input type="text" value="0"/>	<input type="text" value="10"/>	<input type="text" value="10"/>
Min Saved Records	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
Send Period	<input type="text" value="30"/>	<input type="text" value="30"/>	<input type="text" value="30"/>

On Demand Tracking

Period (s)

Duration (s)

Activation by:

DIN1	DIN2
DIN3	AIN1
AIN2	AIN3
AIN4	

Features & Accelerometers Features configuration:

Scenarios can be activated but **must** be set to low priority only. Any eventual data should be disabled.

By default, all the scenarios are disabled.

IO configuration:

Input Name	Units	Priority				Low Level	High Level	Event Only		Operand	Averaging Const
Ignition		None	Low	High	Panic	0	0	Yes	No	Monitoring	10
Movement		None	Low	High	Panic	0	0	Yes	No	Monitoring	1
Data Mode		None	Low	High	Panic	0	0	Yes	No	Monitoring	
GSM Signal		None	Low	High	Panic	0	0	Yes	No	Monitoring	1
Sleep Mode		None	Low	High	Panic	0	0	Yes	No	Monitoring	
GNSS Status		None	Low	High	Panic	0	0	Yes	No	Monitoring	
GNSS PDOP		None	Low	High	Panic	0	0	Yes	No	Monitoring	10
GNSS HDOP		None	Low	High	Panic	0	0	Yes	No	Monitoring	10
External Voltage	mV	None	Low	High	Panic	0	0	Yes	No	Monitoring	10
Speed	km/h	None	Low	High	Panic	0	0	Yes	No	Monitoring	1
GSM Cell ID		None	Low	High	Panic	0	0	Yes	No	Monitoring	
GSM Area Code		None	Low	High	Panic	0	0	Yes	No	Monitoring	
Battery Voltage	mV	None	Low	High	Panic	0	0	Yes	No	Monitoring	10
Battery Current	mA	None	Low	High	Panic	0	0	Yes	No	Monitoring	10
Active GSM Operator		None	Low	High	Panic	0	0	Yes	No	Monitoring	
Trip Odometer	m	None	Low	High	Panic	0	0	Yes	No	Monitoring	
Total Odometer	m	None	Low	High	Panic	0	0	Yes	No	Monitoring	
Digital Input 1		None	Low	High	Panic	0	0	Yes	No	Monitoring	1

Configuration File:

Base configuration file that has been approved by TCA can be provided by Teltonika upon request.

Additional salient guidelines to maintain compliance:

- The following 3 parameters should be discarded by ASP from data received from device or should only be used for internal purposes. TCA's solution should not have the visibility for it.
 - Number of satellites
 - HDOP
 - PDOP
- All peripherals (RS232/RS485, Video Solutions, Digital I/O, FMS, MobilEye, Tacho, Bluetooth etc.) are disabled* by default. To use any peripherals (including any that are not listed otherwise), approval from TCA and Teltonika is needed.

**The only peripheral enabled by default is USB.* The interface can be used to load the initial configurations, e.g., APN, server domain & port etc., as per the instructions provided in [Device Configuration Guide](#).
- External power voltage and Ignition Status is sent with the AVL data and is contained in each packet.

4. SD card slot has not been used since internal memory is enough to hold records for up to 6 hours. In case external SD card is needed, approval is required from TCA and Teltonika.
5. Device is not password protected by default and can be accessed through USB. ASPs should add keyword protection for serial interface over USB. Refer to [Security Configuration](#) guide.
6. The device sends data every second after:
 - a. The Ignition is turned OFF *OR*
 - b. The Ignition is disconnected *OR*
 - c. The External Power is OFF *OR*
 - d. The External Power is disconnected.

If any of the above conditions is met, ASP should filter out and discard any data that is received, for TCA.

Declarations:

1. The date and time data collected by the telematics device is within:
 - a. 1 second from UTC when using GNSS signals &
 - b. 10 seconds from UTC when not using GNSS signals for 24 hours.

Intellectual property rights:

The Customer acknowledges that UAB TELTONIKA TELEMATICS shall be the exclusive owner of all intellectual property rights used in connection with the products and/or Services the Customer purchases.

Changelog			
Initials	Date	Version	Comment
JA	2024.08.27	1.0	Initial TCA protocol change guide for integrators
JA	2024.10.25	2.0	(Major) Added firmware changelog and device configuration guideline sections.
JA	2024.10.25	2.1	Added additional salient guidelines and declarations section.
JA	2024.10.28	2.2	Updated point 2 & 6 in "Additional salient guidelines to maintain compliance" section.
JA	2024.10.28	2.3	Added "security configuration" part in "device configuration" section. Removed Bluetooth mentions from all the sections. Bluetooth disabled by default. Updated point 2 & 5 in "Additional salient guidelines to maintain compliance" section.