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MC Track V2.1 User manual





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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.



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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

ltem	Specification
Operation temperature	0C TO 60C
Power supply	24V
Average current	2A
	LTE-FDD (B1/B3/B5/B7/B8/B20/B28)
Network support	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.

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.



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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 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</macaddress>
Communication protocol to server	MQTT/HTTP
Wi-Fi Security	WPA2/ WPA3

Firmware information feature

Model	Feature
А	Input digital I/O – Output by Wi-Fi
В	Input digital I/O – Output by Ethernet TCP/IP
С	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></packageno>	No. of Package
<time gmt+00=""></time>	Timestamp Unix @Response
<reserve></reserve>	Reserve
<macaddress></macaddress>	MAC Address of device
*(1) <datatype></datatype>	*(4) Data Type
*(1) <dataevent></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></rs232,rs485>	Data from machine spare Maximum 256 byte
<firmware version.=""></firmware>	Firmware version
*(3) <imsi></imsi>	SIM card declare provider
*(3) <iccid></iccid>	SIM card information
*(3) <imei></imei>	Declare LTE module
<package type=""></package>	This package type is value 3
<is backup="" data=""></is>	Specific data come from backup
<crc></crc>	Cyclic redundancy check

 \triangle 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.

	MCTrack Configul	ation 01.00.00				_		×
	Enter IF Refre	esh Selected : 1			evice Set	tings Firn	nware Upd	ate
	Device Name	MacAddress	IP Address	Firmware	RSSI	Status		
\langle	MCTrack	EC:62:60:C7:DE:F8	192.168.17.170	01.00.00	-61	Normal		

Change Network Settings

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

		GPIO Input			MQTT				
evice Name	MCTrack	Module	~	Enable	Mod	ule	Enable		
evice Group	Default	Active M	ode A	Active High \sim	End	point	mqtts://a2iwa	hdssgpc3w-	ats.iot.
irmware	01.00.00				State	us Topic	iot/McMonit		
IQTT	False	RS232			Firm	ware Topic	iot/firmware		
NTP	00:00:00 00/00/0000	Module		Enable	Cert	ficate Tonic	iot/certificate		
thernet lacaddress	Not Connect 00:00:00:00:00:00	Baudrate	96	00 ~	Certi		lotycertificate		_
Address	0.0.0.0	Timeout	10	00 v ms	Serv	er CA	Selec	t File	X
letmask ateway	0.0.0.0	Header S	String	~	Devi	ce Certificate	Selec	t File	X
ViFi	Connected	Ending St	tring		Devi	ce Key	Selec	t File	x
SID SSI	TA -58	Ending 5		~	нтт	PS Certificate	Selec	-t Filo	
lacaddress	EC6260C7DEF8	Irigger		Enable	Onli	ne Undate	Seree		
letmask	255.255.255.0	Trigger S	tring		Unin	ne opuate	Upo	date	X
ateway	192.168.17.1	Trigger D	elay 0	~ ms					
TE	Not Connect								
		- SNTD							
		SINT			- Option	IS			
Refresh	Network Settings	SNTP Ser	ver p	ool.ntp.org	Option	IS			
Refresh	Network Settings	SNTP Ser	ver p	ool.ntp.org	Option	bort Export			
Refresh	Network Settings	SNTP Ser	ver p	ool.ntp.org	Option	bort Export			
Refresh	Network Settings	SNTP Ser	ver p	ool.ntp.org		ns port Export Close	Save	Save &	Restar
Refresh (Network Settings	SNTP Ser	ver p	s	Option Imp	IS Export Export Close	Save	Save &	Restar
Refresh (Network Setting WiFi Ethern	Network Settings	SNTP Ser	Ver p Network Setting WiFi Ethern	s et Celular	Option Imp	IS DOOT Export Close Network Setting WiFi Ether	Save s set Cellular	Save &	Restar
Refresh Network Setting WiFi Ethern WiFi STA Macaddress	Network Settings	SNTP Ser	Network Setting WiFi Ethernet Macaddress	s et Celular Enable	Coption Imp	IS Close Network Setting WiFi Ethern Moderm INEL	Save s Let Cellular Enable	Save &	Restar
Refresh Network Setting WiFi Ethern WiFi STA Macaddress SSID	Network Settings	SNTP Ser	Network Setting WiFi Ethernet Macaddress DH/CP	s et Cellular Enable 0000000000	 Option Imp 	IS Close WiFi Ethern Moderm IMEI IMSI	Save	Save &	Restar
Refresh (Network Setting WiFi Ethern WiFi STA Macaddress SSID Password	Network Settings	SNTP Ser	Network Setting WiFi Ethernet Macaddress DHCP IP Address	s et Cellular Enable 00.00000000 Enable 00.000 000	Coption Imp	IS Export Export Close Network Setting WiFi Ethern Moderm IMEI IMSI ICD	Save	Save &	Resta
Refresh Network Setting WiFi Ethern Macaddress SSID Password	Network Settings	SNTP Ser	Network Setting Wifi Ethern Ethernet Macadress DHCP IP Address Netmask	s et Cellular Cellular Cellular Enable 00.00000000 Color Col	x	IS Export Export Close Network Setting WiFi Ether Moderm IMEI IMSI ICCD IP Address	Save S s s cellular Enable 0.0.0.0	Save &	Resta
Refresh Network Setting WiFi Ethern WiFi STA Macadress SSID Password DHCP	Network Settings	SNTP Ser	Network Setting Wifi Ethern Ethernet Macadress DHCP IP Address Netmask Gateway	s et Cellular Enable 00.000 0.0.0 0.0.0 0.0.0	×	IS Export Export Close Network Setting WiFi Ether Moderm IMEI IMSI ICCD IP Address	Save S s s tet Cellular Enable 0.0.0.0	Save &	Restar
Refresh Wifi Ethern Wifi StA Macaddress SSID Password DHCP IP Address	Network Settings	SNTP Ser	Network Setting Wifi Ethernet Macadress DHCP IP Address Netmask Gateway	s et Cellular Enable 00.000000000 Enable 00.000 0.0.00 0.0.00 0.0.00	 Option Imp 	IS Export Export Close Network Setting WiFi Ether Moderm IMEI IMSI ICCD IP Address	Save	Save &	Restar
Network Setting WiFi Ethern WiFi STA Macadress SSID Pasword DHCP IP Address Netmask Gateway	Network Settings	SNTP Ser	Network Setting Wifi Ethernet Macadress DHCP IP Address Netmask Gateway	s et Cellular Enable 00.000 0.0.00 0.0.00 0.0.00 0.0.00	×	IS Export Export Close Network Setting WiFi Ether Moderm IMEI IMSI ICCD IP Address	Save	Save &	Restar

• 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.

DeviceSetting					-		×
Device Status		GPIO Input		MQTT			
Device Name	MCTrack	Module	🗹 Enable	Module	Enable		
Device Group	<u>Default</u>	Active Mode	Active High ~	Endpoint	mqtts://a2iwzhdssgpc	:3w-ats.i	iot.a
Firmware	<u>01.00.00</u>			Status Topic	iot/McMonit		
MQTT SNTP	False	- RS232		Firmware Topic	iot/firmware		

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.

<u>RS232</u>

DeviceSetting					_	
Device Status Device Status Device Name Device Group Firmware MQTT SNTP Ethernet Macaddress NAcdress	MCTrack Default 01.00.00 False 00:00:00 00/00/0000 Not Connect 00:00:00:00:00:00	GPIO Input Module Active Mode RS232 Module Baudrate	Enable Active High Enable 9600	MQTT Module Endpoint Status Topic Firmware Topic Certificate Topic Server CA	Enable mqtts://a2iwzhdssgpc iot/McMonit iot/firmware iot/certificate	3w-ats.iot.a
P Address Netmask Gateway WiFi SSID RSSI Macaddress IP Address Netmask Gateway LTE	0.0.0 0.0.0 0.0.0 Connected TA -58 EC6260C7DEF8 192.168.17.170 255.255.255.0 192.168.17.1 Not Connect	Timeout Header String Ending String Trigger Trigger String Trigger Delay	1000 ~ ms ~ ~ Enable 0 ~ ms	Device Certificate Device Key HTTPS Certificate Online Update	Select File Select File Select File Update	
Refresh	Network Settings	SNTP SNTP Server	pool.ntp.org	Options Import Export Close	Save Sav	e & Restart

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

IP Address Netmask Gateway	192.168.17.170 255.255.255.0 192.168.17.1 Not Connect	Trigger String Trigger Delay	0 ~ ms	Online Update	Update
IMEI Refresh	Network Settings	SNTP Server	pool.ntp.org	- Options Import Export	
		-		Close	Save & Restart

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

svice Status		GPIO Input		MQT		
Device Name	MCTrack	Module	Enable	Module	🗹 Enable	
Device Group	Default	Active Mode	Active High \sim	Endpoint	mqtts://a2iwzhdssgpc3w	-ats.iot.a
Firmware	<u>01.00.00</u>			Status Topic	iot/McMonit	
MQTT SNTP	False 00:00:00 00/00/0000	- RS232		Firmware Topic	iot/firmware	
Ethernet	Not Connect	Module	Enable	Certificate Topic	iot/certificate	
Macaddress IP Address	00:00:00:00:00:00 0.0.0.0	Baudrate	9600 ~ ms	Server CA	Select File	x
Netmask Gateway	0.0.0.0 0.0.0.0	Header String	· · · · · · · · · · · · · · · · · · ·	Device Certificate	Select File	X
WiFi SSID	Connected TA	Ending String		Device Key	Select File	X
RSSI Macaddress	-58 EC6260C7DEF8	Trigger	Enable	HTTPS Certificate	Select File	Х
IP Address Netmask	192.168.17.170 255.255.255.0	Trigger String		Online Update	Update	X
Gateway	192.168.17.1	Trigger Delay	0 ~ ms			
LTE IMEI	Not Connect					
Refresh	Network Settings	SNTP Server	pool.ntp.org	Options Import Export		

Update Server Certificate

DeviceSetting					- (- X
Device Status		GPIO Input		- MQTT		
Device Name	MCTrack	Module	🗹 Enable	Module	🗹 Enable	
Device Group	<u>Default</u>	Active Mode	Active High \sim	Endpoint	mqtts://a2iwzhdssgpc3v	v-ats.iot.a _l
Firmware	<u>01.00.00</u>			Status Topic	iot/McMonit	
MQTT SNTP	MQTT False	~ RS232		Firmware Topic	iot/firmware	
Ethernet	Not Connect	Module	Enable	Certificate Topic	iot/certificate	
Macaddress IP Address	00:00:00:00:00:00 0.0.0.0	Baudrate	9600 ~ 1000 ~ ms	Server CA	Select File	x
Netmask Gateway	0.0.0.0 0.0.0.0	Header String	·····	Device Certificate	Select File	x
WiFi SSID	Connected TA	Ending String		Device Key	Select File	×
RSSI Macaddress	-58 EC6260C7DEF8	Trigger	Enable	HTTPS Certificate	Select File	x
IP Address Netmask	192.168.17.170 255.255.255.0	Trigger String		Online Update	Update	x
Gateway	192.168.17.1	Trigger Delay	0 ~ ms			
LTE IMEI	Not Connect					
		SNTP		Options		
Refresh	Network Settings	SNTP Server	pool.ntp.org	Import Export		
				Close	Save Save a	& Restart

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.

Netmask Gateway LTE	255.255.255.0 192.168.17.1 Not Connect	Trigger Delay	0 v ms	
IMEI Refresh	Network Settings	SNTP SNTP Server	pool.ntp.org	Options Import Export
				Close Save & Restart

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

1	
2	"device name": "MCTrack".
3	"group name": "Default".
4	"gpio enable": true.
5	"gpio active": 0.
6	"rs232 enable": false.
7	"rs232 baudrate": 9600.
8	"rs232 timeout": 1000,
9	"rs232 header": "",
10	"rs232 endding": "",
11	"rs232 trigger enable": false,
12	"rs232_trigger": "",
13	"rs232_trigger_delay": 0,
14	"mqtt_enable": true,
15	"mqtt_endpoint": "mqtts://a2iwzhdssgpc3w-ats.iot.ap-southeast-1.amazonaws.com:8883",
16	<pre>"mqtt_status_topic": "iot/McMonit",</pre>
17	<pre>"mqtt_certificate_topic": "iot/certificate",</pre>
18	<pre>"mqtt_firmware_topic": "iot/firmware",</pre>
19	"sntp_server": "pool.ntp.org",
20	"wifi_enable": true,
21	"wifi_dhcp_enable": true,
22	"wifi_ssid": "",
23	"wifi_password": "",
24	"wifi_set_ip_address": "0.0.0.0",
25	"wifi_set_subnet_mask": "0.0.0.0",
26	"wifi_set_gateway": "0.0.0.0",
27	"eth_enable": false,
28	"eth_dhcp_enable": true,
29	"eth_set_ip_address": "0.0.0.0",
30	"eth_set_subnet_mask": "0.0.0.0",
31	"eth_set_gateway": "0.0.0.0",
32	"lte_enable": false,
33	"lte_imei": "",
34	"lte_iccid": "",
35	"lte_imsi": "",
36	"lte_ip_address": "0.0.0.0"
37	}

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.

MCTrack Config	gulation 01.00.00				—		×
Enter IP R	efresh Selected : 1			Device Settings	Firr	nware Up	date
Device Name	MacAddress	IP Address	Firmware	RSSI Sta	tus		
MCTrack	EC:62:60:C7:DE:F8	192.168.17.170	01.00.00	-61 No	rmal		

Firmware Updater	×	
Online Update		
Select Firmware	v	
Progress		
Total		
Ready	Update	

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

Firmware Updater		×
Online Update		
Select Firmware		\sim
	Select File	
Progress		
Total		
Ready	Updat	e

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

Section 2-639-3500 Ext. 1616

Email: <u>nbd_marketing@th.nexty-ele.com</u>



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