AVT110 RS485 User Manual

EGPRS / LTE Cat-1

V1.02

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Contents

0. Revision History

Revision	Date	Author	Description of Change
1.01	August 10, 2025	Joel	Initial
1.02	Nov 7, 2025	Joel	Added CAN LED Indicator description

1. Introduction

The AVT110 is a compact GNSS tracker designed for a wide variety of vehicle tracking applications. It has multiple I/O interfaces that can be used for monitoring or controlling external devices. Its built-in GNSS receiver has superior sensitivity and fast time to first fix. Its seven-band LTE-FDD in Europe and GSM/GPRS 850/900/1800/1900 MHz allowing the AVT110's location to be monitored in real time or periodically tracked by a backend server and mobile devices. Its built-in 3-axis accelerometer allows driving behaviour monitoring, motion detection and extended battery life through sophisticated power management algorithms. It also has built-in CAN Module.

1.1. Specifications

General Specifications	
Dimensions	112mm*57mm*27.5mm
Network	1.EGPRS: GSM850/GSM900/DCS1800/PCS1900 2.Cat-1: B1, B3, B5, B7, B8, B20, B28
GNSS (Optional)	GPS, GLONASS, BDS, GALILEO
Bluetooth	BLE 5.3
Sensors & Interface	1. G-Sensor 2. 1wire 3. RS485 4. IGN input. 5. OUTPUT 6. Analog input and negative trigger input multiplexing. 7. CAN1 L, CAN1 H 8. CAN2 L, CAN2 H 9. K-Line
Battery	3.7V 150mAh Rechargeable Li-polymer Battery
IP Rating	IP67
Operating Temperature	-20℃~+60℃
LED indicator	Power LED NET LED GNSS LED CAN LED
Debug Port	Type C

2. Product Overview

2.1. Interface Definition

AVT110 has a 14 PIN interface connector that contains the power, Input, Output, Analog input, 1wire, RS485, CAN etc. the sequence and definition of the 14 PIN connectors are shown in the following table:

PIN	Defined	Color	Comment
1	VIN	Red	External DC power input, 8-32V
2	GND	Black	Power and digital ground
3	IGN	White	Ignition input, positive trigger
4	ADIN	Orange	Analog input and negative trigger input multiplexing.
5	OUT1	Brown	Digital output, Open drain, 150 mA max, with latch circuit
6	1W Data	Yellow	Data for 1 wire
7	1W VDD	Blue	VDD for one wire
8	RS485 A	Gray	RS485 A
9	RS485 B	Light Blue	RS485 B
10	CAN2 H	Purple	CAN 2 positive
11	CAN2 L	Purple/White	CAN 2 negative
12	CAN1 H	Green	CAN 1 positive
13	CAN1 L	Green/White	CAN 1 negative
14	K-Line	Pink	Data for K-Line

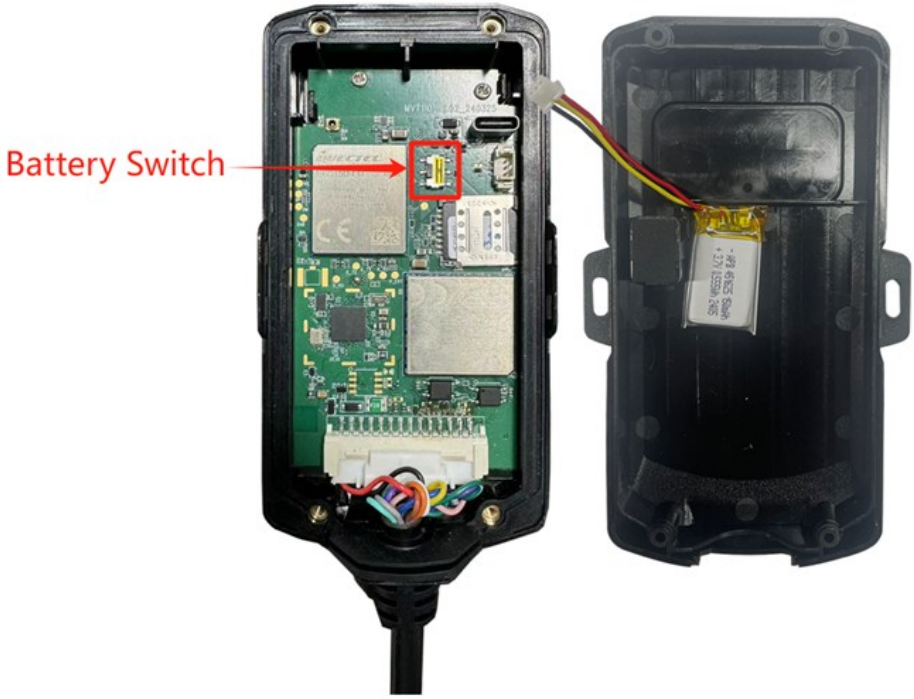
2.2. Install a SIM Card

Open the case and ensure the unit is not powered. Slide the holder right to open the SIM card holder. Insert the SIM card into the holder as shown below with the gold-colored contact area facing down. Take care to align the cut mark. Close the SIM card holder. Close the case.

2.3. Install the Internal Backup Battery

AVT110 has an internal backup 150mAH Li-ion battery.

Battery Switch refer to the following:



2.4. Power Connection

PWR (PIN1)/GND (PIN2) are the power input pins. The input voltage range for this device is from 7V to 32V. The device is designed to be installed in common vehicles that operate on 12V or 24V systems without the need for external transformers.

2.5. Ignition Detection

Table 1. Electrical Characteristics of Ignition Detection

Logical Status	Electrical Characteristics
Active	7V to 32V
Inactive	open

IGN (PIN3) is used for ignition detection. It is strongly recommended to connect this pin to ignition key “RUN” position as shown above.
An alternative to connecting to the ignition switch is to find a non-permanent power source that is only available when the vehicle is running, for example, the power source for the FM radio.
IGN signal can be configured to start transmitting information to the backend server when ignition is on, and enter the power saving mode when ignition is off.

2.6. Terminal Status LED

LED	Device Status	LED Status
CAN	Operating mode, CAN-BUS or J1708 active (only one of those)	The green LED flashes once every 1s.
	Operating mode, CAN-BUS(es) and J1708 sleep or disabled	The green LED flashes once every 4s.
	Low power mode (sleep)	OFF
	CAN-BUS codes synchronization	The red LED flashes quickly (ca.7times per second).
	CAN-BUS codes synchronization finished successfully.	Green ON (after synchronization)
	CAN-BUS codes synchronization failed (CAN-BUS wires are properly connected, but codes have not been recognized).	Red ON (after synchronization)
	CAN-BUS codes synchronization failed (no CAN-	The red LED flashes 0.5s/

	BUS connection or CAN-BUS sleep).	The green LED flashes 0.5s.
	The device failed to power on. Return the device to the producer for analysis.	Red ON (after power-on)
GNSS	GNSS chip is powered off.	OFF
	GNSS sends no data or data format error occurs.	High speed flashing
	GNSS chip is searching GNSS information.	Medium speed flashing
	GNSS chip has gotten GNSS information.	ON
CELL	The device is searching network.	Fast flashing
	The device has been registered on the network.	Slow flashing
PWR	No external power and internal battery voltage is lower than 3.5V.	OFF
	No external power and internal battery voltage is lower than 3.7V.	Slow flashing
	The external power supply has been connected to the device and the internal battery of the device is charging.	Fast flashing
	The external power supply has been connected to the device and the internal battery of the device is fully charged.	ON

Note:

CELL LED, GNSS LED and PWR LED can be configured to be turned off after a period time by using the configuration tool.

2.7. G-Sensor Direction

AVT110 has an internal 3-axis sensor supporting driving behavior monitoring, crash detection and motion detection. The following shows the directions of the motion sensor:

Motion Sensor Direction

3. CAN Installation

3.1. CAN Interface

There are two CAN interfaces, CAN2L/CAN2H, CAN1L/CAN1H. And CAN2 can also be connected to the J1708 interface of the vehicle.

Note:

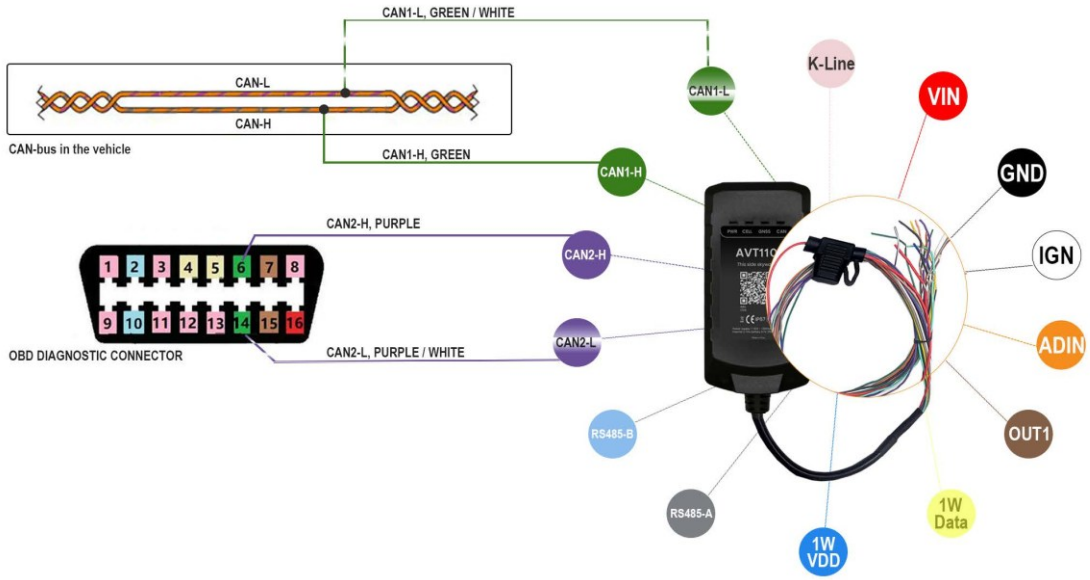
There is an installation manual for every supported car model. It is crucial to connect CAN1 wires to particular vehicle's CAN-BUS. Connecting to invalid CAN-BUS may result in partial or total loss of logistic data.

When, due to installation manual of particular car model, CAN1 is to be connected to OBD pins 6&14, connection of CAN2 shall be void.

3.2. Installation Diagram

3.2.1. Connection Diagram for Light Cars

CAN1 and CAN2 interfaces in AVT110 can be connected to a light car's CAN-BUS interface and OBD interface, as shown below:



Note:

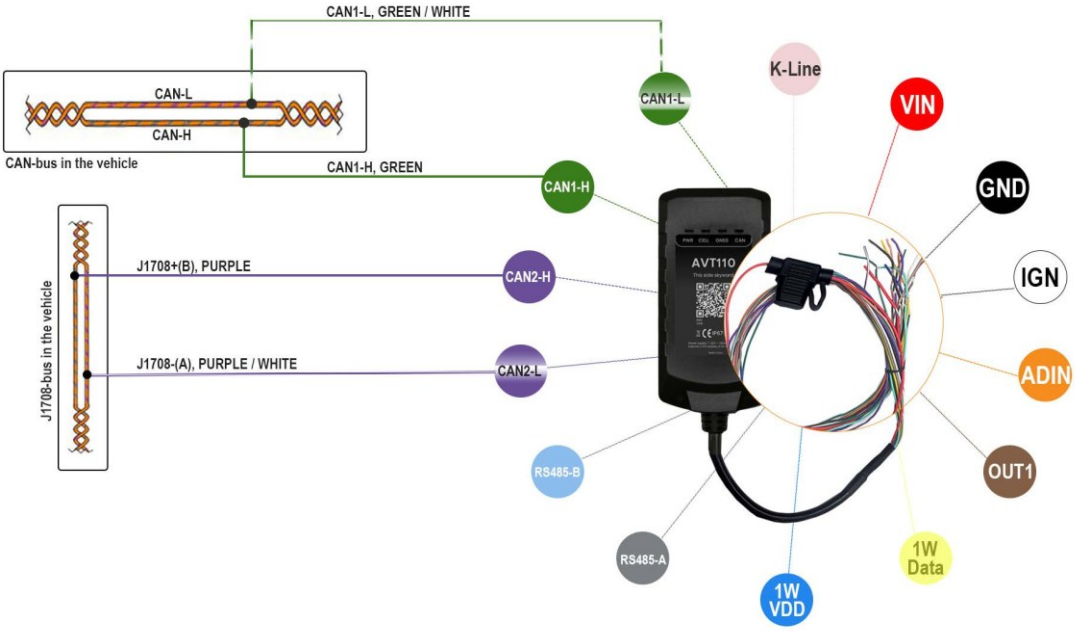
There is an installation manual for every supported car model. It is crucial to connect CAN1 wires to particular vehicle's CAN-BUS. Connecting to invalid CAN-BUS may result in partial or total loss of logistic data.

When, due to installation manual of particular car model, CAN1 is to be connected to OBD pins 6&14, connection of CAN2 shall be void.

If need DTC code, the CAN2 should be connected to OBD of light cars.

3.2.2. Connection Trucks Using J1939 (CAN-BUS) and J1708

J1939 can be connected to CAN1 of AVT110, J1708 can be connected to CAN2 of AVT110, as shown below:



Note:

For connection places of CAN for particular truck model, please refer to installation manual for particular truck model.

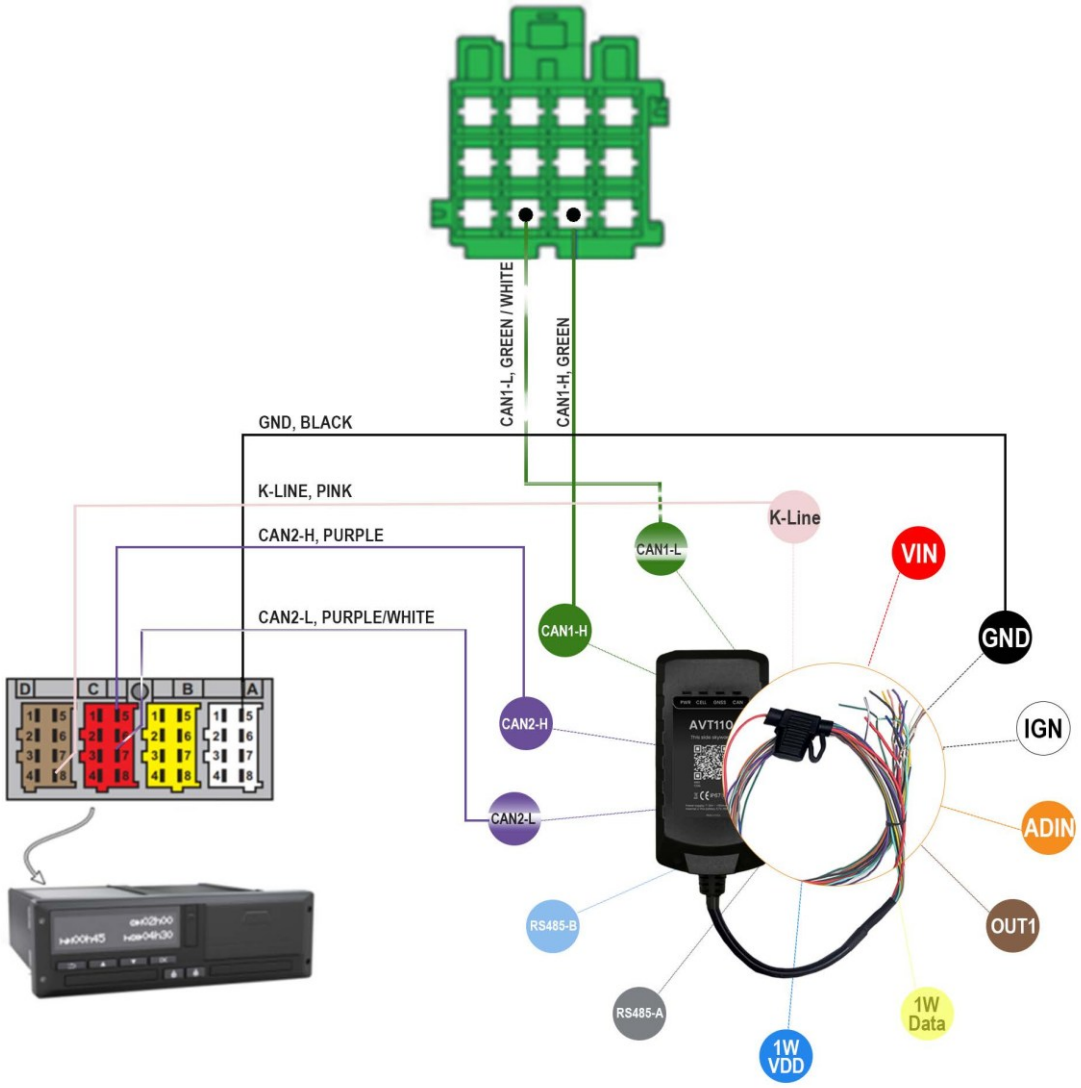
3.2.3. Connection FMS Connector for Trucks

The FMS connector can be connected to CAN1 of AVT110.

FMS connector shape and pinout may vary between truck makes and models. The picture is illustrative. For CAN1 connection position, please refer to the installation manual for the particular

truck model.

Tachograph should be connected to CAN2, K-LINE and GND while car's CAN-bus is connected to CAN1. If only the tachograph is connected, connect it to CAN2, K-LINE, GND and run auto-synchronization.



3.3. CAN-BUS Synchronization

CAN-BUS codes synchronization function allows AVT110 to detect the vehicle model to which the AVT110 is connected. Switch vehicle ignition on and send the command **AT@RTO**=AVT110,14,2,,,,,FFFF# after the AVT110 is installed in the vehicle, and then the synchronization will start. During synchronization, the flashing of the can lamp can be observed. For details, please refer to the commands **AT@RTO (sub command is 13)** and **AT@RTO (sub command is 14)**.

3.4. CAN LED Indicator

LED Diode	Work Mode
Blinks green once every 1s	Operating mode, CAN-bus or J1708 or D8 active (only one of those)
Blinks green twice every1s	Operating mode, two buses active (i.e. 2 CAN-buses or CAN-bus and J1708 or CAN-bus and D8)
Blinks green thrice every 1s	Operating mode, three buses active (i.e.2 CAN-buses andD8)
Blinks green once every 4s	Operating mode, CAN-bus(es) and j1708 sleep or disabled
Off	Low power mode (sleep)
Blinks red quickly (ca. 7 times per second)	CAN-bus codes synchronization
Green on (after synchronization)	CAN-bus codes synchronization finished successfully
Red on (after synchronization)	CAN-bus codes synchronization failed (CAN-bus wires Are properly connected, but codes have not been recognized)
Flashes red 0.5s on / green 0.5s on	CAN-bus codes synchronization failed (no CAN-bus connection or CAN-bus sleep)
Blinks red twice every 1s	Fail safe mode (see section 6.8.4 for details)
Blinks red once every 2s	Invalid configuration (e.g. vehicle not synchronized)
Flashes green 2s on /100ms off	Supervised mode (when connected to configurator application)
Flashes green 1s on /100ms off	Development test mode (see section 6.8.5)
Red on (after power-on)	Device startup failed. Return the device to the producer for diagnosis.

3.5. Firmware Upgrade

The file with the firmware / configuration is supplied by the manufacturer. CAN firmware upgrade or CAN configuration upgrade can be set through **AT@CFU**. For details, please refer to the command **AT@CFU**.