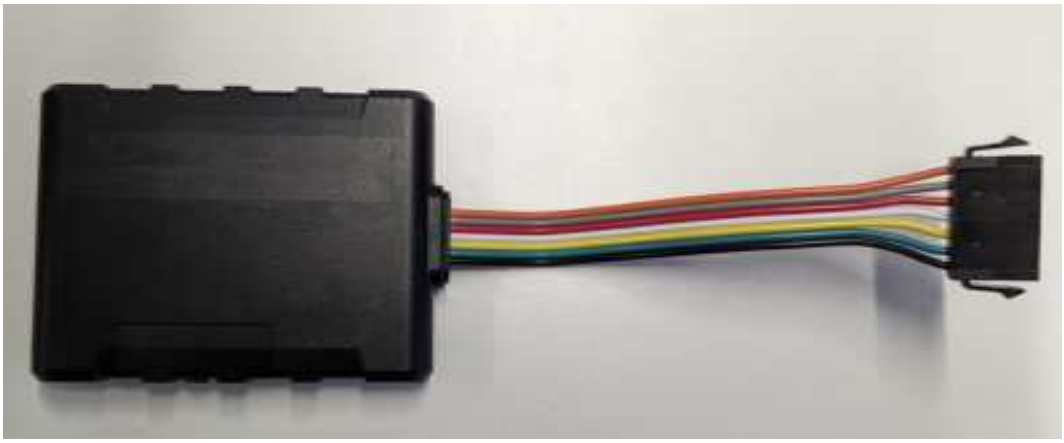
ENGIMM-01 User manual
Engine Immobilizer V1.00



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Contents

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History

version	Date	Author	Description of Change
1.00	Jan 11, 2024	Nikhil	Initial.

1. Introduction

THE ENGIMM-01 is a compact GNSS vehicle tracking device that supports EGPRS and LTE Cat M1/NB2. The device has multiple I/O interfaces that can be used for monitoring or controlling external devices. The built-in GNSS receiver has superior sensitivity and fast initial positioning. The full-featured @Track Air Interface Protocol provides the complete documentation, so it's easy to learn system integration. The @Track protocol supports a wide variety of reports including emergency alarm, geo-fence boundary crossings, as well as external power supply monitoring and position report

1.1 References

Table 2 : ENGIMM-01 Protocol Reference

S.NO	Document Name	Remark
1	ENGIMM-01 @TrackAirInterface Protocol	The air protocol interface between ENGIMM-01 and a backend server.

1.2 Terms and Abbreviations

Table 3: Terms and Abbreviations

Abbreviations	Remark
RXD	Receive Data
TXD	Transmit Data
GND	Ground
VIN	External DC Power Input
VG	Vehicle Gateway

2. Product Overview

2.1 Appearance

Figure 1. Appearance of the ENGIMM-01

2.2 Parts List

Table 4: Parts List

Name	Picture	Dimensions	weight
ENGIMM-01		87× 55 × 12.5mm 3.43”(L) × 2.17”(W) × 0.49”(H)	95 grams (Max)
Extension harness			

2.3 Interface Definition

The ENGIMM-01 has a 7-pin pitch connector that is used to connect to the power

and I/Os. You can find its sequence and description in the following figure.

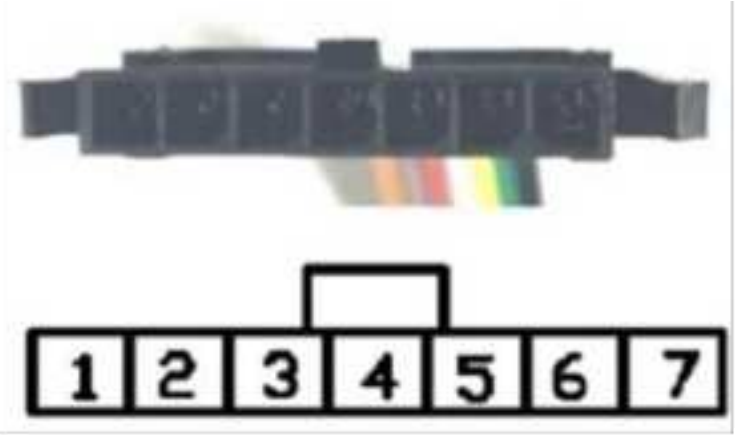

Figure 2. 7-pin Connector of the ENGIMM-01

Table 5: Description of 7-pin Connections

Index	Description	Remark
1	DBG_RX	UART RXD, TTL
2	DBG_TX	UART TXD, TTL
3	VIN	External DC Power Input, 8-32V
4	ACC	Ignition input, positive trigger
5	OUT1/IN1	Digital Output1/Input1, open drain, 150mA max
6	OUT2	Digital Output2, open drain, 150mA max
7	GND	Ground

2.4 User cable Interface

Table 6: User Cable Definition and Colors

Definition	Color	Index	Cable
DBG_RX	Orange	1	
DBG_TX	Gray	2	
VIN	Red	3	
ACC	White	4	
OUT1/ IN1	Yellow	5	
OUT2	Green	6	
GND	Black	7	

2.5 Motion Sensor Detection

The ENGIMM-01 has an internal 3-axis accelerometer that supports driving behavior monitoring and motion detection. The following screenshot shows the directions of the motion sensor. The Z axis faces vertically inward.

Figure 3. Motion Sensor Direction

3. Getting Started

3.1 Opening the Battery Switch Cover

Follow the direction indicated on the case and push to open the SIM card cover.

Figure 4. Opening the Battery Switch Cover

3.2 Switch on the Backup Battery

To use the backup battery's power, the switch must be in the ON position. The ON/OFF switch positions are shown (Figure 5).

Figure 5. ON/OFF Switch Positions

Note:

1. The switch must be in the OFF position when the device is in air freight transport.
2. When the switch is in the OFF position, don't charge or discharge the battery

3.3. Closing the Battery Switch Cover

Align and push to close the SIM card cover.

Figure 6. Closing the SIM Card Cover

4. Device Status LED

Figure 7. ENGIMM-01 LEDs on the Case

Table 7: Definition of Device Status and LEDs

LED	Device Status	LED Status
Cellular LED (Green)	The device is searching for network.	Fast flashing
	The device has been registered on the network.	Slow flashing
	The SIM card needs pin code to unlock.	Solid green
GNSS LED (Red)	GNSS is turned off.	OFF
	The device has got GNSS location information.	Solid red
	The device is searching for GNSS signal.	Fast flashing

1. **Note:** Fast flashing is about 100ms when the LED indicator is on and 200ms when it is off.
2. Slow flashing is about 200ms when the LED indicator is on and 1000ms when it is off.

5. Power Connection

The PIN3 (VIN) and the PIN 7 (GND) are used for the power input. The power source you connect to the PINs has to be 8V to 32V for the ENGIMM-01 to work. The device is designed to be installed in vehicles that operate on 12V/24V systems without the need to use external transformers.

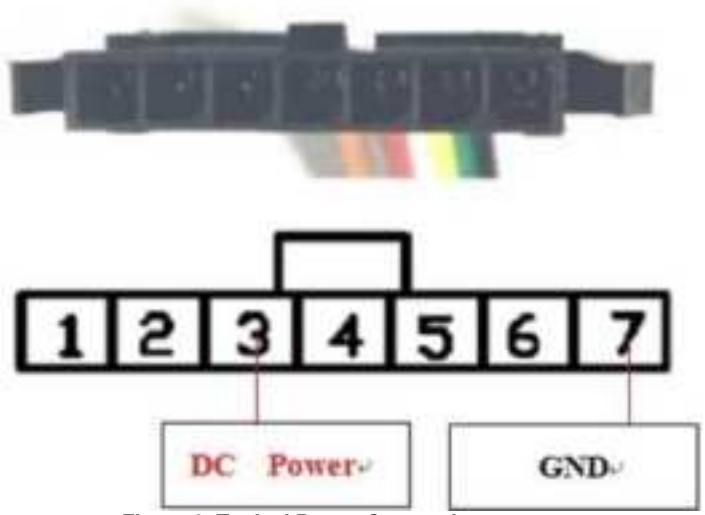

Figure 8. Typical Power Connection

Note: Don't connect any external cable to the device.

6. Ignition Detection

The PIN 4 (ACC) is used for ignition detection. We recommend that you connect it to the RUN position of the vehicle ignition switch as shown (Figure 10).
If you look for an alternative, we recommend that you find a power source that is available only when the vehicle is started, for example, the power source for the FM radio. The device will send the backend server as the IGN signal completes configuration when the ignition is on, and switch to power saving mode when the ignition is off.

Table 8: Electrical Characteristics of Ignition Detection

Index	Description	Remark
1	Active	5.0V to 32V
2	Inactive	0V to 3V or open loop

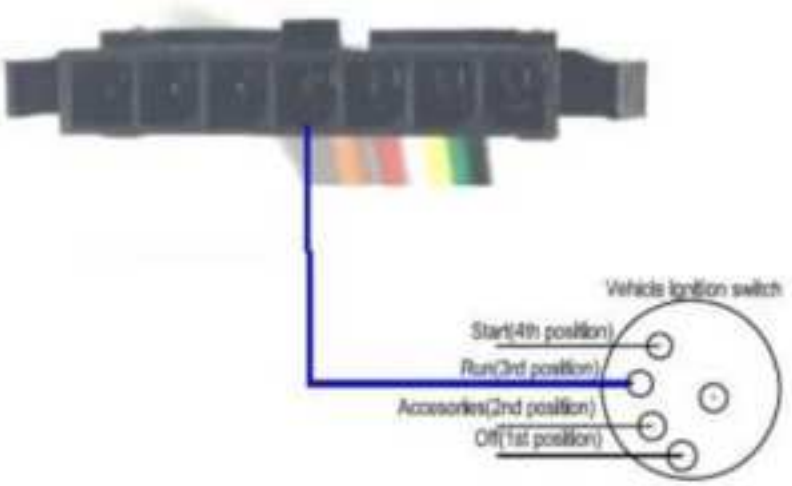

Figure 9. Typical Ignition Detection

7. Digital Output/Input Connection

The PIN 5 (OUT1/IN1) is an open-drain digital output/input. The maximum drain current for the device is 150mA. It can be used either as a digital output or a (negative trigger) digital input based on your needs.

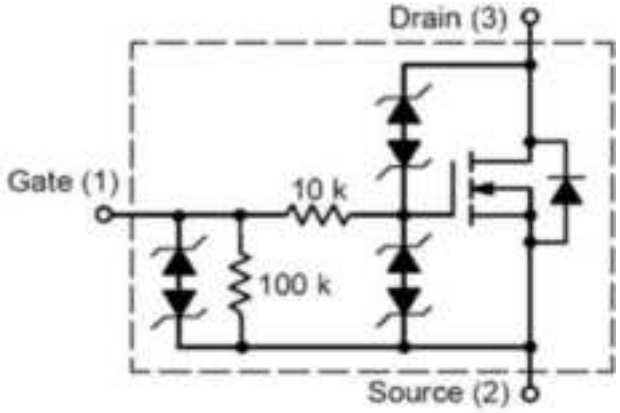

Figure 10. Internal Driver Circuit for Digital Output

Index	Description	Remark
1	Enable	<1.5V @ 150mA
2	Disable	Open drain

Table 9: Electrical Characteristics of Digital Output

Index	Description	Remark
1	Active	0V to 0.8V
2	Inactive	Open Loop

Table 10: Electrical Characteristics of digital Input

7.1 . Digital Output

The PIN 6 (OUT2) is an open-drain digital output. The maximum drain current for the device is 150mA.

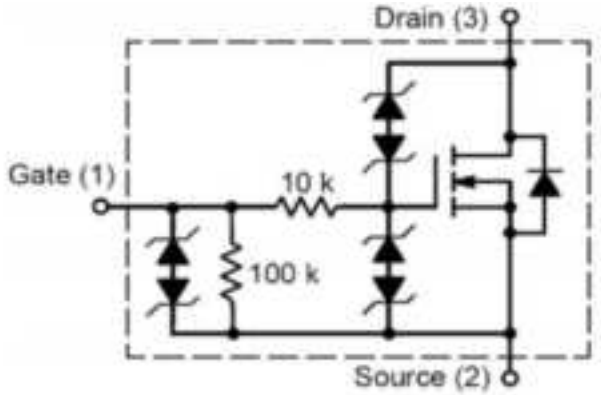

Figure 11: Electrical Characteristics of digital output

Index	Description	Remark
1	Enable	<1.5v @150mA
2	Disable	Open Drain

Table 11: Electrical Characteristics of digital Output

8. Troubleshooting and Safety Information

Problem	Possible Reason	Solution
The Cellular LED flashes fast all the time when the device is turned on.	1. The cellular signal strength is weak; Or 2. The device isn't registered on the network.	Please place the device in an area with good network coverage.
Messages can't be reported to the backend server.	The IP address or port of the backend server is wrong.	Please make sure the IP address for the backend server is identified by the Internet.
The device can't power off.	The device is connected to the power cord (that is external DC power input).	Please disconnect the power cord and try again.
The device can't get GNSS fix successfully.	The GNSS signal is weak.	Please place the device in an open area. Let the side without LED indicators face up.

8.1. Safety Information

- Don’t disassemble the device by yourself.
- Don’t place the device in an environment with high temperature and high humidity. Avoid exposure to direct sunlight. The high temperature will damage the device.
- Don’t use the device on an airplane or near medical equipment.

9. FCC, ISED Caution Statement

a. This device contains license-exempt transmitters/receivers that comply with Part 15 of the FCC Rules and with Innovation, Science and Economic Development Canada’s License-exempt RSS(s). Operation is subject to the following two conditions:
   i. This device may not cause harmful interference, and
   ii. this device must accept any interference received, including interference

that may cause undesired operation.

CAN ICES-3(B)/NMB-3(B)

b. Changes or modification warning

Note: Any Changes or modifications not expressly approved by Motive Technologies, Inc. could void the user's authority to operate the equipment.

c. Information to the user

Note: This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment and RSS 102 RF exposure compliance requirements. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by disconnecting, then reconnecting the equipment, the user is encouraged to try to correct the interference by one or more of the following measures:
-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

NOM Caution Statement

La operación de este equipo está sujeta a las siguientes dos condiciones: (1) es posible que este equipo o dispositivo no cause interferencia perjudicial y (2) este equipo o dispositivo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.

ESTE EQUIPO NO CUENTA CON LA TECNOLOGIA VoLTE incorporada

Warranty
Motive Technologies, Inc. (“Motive“) provides the Hardware Terms and Warranty, see more details, please refer to https://gomotive.com/legal/hardware-terms/

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