MEITRACK T399G Vehicle Tracker User Guide

Change History

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Contents

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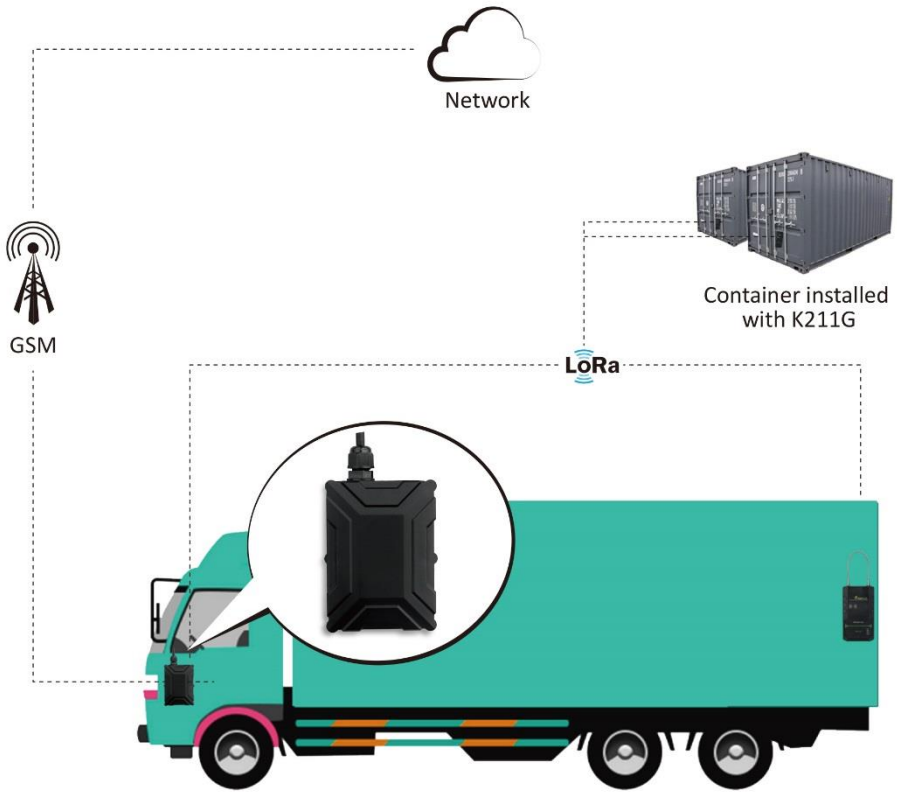
2 Product Introduction

The T399G is a multi-purpose vehicle tracker. It not only can be used for tracking and positioning, but also used for K211G GPS smart lock management. It has an ability to monitor and record K211G status in real time, and to systematically manage the connection status, battery power and alerts of the K211G. This unit features an IP67 water resistance rating, is equipped with built-in GPS and GSM antennas, and can work in different environments. When it works with the K211G, it can be installed into trailers and box trucks. When it works alone, it can be installed into cars, motorcycles, yachts, boats, etc.

2.1 Product Features

2.1.1 LoRa communication

This function is used for communication between the T399G and the K211G GPS smart lock. After the LoRa connection is successful, the K211G will send information such as lock status information, alert events and battery power to the T399G via LoRa. Then the T399G will upload K211G status information to the server at specific interval via GPRS network and will monitor the K211G status in real time.



2.1.2 K211G Status Monitoring

K211G Status	Description
Number of the K211G devices	Indicates the number of the K211G devices that are bounded to the T399G. Value range: [1...30].
K211G ID	Indicates the ID number of the current K211G device. It is the IMEI number by default.
T399G connection status	Indicates the connection status of the current K211G device (disconnected or connected).
Battery power	Indicates the remaining power of the K211G.
Lock status	Indicates the lock status of the current K211G device: unlocking, locking or lock tampering.
Outer case status	Indicates whether the outer case or back cover of the K211G is opened.

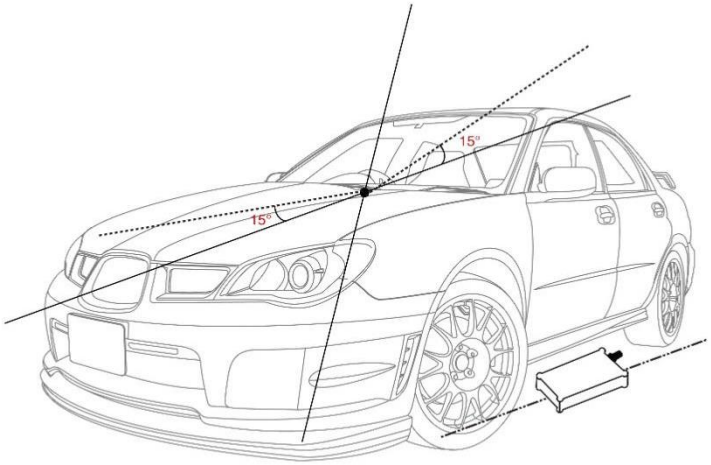
2.1.3 Harsh Acceleration/Braking Alert

You can detect the harsh acceleration/braking alert by setting the limit value.

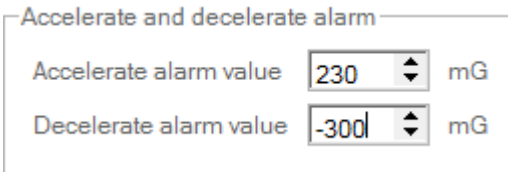
Cautions on device installation:

1. The device should be installed into the vehicle according to the following direction.

2. The device installation angle cannot exceed 15 degrees.



The default harsh acceleration and braking alert values are 230 mG and -300 mG respectively.

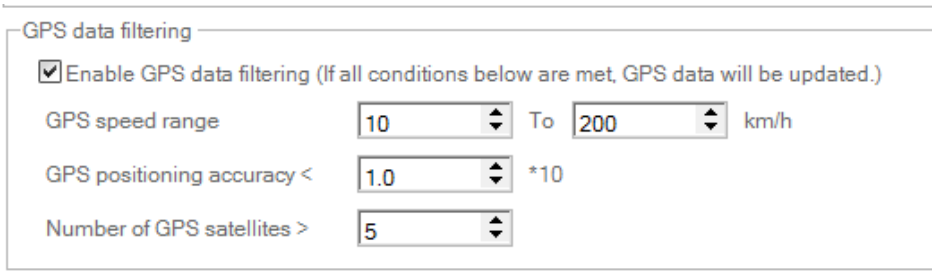


Note: The alert results vary according to the device installation, vehicle model, vehicle weight, and driving behaviors. After the device has been installed properly, you can use the Meitrack Manager software to adjust the harsh acceleration and braking alert values by every 10 mG. You can also use the D79 command to set the values.

2.1.4 GPS Data Filtering

The GPS data filtering function can ensure GPS data accuracy and eliminate static drift.

You can set the following parameters by Meitrack Manager: **GPS speed range**, **GPS positioning accuracy**, and **Number of GPS satellites**. When the GPS data filtering function is enabled, if all conditions are met, GPS data will be updated.



Note: This function can be enabled by Meitrack Manager.

2.1.5 Activating Output by Event

You can activate output by event.

For example:

1. When speeding is detected, the device can control buzzer sounds.
2. When unauthorized ignition or GPS antenna cut-off is detected, the engine will not be able to start.
3. When iButton triggering is detected, the device can control engine startup.
4. When input or output status is detected, the output will be active or inactive.

2.1.6 Idling Detection

This function is used to detect whether a vehicle's engine is switched off while parking. To enable the function, you must connect input 2 to ACC detection.

When the device detects that the driving speed is 0 and the ACC is on for one consecutive minute (default time), an idling alert will be generated.

For details, see section 6.5.6 "Setting Idling Time – D34."

2.1.7 Changing I/O Port Mode

This function is used to change the I/O port mode. For example, change active negative input to analog port or positive input.

For details, see section 6.5.5 "Setting I/O Port Status – C08."

2.1.8 Auto Arming

You can enable the auto arming function by B27 command, Meitrack Manager software or MS03 tracking platform. This function is disabled by default.

When the device is in sleep mode and the function has been enabled, the device will enter auto arming state.

You can set disarming by B21 command or remote control.

Function	Call	GPRS	SMS	Output 1	Buzzer	Description
Open vehicle doors in arming state	√	√	√		√	When a vehicle door is opened without permission, the device will dial the authorized phone numbers in sequence and send a vehicle theft alert by SMS or GPRS. The buzzer will not stop buzzing until the arming state is disabled.
Start the engine in arming state	√	√	√	√	√	When the engine is started in arming state, the vehicle fuel will be cut off, and the device will dial the authorized phone numbers in sequence and send a vehicle theft alert by SMS or GPRS. The buzzer will not stop buzzing until the arming state is disabled.
Set arming while moving (Intercept moving vehicles)		√	√	√		When the stolen vehicle is moving, you can set arming by B21 GPRS or SMS command to intercept the vehicle. When the vehicle speed is lower than 5 km/h and the arming has been set, the vehicle fuel will be cut off, and the device will send an alert to the authorized phone numbers. Note: You cannot use the remote control to set arming when the vehicle is moving.
Tow vehicles	√	√	√			When the ACC is off and the vehicle vibrates continuously, a towing alert will be generated. The

in arming state						device will dial the authorized phone numbers in sequence and send a vehicle theft alert by SMS or GPRS. The buzzer will make sounds for five consecutive minutes. During this period, you can disable the arming state and then the buzzer will stop buzzing.

Note:

1. To implement the fuel/power cut-off function for a vehicle theft alert, you should select the vehicle theft event in the Output 1 column on the Meitrack Manager software.
2. To implement the alert function of the buzzer, you should set the 1-Wire interface (green cable) to alert output.

2.1.9 Starting the Engine by RFID/iButton

After swiping the authorized RFID card or the authorized iButton key touches the iButton reader, the driver must start the engine within 1 minute. Otherwise, the tracker's output 1 will be triggered (engine cut-off), and thus the driver cannot start the vehicle. At the moment, if you want to start the engine, you must swipe the iButton key/RFID card again.

Before starting the engine, ensure that:

1. The tracker's input 2 is connected to the engine detection cable.
2. An iButton key or RFID card has been authorized.
3. The tracker's output 1 is connected to the engine control cable through a relay.
4. The RFID ignition function has been enabled by Meitrack Manager or MS03 tracking platform.
5. The RFID event has been enabled on Meitrack Manager.

3 Product Functions and Specifications

3.1 Product Functions

3.1.1 Position Tracking

- GPS + LBS positioning
- Real-time location query
- Tracking by time interval
- Tracking by distance
- Tracking by mobile phone
- Speeding alert
- Cornering report

3.1.2 Anti-Theft

- Polygonal geo-fence alert
- Engine or vehicle door status alert
- Remote vehicle fuel/power cut-off
- GPS blind spot alert
- Towing alert

3.1.3 Other Functions

- SMS/GPRS (TCP/UDP) communication
- Built-in 8 MB buffer for recording driving routes
- IP67 water-resistance rating
- Mileage report
- Roaming parameter settings
- Smart sleep mode
- Built-in 3-axis accelerometer
- Online Parameter Editor
- GPS data filtering
- Activate output by event
- Stop Moving and Start Moving alerts
- Vehicle power protection
- Idling alert
- AGPS

3.1.4 Functions of Optional Accessories

Optional Accessories	Function
iButton	Identify the driver ID and grant permission to start the vehicle.
A53 fuel level sensor	Check the fuel level and detect a fuel theft alert.
Digital temperature sensor	Check temperature (At most 8 temperature sensors are supported, and the sensor must be used with the A61 sensor box.).
400 mAh/3.7 V high-temperature battery (0°C to 80°C)	The device can continuously work after the external power supply is cut off. When the battery power is low, a low power alert will be generated.

3.2 Product Specifications

Item	Specifications
Dimension	80.5 mm x 60 mm x 23.5 mm
Weight	100g
Power supply	DC 11–36 V/1.5 A
Power consumption	Current in standby mode: 65 mA
Operating temperature	-35°C to 80°C (available for the device without a battery)
Operating humidity	5% to 95%
LED indicator	Green indicator showing the GSM signal Blue indicator showing the GPS signal
Button/Switch	1 upgrade button (used to manually upgrade the firmware) 1 power button
Memory	8 MB buffer
Sensor	3-axis accelerometer (used to wake the device up by vibration and detect towing alerts, harsh acceleration alerts, and harsh braking alerts)

LoRa communication distance	At most 20 meters (obtained from actual tests in trucks' containers)
LoRa working frequency	137–1020 MHz (433 MHz by default)
LoRa antenna	Built-in spring antenna
Frequency band	T399G-E: UMTS/HSDPA: 900/2100 MHz GSM/GPRS: 900/1800 MHz T399G-A: UMTS/HSDPA: 850/1900 MHz GSM/GPRS: 850/900/1800/1900 MHz T399G-T: UMTS/HSDPA: 850/2100 MHz GSM: 850/900/1800/1900 MHz Note: Select proper device according to the local frequency band.
GPS sensitivity	-165 dB
Positioning accuracy	2.5m
I/O port	2 digital inputs and 1 analog detection input (0–30 V; selectable positive, negative, and analog detection inputs) 1 output 1 USB port 1 1-wire interface (set to an output or a negative input) 1 output (voltage: 5V) 1 RS232 port (T399G RS232 version): GND/TX/RX

4 T399G and Accessories

T366G and standard accessories:

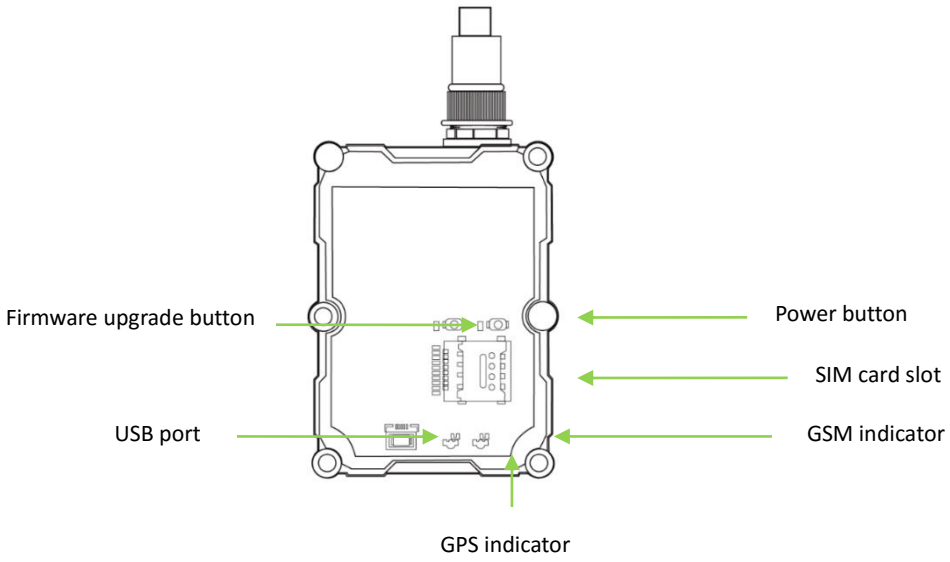
- T366G tracker (with a cable of 50 cm in length)
- 400 mAh battery (-20°C to 60°C)
- L wrench
- Hexagon screw
- CD download card

Optional accessories:

Optional Accessory	Description
Relay (12 V/24 V)	Connect to output 1.
Buzzer	Connect to the 1-Wire interface (green cable), which needs to be set to output 2. The buzzer should be connected to 5 V power supply.
A52 digital temperature sensor	Connect to the 1-Wire interface (green cable).
iButton reader	Connect to the 1-Wire interface (green cable).
A53 fuel level sensor	Connect to AD input 1 (blue cable).
A64 remote control receiver	Connect to input 1 (grey cable), which needs to be set to the remote control input.

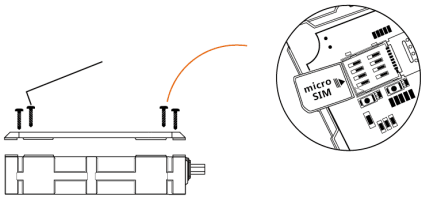
A67 remote control	
USB cable	Standard Android cable
400 mAh high-temperature battery	High-temperature battery optional
External GPS antenna	3 meters in length Available for the device with an external antenna connector (two hardware versions available: internal or external antenna)
Ultrasonic fuel level sensor	Connect to the RS232 port (T399G RS232 version)
LED display	Connect to the RS232 port (T399G RS232 version)
RFID	Connect to the RS232 port (T399G RS232 version)

5 Appearance



6 First Use

6.1 Installing the SIM Card



1. Use the screwdriver to open the back cover.

2. Insert the SIM card into the card slot (card chip facing down).
3. Close the cover, and tighten the screws.

Note:

- Power off the device before installing the SIM card.
- Ensure that the SIM card has sufficient balance.
- Ensure that the phone card PIN lock has been closed properly.
- Ensure that the SIM card in the device has subscribed the caller ID service if you want to use your authorized phone number to call the device.

6.2 LED Indicator

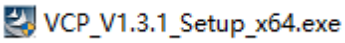
Press and hold down the power button for 3–5 seconds to start the device.

GPS LED Indicator (Blue)	
Blink fast (once every 0.1 seconds)	The device is being initialized, or the battery power is low.
Blink fast (0.1 seconds on and 2.9 seconds off)	A GPS signal is received.
Blink slowly (1 second on and 2 seconds off)	No GPS signal is received.
GSM LED Indicator (Green)	
Steady on	There is an incoming call, or the subscriber you dialed is busy now.
Blink fast (once every 0.1 seconds)	The device is being initialized.
Blink fast (0.1 seconds on and 2.9 seconds off)	A signal is received from a base station.
Blink slowly (1 second on and 2 seconds off)	No signal is received from a base station.

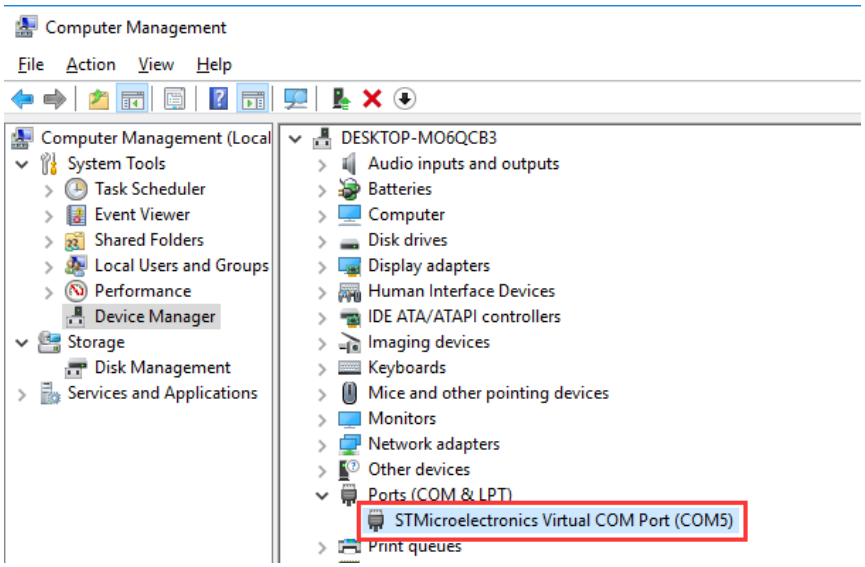
6.3 Device Configuration

6.3.1 Installing the USB Driver

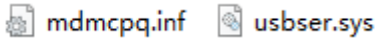
1. Decompress the **stsw-stm32102.zip** file provided by Meitrack, locate the following file, and install the USB driver on a computer with 64-bit Windows system.



2. After the installation is finished, connect the tracker to the computer by USB cable. If **STMicroelectronics Virtual COM Port (COM5)** is displayed on the **Computer Management** page, the driver is installed successfully. Note: Before connecting the device to the computer by USB cable, turn on the device first. Otherwise, it cannot be detected by Meitrack Manager.



Note: After you finish the driver installation, if the preceding figure is not displayed, copy the **mdmcpq.inf** file to the **c:/windows/inf/** directory and **usbser.sys** file to the **C:/windows/system32/drivers/** directory. Then restart the computer.

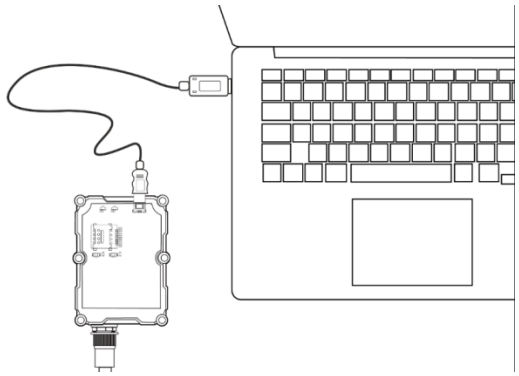


6.3.2 Configuring Device Parameters by Meitrack Manager

This section describes how to use Meitrack Manager to configure the device on a computer.

Operation steps:

1. Install the USB driver and Meitrack Manager.
2. Connect the device to a computer by using the USB cable.



3. Run Meitrack Manager (6.0.0.9 version or later), then the following dialog box will appear:

4. Turn on the device, then Meitrack Manager will automatically detect the device model and the parameter page will appear accordingly.

For details about Meitrack Manager, see the *MEITRACK Manager User Guide*.

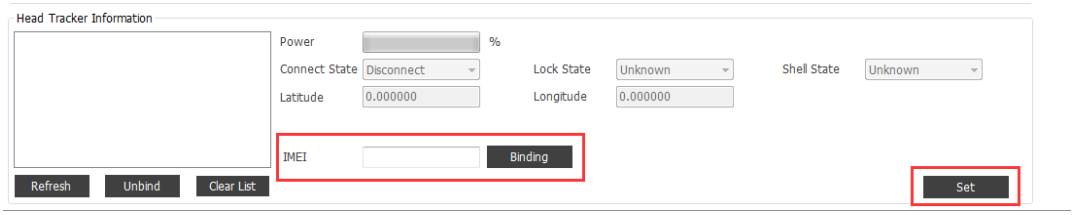
6.3.3 Binding the K211G

To make the T399G and K211G communicate with each other via LoRa, bind the two devices. After the binding is successful, the T399G can communicate with multiple K211G devices, and will upload lock status information and alerts of multiple K211G devices to the server.

Perform the following steps to bind the K211G:

1. Go to the **Peripheral** page of Meitrack Manager.
2. Enter the IMEI number of the K211G.
3. Click **Binding**.
4. Click **Set**.

After the binding is successful, the IMEI number of the K211G will displayed on the **Head Tracker Information** area.

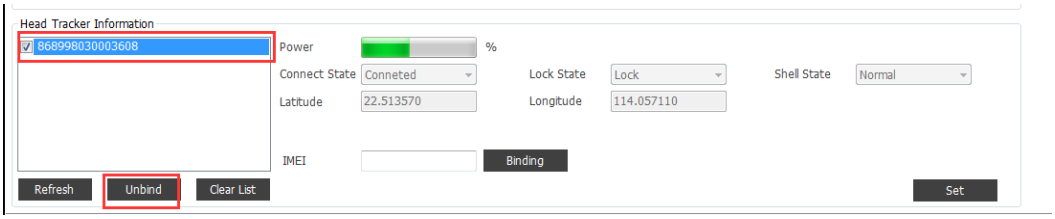


6.3.4 Unbinding the K211G

This operation is used to disconnect the communication between the T399G and the K211G. After the unbinding is successful, the T399G will not obtain status information and alerts of the K211G.

Perform the following steps to unbind the K211G:

1. Go to the **Peripheral** page of Meitrack Manager.
2. Select the IMEI number to be unbounded.
3. Click **Unbind**.
4. Click **Set**.

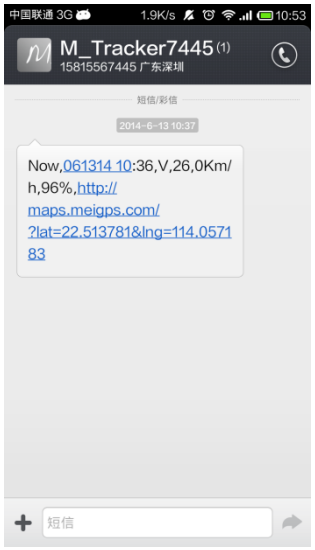


6.4 Tracking by Mobile Phone

Call or send the **0000,A00** command by SMS to the device's SIM card number. The device will reply to an SMS with a map link.

Click the SMS link. The device's location will be displayed on Google Maps on your mobile phone.

Note: Ensure that the device's SIM card number has subscribed the caller ID service. Otherwise, the tracking function by mobile phone will be unavailable.



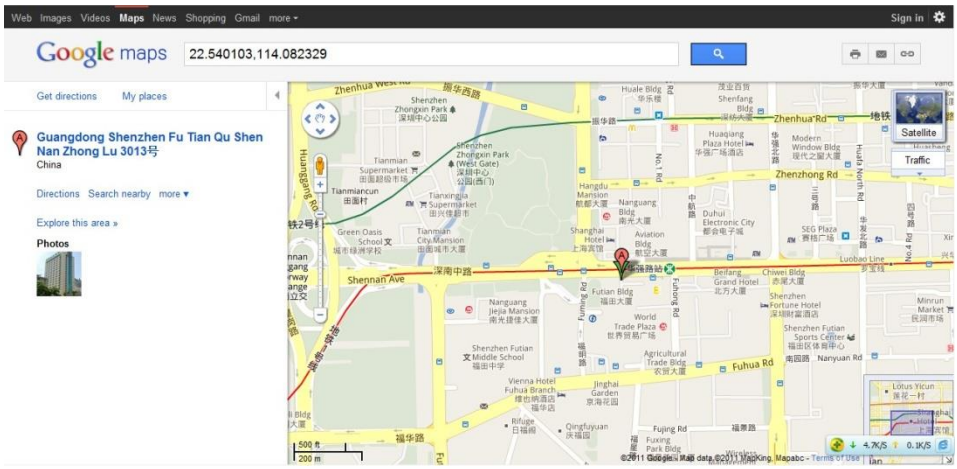
SMS example:

Now,061314 10:36,V,26,0Km/h,96%,http://maps.meigps.com/?lat=22.513781&lng=114.057183

The following table describes the SMS format:

Parameter	Description	Remarks
Now	Indicates the current location.	SMS header: indicates the current location or the alert type.
061314 10:36	Indicates the date and time in **MMDDYY hh:mm** format.	None
V	The GPS is invalid.	A = Valid V = Invalid
26	Indicates the GSM signal strength.	Value: 1–32 The larger the value is, the stronger the signal is. If the value is greater than 12, GPRS reaches the normal level.
0Km/h	Indicates the speed.	Unit: km/h
96%	Indicates the remaining battery power.	None
http://maps.meigps.com/?lat=22.513781&lng=114.057183	Indicates the map link. Latitude: 22.513781 Longitude: 114.057183	None

If your mobile phone does not support HTTP, enter the latitude and longitude on Google Maps to query a location.



6.5 Common SMS Commands

6.5.1 Real-Time Location Query – A00

SMS sending: 0000,A00

SMS reply: Now,*Date and time*,*Positioning status*,*GSM signal strength*,*Speed*, *Remaining battery power*,*Map link*

Description: This command is used to query tracker's current location.

Example:

Sending: 0000,A00

Reply: Now,160721 16:40,V,12,56Km/h,97%,http://maps.meigps.com/?lat=22.513015&lng=114.057235

6.5.2 Setting Authorized Phone Numbers – A71

SMS sending: 0000,A71,*Phone number 1*,*Phone number 2*,*Phone number 3*

SMS reply: IMEI,A71,OK

Description:

Phone number: A phone number has a maximum of 16 bytes. If no phone numbers are set, leave them blank. Phone numbers are empty by default.

Phone number 1/2/3: Set these phone numbers to authorized phone numbers. When you call the tracker by using these phone numbers, you will receive SMS notification about the location, geo-fence alert and low power alert and SMS notification or a call about the unauthorized door open and unauthorized ignition.

If you need to delete all authorized phone numbers, send **0000,A71**.

Example:

Sending: 0000,A71,13811111111,13822222222,13833333333

Reply: 353358017784062,A71,OK

6.5.3 Setting the Smart Sleep Mode – A73

SMS sending: 0000,A73,*Sleep level*

SMS reply: IMEI,A73,OK

Description:

When the sleep level is **0**, the sleep mode is disabled (default).

When the sleep level is **1**, the tracker enters the normal sleep mode. The 3G module always works, and the GPS module occasionally enters the sleep mode. The tracker works 25% longer in the normal sleep mode than that in the normal working mode. This mode is not recommended for short interval tracking; this will affect the route precision.

When the sleep level is **2**, the tracker enters the deep sleep mode. If no event (SOS, button changes, incoming calls, SMSs, or vibration) is triggered after five minutes, the GPS module will stop working, and the 3G module will enter sleep mode. Once an event is triggered, the GPS and 3G modules will be woken up.

Note: In any condition, you can use an SMS command to disable the sleep mode, and then the tracker exits the sleep mode and returns back to the normal working mode.

Example:

Sending: 0000,A73,2

Reply: 353358017784062,A73,OK

6.5.4 Controlling Output Status – C01

SMS sending: 0000,C01,*Speed*,ABCDE

SMS reply: IMEI,C01,OK

Description:

When the speed is **0**, no speed limit exists. That is, when the tracker receives a command, the output control takes effect immediately.

When the speed is a value ranging from 1 to 255 (unit: km/h), set the speed limit for output control. When the driving speed is lower than the speed limit, the output control takes effect.

ABCDE: indicates the output 1, output 2, output 3, output 4, and output 5 respectively. When the parameter value is **0**, the output is disabled. When the parameter value is **1**, data will be generated according to preset output mode. When the parameter value is **2**, previous status will be remained.

Example:

Sending: 0000,C01,10,10000

Reply: 353358017784062,C01,OK

6.5.5 Setting I/O Port Status – C08

SMS sending: 0000,C08,IO0:Mn,IO1:Mn,IO2:Mn,IO3:Mn,IO4:Mn

SMS reply: IMEI,C08,IO0:Mn,IO1:Mn,IO2:Mn,IO3:Mn,IO4:Mn

Description:

1. IO0, IO1, IO2, IO3, and IO4 indicate I/O ports.
   IO0: open collector 1 by default (yellow cable)
   IO1: 1-Wire interface by default (green cable)
   IO2: negative input 1 by default (grey cable)
   IO3: positive input 2 by default (white cable)
   IO4: AD input 1 by default (blue cable)
2. Mn indicates the I/O port status. The parameter value is as follows:
   0: low trigger
   1: high trigger
   2: AD input
   3: Remote control input
   4: open collector

5: low output

6: PWM output

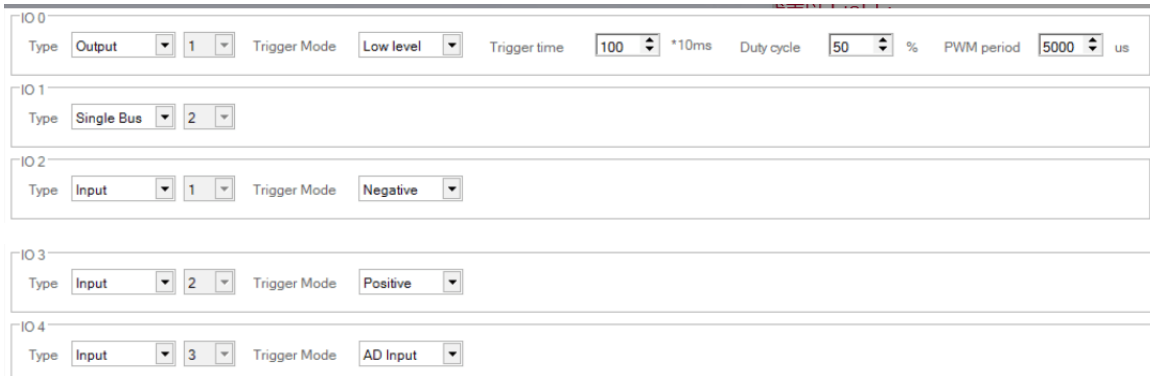
7: Buzzer alert output

8: 1-Wire

3. You can set one or multiple input ports at the same time. The command **0000,C08** is used to read I/O port parameters.

Note:

1. IO0: **Mn** parameter value is 4, 5, or 6.
2. IO1: **Mn** parameter value is 0, 4, 5, 7, or 8.
3. IO2: **Mn** parameter value is 0, 1, or 2.
4. IO3: **Mn** parameter value is 0, 1, or 2.
5. IO4: **Mn** parameter value is 0, 1, 2, or 3.



Example:

Sending: 0000,C08,IO0:5

Reply: 353358017784062,C08,IO0:5,IO1:0,IO2:2,IO3:2,IO4:1

6.5.6 Setting Idling Time – D34

SMS sending: 0000,D34,*Time*

SMS reply: IMEI,D34,OK

Description:

Time: When the device detects that the driving speed is 0 and the ACC is on (input 2 activated) for consecutive several minutes, an idling alert will be generated.

Value range: 0–65536; unit: minute; default value: 1 minute

Example:

Sending: 0000,D34,1

Reply: 353358017784062,D34,OK

For details about SMS commands, see the *MEITRACK SMS Protocol*.

Note:

1. The default SMS command password is **0000**. You can change the password by using Meitrack Manager and SMS command.
2. The device can be configured by SMS command with a correct password. After an authorized phone number is set, only the authorized phone number can receive the preset SMS event report.

7 MS03 Tracking System

Visit http://ms03.trackingmate.com, enter the user name and password, and log in to the MS03. (Purchase the login account from your provider.)

For more information about how to add a tracker, see the *MEITRACK GPS Tracking System MS03 User Guide* (chapter 4 "Getting Started").

The MS03 supports the following functions:

- Track by time interval or distance.
- Query historical trips.
- Set polygonal geo-fences.
- Bind driver and vehicle information.
- View various reports.
- Send commands in batches.
- Support OTA updates.

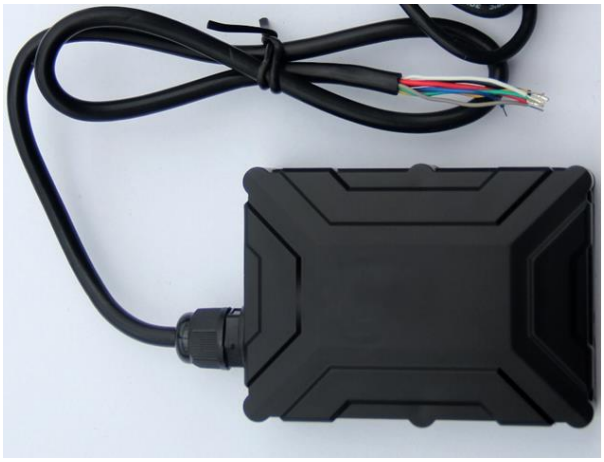
For details, see the *MEITRACK GPS Tracking System MS03 User Guide*.

8 Installing the T399G

8.1 Installing an I/O Cable

8.1.1 Interface Definition

The I/O cable is an 8-pin cable, including the power, analog input, and negative/positive input and output interfaces.



1	2	3	4	5	6	7	8
Power (+)	GND (-)	Input 1 (-)	Input 2 (+)	AD input 1	Output 1	1-wire interface	5 V output cable

Pin Number	Color	Description
1 (Power +)	Red	Positive charge of the power input, connected to the positive charge of the vehicle battery. Input voltage: 11–36 V. 12 V or 24 V is recommended.
2 (GND)	Black	Ground wire, connected to the negative charge of the vehicle battery or to the negative terminal.

3 (Input 1)	Grey	Digital input, (negative trigger by default) Connect to a door trigger signal cable to detect vehicle door status. (Most Chinese, Korean, and Japanese cars are negative edge-triggered.) The port can be set to positive trigger, AD input 2 (0–30 V), or remote control input.
4 (Input 2)	White	Digital input, positive trigger. The port can be set to negative trigger or AD input 3 (0–30 V). Connect to the vehicle ACC cable by default to detect the vehicle ACC status.
5 (AD input 1)	Blue	Analog input with 12-bit resolution and valid voltage 0–30 V. The port can be set to input 3 (positive/negative).
6 (Output 1)	Yellow	Valid: low level (0 V) Invalid: open collector Maximum voltage for output open collector (invalid): 60 V Maximum current for output low level (valid): 500 mA Set the PWM output (output time and adjustable pulse width). Connect to an external relay to remotely cut off the vehicle fuel cable or engine power supply.
7 (1-wire interface)	Green	Connect to the iButton and other devices supporting 1-wire protocol. The port can be set to negative input 4 or output 2 open collector.
8 (5 V output cable)	Pink	5 V output It can be connected to the power supply of a temperature sensor.

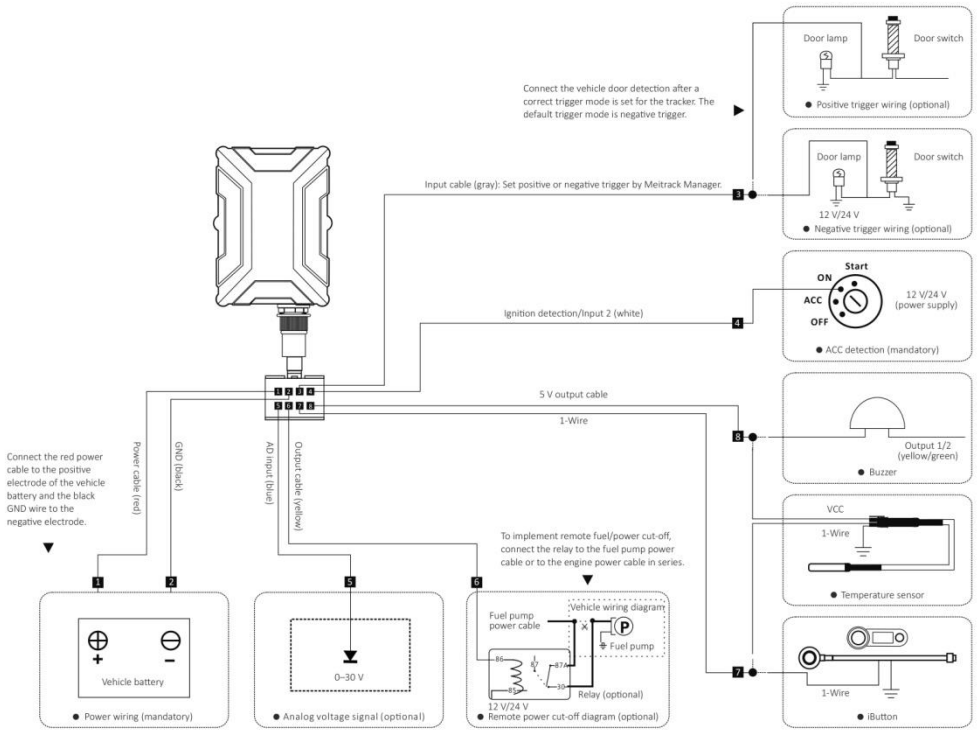
The I/O cable of T399G RS232 version is an 11-pin cable. Besides the above 8 pins, there are the following 3 pins.

9	10	11
GND	RS232-Tx	RS232-Rx

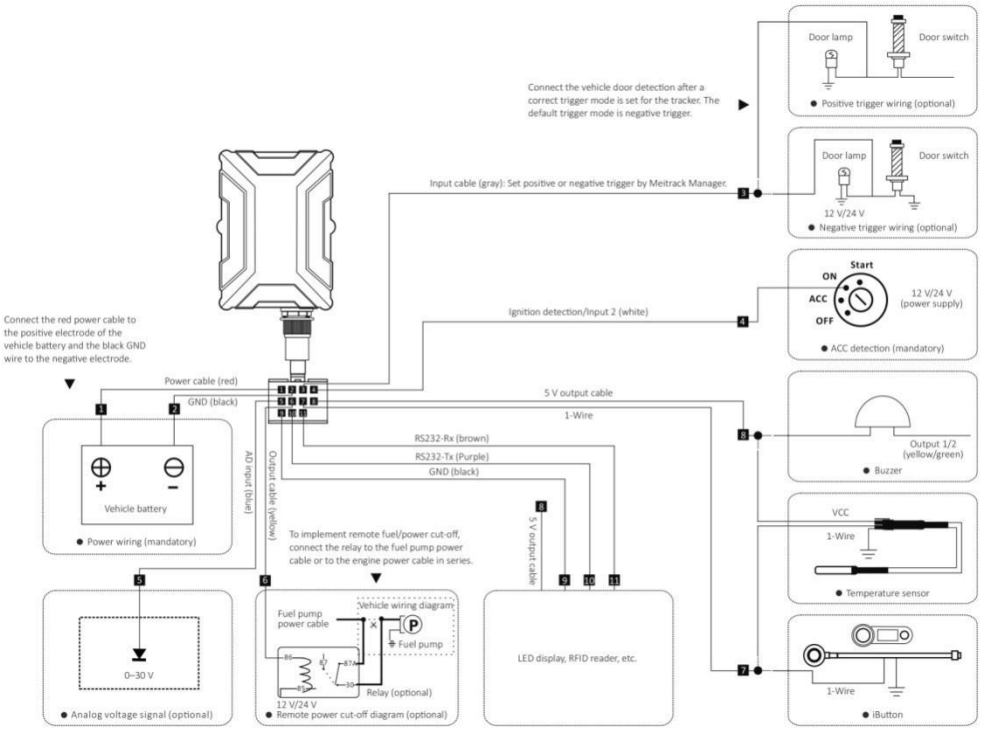
Pin Number	Color	Description
9 (GND)	Black	Ground wire
10(RS232-Tx)	Purple	The device sends data through RS232 port.
11(RS232-Rx)	Brown	The device receives data through RS232 port.

8.1.2 Wiring Diagram

T399G standard version:

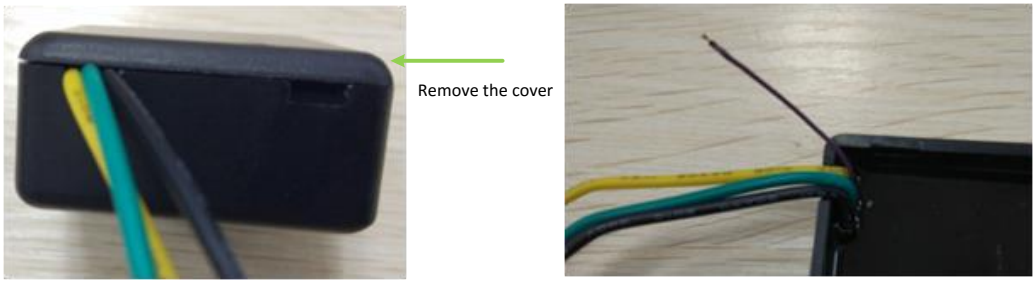


T399G RS232 version:



8.1.3 Setting Code Matching of the RF Remote Control

After the cover of the remote control receiver is removed, there will be a purple cable, as shown in the following figures.

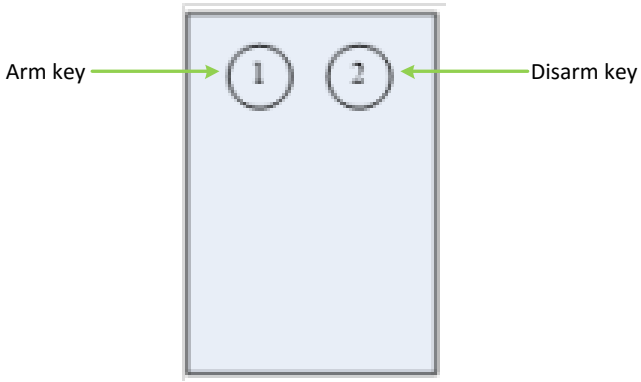


Cable Color	Description
Yellow	Connect to 5 V power supply.
Black	GND
Green	Remote control output cable Connect to input 1 (grey cable), which needs to be set to the remote control input.
Purple	Cable for code matching

Perform the following steps to set code matching:

1. Connect the remote control receiver's yellow cable to 5 V power supply and code matching cable (purple) to GND for more than 2 seconds.
2. Press any key of the remote control, and then press any key of the other remote control.
3. Release the code matching cable of the remote control receiver.
4. Enable the SMS/GPRS events of arming and disarming, and use the remote control to set arming or disarming. If an SMS or GPRS event is received, the code matching is set successfully.

Definitions of RF Remote Control Keys:



Function Key	Vehicle State	Operation	Description
1: Arm key	Disarming state	Press once	The buzzer will make a sound, indicating that the device is in arming state. In this way, if input 1 (vehicle door), input 2 (ACC) or a towing event is triggered, a vehicle theft alert (event 58) will be generated by SMS or GPRS and the device will dial the authorized phone numbers in sequence.

	Arming state	Press once	The buzzer will make a sound, indicating that the device is in arming state.
2: Disarm key	Arming state	Press once	The buzzer will make two sounds, indicating that the device is in disarming state.
	Disarming state	Press once	The buzzer will make two sounds, indicating that the device is in disarming state.

Note: The buzzer connects to the 1-Wire interface (green cable), which needs to be set to output 2.

8.2 Mounting the T399G

Mount the device in the vehicle by cable tie.

Note: Do not install it at a metal covered place.

If you have any questions, do not hesitate to email us at info@meitrack.com.