

Cambrionix Connect

User Manual

Cambrionix Connect

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2. Introduction

This Application was named LiveViewer in versions prior to v3.2

Cambrionix Connect is our application designed to manage your Cambrionix hubs. It can be accessed across mobile devices, tablets, and computers running macOS, iOS, Windows, and some Linux distributions. The application can be accessed via any browser by navigating to the web address below.

<https://connect.cambrionix.com>

Within this application you can see all connected hubs and devices. Using Connect, you can:

- Monitor hub temperatures, power consumption, port status and error flags.
- Manage firmware updates.
- Manage the ports on the hub and switch between modes.
- Write and execute Cambrionix CLI scripts, Python or send JSON packets to control your hub

You will have the option to create a Cambrionix Connect account, which will allow you to save preferences and templates. With an appropriate license, it will also enable you to connect to hubs remotely, meaning you can view and manage all products on your network. Each host system can be added to an organisation owned by yourself and each user from your organisation can access and manage these hubs (depending on roles and permissions). By using this function, your organisation will be able to:

- Remotely control your products from across the room, or across the world, 24/7.
- Remotely Manage firmware updates across your whole fleet of products.
- Monitor and control your Cambrionix products using phone/tablet/computer.

2.1. Prerequisites

For Cambrionix Connect to connect to your hubs, the host system the hub is connected to must have the Cambrionix Hub API installed, with a minimum of V3.12.1. The Cambrionix Hub API is a service that runs on your host system, which is what enables communication with your Cambrionix hubs.

You can find more information on the Cambrionix Hub API from the user manual. This can be downloaded from our website at the below link. along with the Cambrionix Hub API installation files.

www.cambrionix.com/products/api

Once the host system has the API installed, you need a browser to open the Cambrionix Connect website. Known compatible browsers, for example, will be:

- Google Chrome
- Safari*
- Microsoft Edge

*You cannot connect to local APIs on Safari due to security reasons.

Your hub will need to be connected to your host system and visible to the API. As long as the hub is visible in the device manager or system info, then the API will be able to see the hub and interact with

it. If you use any other 3rd party software that controls the port that the hub requires, the API will not be able to connect to it, and as such, the hub will not be visible in the application.

Operating System

We have tested the Cambrionix Connect and can confirm that the following operating systems work with the Cambrionix Connect. There may be other OS that will work but may not have been tested:

- Windows 10
- Windows 11

- macOS 11 (Big Sur)
- macOS 12 (Monterey)
- macOS 13 (Ventura)
- macOS 14 (Sonoma)

- Linux Ubuntu
- Linux Debian

With Linux, we only perform testing using the OS mentioned above. An ARM hard float (armhf) version has also been tested on oDroid and Raspberry Pi.

2.2. Installing the Cambrionix Hub API

Cambrionix Hub API is available to download from www.cambrionix.com/software, you will find software available for Windows™, Mac® and Linux® Systems.

Linux® OS systems tested with our software are Ubuntu 18.04 LTS or Debian 9; some other OS versions based on the two mentioned should also work. Some different Linux® OS versions may work, but we don't test against other distributions.

To install on Mac® and Windows™ systems, download the install files from the above link, once downloaded run the install process and dialogue boxes will help you through installation and initial set-up.

For Linux® systems, download the install files from the website at the above link. Once downloaded, you can either install it from the desktop GUI or the command line via:

```
sudo apt install ./
```

after this command you will need to enter the file name that has just been downloaded from our website.

3. Using Cambrionix Connect

Cambrionix Connect has many great features that will improve our products use. This section is designed to explain the features in more detail.

3.1. Managing ports

You can manage the ports on your hub(s) easily using Cambrionix Connect. You can switch ports between the following modes*.

Charge	Turn specific ports or the whole hub to charge only mode (no data connection, hub emulates an OEM charger)
Sync	Turn specific ports or the whole hub to sync mode
Biased	Detect the presence of a device but it will not sync or charge it
Off	Turn the selected ports on or off (no power and no data channels open, mimics unplugging the device)

*some products do not have all above modes, please see individual product manuals for more information

There is more detailed information on managing your ports in the [Ports overview](#) section.

3.2. Device Information

You can obtain information on connected devices by using Cambrionix Connect. To obtain the information you can either go through the hub to look at the [Ports overview](#) or go direct to the [Devices](#) viewer section.

From these pages you can obtain charging information of the device, the history of the devices location and additional information about the device.

3.3. Managing your hub(s)

You can manage the hub settings through Cambrionix Connect. This can be done by adjusting the settings in the [Internal hub settings](#) or by loading and editing templates from the [Hub Templates](#) page

Managing your hub(s) is useful as certain settings will need to be changed to alter the behaviour of the hub. For example, you can turn 'charging downstream ports' (CDP) off which will reduce the amount of charge being delivered to a device whilst syncing data. If you then save this setting change to a template, you could really easily apply the same set of settings across host systems, by applying that template.

3.4. Managing Firmware

Using Cambrionix Connect you can manage and change the firmware version currently running on your hub(s). All you need is for the hub(s) to be connected to a host API. If doing this remotely, you'll need to ensure the API is running on those local host systems and you can then do all updates from

the 'Master' host system. Once the hub is connected to the API you can go to the firmware section and update multiple hubs at a time.

We release new firmware versions regularly, to ensure the hubs are kept up to date with new devices and functionality. Keeping your hubs firmware up to date will ensure that you have the latest features along with any fixes to any known bugs.

For more information please see the [Firmware](#) section.

3.5. Using your account

With Cambrionix Connect, there is the function of being able to sign into an account. You can sign into your account from the profile/login button along the top bar. Having an account will allow you to access the API's and settings associated with your account, from any device.

See the [Accounts](#) section for more information

3.6. Adding an API

When you open Cambrionix Connect you will see a section called "Hub API Connections". This is the section which will show you the API connections currently available to Connect. On initial launch (without logging in) this section will be empty and it will give you two options:

Option one is to "Get the API" this option will link you to the Cambrionix website where you can download the API if it has not already been downloaded.

Option two is "Refresh". When you select this, Cambrionix Connect will access the local system and obtain the API information that is currently running. Once it has obtained this, it will automatically connect and you will be able to view and manage the connected hubs.

If you have logged into your Cambrionix Connect Account then you will be given an option to add the API to your account. When you log into your account on a different host machine, this API will then be available to view. For more information please see the section [Accounts](#)

You will not be able to add an API to your account through Safari due to security reasons. On macOS you must add the API through the Cambrionix Connect Desktop application.

3.7. Remote access

A great feature of using Cambrionix Connect is the ability to remotely access and manage your hubs. In order to remotely access a hub you will need to ensure the host API is at least on v3.14 and the hub has a digital certificate linked (see [Digital Certificates](#) section). You will also require a license if you wish to connect to remotely. You can obtain information on licenses from Cambrionix by contacting us at sales@cambrionix.com

Note

In order to access a remote API the device used to communicate with the hub must be able to access the remote API. This can be either with the API and device being on the same local network, the API to be provided with a public IP address or to set up port forwarding using your public facing router. For more information please see the [Networking](#) section of this manual.

3.8. Help and Support

FAQs and help can be found in our Support Portal. You can raise a support ticket for more in depth support here

- <https://support.cambrionix.com>

You can also download any of our manuals and keep up to date at the link here

- www.cambrionix.com/product-user-manuals

When contacting support, please supply the product information for the hub in question. This can be found on the Device Information Plate which is either on the underside or back of the unit.

Providing serial and Purchase Order numbers will help us identify your specific product and speed up the process.

4. Accounts

With Cambrionix Connect there is the ability to manage settings and hub(s) and save the preferences to an account. Your account is assigned to an email address which will need to be verified. Once set up to access your account settings and information you will need to sign in. To view more information on the settings please see the [Organisations Settings](#) section.

You can access your Cambrionix Connect account by clicking the 'Sign In' button:



Once selected, you can either sign in to an existing Cambrionix Connect account or create a new one.

4.1. Creating an Account

If you require a new Cambrionix Connect account, click on 'Sign In'. You will need to fill in some basic information such as email address and name and you will be asked to verify this email address before you're able to proceed with creating the account. Click on "Verify Email" to send you a code to the email address provided, get the code and paste it into the box. Hit "Verify Code" and you will then be able to proceed with creating the account.

5. Organisations

Your Cambrionix Connect account can be linked to an Organisation, which will manage the API connections. You can have multiple accounts connected to an Organisation, and each API/Host Machine can be connected to multiple Organisations. If you navigate to the Organisation settings page you can access and view all of your Organisation's and click on individual Organisations for more information.

From here view you can view/change your default organisation, change the name of Organisations, view users' accounts which are linked to the Organisation, invite other users to join the Organisation.

When a user has an organisation selected, any API they add will be visible to all other users within the same Organisation. These can then be accessed and managed from all logins simultaneously.

5.1. Organisation name

When you first set up your Cambrionix Connect account, your Organisation will be set as "unknown Organisation". You can change this to be any name including upper and lower case characters and symbols. We do not recommend a name longer than 64 characters.

5.2. Organisation Id

Each organisation will have a random, unique id, assigned to it as a unique Organisation name can't be guaranteed. This is the way to identify an organisation, which will be required for licensing and support purposes. The Id cannot be changed and can be viewed from the Organisation settings page. This will follow the format: xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx

5.3. Organisation selection

A Cambrionix Connect account can be linked to multiple organisations. You can only access one organisation and the hubs associated with that organisation at a time. From the Organisations page you can select any Organisation you are a part of and make that your current one.

5.4. Organisation users

You can have multiple users associated with an organisation. From the [Organisations Settings](#) page you can view all user accounts currently in your organisation.

5.5. Organisation invites

In order to add more user accounts to your organisation, you can send them an invite with an email address from the [Organisations Settings](#) page.

Once you have invited a user to your organisation, they will need to navigate to the General Settings page and accept the invitation.

6. Pages

Cambrionix Connect has several pages that can be accessed via the Navigation Panel of the application. Each page will give you access to different information and functions using the API and your hub. A brief description of each section can be seen below.

Section	Description
Home	An overview of connected hubs, API's and quick actions
Hubs	An overview of connected hubs
Devices	An overview of connected devices
Computers	A list of host computers associated with your organisation.
Settings	Settings for API, connected hubs and Accounts
About	Information on running versions of the API, Cambrionix Connect
Help	information on Cambrionix and a link to Cambrionix Support centre

These pages can be accessed by selecting the icon on the Navigation Panel.

6.1. Home

From the home section, you can view all connected hubs and see the status of each hub. This is the default page of Cambrionix Connect but can also be accessed by clicking on 'Home' in the Navigation Panel.

Hubs

From a glance, you can see which hubs are connected to your Host Machine, what standard of USB cable is being used to connect the Hub to the Host, as well as a small icon of the hub itself.

You are able to click into any connected hubs to see further information about connected devices.

Hub API Connections

From the Home section, you can see Hub API Clients connected to your Cambrionix Connect Account. You can select each API to navigate to the API settings for that specific API. You can also get an overview of each connected API. The information available and settings are explained more in the [API Settings](#) page.

Quick Actions

From the home screen you also have a 'Quick Actions' section. This has some of the more common actions and sections for user's to be able to navigate around the application quickly from the 'Home' section.

6.2. Hubs

You can select a connected hub from the available list on the home page or by selecting 'Hubs' from the Navigation Panel.

To obtain more information on the hubs, select one from this page and you'll be taken to that hub page. Once you have navigated to a particular hubs page, at the top of the page you'll see some options for:

- [Ports overview](#)
- [Charts](#)
- [Hub details and properties](#)
- [Internal hub settings](#)

6.2.1 Ports overview

If you click on the home page on the Navigation Panel and select a hub, you will be taken to the Ports overview page.

When you first select a hub will default to the ports overview section. From this page you will have more detail on the hub and connected devices such as:

- Number of ports
- The name of the device
- The devices serial number or UDID
- Charging rates in mA
- USB information
- Battery Health information

From this page, you can change the port mode on all ports individually or multiple simultaneously.

Port Modes

The different port modes can be seen below. The port modes available vary between products. For more information, please see individual product user manuals at the below link.

www.cambrionix.com/product-user-manuals

Charge	Turn specific ports or the whole hub to charge only mode (no data connection, hub emulates an OEM charger)
Sync	Turn specific ports or the whole hub to sync mode
Biased	Detect the presence of a device but it will not sync or charge it
Off	Turn the selected ports on or off (no power and no data channels open, mimics unplugging the device)

Device information

When looking at a connected hub, you can see all the devices connected to that hub. If you select a port, you will be given further information on the device connected to that port.

You can obtain more information on a device if the host system has been trusted on initial connection. This can be done when you first connect the device to the host computer, a prompt will appear on the page, asking you to trust the device. Please see individual device documentation for information on trusting and pairing a device with a host system.

Without pairing, the following information will be supplied if available:



- VID/PID
- USB Serial (UDID)
- USB location
- Host computer

If you pair the device, this additional information will be supplied if available:

- Device internal name
- Device OS version
- Device Serial number
- Devices Wifi Mac address
- Battery health information (this will require iTunes or ADB to obtain this information)

From the port information page, if you have the Cambrionix Recorder service installed, you will also be able to obtain information on the device charging levels over time, along with the device presence history. Please see [API User manual](#) for more information on the Recorder service

Icons may be visible against your device if you have the necessary battery service running and the information can be collected from your device, you can find more information on battery services in the [API Settings](#) section.

Battery Icon	Description
	Battery service is running and device is paired
	Battery service running but device is not paired
No Image	Battery service is not running

6.2.2 Charts

If you installed the Cambrionix Recorder service and the API, you can access charts and information on the hub charging performance and health.

If you click on the home section on the menu and select a hub, you will be taken to the Ports overview page. Select the chart symbol from this page in the top right corner to enter this section.

You can adjust the time scale on each chart by using the drop-down on the top right-hand side. This can be changed from 30 minutes up to 1 year. You can use this to view historic charging information.

You can also zoom on the charts; this can be done by clicking on the Zoom button at the bottom of a chart and then dragging on the graph to select a specific period to zoom in to. Alternatively, you can use the scroll wheel on your mouse for fine-tuning. There is a reset button for going back to the default view.

Hub charging performance

This chart will show the hubs charging information. On the chart, the Y axis will show the charging current in mA, and the X axis will show the time.

Using this chart, you can see the different devices that are connected and their charging rates over time. A different coloured line will represent each device.

Hub health history

This chart will display the hub health history. There are two different Y axis on this chart, the left side will show voltage in V, and the right-hand side will show the temperature in Celsius. The X-axis shows the time.

Using this chart, you can see the temperature of the hub, the 12V internal voltage and the 5V internal voltage. If the temperature or voltage goes above or below specific parameters a flag will be raised, and the hub may switch off. More information on exact values can be found in individual product user manuals, which can be found in the link below.

www.cambrionix.com/product-user-manuals

6.2.3 Hub details and properties

Once you've selected a hub, you can click on the following symbol to be taken to the Hub details and properties page.



From this page, you can view information on the hub. You can view the serial port connection the hub is currently using and the actual hardware information.

Serial port information

Variable	Description
Computer	The name of the computer as set by Cambrionix Connect
Port	The port the hub is connected to e.g. COM17
Status	Whether the hub is active
Uptime	Time since the hub was rebooted

Hardware information

Variable	Description
Firmware type	The type of firmware used by the hub
Manufacturer name	The Manufacturer of the hub
Firmware version	The Version of firmware installed on the hub
Bootloader version	The Bootloader version installed on the hub
Group	The Group associated with the firmware

You can now see the Hub Sensors for 'Temperature', 'External Voltage' and 'Internal Voltage' from the Hub Details page.

6.2.4 Internal hub settings

If you click on the home section on the menu and select a hub, you will be taken to the Ports overview page. You can select the cog symbol at the top of this page to enter this section.



The hub's internal settings can be accessed and changed from this page. Available hub settings differ, per hub, so only the applicable settings for that type of hub will be visible. For a list of settings applicable to each product, please see individual product user manuals.

www.cambrionix.com/product-user-manuals

You can save settings templates locally and load them from the internal settings. You can also export the configuration string to the clipboard and import a configuration string from the clipboard as well if you wish to copy settings between different hubs and host machines. The Settings that can be adjusted can be seen in the table below.

Setting name	Description	Default value
Friendly Name	Optional, "Friendly Name", set by the user. Limit of 31 characters. This name will appear in the device's system information if set.	Empty

Table 6-1

Setting name	Description	Default value
Attach Threshold (mA)	The attach threshold is the device current (mA) level at which the hub can determine that a device (iPhone etc.) has been attached to a port. The attach threshold may need to be increased if the device (iPhone etc.) is connected to a Cambrionix port with a cable which includes an LED or other electronics. It may also need to be increased if you are using a device (iPhone etc.) with a 3rd party sled/holder/case (such as a barcode scanner or battery pack) which contains electronics or charging pass-through	10
Charged Threshold (mA)	The charged threshold is used to determine if the device is probably charged. If the drawn power drops below this mark for 2 minutes, then we set a charged flag	100
Maximum Internal Hub Temperature (°C)	Sets Maximum temperature before the shut-down of ports	70
Port Mapping	Change the ordering of the ports from the default	Sequential order
Default Profiles	Change the default profile for specific ports. Use 0 for default operation	0
Ports AlwaysOn	Configure which ports to be always powered regardless of attach status. This must only be used in conjunction with a default profile	Off
Sync Charge	Enable CDP* on a per port basis	On
Alternative Charge Mode	Enable alternative method CDP* to support some hardware. This has no effect if Sync Charge for that port is disabled.	On
Display Mode	Change display mode for hubs that have extended LEDs	Current (mA)
Flags	Change various flags, these are hardware specific so please see individual product user manuals for more information.	None selected
Stagger Delay (ms)	Introduce a delay between ports turning on when either host is detected or mode is switched to Sync. 0-9999ms	3000
Stagger Offset (ms)	An additional delay to add before starting the staggered process. 0-9999ms	0

Table 6-1

*Charging Downstream Port (CDP) Being enabled means that a port is capable of transferring data and charging the device at the same time with a higher current than just data syncing alone. With CDP enabled the hub can supply up to 1.5A

If you disable CDP you will receive the notification “This Hub has the Charge Downstream Port UCS mode disabled. This could limit the maximum current seen on some ports.” This notification is there to ensure you havent turned this off by accident and can still have the highest charge available.

6.3. Devices

From this page, you can view and search for specific devices connected to a hub that Cambrionix Connect has access to. You can access this page by selecting 'Devices' on the menu.

You can see every device you have connected from the device list. You can select specific devices and change the port mode. You can also use filters to look at specific devices, so if you want only to view iPhones connected, you can filter for this.

From here, if you click into a connected device, you are then able to see a lot more detailed information about that device.

6.4. Computers

This section lets you view and manage the computers connected to your organisation. You can access this section by selecting the computers section in the Navigation Panel.

You will see a list of computers that can be managed along with the logo of the operating system of that computer. When you select a computer, you can see the details of that computer including:

- IP Address
- Domain Name
- Operating System
- CPU Brand
- CPU Architecture
- CPU Cores

You will also see the different API services running on that computer, an option to remove the computer from your organisation or go through to look at further settings and connected devices.

From here, you are also able to view all connected hubs and devices to that computer. By clicking on any connected Computer under this section, you will notice a settings bar with the following options:

- Computer details and configuration
- List of ports with attached devices connected to this computer
- List of hubs connected to this computer
- Settings

The Computer Details section is the landing page and if you click over to either the Ports or Hubs section, you are able to manage your hubs and devices.

Settings

You have the option to rename your computer, in Cambrionix Connect, as well as configure the local API running on that machine. You can do this from the settings menu after navigating to your computer.

Cambrionix Recorder service

If you wish to use charts and log information on the Host API connection, you will require the Recorder API connection to be connected. To install the Recorder API onto your host computer, you must ensure this optional service is installed when installing the Cambrionix Hub API (This is selected by default).

6.4.1 API Settings

When you navigate to the Computers page, you will see a list of all available APIs. You will need to select an API from the list to manage an API. You can navigate to this page by selecting 'Computers' in the Navigation Panel and then clicking on your connected API.

Overview of API's

From the overview you can see the following information

- Status Colour
 - Green = The API is connected and you have an appropriate license.
 - Orange = The API is connected and you don't have an appropriate license.
 - Red = The API is not connected.
- Computer name
 - The Computer name will be the name assigned by the user in the individual API settings
- Status
 - The status of the API these can be one of the following

Status	Description
Local	The API is visible and is connected to the application using a local connection
Activated	The API is visible and is connected to the application using an SSL (Secure Sockets Layer) connection
Deactivated	The host computer has been deactivated meaning an API can only be connected to a local host machine.

- Version
 - The version information of the API
- Certificate information
 - The following symbol will show if there is no certificate or the API is unable to get the certificate information



Individual API settings

Once an API is selected, you can then click on the settings page for that API. You can alter the following information.

Name	Description
Computer Name	This is the name you will see as a description for the host computer on your Cambrionix Connect Account. Defaults to the hostname.
Address	This is the URL of the API; the URL will be read from the local computer when the API is added to your account. A custom URL can be entered if required.

Name	Description
Port	This is the port the API will connect through. As default this is 43427 it should not normally be changed. This is for advanced use and complex networks with restrictions on which ports can be used. The port number used must match that of the connected API.

Once you have changed the above values, you must press the save button for these changes to take effect. You can press the revert button to return to the previous settings. You can press the remove API button to remove an API from your organisation. You can also deactivate the host computer associated with an API, meaning an API can only be connected to a local host machine.

Battery Services

If you have iTunes installed or an adb server running on your host, you will be able to obtain battery information on connected devices. You can adjust the settings of the battery update information by changing how often then battery information is obtained in intervals message in seconds. You can also alter the number of battery updates that can be run simultaneously.

API Logging

The API can generate logging information for all USB events and store information on what has happened, along with specific hardware information. This is useful for troubleshooting any issues encountered with the API and capturing any faults or issues. You should use full logging when obtaining logs for support unless otherwise instructed, once you have enabled logging and the event has taken place zip the logs to send through to Cambrionix for investigation. The zip logs button is currently only available in the desktop version.

Once you have obtained some logs you will need to send them to Cambrionix, ensure they are zipped so that if the files are large, they can still be sent over. If the files are still too large, then please use an online drive that Cambrionix support can have access to or send via a file transfer service.

Certificate

From the API settings page you can view information on the certificate assigned to the API. For more information on certificates and how to assign them to an API please see the [Digital Certificates](#) section.

6.5. Firmware

From this page, you can view and manage firmware versions and updates. You can access this page by going to Settings (in the navigation panel) and then 'Firmware'.

On this page you will see two sections. One for 'Cambrionix Hubs' and one for 'Preview Updates'. You can select the hubs you want to update in one section and select and update the firmware for the chosen hub(s) in the other. You can filter the hardware in the following ways.

Filter	Description
Type	Firmware type*
Endpoint	Computer name
Description	Hub Name

*products and their firmware type below

Firmware	Part Number	Product Name
Universal	PP15S	PowerPad15S
Universal	PP15C	PowerPad15C
Universal	PP8S	PowerPad8S
Universal	SS15	SuperSync15
Universal	TS3-16	ThunderSync3-16
SMART	TS3-C10	ThunderSync3-C10
Universal	U16S Spade	U16S Spade
Universal	U8S	U8S
PDSync	PDSync-C4	PDSync-C4
Universal	ModIT-Max	ModIT-Max
Motor Control	Motor control board	ModIT-Max

Selecting hubs

Any hubs that do not have the latest version of the firmware will have the firmware version number in red. The firmware version will be blue if the hub is up to date.

You can select and update multiple hubs at once; you can see if it is selected as the box will be highlighted, and under the 'Preview Updates' section, you will see which hub(s) you have selected to be updated.

Updating the Firmware

Cambrionix Connect will automatically choose the latest version of the firmware to update to; this can be changed by using the drop-down and selecting the firmware you wish to install on the hub. We recommend always using the latest firmware version unless there is a specific reason not to update.

Once you have selected the hubs you wish to update and the firmware version to update, press the update firmware button, which will then run the process. Once updated, a tick will appear in the Update Preview section to show the update has been successful.

Errors

It is important that once you have started a firmware update that you do not disconnect the hub from the host system. If you disconnect the hub while it's updating, then the hub will be in an unusable state. This state is called bootloader mode, which is a different piece of firmware used to launch the hub's firmware. If you get the hub stuck in bootloader mode then you will need to recover the hub using the Cambrionix Command line updater which can be downloaded from the below link along with the user manual.

<https://www.cambrionix.com/firmware>

6.6. Testing

Cambrionix Connect has a built-in testing facility to test your hubs. You can access this page from Navigating to Settings and then 'Testing'.

This is designed to ensure your hubs perform correctly and have no issues. The tests that are run using this facility are listed below:

Test	Description
Test Hub's id response	Validate that the hub returns sensible information in response to its 'id' command. This includes checking that the firmware version is at least 1.79 and that it is in the correct mode.
ModIT Gate Configuration	If the connected hub is a ModIT Pro with lockable gates, this test will validate that the configuration is correct.
ModIT Gate Exerciser	If the connected hub is a ModIT Pro with lockable gates, this test will validate that they open and close within the expected time and that their current draw is within reasonable limits.
Validate Hub Health	Validate that there are no hub error flags set
Hub Settings	Validate the hub returns sensible information in response to its 'settings_display' command.
Validate Port Health	Validate that there are no port error flags set on individual ports
Validate USB	Validate the hub's USB functionality
API Validation	Validate that the API is functioning and is of a suitable version for other tests

There are three different pages to the Testing section:

- Test Selected Hubs
- Automatic Testing
- Configuration

Test Selected Hubs

Using this first page, you will be given a list of all connected hubs and can choose which hubs you wish to test. Once you have selected all the hubs you want to test, press the go button, and they will begin.

Automatic Testing

Using the Automatic page will run all tests on all connected hubs as soon as you navigate to it. The view will be the same as selected but without the option to choose specific hubs to test with.

If you click on the down arrow on the menu, you will be shown each test that has been performed and the status of the test. A progress bar will run from left to right and turn green if all the tests are completed and passed. If any test fails, the bar will turn red.

Configuration

In the Configuration section, you can select which tests are to be run in Automatic and Selected mode and also configure the values in which a test will have deemed to pass. You can amend the values on three of the tests.

- Test Hub's id response
 - Minimum Firmware version
 - Minimum Bootloader version
- ModIT Gate Configuration
 - Stall setting
 - Minimum Motor Control Firmware Version
- ModIT Gate Exerciser
 - Fail Limit
 - Iterations
 - Maximum Current
 - Maximum Transition Time

6.7. Settings

Several different settings can be managed using Cambrionix Connect. You can access this page from the Navigation Panel. They are separated into other pages:

- [General Settings](#)
- [Organisations Settings](#)
- [Dynamic Hub Settings](#)
- [RFID Settings](#)
- [Hub Templates](#)
- [Firmware](#)
- [Testing](#)

6.7.1 General Settings

You can manage and view the general settings from this page, these settings will be saved to your account if signed in, if not signed in these settings will be saved locally. You can navigate to this page by selecting the settings in the menu and then selecting 'General'.

Notifications

The notifications managed are:

- API Disconnection
- RFID events
- Available Software Updates
- Available Firmware Updates

Theme selection

From this page, you can also select the theme of Cambrionix Connect, which will visually change how the application looks.

Theme	Description
Default	This will match the OS theme
Light	This is a white background for typical use
Dark	This is a black background for less eye strain in lower light

Join another organisation

If you are joining another organisation you will need a user from that organisation to invite you from the [Organisations Settings](#) page. Once invited you will find the invite at the bottom of the general settings page, once you have accepted the invitation you will then be able to select that organisation as your active one.

6.7.2 Organisations Settings

From the Cambrionix Connect Organisations settings page, you can view and manage your Organisation's information. For more information on organisations please see [Organisations](#) section. You can navigate to this page in the Navigation Panel.

Your organisation

If you have the appropriate permissions to do so, from this section you can;

- View the current organisation selected
- Change to a different organisation
- Create a new organisation
- View your organisation Id
- Change the name of your current organisation
- View your license status
- Manage organisation users
- Manage user roles (see [User Roles \(Licensed\)](#) section for more info)
- Leave the organisation

Manage users

From this section you can view organisation users information such as;

- Given name (first name)
- Surname (last name)
- User Id
- Email address

You can also remove users from your organisation or change their user role/permissions.

Invite users to your organisation

To be able to add users to join your organisation you will need to send them an invite. There is a section at the bottom of the page to send invites, once clicked you will then be given a prompt to input their email and assign them a role for the organisation. The invited user will need to accept the invite from the Organisations page.

6.7.3 Dynamic Hub Settings

From this page, you can create and manage 'Dynamic hubs'. A Dynamic hub is a collection of hubs that Cambrionix Connect will treat as a single hub. You can navigate to this page by selecting settings in the Navigation Panel and then 'Dynamic Hubs'.

Creating a Dynamic hub

To create a Dynamic hub, you can drag and drop your chosen hub(s) from the 'Physical Hubs' section over to the 'Dynamic Hubs' section. Once you have grouped up the hubs you want into a Dynamic

hub, you have the option to rename it and then remember to press save to store this as a Dynamic hub.

6.7.4 RFID Settings

RFID (radio frequency identification) is a form of wireless communication. The Cambrionix API is capable of managing RFID detection events and can be used to store information about RFID cards. You can access the RFID settings by selecting settings and then selecting RFID (Settings / RFID)

Currently, the API only deals with the RFID reader in the ModIT Boss module. This is an RFIDeas model: RDR-80581AK0. This page in Cambrionix Connect manages information obtained from the RFID reader and the API.

The first time you use an RFID card, you must check the 'Enable RFID detection in the API' box so that Cambrionix Connect and the API can see the initial RFID event. When you scan an RFID card, it will appear in a list, and you can select a name for the card and the behaviour you wish to occur when the card is scanned going forward.

Once you have scanned the cards and set them up, you can export the settings so other versions of Cambrionix Connect can maintain the same settings.

6.7.5 Hub Templates

From this page, you can manage the templates for the [Internal hub settings](#). The templates are saved locally. You can access this page by selecting settings in the Navigation Panel and then selecting 'Hub Setting Templates'.

Editing Templates

The first template you create will need to be done through the [Internal hub settings](#). Once the template is created navigate to this page and you can edit the information. You can change the name of each template by selecting the name and typing in a new one. You can edit the settings by selecting the pencil icon next to the delete icon.



Once you have the editing window open you can view all the Internal hub settings and amend each settings, once you have finished making any changes you will need to press 'OK' which will close the editing window. Remember to click save after closing the editing window or the changes will be lost.

Copying Templates

From this page you can select a template and copy it. By selecting the tick box next to the name, the 'COPY' button below will become active. Click this to make a copy of the template appear underneath. Again, remember to click save once you have created copies or navigating away will delete the copy.

Deleting Templates

You can delete any stored templates by pressing the delete icon. Ensure you click save after deleting a template, or it won't actually be deleted.

6.7.6 Developer Settings

You can use these script pages to send commands through the Host or Recorder API to the selected hub(s) or computer(s). You can navigate to this page by selecting settings in the Navigation Panel and then 'Developer'.

From the Developer settings you will be able to access the scripting pages for the installed API's. The API scripting pages are listed below.

- Hub API
- Recorder API

Hub API

The two methods of communication supported from the script page are JSON and the Cambrionix CLI.

If you wish to have detailed information on scripting and the commands/ methods that can be sent with the API and the Cambrionix CLI, please see the specific software user manuals, which can be found through the below links.

www.cambrionix.com/cli

<https://www.cambrionix.com/products/api>

On the top right-hand side of the page, there are two drop-downs. One is to select which hub you wish to send commands to, and the other is to choose between JSON and the Cambrionix CLI.

Once you have chosen a hub and a method of communication, you can write your script or use one of the pre-made examples in the drop-down. Once you have written or selected a pre-made script, press the 'RUN' button or use 'CTRL+E'. You will then receive the response to the script in the window below your initial script.

If you wish to send commands to a computer then you will need to select a hub that is connected to that computer. Any commands then sent will be sent to that computer, for example if you wish to find details on the USB tree for a specific computer.

Recorder API

If you selected to install the 'Recorder API' along with the 'Hub API' (this is selected by default) then you will be able to access more historical information such as battery health and device presence.

From this section you can send queries directly to obtain information. There is a drop down to select the 'Recorder API' you wish to communicate with, this list will be populated with all the API's in your organisation. You can type your own script or there is also a drop-down to select some pre-made

scripts with legacy queries. Once you have written or selected the script you can then run the query using the 'Run Query' Button.

6.8. About

From this page, you can see various pieces of information about the APIs and Cambrionix Connect. You can navigate to this page by selecting 'about' on the Navigation Panel.

You can see the version of the local API that is running alongside the version of Cambrionix Connect.

There is a link to be able to download and view the Cambrionix Hub API User manual.

<https://downloads.cambrionix.com/documentation/en/Cambrionix-Hub-API-User-Manual.pdf>

There is a link to be able to download and view the Cambrionix Connect User manual.

<https://downloads.cambrionix.com/documentation/en/Cambrionix-Connect-User-Manual.pdf>

Below the 'About' section on the Navigation Panel, there is also a 'Help' button to take you to our support centre should you ever need any assistance.

Cookies

Cambrionix uses cookies necessary for features including optimisation and performance. You can find information on the cookies included on this page, they are also listed below.

Cookie Name	Function	Duration	Description
msal	Authentication	Session	Used by the Single Sign-on service (SSO) to generate a user session cookie

From this page you can also view company information for Cambrionix;

- Contact information
- Social media links
- Company number
- VAT number

6.9. Help

By selecting the help page on the menu you will be taken to Cambrionix Support centre. From the support centre you can;

- Get technical support for Cambrionix hardware and software
- Suggest a new product
- Suggest a new feature for Cambrionix hardware and software
- Suggest an improvement to existing Cambrionix hardware and software

When contacting support, please supply the product information for the hub in question. This can be found on the Device Information Plate which is either on the underside or back of the unit. Providing serial and Purchase order numbers, can help identify your specific product and speed up the process.

With any hardware support we recommend first checking the troubleshooting section in the products user manual.

Cambrionix Product User Manuals: www.cambrionix.com/product-user-manuals

Cambrionix Support Portal: <https://support.cambrionix.com/>

7. Digital Certificates

You will require a secure connection to access APIs connected to your network. To have a secure connection, digital certificates will be required. A digital certificate is a file or electronic password that proves the authenticity of a device, server, or user. This helps Organisations ensure that only trusted devices and users can connect to their networks.

You must supply a certificate and private key to the API to create a secure connection which is called an SSL (Secure Sockets Layer) connection. An SSL protocol establishes authenticated and encrypted links between networked computers. Once you have an SSL connection, you can connect outside of localhost (the machine the API runs on). Without this certificate, the API will only listen for connections from the local host. External connections will only be allowed if they are secure (HTTPS or Secure WebSockets).

The identity the API is running as will need access to the files to use them, so the certificates must be stored in an accessible folder or library.

It is up to the user to supply a suitable certificate for their usage. Some providers are

- [Comodo](#)
- [Digicert](#)
- [Identrust](#)
- [Globalsign](#)

If a certificate authority used is not recognized by the browser, then this will have to be handled dependant on the browser that is being used. You will need to sign your certificate with your own certificate authority and adding that to your application or browser.

With Google Chrome, you can use this [guide](#).

With Firefox, you can use this [guide](#).

With Safari, you can use this [guide](#).

If you wish to use different browsers you will need to find their guides to be able to setup.

Only a single certificate configuration is supported. If a password is supplied, it is obfuscated for security. The API does not make a copy of the certificate or private key as this could violate security if they are in limited access folders.

7.1. Managing Certificates

You can manage the API's certificates using the following commands. To send these commands to the API, you will need to open a terminal to open a connection and send commands to the API; a simple way of doing this is to use the inbuilt script section within Cambrionix Connect.

When adding a certificate to an API you will need to add the certificate on the local machine hosting the API. By using Cambrionix Connect without signing in you will ensure that you are connected locally and as such will be able to talk to the local API. More information on using the API can be found in the API user manual at the below link.

www.cambrionix.com/products/api

7.1.1 Setting a Certificate

Supply a certificate and private key to the API.

```
{
  "method": "cbrx_certificate",
  "params": [
    "set", {
      "private-key": key-filename,
      "certificate": certificate-filename,
      "password": password
    }
  ]
}
```

Parameter	Description
<i>key-filename</i>	The file path of the private key
<i>certificate-filename</i>	The file path of the certificate
<i>password</i>	optional password if required by private key

If there is any issue with the code, you will receive an error ; if this sets correctly, a response of "true" will be returned. One thing to keep in mind is that the location will need to be in a local library and not locked within a user's files, and using double slashes (//) will remove any issue of escape characters being input into the file name.

Example

```
{
  "jsonrpc": "2.0",
  "id": 0,
  "method": "cbrx_certificate",
  "params": [
```

```
"set",
{
  "private-key": "C:\\git\\capi\\cbrxjson\\certificate\\key.pem",
  "certificate": "C:\\git\\capi\\cbrxjson\\certificate\\cert.pem"
}
]
```

7.1.2 Removing a Certificate

If you wish to remove the certificate and private key from the API, you can do so with the following script:

```
{
  "jsonrpc": "2.0",
  "id": 0,
  "method": "cbrx_certificate",
  "params": ["remove"]
}
```

On successful removal, a response of true will be returned.

8. Networking

If your network has restrictive firewall or proxy server settings, you or your network administrator will need to whitelist certain domains and IP address ranges to ensure that Cambrionix Connect and its related services work as expected.

8.1. Domain Names

Cambrionix Connect uses domains with differing levels of subdomains. For it to operate correctly, please allow these first-party Cambrionix domains and their levels of subdomains. These domains are directly operated and managed by Cambrionix.

Domain	Purpose
*.connect.cambrionix.com	Cambrionix Connect web application and required functional services
*.downloads.cambrionix.com	Cambrionix Connect retrieves firmware from this location.

When allowing a domain, make sure the action permits the top-level domain and multiple levels of subdomains, not just immediate subdomains.

For example, a permit entry for **.connect.cambrionix.com* should allow both *server1.connect.cambrionix.com* AND *server2.connect.cambrionix.com*.

Additionally, ensure that top-level domains themselves are also permitted, not just their subdomains. For example, **.connect.cambrionix.com* should permit both *server.connect.cambrionix.com* AND *connect.cambrionix.com*.

8.2. IP address ranges

Cambrionix Connect doesn't have a fixed IP address. Instead, it uses a defined range of IP addresses. You should allow-list the IP ranges described below to maintain access to Cambrionix Connect.

We currently use a mix of IP addresses provided by third parties (namely Microsoft Azure). You should review your network restrictions and update them to ensure Cambrionix Connect works as intended. The IP ranges are used for both receiving and responding to requests from clients (e.g. browsers) and for making connections to the internet on your behalf (e.g. webhooks and application functions).

The list of IP ranges to be allow-listed are the ranges with the tag 'AzureFrontDoor' from the [Azure IP Ranges](#) from Official Microsoft Download Center.

8.3. Connecting from outside your network

You may wish to connect to hosts outside of your local network. One way to do this would be to enable port forwarding. You or your network administrator will need to set this up on your public facing router.

Port Forwarding

Port forwarding allows remote computers to connect to a specific computer or service within a private network. This will need to be set up on the router that the host system is connected to.

You will need to access the router settings to set up port forwarding. To access your router settings, you will need to find the default address for your router and enter it in a web browser. You will then need to log in to the router's user interface using the admin username and password. If you have not changed the username and password, you will need to use the default username and password, which will be listed in your router's user manual or online documentation.

Once you are in the router settings you will need to access the Port forwarding section which is usually found in the advanced settings section, this is different for all routers but you should be able to find information on accessing this section through your router's user manual or online documentation.

Once you are in this section, you will need to set up a custom port forwarding rule using the following information:

- Name - This is the custom name you can enter to easily identify the rule
- Type - We recommend using "Both" or "TCP/UDP" dependant on your router
- Inbound - This is the port number, you should check this port number is not currently being used before defining it
- Private or End - Enter the same port number as Inbound
- IP Address - This will be the IP address of the host computer with the API running, this should be made a static IP address to avoid any conflicts in the future

The Default port the API runs on (when a digital certificate is assigned) will be: 43424.

There are lots of guides online for each router and also guides on setting up port forwarding. If you are unsure how to perform this function, we recommend reading some documentation. For example, more information can be found [here](#).

9. User Roles (Licensed)

User roles allows you to define and assign specific sets of permissions and privileges to users within the organisation. By creating custom user roles, you can control and manage access levels for different individuals based on their responsibilities, job functions, or organisational requirements.

Custom user roles provide several benefits, including:

- **Security:** By assigning specific permissions to users based on their roles, the system ensures that users only have access to the resources and functionalities necessary for their job responsibilities. This helps prevent unauthorized access and reduces the risk of data breaches or accidental misuse of system capabilities.
- **Control:** Custom user roles allow you to define precise levels of access for different users. This enables organisations to enforce separation of duties, ensuring that users can only perform actions within their defined role and reduce to chance of errors.
- **Scalability:** As organisations grow and evolve, custom user roles make it easier to manage user access and permissions. New roles can be created, and existing roles can be modified to accommodate changing organisational structures or requirements without compromising system security or functionality.

User roles

Within your organisation you can have multiples roles and assign a role to each user. By default the following roles that can be assigned to a user are:

Role	Description
Member	Can read everything and view all information, but cannot make any changes.
Contributor	Can perform all actions except manage/ invite users to the organisation.
Owner	Can perform all actions and manage users in the organisation.

9.1. Creating custom user roles

You can create custom user roles for your organisation by selecting the "Manage Roles" and the "Create Role" button.

N.B. This option will only appear within Cambrionix Connect with the appropriate license.

Basics

When you initially create a new role you will need to input some basic information such as the name of the user role and a short (optional) description of the role to help identify the specific role and its permissions

Permissions

You can view permissions that are currently selected for the user role and select different permissions you would like to assign to a user role. A list of each permission

Permission Group	Permissions	Description
API Permissions related to the Host API Service	API.Read	Read Data provided by the Host API service.
	API.Write	Perform update/ create/ delete actions via the Host API service
	API.Admin	Perform administrative actions via the Host API service
Organisation Users Permissions related to organisation users	User.Read	Read organisation users
	User.Write	Update organisation users
	User.Delete	Remove organisation users
Organisation Role Assignment Permissions related to organisation role assignments	RoleAssignment.Write	Assign or remove a role from a user
Organisation Invitations Permissions related to organisation user invites	Invite.Write	Invite users to the organisation
	Invite.Read	Read organisation user invites
	Invite.Delete	Delete user invitations
Organisation Custom Roles Permissions related to organisation custom roles	CustomRole.Write	Create/ update/ delete organisation custom roles
	CustomRole.Read	Read organisation custom roles
	CustomRole.Delete	Delete organisation custom roles

Review

Once you have completed the basic information and selected the permissions require for the user role you will then have the opportunity to review the information before creating the role.

9. Features

Below you can see a table of all the features of Cambrionix Connect

Feature	Unlicensed	Licensed
Standard	✓	✓
View locally connected hubs	✓	✓
View locally connected devices	✓	✓
Obtain battery information on locally connected devices	✓	✓
Update firmware on local hubs	✓	✓
Manage settings on local hubs	✓	✓
Control ports on local hubs	✓	✓
Write and execute Cambrionix CLI scripts, Python or send JSON packets to control your local hub and obtain information on local hubs and devices	✓	✓
Manage RFID settings for use with ModIT Max	✓	✓
Perform tests on local hubs	✓	✓
Setup and manage organisations	✓	✓
Remote Access		✓
Remote connectivity		✓
View remote hubs		✓
View remote devices		✓
Obtain battery information on remote devices		✓
Update firmware on remote hubs		✓
Manage settings on remote hubs		✓
Control ports on remote hubs		✓
Write and execute Cambrionix CLI scripts, Python or send JSON packets to control remote hubs and obtain information on remote hubs and devices		✓
Perform tests on remote hubs		✓
Add remote APIs to your organisation		✓
Built-in Roles		✓
Custom Roles		✓
Users		✓

Licensing

The use of Cambrionix Connect is subject to the Cambrionix Connect SaaS conditions, the document can be downloaded and viewed using the following link.

<https://downloads.cambrionix.com/documentation/en/Cambrionix-Connect-SaaS-Conditions.pdf>

10. Troubleshooting

If you experience any issues with Cambrionix Connect; please try the following troubleshooting steps. If your issue is not addressed in this section, please get in touch with your local vendor or Cambrionix. To contact Cambrionix Support please see [Help and Support](#). For more information on troubleshooting with your hardware please see the troubleshooting section in your products user manual. www.cambrionix.com/product-user-manuals

10.1. Logging through Cambrionix Connect

If you are experiencing a bug or an issue, we may ask you to obtain some logs of the behaviour, to see in more detail what is happening. To get logs of the behaviour use the following steps to get a zip file of them to send to us.

1. Open up the Cambrionix Connect application.
2. Once inside, select the Computers tab.
3. Then, select the button 'Go to settings'.
4. Then, under the 'Host API' section, select 'Configure'.
5. From here, you should see a section titled 'API Logging Sections'. Expand the 'Advanced logging settings' downwards.
6. Click the "select all" tick box and then the save button.
7. After this is enabled, use the hub in a way that causes the issue you are seeing.
8. Wait for the issue to occur
9. Make a note of the time and date that the issue occurs then go back to the API page in Cambrionix connect, and press the zip logs.
10. Once you have the logs un-tick the "select all" box and save your settings.
11. Send the logs to us for us to take a look at.

The API keeps a maximum of 20 logs at 256Mb each, so the latest one is usually smaller. If a crash occurs, you would see a smaller log file and the next instance of API shuffles the existing ones

Default locations

Log messages generated by the CambrionixApiService go to syslog.

Using Windows the logs will default to the below location

```
C:\ProgramData\Cambrionix
```

Using macOS the logs will default to the below location

```
Library>Logs>Cambrionix
```

Using Linux the logs will default to the below location

```
/var/log/cambrionix
```

Using with a headless system

If you are using a headless system with no GUI, then and you require to enable logging for support issues, you can use the following command to create the logging cfg file manually:

```
echo  
    *=DEBUG>/etc/opt/cambrionix/cambrionix.log.cfg
```

Then after re-producing the problem, you can zip the logs from the folder

```
/var/log/cambrionix
```

You may delete the file below when you are finished with it.

```
/etc/opt/cambrionix/cambrionix.log.cfg
```

10.2. Removing Software

If you wish to uninstall the software (Cambrionix Hub API and the Cambrionix Recorder Service) from your host system, the following steps can do this.

Windows™

To remove the software from a Windows™ system, you can do so by going into "Add or remove programs" finding the software you wish to remove, selecting it and pressing "uninstall"

macOS®

To remove the software from a macOS® system, locate the application in the Finder, drag the application to the Trash, or select the application and choose File > Move to Trash. You may be asked to enter the name and password of an administrator account on your Mac®. Then to completely delete the application, choose Finder > Empty Trash.

Alternatively, use the below instructions.

```
sudo /Library/Cambrionix/ApiService/bin/CambrionixApiService --remove  
sudo /Library/Cambrionix/ApiService/bin/CambrionixRecorderService --remove
```

Linux®

To remove software on Linux® there are two options.

The first is to use the Software centre, then either the list of installed applications or the search bar to find the software you wish to remove. Once you have selected the application, click on the remove

button and you will be prompted for a password, enter the password and the software will be removed.

The second way you can remove software is by using the command line. All you need to do is to use the command in the following fashion:

```
sudo apt remove program_name
```

Variable	Description
<i>program_name</i>	The file name of the program including any version numbers

You'll be asked to enter your account password. When you enter it, nothing is visible on the screen. You will need to confirm removal, it will ask for your confirmation, press the enter key or Y key: Keep in mind that you'll have to use the exact package name in the apt remove command otherwise, it will show 'unable to locate package error'. You can type the first few letters of the program you want to uninstall, and then hit the tab key. It will show all the installed packages that match those letters at the beginning of their names.

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