



Cassia M2000 User Manual

Official Version
2024/08/29

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1. Overview

M2000 is a compact Bluetooth gateway that supports 4G and Wi-Fi connectivity. It is easy to install and use and has excellent Bluetooth performance. Additionally, it is cost-effective, stable, secure, and scalable. M2000 is part of Cassia Network's enterprise-level Bluetooth gateways and can be managed through the Cassia Network's Access Controller (AC). M2000 is ideal for situations that require mobility and rapid deployment, but do not need high Bluetooth device density. It is commonly used for monitoring mobile vital signs, remote healthcare at home, and for monitoring vehicle assets. Moreover, M2000 has robust applications in supply chain management, as well as for people and asset tracking on campuses and medical institutions.

Notes for the M2000 official version:

- SIM card is not included in the M2000.
- The cellular connection with NB-IOT has very limited bandwidth (<5Kbps) and high network latency (1.6s-10s), so M2000 firmware will need to be further customized in the future to work in this case.
- AC software needs to be upgraded to the following Cassia-AC-2.2.0.24 version to support M2000.
- AC software and M2000 firmware are available at: <https://www.cassianetworks.com/support/knowledge-base/>
- M2000 GA firmware cannot be upgraded on M2000 beta hardware.

2. Local Console

2.1 Login

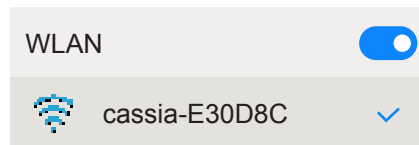
01. Please record the last six digits of the MAC address on the back of the M2000 chassis.



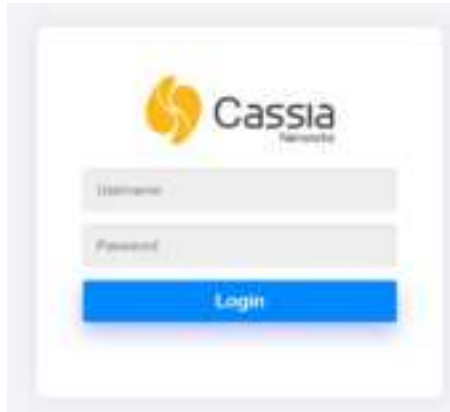
02. Connect to the M2000's Wi-Fi hotspot using a computer or mobile phone.

- The hotspot's name is cassia-xxxxxx.
- The password is the same as the name, cassia-xxxxxx
xxxxxx is the last six digits of the M2000's MAC address.

For instance, if the MAC address of an M2000 is CC:1B:E0:E3:0D:8C, both the Wi-Fi hotspot name and password are cassia-E30D8C.



03. After connecting to the M2000's Wi-Fi hotspot, open a web browser and enter 192.168.40.1 into the address bar. You will be prompted to enter a username and password. The default username is admin, and the password is admin.



2.2 Status

01. Upon successful login, you will be able to view the basic M2000 information on the 'Status' page, including its MAC address and the IP address.



2.3 Configuration

2.3.1 Using 4G to connect to the network

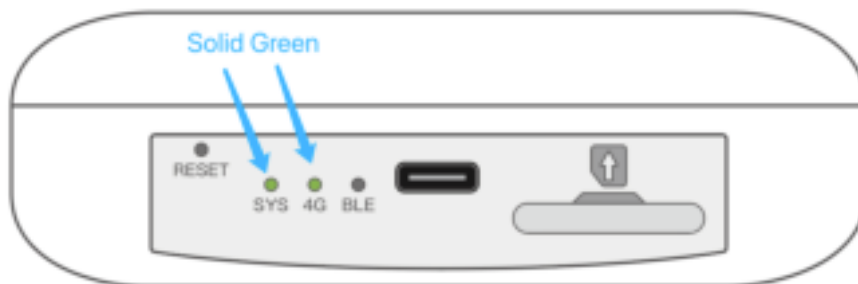
01. Insert the Micro SIM card into the M2000.

Refer to the diagram below. Make sure that the beveled corner of the SIM card is facing the lower left corner.



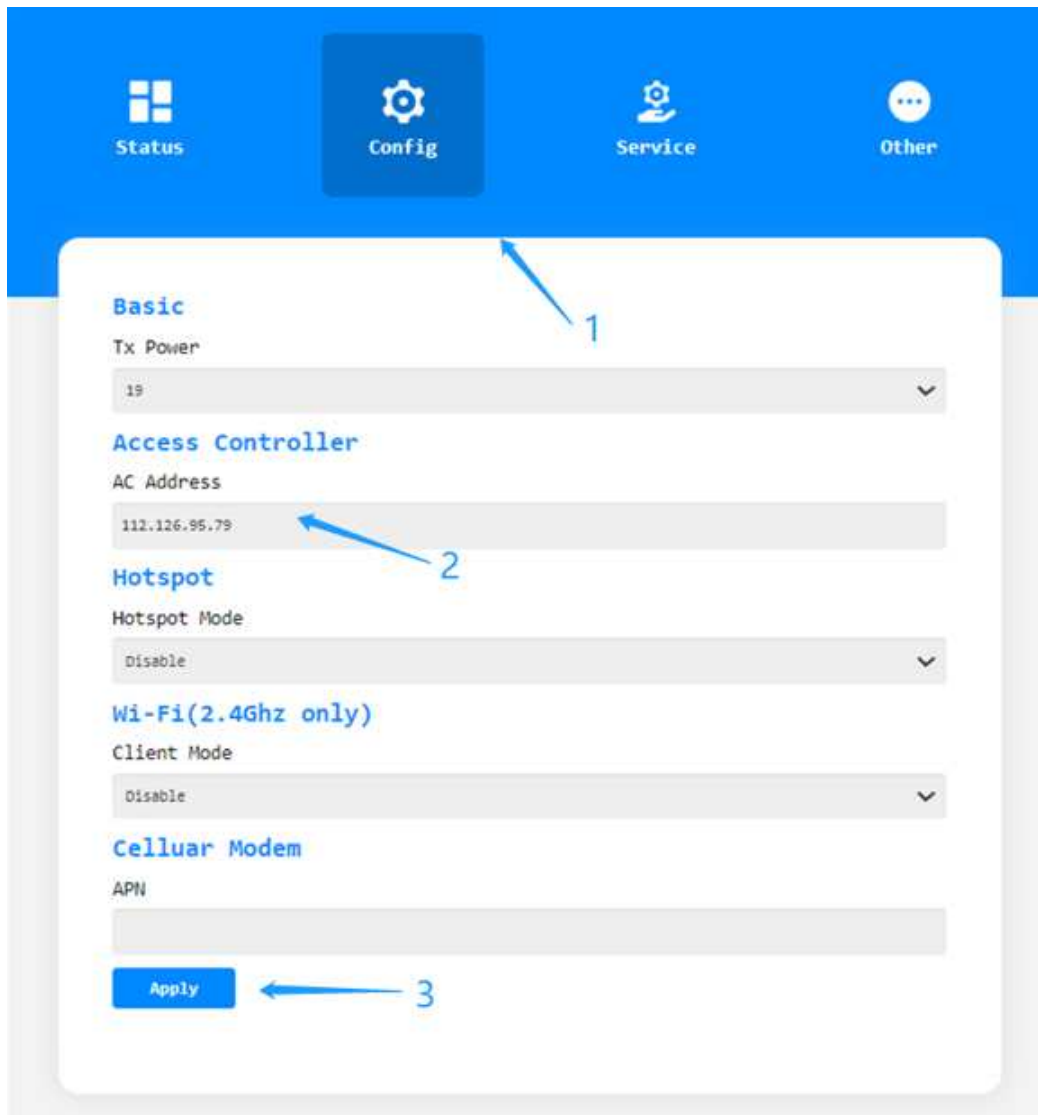
02. Connect the USB power supply to the M2000.

After 30 seconds, the M2000 will finish booting up and connect to the carrier's 4G network. The SYS light and 4G light will both turn solid.



03. To connect with the AC server, go to the Configuration page on the M2000 local console.

Enter the AC address (only AC version Cassia-AC-2.2.0.24 supports M2000) and click Apply. The AC version is available at: <https://www.cassianetworks.com/support/knowledge-base/ac-server-software/>



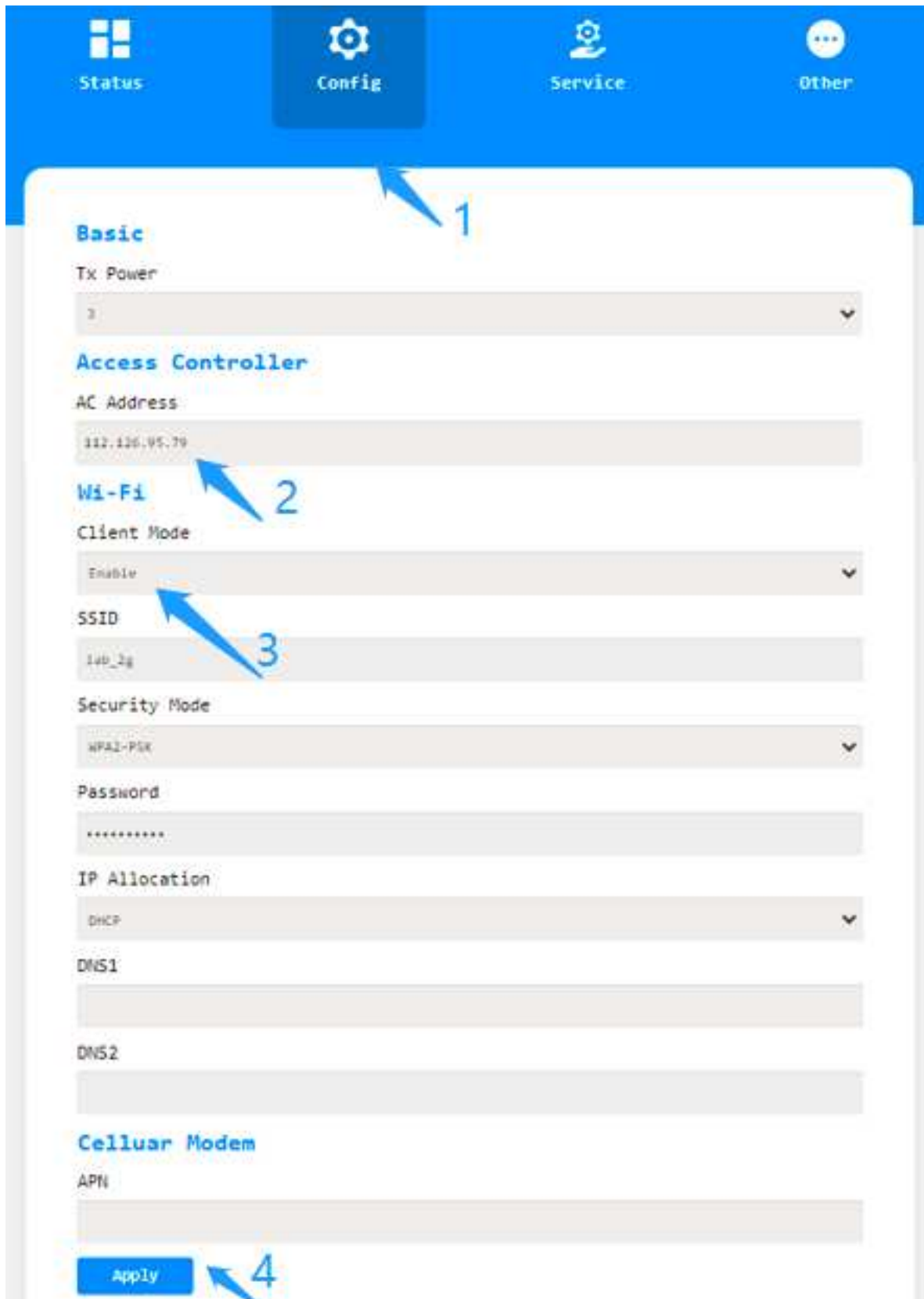
Please get in touch with your AC administrator to check if the M2000 is showing online on the AC.

Notes:

- When inserting the SIM card, make sure that the beveled corner of the SIM card is facing the lower left corner, as shown in the diagram above.
- When inserting the SIM card, push it in with your fingernail or the tip of a pen until it is held in place by the slot.
- When removing the SIM card, push it in with your fingernail or the tip of a pen until it pops out.

2.3.2 Using Wi-Fi to connect to the network

01. Click on the Configuration page first, enable Wi-Fi client mode, and complete SSID and other settings based on your Wi-Fi router information. For example, set the Security Mode to WPA2-PSK, enter the password, and click save.
02. To connect with the AC server, enter the AC address (only the 2.2.0 AC version supports M2000) and click Apply.



The screenshot shows the Cassia Networks configuration interface. At the top, there is a blue navigation bar with four tabs: Status, Config, Service, and Other. The Config tab is selected. Below the navigation bar, the 'Basic' configuration section is visible. It contains several fields: 'Tx Power' (set to 3), 'Access Controller' (set to 112.126.95.79), 'Wi-Fi' (set to Enable), 'SSID' (set to 14b_2g), 'Security Mode' (set to WPA2-PSK), 'Password' (masked with dots), 'IP Allocation' (set to DHCP), 'DNS1', 'DNS2', and 'Cellular Modem' (set to APN). Four blue arrows with numbers 1 through 4 point to specific elements: Arrow 1 points to the Config tab, Arrow 2 points to the Wi-Fi section, Arrow 3 points to the SSID field, and Arrow 4 points to the Apply button at the bottom.

Status **Config** **Service** **Other**

Basic

Tx Power
3

Access Controller

AC Address
112.126.95.79

Wi-Fi

Client Mode
Enable

SSID
14b_2g

Security Mode
WPA2-PSK

Password

IP Allocation
DHCP

DNS1

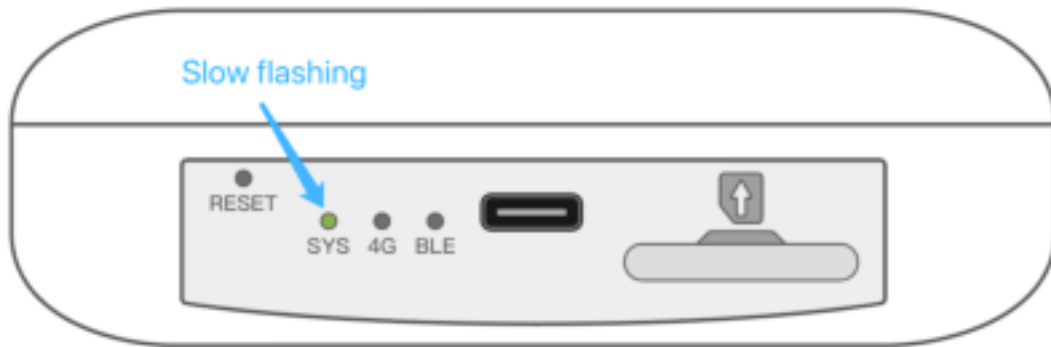
DNS2

Cellular Modem

APN

Apply

After 30 seconds, the M2000 will finish booting up and connect to the AC server.
Please get in touch with your AC administrator to check if the M2000 is showing online on the AC.



Notes:

- M2000 can only connect to the internet through the 2.4Ghz Wi-Fi router and does not support 5Ghz Wi-Fi router.

2.4 Service

The M2000 MQTT Bypass Service can route BLE advertising packets directly to the MQTT server by configuring MQTT and scanning setting information in the Service tab.

Status

Config

Service

Other

Overall

Service Access

mqtt

Data Push Interval(ms)

100

Data Cache Size(packets)

20

MQTT

Host

Port

Connection Type

long

User Name

Password

Topic

QoS

At most once (0)

Encryption Mode

None

Scan Setting

Scan Mode

off

Name Filter

e.g. cassia_np,cassia*,*cassia

MAC Filter

e.g. CC:18:18:18:00:01,CC:18:18:18:00:02

UUID Filter

e.g. 0201,0202

RSSI Filter

e.g. -60

Value Filter

offset

data

Duplicates Filter

e.g. 0,1,>=1000

Include Timestamp

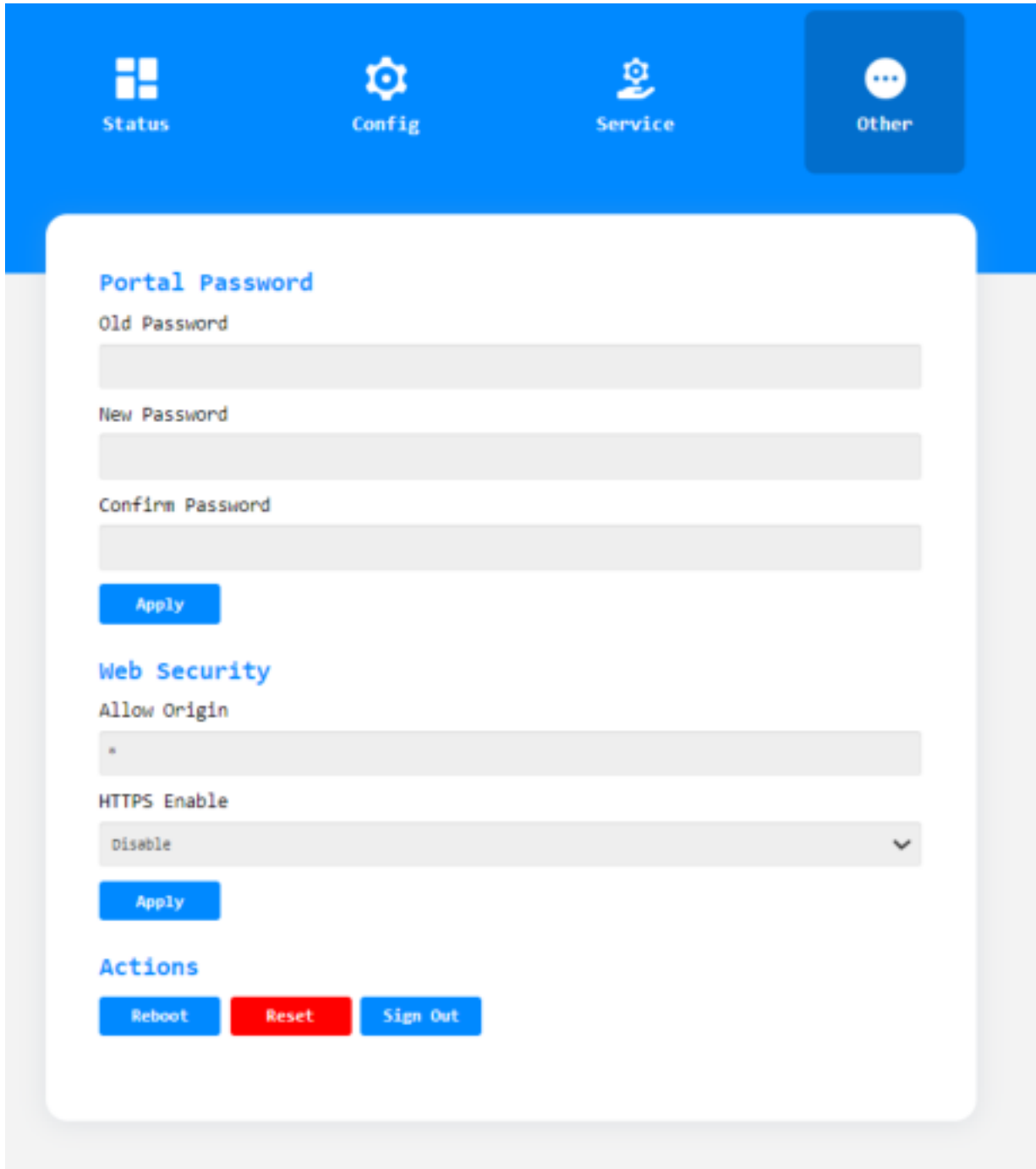
No

Apply

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2.5 Others

Users can perform various operations on the “Others” page, such as modifying their login password, rebooting, resetting, and signing out.



The screenshot displays the 'Others' page of the Cassia Networks interface. The top navigation bar is blue with four icons: a grid for 'Status', a gear for 'Config', a gear with a hand for 'Service', and a circle with three dots for 'Other'. The 'Other' tab is selected and highlighted in a darker blue. Below the navigation bar, the main content area is white. It features three sections: 'Portal Password' with three input fields for 'Old Password', 'New Password', and 'Confirm Password', followed by a blue 'Apply' button; 'Web Security' with an 'Allow Origin' input field containing an asterisk, an 'HTTPS Enable' dropdown menu set to 'Disable', and another blue 'Apply' button; and 'Actions' with three buttons: 'Reboot' (blue), 'Reset' (red), and 'Sign Out' (blue).

2.6 Parameter Description

01. Status Tab (Not Changeable)

meter	Description
Model	M2000
MAC	Gateway MAC Address - printed on the bottom of the M2000
Wi-Fi IP	Gateway IP address for Wi-Fi connection
Cellular IP	Gateway IP address for cellular connection
Firmware Version	Firmware version
Uptime	The gateway up time in hours since the last reboot
AC Online Time	The time of the gateway connected with the AC. If not connected, it shows offline.
AC Server Address	AC Server Address

02. Config Tab

Parameter	Description
Tx Power	Transmit power for Bluetooth. The default value is 19dbm (or 8dbm for Japan). To change this, follow local regulations for the maximum transmit power for 2.4 GHz devices.
AC Server Address	AC Server IP address or domain name. Note: Remove http:// or https:// header or port number
Country Code	Country code configuration for the Wi-Fi function. The default value is US. This option can only be set from the AC server by the administrator.
Client Mode	Wi-Fi Client Enable (default) or Disable
SSID	SSID of Wi-Fi AP
Security Mode	Wi-Fi Security Mode: None (no password or encryption, default value), WPA2-PSK WPA[TKIP]+WPA2[AES]
Password	The password of Wi-Fi AP's SSID.
IP Allocation	DHCP (default) or Static IP
IP	Static IP address
Netmask	Static IP network mask
Gateway	Static IP network gateway
DNS1	DNS server address 1
DNS2	DNS server address 2

3. AC Operations

3.1 Check M2000 information details

Cassia IoT Access Controller Cassia AC A1100

Refresh Rate: 20s

Discover Add

#	Group	Gateway Name	Status	Public IP	Private IP	MAC Address	Model	Version	Online Time	Container Status
0	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.133	CC:18:12:00:18:13	M2000	2.2.0.3402222249	2h 29m 29s	Container Status
8	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.133	CC:18:12:00:18:13	M2000	2.2.0.3402222249	2h 29m	Container Status
15	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.133	CC:18:12:00:18:13	M2000	2.2.0.3402222249	2h 30m 10s	Container Status
7	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.133	CC:18:12:00:18:13	M2000	2.2.0.3402222249	2h 30m 5s	Container Status
14	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.133	CC:18:12:00:18:13	M2000	2.2.0.3402222249	2h 30m 23s	Container Status
10	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.144	CC:18:12:00:18:14	M2000	2.2.0.3402222249	2h 29m 49s	Container Status
9	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.147	CC:18:12:00:18:14	M2000	2.2.0.3402222249	2h 30m 54s	Container Status
11	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.145	CC:18:12:00:18:14	M2000	2.2.0.3402222249	2h 29m 5s	Container Status
13	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.144	CC:18:12:00:18:14	M2000	2.2.0.3402222249	2h 29m 57s	Container Status
12	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.142	CC:18:12:00:18:14	M2000	2.2.0.3402222249	2h 30m 40s	Container Status

Cassia IoT Access Controller Cassia AC A1100

Refresh Rate: 20s

Discover Add

#	Group	Gateway Name	Status	Public IP	Private IP	MAC Address	Model	Version	Online Time	Container Status
8	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.133	CC:18:12:00:18:13	M2000	2.2.0.3402222249	2h 29m 29s	Container Status
8	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.133	CC:18:12:00:18:13	M2000	2.2.0.3402222249	2h 29m	Container Status
15	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.133	CC:18:12:00:18:13	M2000	2.2.0.3402222249	2h 30m 10s	Container Status
7	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.133	CC:18:12:00:18:13	M2000	2.2.0.3402222249	2h 30m 5s	Container Status
14	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.133	CC:18:12:00:18:13	M2000	2.2.0.3402222249	2h 30m 23s	Container Status
10	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.144	CC:18:12:00:18:14	M2000	2.2.0.3402222249	2h 29m 49s	Container Status
9	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.147	CC:18:12:00:18:14	M2000	2.2.0.3402222249	2h 30m 54s	Container Status
11	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.145	CC:18:12:00:18:14	M2000	2.2.0.3402222249	2h 29m 5s	Container Status
13	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.144	CC:18:12:00:18:14	M2000	2.2.0.3402222249	2h 29m 57s	Container Status
12	M2000	Cassia Gateway	Online	192.168.8.133	192.168.86.142	CC:18:12:00:18:14	M2000	2.2.0.3402222249	2h 30m 40s	Container Status

Cassia Gateway Online

Details Container Config Tools

Overview

- MAC: CC:18:12:00:18:13
- Model: M2000
- Firmware Version: 2.2.0.3402222249
- Private IP: 192.168.86.133
- Public IP: 192.168.8.133
- Last Online Time: 2024-02-29 02:06:21 UTC
- AC Online Time: 2h 30m 45s
- Gateway Up Time: 2h 30m 7s
- CPU Usage
- Memory Usage
- Storage Usage

Upgrade/Win-Fix

Cassia IoT Access Controller Cassia Gateway

Refresh Rate: 20s

Discover Add

#	Group	Gateway Name	Status	Public IP	Private IP	MAC Address	Model	Version	Online Time	Container Status
1	Kevin	M2000 Test 1	Online	192.168.256.128	192.168.3.39	CC:18:12:00:18:13	M2000	2.2.0.3402222249	2h 29m 29s	Container Status
2	Kevin	M2000 Test 2	Online	192.168.256.149	192.168.3.67	CC:18:12:00:18:13	M2000	2.2.0.3402222249	2h 29m	Container Status
3	Kevin	M2000 Test 3	Online	192.168.256.149	192.168.3.1	CC:18:12:00:18:13	M2000	2.2.0.3402222249	2h 30m 10s	Container Status

M2000 Test 1 Online

Details Config Tools

Overview

- MAC: CC:18:12:00:18:13
- Model: M2000
- Firmware Version: 2.2.0.3402222249
- Private IP: 192.168.3.39
- Public IP: 192.168.256.128
- Last Online Time: 2024-02-29 02:06:21 UTC
- AC Online Time: 2h 30m 45s
- Gateway Up Time: 2h 30m 7s
- CPU Usage
- Memory Usage
- Storage Usage

Upgrade/Win-Fix

Cassia IoT Access Controller Cassia AC A1100

Refresh Rate 20s

Export Connected History

OC:1B:82:80:10:10

#	Time	Device	Gateway	Event	Reason
1	2024-02-23 12:37:38	AA-AA-AA-88-88-88	CC-1B-82-80-10-10	connected	
2	2024-02-23 12:37:37	AA-AA-AA-88-88-88	CC-1B-82-80-10-10	disconnected	host disconnect
3	2024-02-23 12:37:36	AA-AA-AA-88-88-88	CC-1B-82-80-10-10	connected	
4	2024-02-23 12:37:34	AA-AA-AA-88-88-88	CC-1B-82-80-10-10	disconnected	host disconnect
5	2024-02-23 12:38:34	AA-AA-AA-88-88-88	CC-1B-82-80-10-10	connected	
6	2024-02-23 12:38:33	AA-AA-AA-88-88-88	CC-1B-82-80-10-10	disconnected	host disconnect
7	2024-02-23 12:38:32	AA-AA-AA-88-88-88	CC-1B-82-80-10-10	connected	
8	2024-02-23 12:38:31	AA-AA-AA-88-88-88	CC-1B-82-80-10-10	disconnected	host disconnect
9	2024-02-23 12:38:31	AA-AA-AA-88-88-88	CC-1B-82-80-10-10	connected	
10	2024-02-23 12:38:28	AA-AA-AA-88-88-88	CC-1B-82-80-10-10	disconnected	host disconnect
11	2024-02-23 12:34:38	AA-AA-AA-88-88-88	CC-1B-82-80-10-10	connected	

3.2 Configure M2000 from AC

Cassia IoT Access Controller Cassia AC A1100

Refresh Rate 20s

Group Status M2000 Backhaul

#	Group	Gateway Name	Status	Public IP	Private IP	M
6	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.133	CI
8	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.133	CI
10	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.133	CI
7	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.138	CI
14	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.140	CI
10	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.140	CI
9	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.147	CI
11	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.148	CI
13	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.144	CI
12	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.142	CI
12	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.142	CI

Cassia Gateway

Details Container Config Tools

General

Country of Deployment: United States

Name: Cassia Gateway

Group: M2000

Save

Save

Save

Cassia IoT Access Controller Cassia AC A1100

Refresh Rate 20s

Group Status M2000 Backhaul

#	Group	Gateway Name	Status	Public IP	Private IP	M
14	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.140	CI
10	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.140	CI
9	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.147	CI
11	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.140	CI
13	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.144	CI
12	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.142	CI
8	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.140	CI
4	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.142	CI
17	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.140	CI
16	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.138	CI
2	M2000	Cassia Gateway	Online	192.168.8.133	192.168.88.137	CI

Cassia Gateway

Details Container Config Tools

Networks

Wi-Fi (Strong Wi-Fi is not supported)

Mode: Client

SSID: M2_3g

Security Mode: WPA2-PSK

Passphrase: *****

IP Allocation: DHCP

DHCP

DHCP

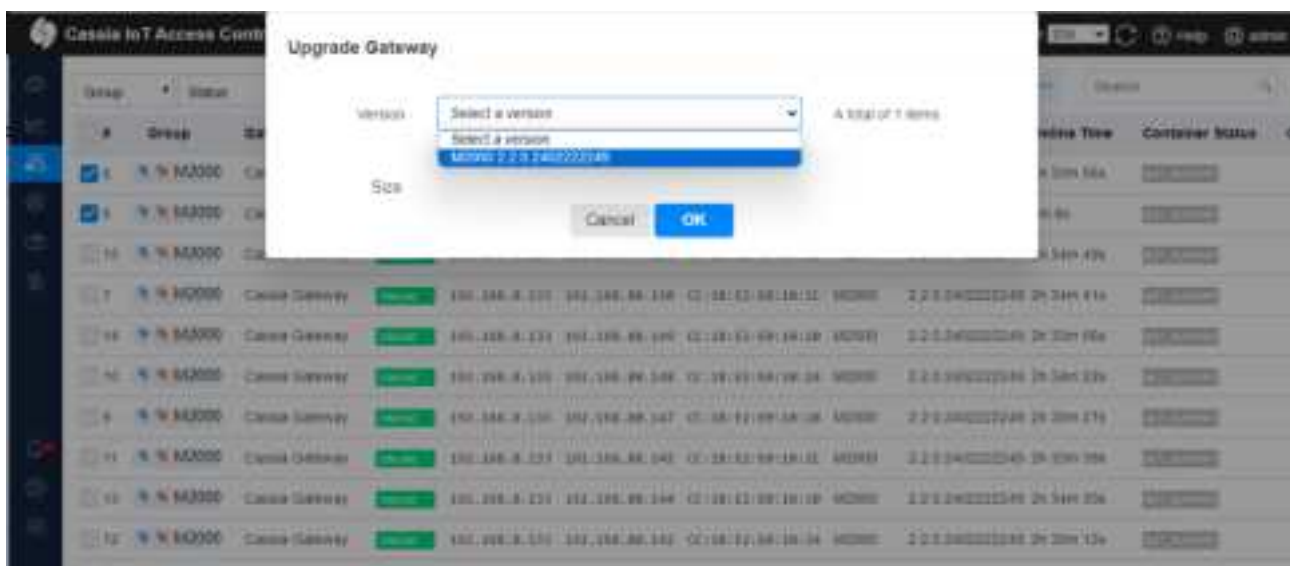
Save

3.3 OTA firmware update

01. Upload M2000 firmware to the AC server from the AC Maintenance Tab -> Gateway's Firmware Update section:



02. Select M2000 to upgrade to this firmware version.



4. Cassia RESTful API

M2000 supports the Cassia RESTful API, which can be called from the AC server or the local network. Please refer to the following link for details of the "Cassia SDK Implementation Guide."

<https://github.com/CassiaNetworks/CassiaSDKGuide/wiki>

15

Status

Config

Service

Other

Overall

Service Access

mqtt

Data Push Interval(ms)

100

Data Cache Size(packets)

10

MQTT

Host

168.168.16.146

Port

1883

Connection Type

Long

User Name

Password

Topic

QoS

At most once (0)

Encryption Mode

None

Scan Setting

Scan Mode

Passive

Name Filter

CGN*

MAC Filter

e.g. CC:18:DB:0B:00:01,CC:18:DB*

UUID Filter

e.g. 0001,0002

RSSI Filter

e.g. -60

Value Filter

offset

data

Duplicates Filter

e.g. 0,1,>=2000

Include Timestamp

No

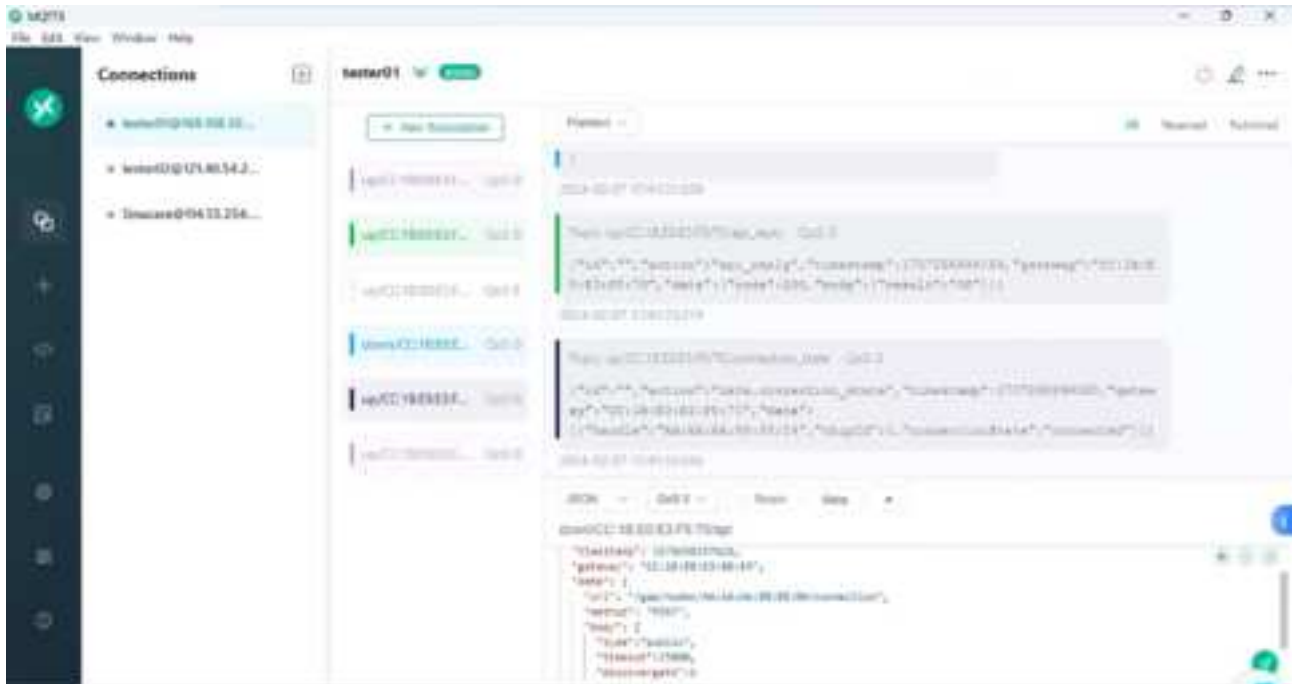
Apply

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02. MQTT server sends API to the gateway to make a BLE connection

MQTT API sample code is available at

https://github.com/CassiaNetworks/CassiaSDKGuide/tree/master/node_examples/MQTT



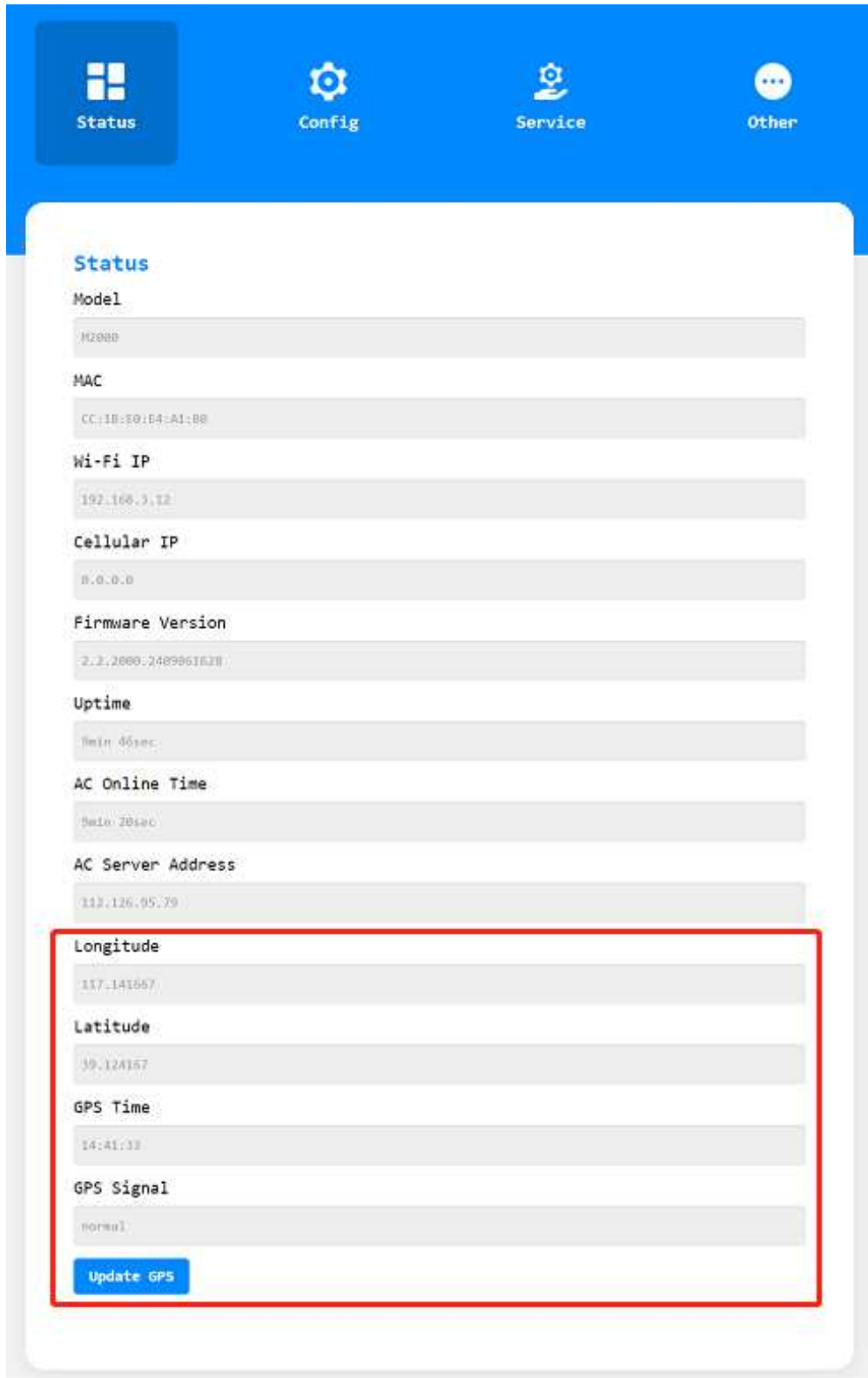
6. LED Status

LED	Status	Description
SYS	Off	Power off
	Fast flashing	The system is starting
	Solid on	The system is operating normally. Wi-Fi connection is NOT established.
	Slow flashing	The system is operating normally. Wi-Fi connection is established.
4G	Slow flashing (200ms High/1800ms Low)	Network searching.
	Slow flashing (1800ms High/200ms Low)	Idle
	Fast flashing (125ms High/125 Low)	Data transfer is ongoing.
BLE	Off	The Bluetooth chip didn't start
	Solid on	Bluetooth is operating normally.
	Flashing	Flash twice when the Bluetooth connection is established

7. Obtain GPS Location

01. To acquire the GPS location from local console:

- Click the 'Update GPS' button.
- Wait for 2 to 4 minutes to fresh browser to get GPS data, including longitude, latitude, GPS timestamp, and GPS signal.



The screenshot displays the 'Status' page of the Cassia Networks interface. The page has a blue header with four navigation icons: Status (selected), Config, Service, and Other. Below the header, the 'Status' section lists various system metrics in a form-like layout. A red rectangular box highlights the bottom portion of the page, specifically the GPS-related fields and the 'Update GPS' button.

Field	Value
Model	M288B
MAC	CC:1B:50:E4:A1:B8
Wi-Fi IP	192.168.3.12
Cellular IP	8.8.8.8
Firmware Version	2.2.2688-2489961638
Uptime	0min 46sec
AC Online Time	0min 20sec
AC Server Address	112.126.95.79
Longitude	117.141667
Latitude	39.124167
GPS Time	14:41:33
GPS Signal	normal

Update GPS

02. To acquire the GPS location from the AC Server:

- Obtain a token for the Cassia RESTful API from the AC Server.
- Initiate the GPS service by using the following API call:
GET AC_IP/api2/cassia/gps/start?mac=CC:1B:E0:E4:A0:A4
- Wait for 2 to 4 minutes for the gateway to cycle offline and online.
- Retrieve the GPS information from gateway status webpage or by calling:
GET AC_IP/api2/cassia/info?mac=CC:1B:E0:E4:A0:A4



03. To acquire the GPS location with local API:

- Login with the API.
- Trigger the GPS service by calling:
GET gateway_IP/cassia/gps/start
- Wait for 2 to 4 minutes for the gateway to gather GPS data.
- Retrieve the GPS information from the gateway status webpage or by calling:
GET gateway_IP/cassia/info

Notes:

- In the current iteration of M2000, it is recommended that GPS data be acquired no more frequently than every 5 minutes. Work is underway to further optimize the system and reduce the time taken to acquire GPS data.
- It is recommended to stop BLE API requests when acquiring GPS information, as GPS operation interrupts LTE service and temporarily disables the network.