



# ELSIGHT HALO USER GUIDE

## Standalone Version

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*REVISION 1.1*

*JUNE 22, 2020*

***SW VERSION 1.3.6-1.5***

## ELS User Manual – Copyright and Disclaimer

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## FCC Regulatory Notices

### FCC ID Information

The Halo FCC ID is **2AWEB-HALOHNF4W**.

### Mobile Device RF Exposure Statement

This device is only authorized for use in a mobile application. Users must maintain a distance of at least 20 cm from this device at all times.

### FCC Modification Warning

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC Rules

### Class B Warnings

#### **The FCC Wants You to Know:**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- a) Reorient or relocate the receiving antenna.
- b) Increase the separation between the equipment and receiver.
- c) Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- d) Consult the dealer or an experienced radio/TV technician.

### Interference Statement

This device complies with Part 15 of the FCC Rules and Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

### Wireless Notice

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines and RSS-102 of the radio frequency (RF) Exposure rules. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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# Introduction

The Elsight cutting-edge technology provides secure, real-time, adaptive data transmission over multiple IP links. Ground-breaking hybrid data connectivity solutions allow for on-the-move and high-bandwidth communication, anytime and anywhere.

## Elsight Halo Communication Platform

The world's most compact, next-generation bonding technology, Elsight Halo provides high-bandwidth, highly-secured communication for the transmission of live data, in real-time, from anywhere and to anywhere, while on-the-move or on-the-ground.

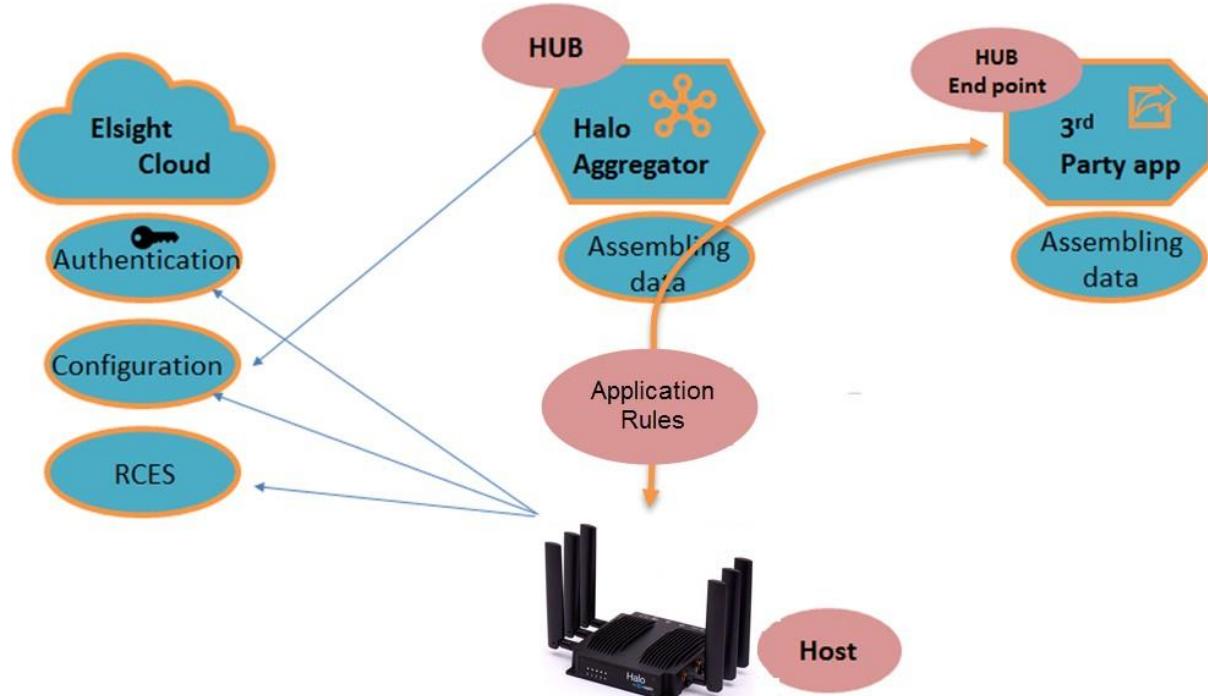


The Halo communication platform is available in 2 form factors:

- As a standalone device (described in this guide)
- As an OEM card (see the [Elsight Halo User Guide OEM Version](#))

## System Flow

The Elsight system flow is illustrated in the diagram below.



The system falls into 3 basic zones:

- Elsight Cloud and Halo host devices:

The Elsight Cloud Platform provides authentication and configuration support for the Halo host devices.

The host is the Halo communication platform described in this guide, which breaks the data into separate data streams and transmits those streams over multiple IP links.

Note that in some cases, for example a P2P connection, the Halo hardware can be both the host and the hub.

- Hub:

The hub is the Halo aggregator, which reassembles the data for final transmission to the endpoint.

- Hub endpoint:

The hub endpoint is in 3<sup>rd</sup> party space, such as a VPN. (See [OpenVPN Application](#).)

The application rules, which are configured via the Cloud Platform, define the functionality and relationships of all 3 zones. (See the [editGse UoPr f/IEP diolC t gisIE](#) for more information.)

# Hardware Overview

This section describes the Halo interfaces and LEDs.

## The Halo Front Panel



On the Halo front panel are the status LEDs:

- LEDs **1-4**: Cellular status LEDs

The cellular status LED states are described in the following table.

State	Description
<b>Red</b>	Cannot recognize SIM card
<b>Green</b>	Connected to the cellular network
<b>Blue</b>	Connected to the aggregator
Blinking <b>Green-Red</b>	Requires custom dialing rules

- LED 'S': System status LED

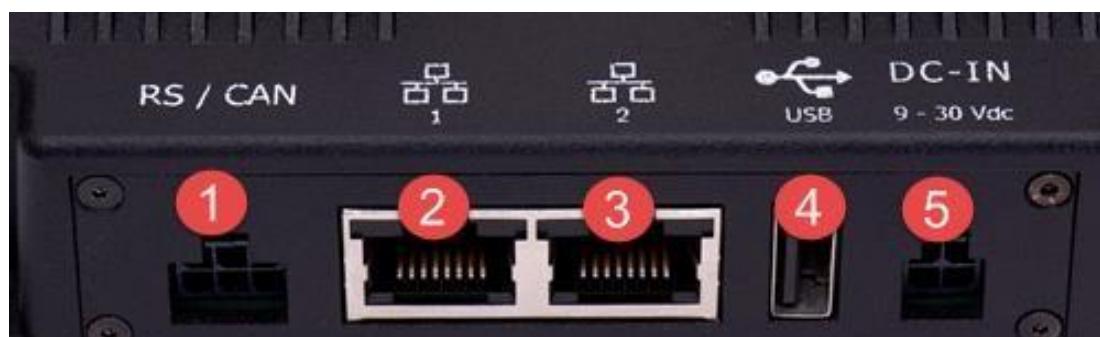
The system status LED states are described in the following table.

State	Description
<b>Red</b>	Boot
<b>Green</b>	Connected to the VPN
<b>Blue</b>	Connected to the aggregator
Blinking <b>Blue-Red</b>	Dialing

## The Halo Back Panel



The following figure shows the back panel connector labels (top view of the device). The connectors are described in the table below.



#	Description
1	RS/CAN BUS
2	ETH 1
3	ETH 2
4	USB 2.0
5	DC IN (9-30V)

# The Elsight Halo Web GUI

The Elsight Halo Web GUI provides access to the Halo device for configuration, monitoring, management, and maintenance.

The application consists of 3 modules:

- **NICs (Network Interface Controllers)**

This module provides access to all of the device Network Interface Controllers:

- Cellular Modem NICs
- Ethernet NICs
- WiFi NICs

For each NIC you can:

- See relevant information such as NIC ID and IP address
- Configure parameters such as dialing rules or IP/subnets
- Perform operations such as enable/disable.

- **Application**

This module centralizes all the device applications:

- OpenVPN application
  - Define VPN profiles.

- **Maintenance**

Through the Maintenance module you can:

- Verify device firmware packages versions.
- Upgrade or downgrade device firmware.
- Setup device to a realm and associate device to an environment.
- Shutdown or reboot the device.

The following table explains the main menu icons:

	<b>Home</b>
	<b>NICs</b>
	<b>Cellular Modem NICs</b>
	<b>Ethernet NICs</b>
	<b>WiFi NICs</b>
	<b>Applications</b>

	<b>OpenVPN</b>
	<b>Maintenance</b>
	<b>Logout</b>

## Logging in to the Halo Web GUI

**NOTE:** It is recommended to use the latest version of Google Chrome web browser.

1. Connect the unit to a computer via one of the Ethernet ports and turn the unit on.
2. Open a web browser and enter the relevant IP address in the address line:

By default the IP addresses are:

- ETH 1: 20.0.0.2
- ETH 2: 20.0.1.2

Note that these IPs can be changed in the NIC/Ethernet configuration (see Ethernet *Settings*).

3. Enter your user name and password and click Login

The default values are:

- Username: admin
- Password: admin

# NICs (Network Interface Controllers)

Use this module to configure and manage the device NICs.

There are 3 types of NICs in the Halo device:

- Cellular Modem NICs
- Ethernet NICs
- WiFi NICs

The main NIC page displays monitoring and statistics graphs regarding each NIC network usage, such as the **Speed** graph.

Each of the specific NIC pages consists of the following sections:

- **Status**

Displays a Status listing of all NICs of that type.

Click on one of the entries to display the settings and operations available for the specific NIC type.

- **Settings**

This section varies, depending on the NIC type:

- For Cellular Modem NICs you can configure **Network Limitations** and **Dialing Rules**.
- For Ethernet NICs you can configure IP **Settings**.
- For WiFi NICs you can configure routing and security type **Settings**.

- **Operations**

This section allows you to perform operations such as enabling or disabling the NIC and pinging a selected destination IP.

## Status

Status						
#	Model	Carrier	Signal	Net	Status / IP	
○	5.1	Telit LE910C4-EU	Partner	▲	LTE	192.168.225.7 
○	5.2	Telit LE910C4-EU	Partner	▲	LTE	192.168.225.8 
●	6.1	Telit LE910C4-EU	Partner	▲	LTE	192.168.225.5 
○	6.2	Telit LE910C4-EU	Partner	▲	LTE	192.168.225.6 

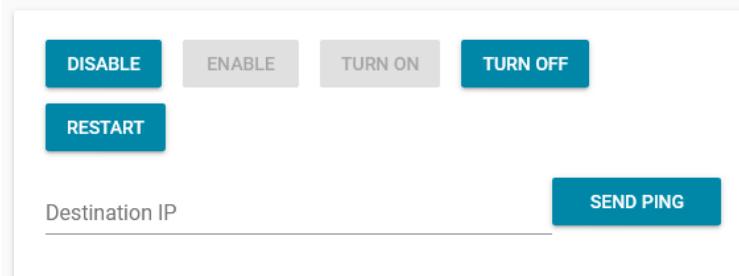
Latest update at: 12/5/2019, 3:52:42 AM

The Status listing appears at the top of the each specific NIC page and shows the status of all modules of that type.

- Click on any line to display the settings and **Operations** sections for the selected NIC.

- For the cellular modem and WiFi NICs, you can click  to display **Further Information**.

## Operations



The available operations vary slightly depending on the NIC type. The following table summarizes available operations.

Enable	Enable the element.	All NIC types
Disable	Disable the element.	All NIC types
Turn On	Turn on the element (must be enabled).	Cellular modem only
Turn Off	Turn off the element.	Cellular modem only
Restart	Restart the element (must be enabled).	Cellular modem only
Send Ping	Ping specified destination IP	All NIC types

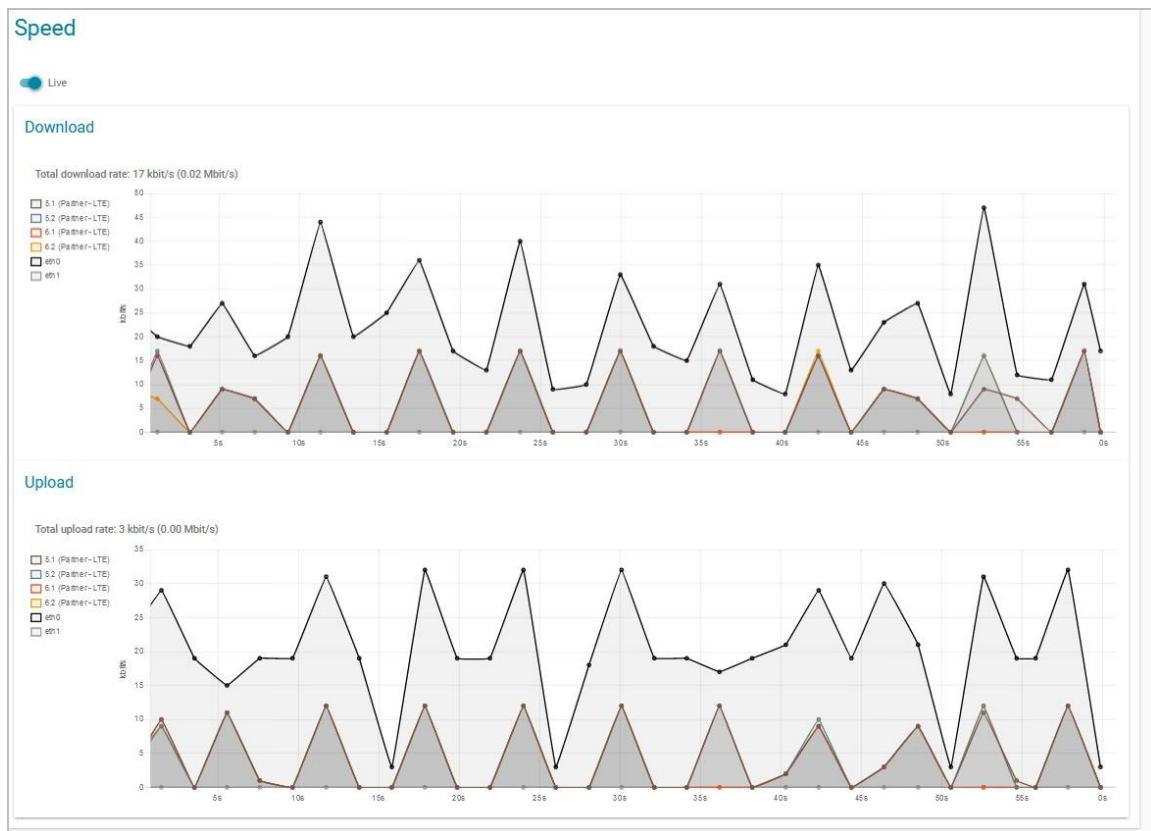
For all NICs, you can ping a specified IP address to test connectivity and verify that the card has internet access to the desired IP address.

### To ping a specified IP:

- Enter the destination IP and click **Send Ping**.

If the test fails, check that the card is connected correctly. You may need to edit some of the parameters such as the dialing rules (cellular modem) or IP addresses (Ethernet).

## Speed



The NIC page displays the total download and upload rate **per second** for each NIC.

- You can view the graph live or freeze it (“Live” switch).
- The legend at the left explains the colors in the graph. You can hide any of the NICs as long as the display is live.
- You can hover on any point on the chart to display a tooltip showing rates for each NIC at this point in time.

## Cellular Modem NICs

The Halo platform may contain either 2 or 4 embedded cellular modules.

This page lets you do the following:

- See the status of the cellular modules
- Configure the dialing rules
- Turn on and off or enable/disable
- Ping a specified destination IP

## Status

Status						
#	Model	Carrier	Signal	Net	Status / IP	
<input checked="" type="radio"/>	5.1	Telit LE910C4-EU	Partner		LTE	192.168.225.7 
<input type="radio"/>	5.2	Telit LE910C4-EU	Partner		LTE	192.168.225.8 
<input type="radio"/>	6.1	Telit LE910C4-EU	Partner		LTE	192.168.225.5 
<input type="radio"/>	6.2	Telit LE910C4-EU	Partner		LTE	192.168.225.6

Latest update at: 12/5/2019, 3:56:52 AM

**Further Information**

Cell ID: 259E03

LAC: 5660

IMSI: 425010900326080

Raw Network Information  
N/A RAW INFO

- For the cellular modem NICs, you can click  to display **Further Information**.

## Network Limitations

You can limit each modem to a specific technology.

If you do not want to limit to one technology, choose **elbasiD**.

## Dialing Rules

Custom 

Username  
None

Password  
\*\*\*\*\*

Auth Mode  
Auto

APN  
uinternet

Dial Number  
\*99#

**APPLY**

Dialing rules are provided by your carrier. The system has pre-defined dialing rules for many global carriers.

If your carrier is familiar, you will find its settings pre-defined. If there are no pre-defined rules for your carrier, manually configure them here.

- If the carrier is familiar, with pre-defined dialing rules, choose **Default** and click **Apply**. All other fields are unavailable.
- If the carrier is not familiar choose **Custom**. All other fields will then be available.

Configure the rules and click **Apply**.

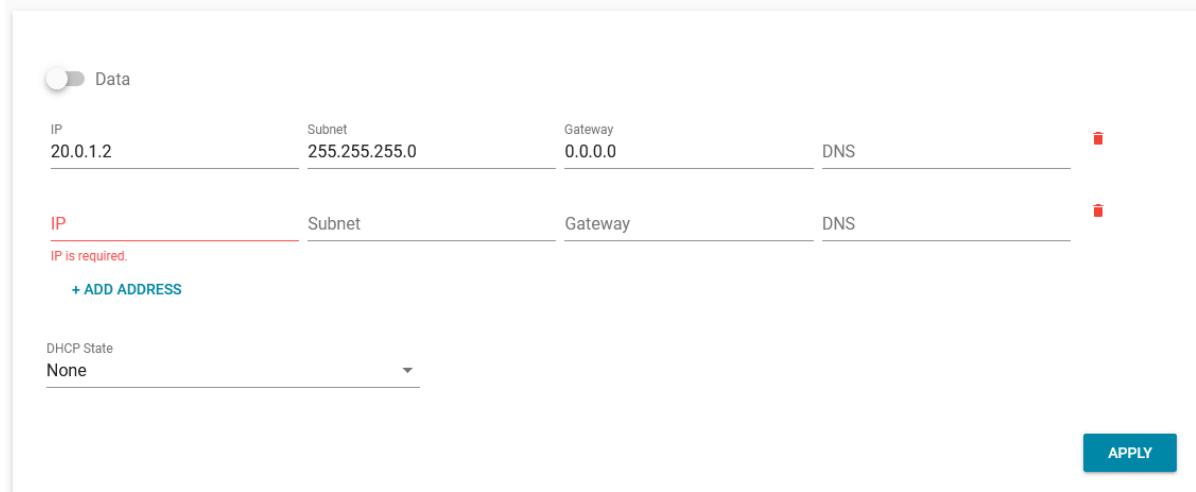
## Ethernet NICs

In most cases, Ethernet interfaces are used for management of the device. However, you can use the **aaaa** switch to use the selected Ethernet interface to carry data (see [Settings](#) below).

This page lets you do the following:

- See the status of the Ethernet modules
- Configure routing settings
- Enable or disable the card
- Ping a specified destination IP

## Settings



<input checked="" type="checkbox"/> Data	IP 20.0.1.2	Subnet 255.255.255.0	Gateway 0.0.0.0	DNS	
	IP IP is required.	Subnet	Gateway	DNS	

+ ADD ADDRESS

DHCP State  
None

APPLY

This section is a listing of all currently configured IP addresses.

You can:

- Switch the **Data** option to use this interface to carry data (rather than as a management interface).
- Add a new IP address:  
Click **Add Address** and enter the IP address, subnet, gateway and DNS.
- Delete an IP address:

Click the  icon at the end of the row.

- **Configure DHCP:**  
Choose client or server role. Or if DHCP is not applicable, choose **None**.
- After making any of these changes, click **Apply** for the change to take effect.

## WiFi NICs

This page lets you do the following:

- See the status of the WiFi modules
- Configure access such as routing information and security type.
- Enable or disable the WiFi card
- Ping a specified destination IP

## Settings

Status

Device	Status	State	SSID	IP	Signal	Built-in	Data	
 wlan0	Down	N/A						

Latest update at: 12/18/2019, 12:17:12 PM

Settings

Data

Built-in

Static Data

IP 20.0.2.2	Subnet 255.255.255.0	Gateway 0.0.0.0	DNS	
----------------	-------------------------	--------------------	-----	---

[+ ADD ADDRESS](#)

Configuration

[+ ADD CONFIGURATION](#)

DHCP State  
None

**APPLY**

This section is a listing of all currently configured WiFi NICs.

You can:

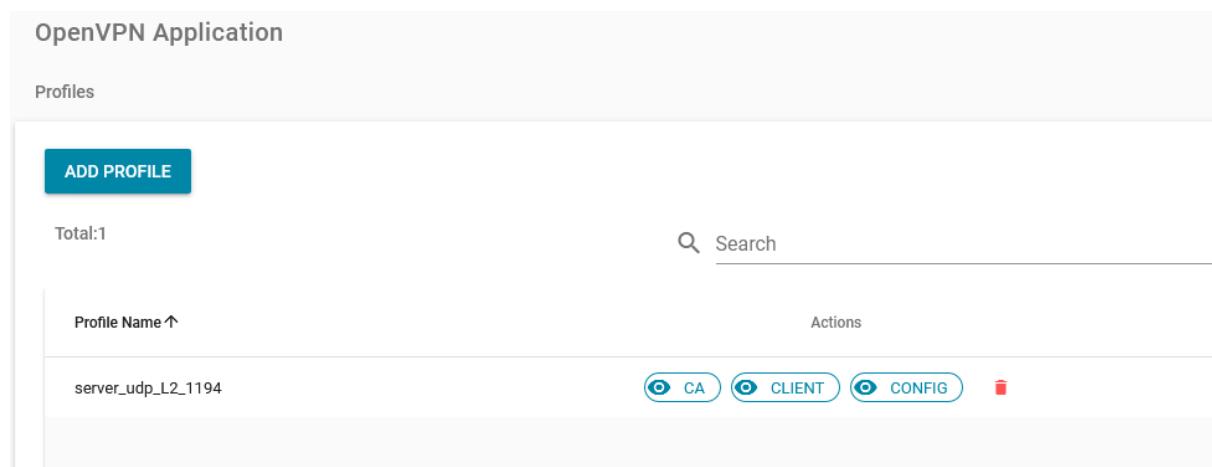
- Switch the **Data** option to use this interface to carry data (rather than as a management interface).
- Add a new IP address:  
Click **Add Address** and enter the IP address, subnet, gateway and DNS.
- Delete an IP address:  
Click the  icon at the end of the row.
- Add a new configuration:  
Click **Add Configuration** and enter the security type and state.
- Delete a configuration:  
Click the  icon at the end of the row.
- Configure **DHCP**:  
Choose client or server role. Or if DHCP is not applicable, choose **None**.
- After making any of these changes, click **Apply** for the change to take effect.

# Applications

Use this module to configure the OpenVPN application.

**NOTE:** When you create an OpenVPN profile with Layer 2 configuration selected, the system creates a bridge between the ETH0 interface and the VPN NICs.

## OpenVPN Application



The screenshot shows the 'OpenVPN Application' interface. At the top, there is a 'Profiles' section with a 'Total:1' label and a 'Search' bar. Below this, a table lists a single profile: 'server\_udp\_L2\_1194'. The table has columns for 'Profile Name' and 'Actions'. The 'Actions' column contains buttons for 'CA', 'CLIENT', 'CONFIG', and a delete icon. The 'Profile Name' column shows the profile name 'server\_udp\_L2\_1194'.

The authentication information required for an OpenVPN connection is contained in a profile. The profile contains the following:

- CA certificate file
- Client certificate file
- File containing the client key
- OVPN configuration file

Click on a file button  to display the contents of the file.

When a hub or host endpoint is a VPN, you must specify the VPN profile in the relevant application rule (see the [diolC t gis/E eiitGsre UoPr f/IEP](#)). A profile **MUST** also be created here on the device **BEFORE** it can be used in an application rule.

- Make sure that the profile name is *exactly* the same here and in the relevant application rule. The profile name is case sensitive.
- It does not matter which is created first, the profile here or the profile name in the application rule in the Cloud Platform configuration.

To add an OpenVPN profile:

**Add OpenVPN Profile**

Profile Name

CA Certificate  

Client Certificate  

Client Key  

Configuration Source  
**Standard** 

Encryption Type  
**Blowfish** 

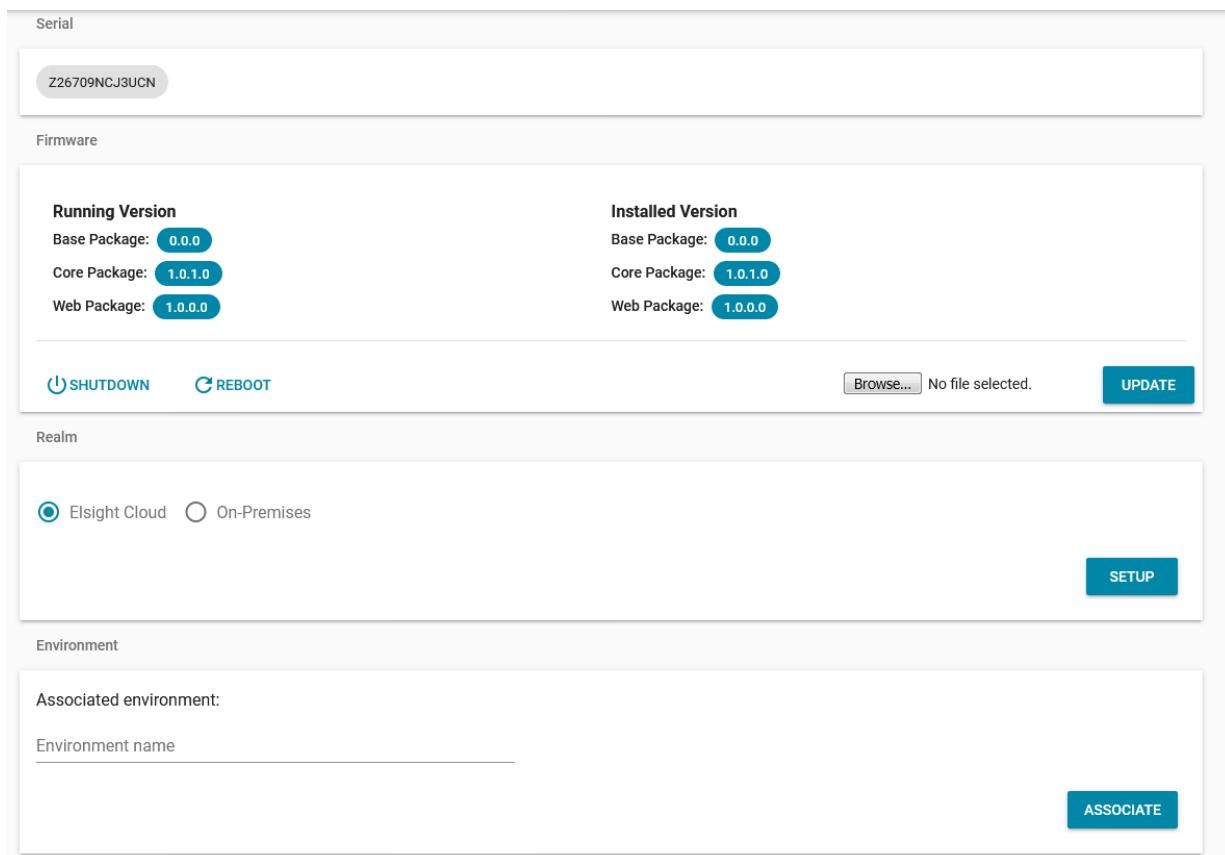
Compression Type  
**LZO** 

Layer Type  
**Layer 2** 

**CANCEL** **ADD**

1. Enter a valid name for the profile. (Alphanumeric characters only, no spaces.)
2. Browse to import the required certificate and key files.
3. Define the configuration source
  - For a **Custom** configuration source:  
Browse to import the OVPN configuration file.  
**NOTE:** The OVPN configuration file **MUST** be syntactically valid in conformation with the guidelines in the [OpenVPN Reference Manual](#).
  - For a **Standard** configuration source:  
Define the following:
    - Encryption type
    - Compression type
    - Layer type
4. Click **Add**.

# Maintenance



The screenshot shows the Elsight Maintenance interface with the following sections:

- Serial:** Displays the serial number **Z26709NCJ3UCN**.
- Firmware:** Compares **Running Version** and **Installed Version** for three packages:
 

Running Version	Installed Version
Base Package: 0.0.0	Base Package: 0.0.0
Core Package: 1.0.1.0	Core Package: 1.0.1.0
Web Package: 1.0.0.0	Web Package: 1.0.0.0

 Includes buttons for **SHUTDOWN** and **REBOOT**, and a file upload field **Browse...** with the message **No file selected.** A **UPDATE** button is also present.
- Realm:** Shows the **Elshift Cloud** option selected (radio button is checked).
- Environment:** Allows associating the device with an environment, with a **SETUP** button.

Use this module to the following:

- Manage the device firmware version.
- Configure the realm and environment.
- Shut down the device.
- Reboot the device.

## Serial Number

The serial number is assigned as part of the manufacturing process. Each Halo device is given a serial number in the factory, which is associated with the unique hardware details of the unit.

## Firmware

You can see both the running firmware version and the installed version. The difference between running and installed version is related to the automated upgrade process.

- **Installed version:** When you install a new firmware version, that version appears as the installed version. However, it is not yet running.

- Running version: Upon the next successful restart, the system firmware updates to the latest installed version, which is now also the running version.

You can also shut down  or reboot  the device.

#### *To install a new firmware version:*

1. Browse to find and select the firmware version file.
2. Click **Update**.

## Realm

...including all services under the cloud, Elsight cloud is installed total is the location where the realm

#### *To assign the device to a realm:*

1. Select the realm according to your cloud configuration.

For an on-premises realm:

- (a) Enter at least one enrollment service IP address or URL. Press **Enter** after each entry.
- (b) Click in the **Realm CA** field to browse to and attach the certificate.

2. Click **Setup**.

## Environment

An environment is a defined group of users who have access to the environment as well as all devices associated with the environment.

The environment **TSUM** be defined via the Elsight Cloud Platform and the device **TSUM** be associated to that environment using the proper device serial number as displayed above (see the [Elsight Cloud Platform User Guide](#)). In addition, you **TSUM** associate the device with the relevant environment here from the Maintenance page.

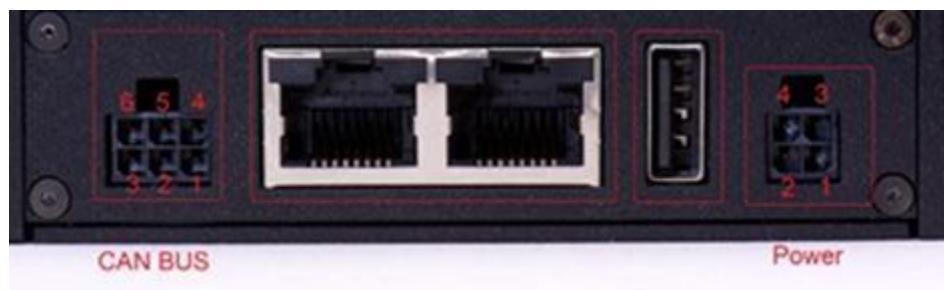
#### *To associate the device with an environment:*

1. Define both the environment and the device in the Elsight Cloud Platform (see the [Elsight Cloud Platform User Guide](#)).
2. Make sure to enter the environment name exactly as it is defined in the Cloud Platform; the name is case-sensitive.
3. Click **Associate**.

## Appendix: Connectors Description

This appendix describes pinouts for the following connectors located on *The Halo Back Panel*.

- CAN bus
- Power



**CAN Bus**

PIN Number	Description
1	RS_RXD#1
2	RS_CTS/CAN_L
3	RS_TXD#1
4	RS_RTS/CAN_H
5	RS_SEL
6	Ground

**Power In Connector**

PIN Number	Description
1	Ground
2	DC in (12 v)