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MC Track V2.1

User manual

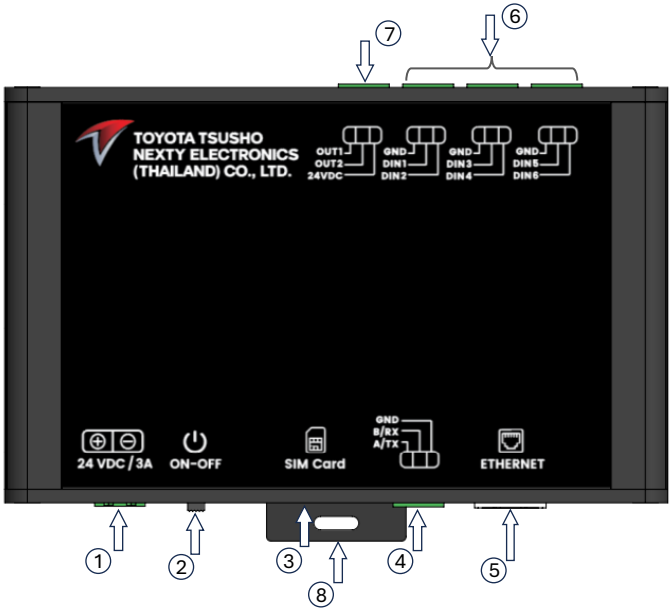
TOYOTA TSUSHO
NEXTY ELECTRONICS
(THAILAND) CO., LTD.

Before Using This Manual

This manual provides detailed information about the peripheral ports, dimensions, mounting, cabling, and specifications of the product. Additionally, it covers essential guidelines for setting up the device, including configuration, and initialization.

Before using this product, ensure you thoroughly read this manual as well as the manuals for any related devices to fully understand the handling and operation. Familiarize yourself with the installation procedures, safety precautions, and settings adjustments to optimize performance and prevent potential issues.

Peripheral ports and Parts



No.	Name
[1]	Power supply
[2]	Power switch ON/OFF
[3]	SIM card slot
[4]	RS232/RS485 connector
[5]	Ethernet connector
[6]	Input connector
[7]	Output connector
[8]	Lock installation din rail

General Hardware Specifications

This section defines the technical specifications, and functional capabilities of the hardware, providing essential details to ensure proper understanding and effective use of the product.

General Specifications

Item	Specification
Operation temperature	0C TO 60C
Power supply	24V
Average current	2A
Network support	LTE-FDD (B1/B3/B5/B7/B8/B20/B28) LTE-TDD (LTE-TDD B38/B40/B41) GSM (850/900/1800/1900 MHZ)
Back up data	Internal EEPROM 1Mbit (128k x 8)
Dimension	93 x 137 x 35 mm
Input type	Active Low ,24V

Module Functional List

Functional	Description
Digital input 6 pins	I/O for get signal from machine 24V
Input/Output RS232 * **	TX RX get signal from machine by protocol RS232
Input/Output Ethernet **	RJ45 get signal from machine by protocol Ethernet IP, Modbus TCP/IP
Output Wi-Fi	Output data to server via Wi-Fi by protocol MQTT/ HTTP
Output Cellular	Output data to server via 3G/LTE by protocol MQTT/ HTTP
Digital output 2 pins	Output signal to control other device 24V

∆ Remark:

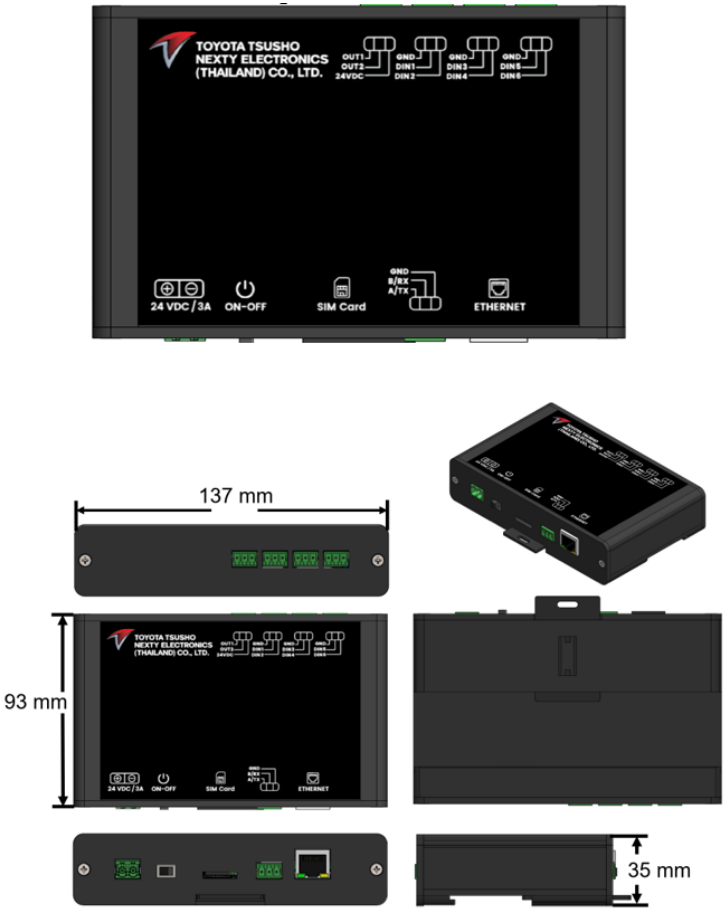
* Only one mode configuration can be selected: either Input/Output RS232 or Input/Output RS485.

** Only one mode configuration can be selected: either Input or Output.

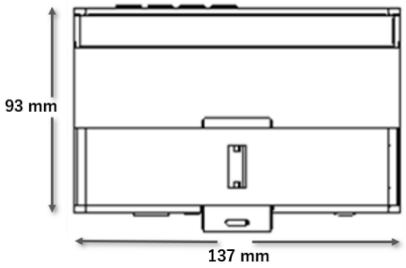
Hardware Installation

This section outlines the steps to connect components and mount the hardware securely for stable operation.

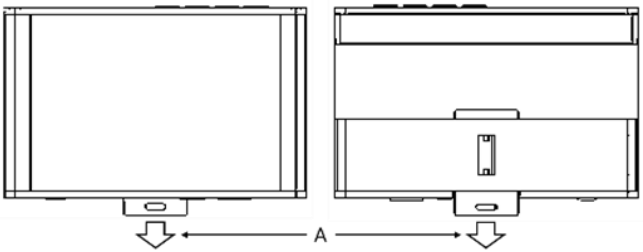
Hardware Dimension



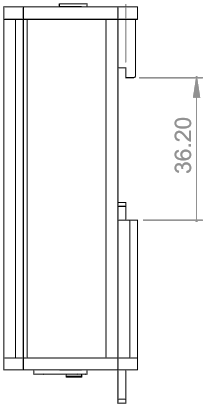
1) Connect the expansion boards and special adapters to the main unit.

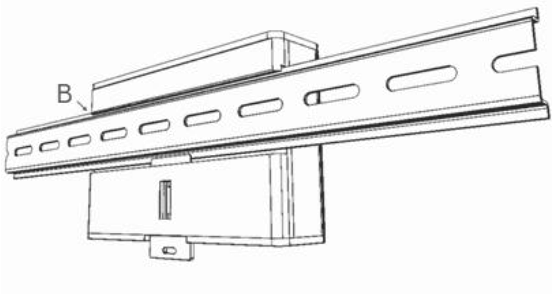


2) Push out all DIN rail mounting hooks (at point A)



3) Align the upper edge of the DIN rail mounting groove (at Point B) with the DIN rail and fit it securely.



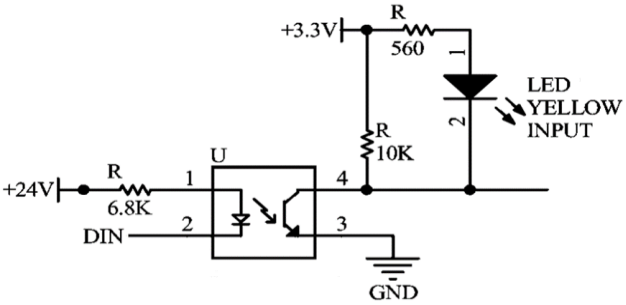


Multipurpose I/O

This section provides an overview of the supported input and output interfaces, detailing the wiring and configuration for digital I/O, serial communication (RS232/RS485), and network outputs, along with their configuration and wiring guidelines.

Input Digital I/O

- The Input Digital I/O on this device uses an active low circuit, designed for reliable operation and compatibility with external devices.

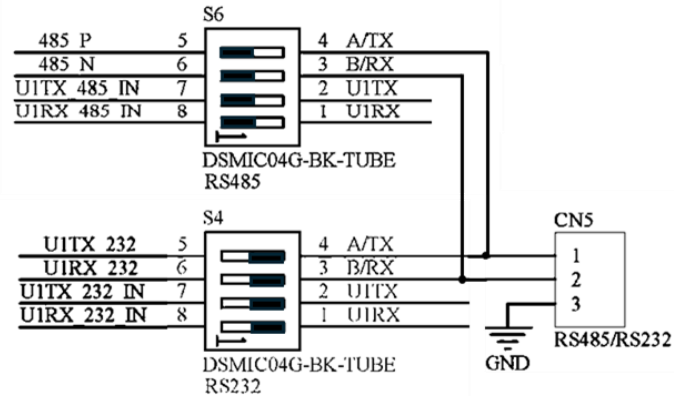


PIN	Description
PIN 1	Andon GREEN
PIN 2	Andon YELLOW
PIN 3	Andon RED
PIN 4	Counter
PIN 5	Reserve SETUP
PIN 6	Reserve QC

PIN details connections specific

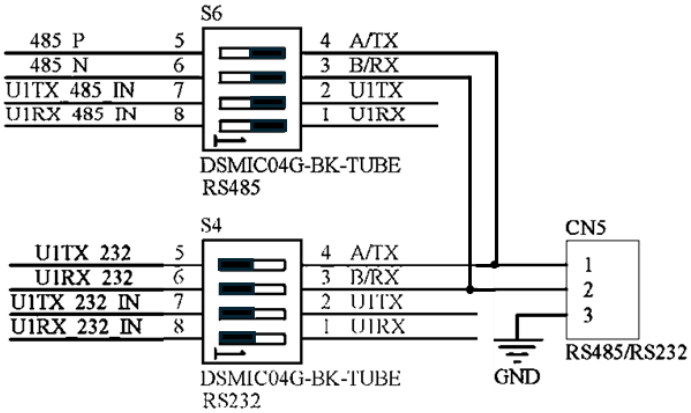
Input RS232/RS485

- The device utilizes a single connector for both RS232 and RS485 communication. To operate the device in RS232 mode, set switches S4 and S6 as shown in the figure below



Switch for RS232 connection

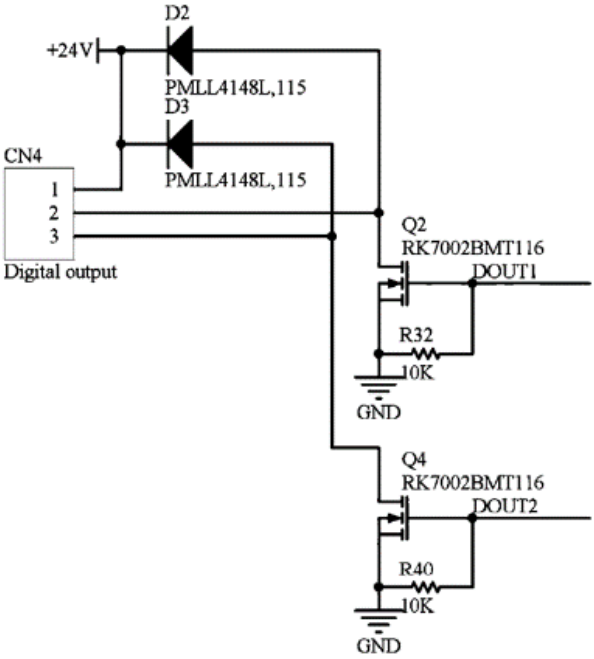
- When using the device in RS232 mode, switches S4 and S6 must be set as shown in the figure below.



Switch for RS485 connection

Output Digital I/O

- The output is 24V active when DOUT1 and DOUT2 are programmed to HIGH. The circuit is as shown in the figure below.



Output digital PIN details connections specific

Output Wi-Fi / Ethernet / Cellular

The device supports an output solution for sending data to the server in three modes. These modes can be configured in detail as explained in the **Connection Configuration** section.

General Firmware Specifications

This section describes the general structure of the firmware, its informational features, and the format of data packages used for communication and processing.

Generic specifications

Item	Specification
Interval time support signal from machine	At least 1 second
Wi-Fi names connect	SSID: MCTrack <MacAddress> Password: 12345678
Communication protocol to server	MQTT/HTTP
Wi-Fi Security	WPA2/ WPA3

Firmware information feature

Model	Feature
A	Input digital I/O – Output by Wi-Fi
B	Input digital I/O – Output by Ethernet TCP/IP
C	Input digital I/O – Output by Cellular
D	RS232 – Output by Wi-Fi
E	RS232 – Output by Ethernet TCP/IP
F	RS232 – Output by Cellular

Data package

```
{     “name” : “MQTT Control”,
      “Information” : {
      “PackageNo” : <PackageNo>
        “UnixTime” : <Time GMT+00>
        “Reserve” : <Reserve>
        “MacAddress” : <MacAddress>
        “DataType” : <DataType>
        “DataEvent” : <DataEvent>
      “RS232,RS485” : “”
        “FwVersion” : <Firmware Version>
      “IMSI” : <IMSI>
        “ICCID”: <ICCID>
        “IMEI” : <IMEI LTE>
        “DataPackageType” : <Package Type>
        “isBackup” : <is Backup Data>
        “CRC” : <CRC>
  }   }
```

Data	Description
<PackageNo>	No. of Package
<Time GMT+00>	Timestamp Unix @Response
<Reserve>	*Reserve*
<MacAddress>	MAC Address of device
*(1)<DataType>	*(4) Data Type
*(1)<DataEvent>	- For I/O (OUT01-OUT07) have 2 types [ON, OFF] - For *(5)Error code (OUT08) 3 digits (000-999) - For life death (OUT16) (ON, OFF)
*(2)<RS232,RS485>	Data from machine spare Maximum 256 byte
<Firmware Version.>	Firmware version
*(3)<IMSI>	SIM card declare provider
*(3)<ICCID>	SIM card information
*(3)<IMEI>	Declare LTE module
<Package type>	This package type is value 3
<is Backup Data>	Specific data come from backup
<CRC>	Cyclic redundancy check

∆ *Remark :*
*(1) Data show for firmware model A, B, C only
*(2) Data show for firmware model D, E, F only
*(3) Data show for firmware model C, F, I only

*(4) Data Type match with NIA platform description
OUT1: DIN1 for Green Andon signal
OUT2: DIN2 for Yellow Andon signal
OUT3: DIN3 for Red Andon signal
OUT4: DIN4 for Counter signal
OUT5: DIN5 for Reserve
OUT6: DIN6 for Reserve
OUT7: Available
OUT8: Error event
OUT16: Life death (every 10 sec.)

Network Setting and Device Configuration

This section provides details on configuring network settings and device parameters, including connection types, IP settings, and operational modes, to ensure seamless communication and optimal performance.

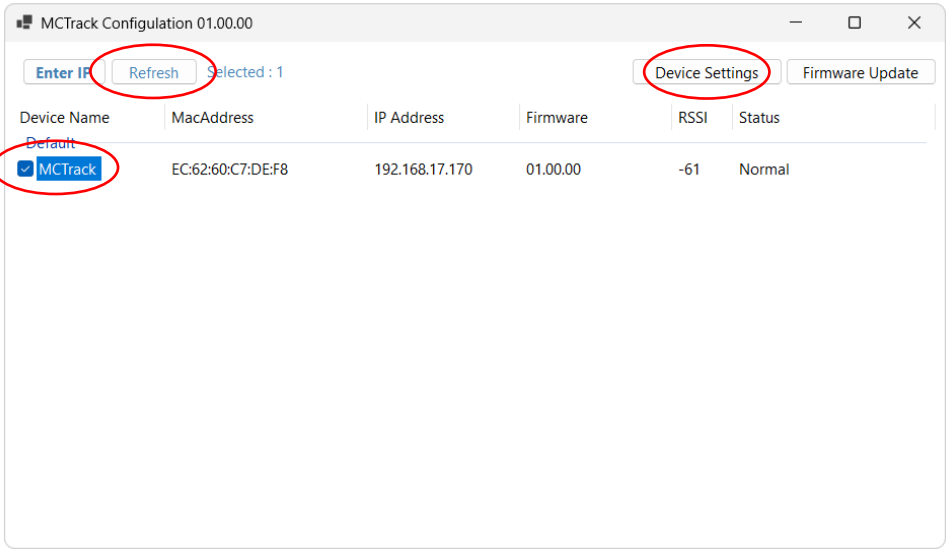
Accessing the Device

The device is configured as a Wi-Fi access point (AP) by default. Users can connect to its Wi-Fi network to access and configure the device.

On the first boot, the device will automatically generate an unsecured Wi-Fi network with the following name:

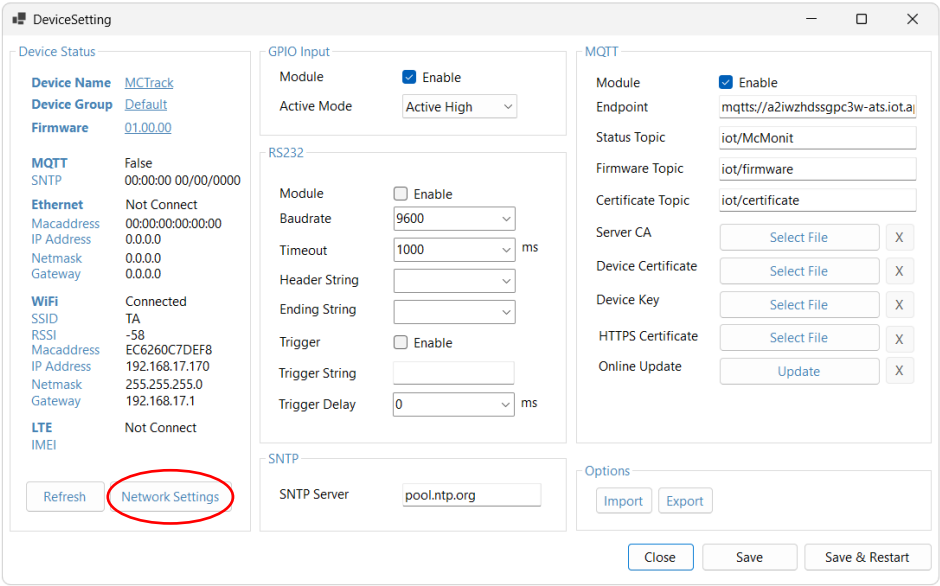
SSID: “MCTrack <MC Track MacAddress>”
Password: “12345678”

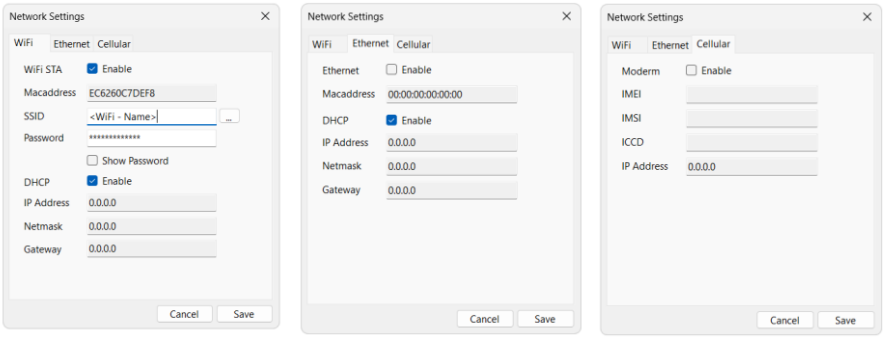
Users can connect to this Wi-Fi network using a laptop. The laptop will be assigned the default IP address 192.168.4.1, allowing users to log in and configure the device settings.



Change Network Settings

Users can view detailed network and device information and change the Wi-Fi connection to their preferred network.

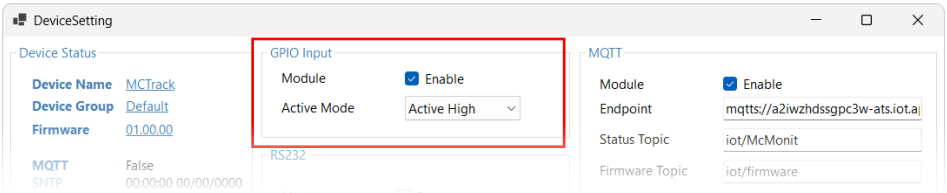




- Users can check box DHCP for more setting network manual IP configuration

Input Settings

To change input settings, configure the GPIO active mode, RS232 baud rate, and terminate string as needed.

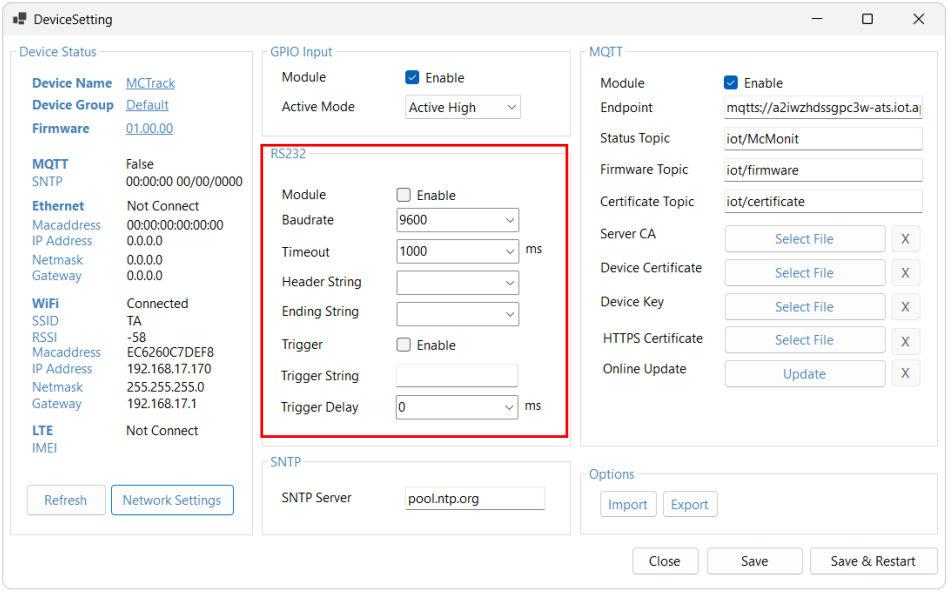


Module Enable: Enable or Disable GPIO Module

Active Mode

- Active High: MQTT GPIO status is ON when the GPIO logic voltage is high.
- Active Low: MQTT GPIO status is ON when the GPIO logic voltage is low.

RS232



Module Enable: Enable or Disable RS232 Module

Baudrate: Change baud rate in Bit Per Second unit support standard baudrate Minimum Value is 1200 and maximum value is 115200

Timeout: When RS232 is sent but no Terminate String data in the Serial Timeout Interval (ms) Default is 1000 ms Minimum Value is 100 and maximum value is 10000

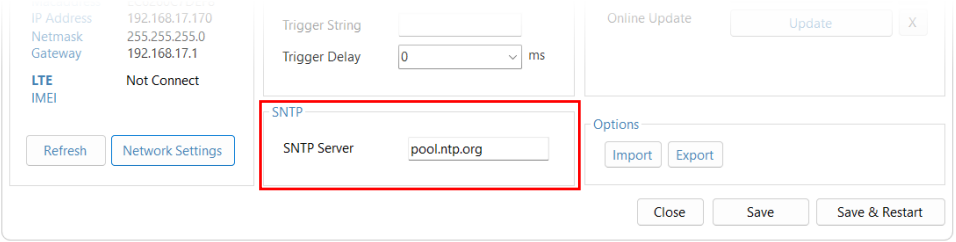
Header String: Detect Header String if input String is present the data awaiting in buffer are flushed and send to mqtt immediately and copy current data in the new buffer header maximum string length is 16

Ending String: When Detect terminate string it sends current buffer to mqtt and clear buffer for new data maximum string length is 16

Trigger: for send trigger string before start reading data if enable trigger string is send before reading data

Trigger String: String to send before reading data maximum string length 32

Trigger Delay: Time to Wait before sending new Trigger String in milliseconds minimum is 0 ms maximum is 1000 ms



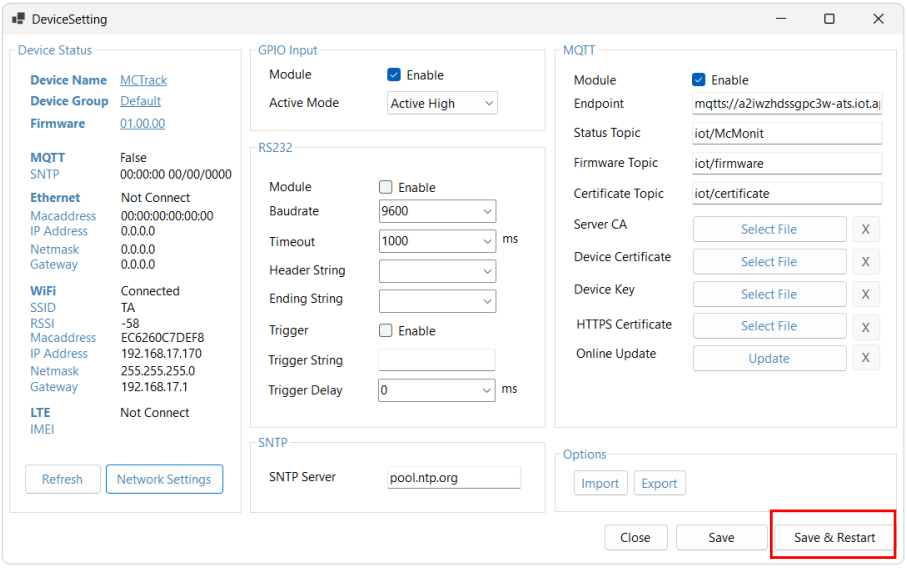
SNTP Server Settings

Users can set a custom NTP server for their local environment. After entering the address, click **Save & Restart** to apply changes. The updated time will appear in the **Current Time** field once synchronized.

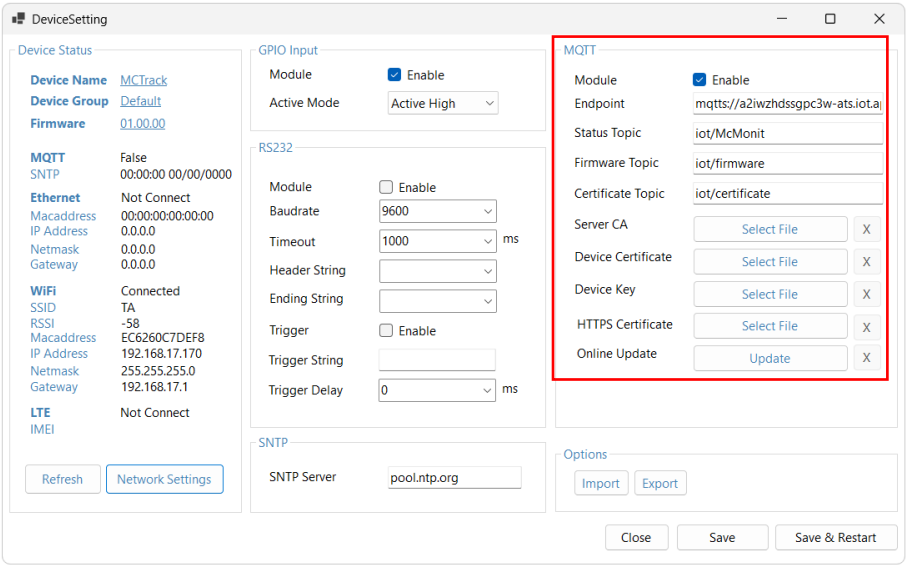
Other Available NTP Server:

- th.pool.ntp.org
- time.google.com
- time.nist.gov

To Update Setting and Restart Device use the **Save & Restart** button



Update Server Certificate



Change MQTT, status, firmware, certificate URL

The MQTT topic can manually change in this page by pasting the URL in textbox

Module Enable: Enable or Disable MQTT Module

Endpoint : MQTT Broker End Point
use mqtt:// for Non-Encryption MQTT
use mqtts:// for SSL MQTT the certificate field is required

Status Topic: MQTT topic for send GPIO, RS232, RS485 status

Firmware Topic: MQTT topic for receive firmware update

Certificate Topic: MQTT topic for receive certificate update

Update Device Certificate

The device sends data to the IoT Core service application at AWS that needs to update the certificate every year so after 1 year contact the supplier to update the certificate

1 Scroll to MQTT Section

2 Click Update in Topic “Auto Certificate Update”

The device will update all certificate required for sending data but if current certificate expired the auto update certificate will not work due to auto update certificate function must use current valid Certificate to obtain new certificate from server in this case user must manually update certificate by

3 Choose Certificate File (PEM Format)

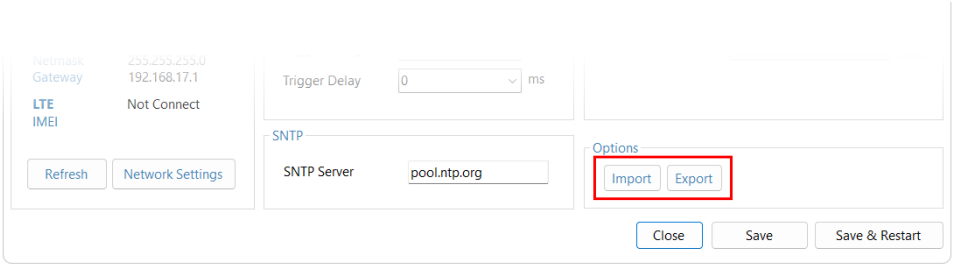
- **Server CA:** is used for server verification, ensuring secure communication between the MC Track and the MQTT broker.
- **Device Certificate:** certificate for the MC Track device to authenticate the device to the MQTT broker. It’s used in mutual TLS authentication.
- **Device Key:** is a secret key that's paired with the Device Certificate. It’s used to prove the identity of the MC Track device to the MQTT broker.
- **HTTPS Certificate:** Used for OTA Update

4 Click Save

5 Restart device by click Restart

Export / Import Settings

After completing the configuration of MC Track, users can export the settings to a JSON file on their computer using the Export Setting button. These settings can then be imported into another MC Track using the Import Setting button. Note that the exported settings file does not include certificates stored in the MC Track for security reasons.



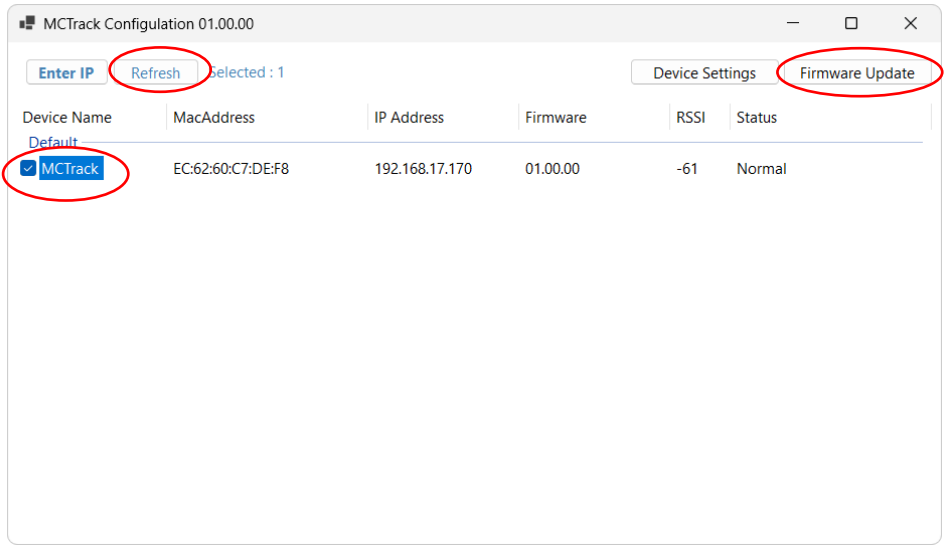
To include the certificate in the exported settings file, users must select the certificate before

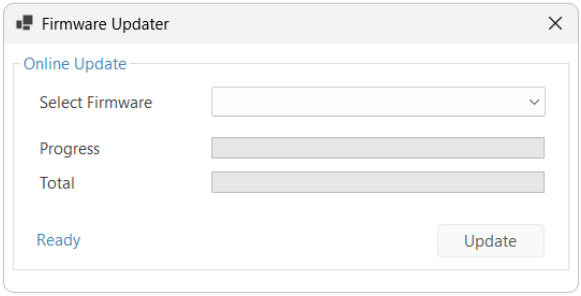
Example Export file format in JSON user can manually edit config file before import config file to another device

```
{
  "device_name": "MCTrack",
  "group_name": "Default",
  "gpio_enable": true,
  "gpio_active": 0,
  "rs232_enable": false,
  "rs232_baudrate": 9600,
  "rs232_timeout": 1000,
  "rs232_header": "",
  "rs232_endding": "",
  "rs232_trigger_enable": false,
  "rs232_trigger": "",
  "rs232_trigger_delay": 0,
  "mqtt_enable": true,
  "mqtt_endpoint": "mqtts://a2iwzhdssgpc3w-ats.iot.ap-southeast-1.amazonaws.com:8883",
  "mqtt_status_topic": "iot/McMonit",
  "mqtt_certificate_topic": "iot/certificate",
  "mqtt_firmware_topic": "iot/firmware",
  "sntp_server": "pool.ntp.org",
  "wifi_enable": true,
  "wifi_dhcp_enable": true,
  "wifi_ssid": "",
  "wifi_password": "",
  "wifi_set_ip_address": "0.0.0.0",
  "wifi_set_subnet_mask": "0.0.0.0",
  "wifi_set_gateway": "0.0.0.0",
  "eth_enable": false,
  "eth_dhcp_enable": true,
  "eth_set_ip_address": "0.0.0.0",
  "eth_set_subnet_mask": "0.0.0.0",
  "eth_set_gateway": "0.0.0.0",
  "lte_enable": false,
  "lte_imei": "",
  "lte_iccid": "",
  "lte_imsi": "",
  "lte_ip_address": "0.0.0.0"
}
```

Update Firmware OTA

To update the firmware over-the-air (OTA), contact the supplier to obtain the latest firmware version and instructions for performing the update. This ensures compatibility and reliable performance with the updated software.





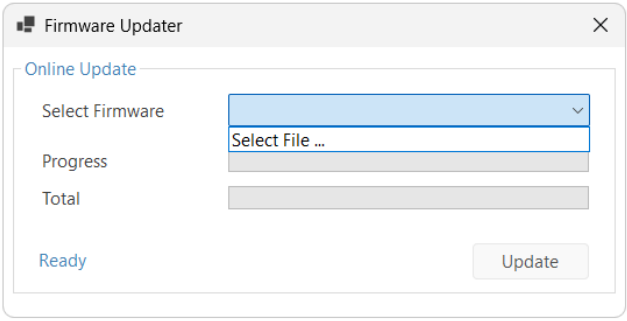
Online update

1 Select firmware version from drop down “Select Version”

2 Select firmware version is compatible for usage

3 Click update button

4 Wait until update done popup show if update fail popup show device will restart to old firmware



Offline update

1 Select .bin file in your pc to upload firmware by click “Select File…”

2 Click Update button

3 Wait until the update is done popup show if update fail popup show device will restart to old firmware

Contact Information

For any inquiries or support, please contact:

Toyota Tsusho NEXTY Electronics (Thailand) Co., Ltd.
540 Mercury Tower, 15-16 Floor, Phloen Chit Rd, Lumphini, Pathum Wan, Bangkok 10330, Thailand

Phone: 02-639-3500 Ext. 1616

Email: nbd_marketing@th.nexty-ele.com

TOYOTA TSUSHO NEXTY ELECTRONICS (THAILAND) CO., LTD.