HALO SMART SENSOR

ADMINISTRATOR MANUAL

v2.9.0.10 | HALO 2.0, 2C, 3C and 3C-PC MODELS

Brought to you by:

IPVIDEO

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ABOUT THIS DOCUMENT

This manual is intended for administrators and users of IPVideo HALO Smart Sensor, and is applicable to hardware versions 2.0, 2C, 3C, and 3C-PC , HALO firmware version 2.8 and later. It includes instructions for using and managing the product on your network. Previous experience of networking will be of use when using this product. Some knowledge electrical circuitry and alarm panel connection may be useful in certain types of installations. Later versions of this document will be posted at https://halodetect.com/resources/manuals-guides/. See also the product's online help, available through the web-based interface.

LEGAL CONSIDERATIONS

WARNING **HALO Smart Sensors are NOT a LIFE SAFETY device. They do NOT replace LIFE SAFETY devices such as carbon monoxide monitors or smoke detectors.**

ATTENTION **HALO Smart Sensors n'est pas un appareil LIFE SAFETY. Il ne remplace PAS les dispositifs LIFE SAFETY tels que les moniteurs de monoxide de carbone ou les détecteurs de fumée.**

Environmental and behavioral monitoring can be regulated by laws that vary from country to country. HALO has been designed to prohibit any direct monitoring or recording of video or audio, please check your local laws to ensure compliance.

LIABILITY

Every care has been taken in the preparation of this document. Please inform your local IPVideo Corporation office of any inaccuracies or omissions. IPVideo Corporation cannot be held responsible for any technical or typographical errors and reserves the right to make changes to products and manuals without prior notice. IPVideo Corporation makes no warranty of any kind with regard to the material contained within this document including, but not limited to, warranties of merchantability and fitness for a particular purpose. IPVideo Corporation shall not be liable nor responsible for incidental or consequential damages in connection with the furnishing, performance, or use of this material. This product is only to be used for its intended purpose.

INTELLECTUAL PROPERTY RIGHTS

IPVideo Corporation has intellectual property rights relating to technology embodied in the product described in this document. In particular, and without limitation, these intellectual property rights may include on one or more patents or pending patent applications in the US and other countries. A list of relevant patents may be found at https://ipvideocorp.com/patents/.

This product contains open source and licensed 3rd party software components. The complete list of open source and licensed 3rd party software components can be found through the Dashboard web page of HALO by navigating to: About > Legal > View Licenses.

EQUIPMENT MODIFICATION

This equipment must be installed and used in strict accordance with the instructions given in the user documentation. This equipment contains no user-serviceable components. Unauthorized equipment changes will invalidate all applicable regulatory certifications and approvals.

TRADEMARK ACKNOWLEDGMENTS

REGULATORY INFORMATION:

ELECTROMAGNETIC COMPATIBILITY

This equipment has been designed and tested to fulfill applicable standards for:

- Radio frequency emission when installed according to the instructions and used in its intended environment.
- Immunity to electrical and electromagnetic phenomena when installed according to the instructions and used in its intended environment.

ANTENNA SPECIFICATIONS

Type	Value	Unit
Radio Frequency	2402-2480	MHz
Max Power	21.9	mW
Antenna Gain	3.5	dBi
Antenna Type	Internal	

USA

This equipment has been tested using a shielded network cable (STP)and found to comply with the limits for a Class A 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 the 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

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

SAFETY INFORMATION

The following convention is used within this manual. French translations of the critical levels are included.

Hazard Levels

DANGER Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE Indicates a situation which, if not avoided, could result in damage to property.

DANGER Indique une situation dangereuse qui, si elle n'est pas évitée, entraînera la mort ou des blessures graves.

ATTENTION Indique une situation dangereuse qui, si elle n'est pas évitée, pourrait entraîner la mort ou des blessures graves.

MISE EN GARDE Indique une situation dangereuse qui, si elle n'est pas évitée, pourrait entraîner des blessures mineures ou modérées.

REMARQUER Indique une situation qui, si elle n'est pas évitée, pourrait entraîner des dommages matériels.

Other Message Levels

IMPORTANT Indicates significant information which is essential for the product to function correctly.

NOTE Indicates useful information which helps in getting the most out of the product.

ELECTRICAL SAFETY

HALO 2.0, 2C

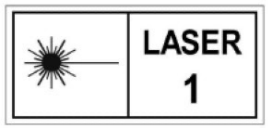
This product complies with IEC/EN/UL 60950-1, Safety of Information Technology Equipment. The product shall be grounded either through a shielded network cable (STP) or other appropriate method. The power supply used with this product shall fulfill the requirements for Safety Extra Low Voltage (SELV) and Limited Power Source (LPS) according to IEC/EN/UL 62368-1 or IEC/EN/UL 60950-1.

HALO 3C

The HALO 3C family of sensors adhere to the KS X 3126 (electrostatic discharges) minimum performance criteria. In certain cases of exposure to a high level of ESD exposure the HALO 3C would require a power cycle to restore power to the downstream ethernet port.

LASER SAFETY NOTICE

CAUTION



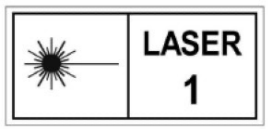
HALO Smart Sensors contain a **CLASS 1 LASER PRODUCT** in accordance with standard **IEC60825-1:2014. This product complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.**

Caution – use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

No regular maintenance is required to keep this product in compliance.

Level 1 Maintenance Considerations
Level 1 Maintenance procedures for the HALO Smart Sensors do not require removal of any components that would expose the Class 1 Laser Assembly.

MISE EN GARDE



HALO Smart Sensors contient un **PRODUIT LASER DE CLASSE 1** conforme à la norme **IEC60825-1: 2014. Ce produit est conforme aux normes 21 CFR 1040.10 et 1040.11, à l'exception de la conformité à la norme IEC 60825-1 Ed. 3., tel que décrit dans l'Avis laser n ° 56 du 8 mai 2019.**

Attention - L'utilisation de commandes ou de réglages ou la réalisation de procédures autres que celles spécifiées dans le présent document peut entraîner une exposition à des radiations dangereuses.

Aucun entretien régulier n'est requis pour maintenir ce produit en conformité.

Considérations de maintenance de niveau 1.
Les procédures de maintenance de niveau 1 pour le capteur intelligent HALO ne requièrent pas le retrait de composants susceptibles d'exposer l'assemblage laser de classe 1.

BATTERY

These products use a lithium battery as the power supply for its internal real-time clock (RTC). Under normal conditions this battery will last for a minimum of five years. Low battery power affects the operation of the RTC, causing it to reset at every power-up. The battery should not be replaced unless required, but if the battery does need replacing, contact IPVideo Corporation support for assistance. Lithium coin cell 3.0 V batteries contain 1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME), CAS no. 110-71-4.

WARNING

- Risk of explosion if the battery is incorrectly replaced.
- Replace only with an identical battery or a battery which is recommended by IPVideo Corporation
- Dispose of used batteries according to local regulations or the battery manufacturer's instructions.

ATTENTION

- Risque d'explosion si la batterie est remplacée de manière incorrecte.
- Remplacez uniquement avec une batterie identique ou une batterie recommandée par IPVideo Corporation.
- Éliminez les piles usagées conformément aux réglementations locales ou aux instructions du fabricant.

DISPOSAL AND RECYCLING

When these products have reached the end of there useful life, dispose of it according to local laws and regulations. For information about your nearest designated collection point, contact your local authority responsible for waste disposal. In accordance with local legislation, penalties may be applicable for incorrect disposal of this waste.

SUPPORT

Should you require any technical assistance, please contact your IPVideo Corporation Authorized Reseller. If your questions cannot be answered immediately, your reseller will forward your queries through the appropriate channels to ensure a rapid response. If you are connected to the Internet, you can download user documentation and software updates.

Technical Support via Telephone: (631) 647-9970
Technical Support via Email: techsupport@ipvideocorp.com

Live technical support is available Monday through Friday (excluding holidays) between the hours of 8 AM and 7 PM Eastern Standard Time.

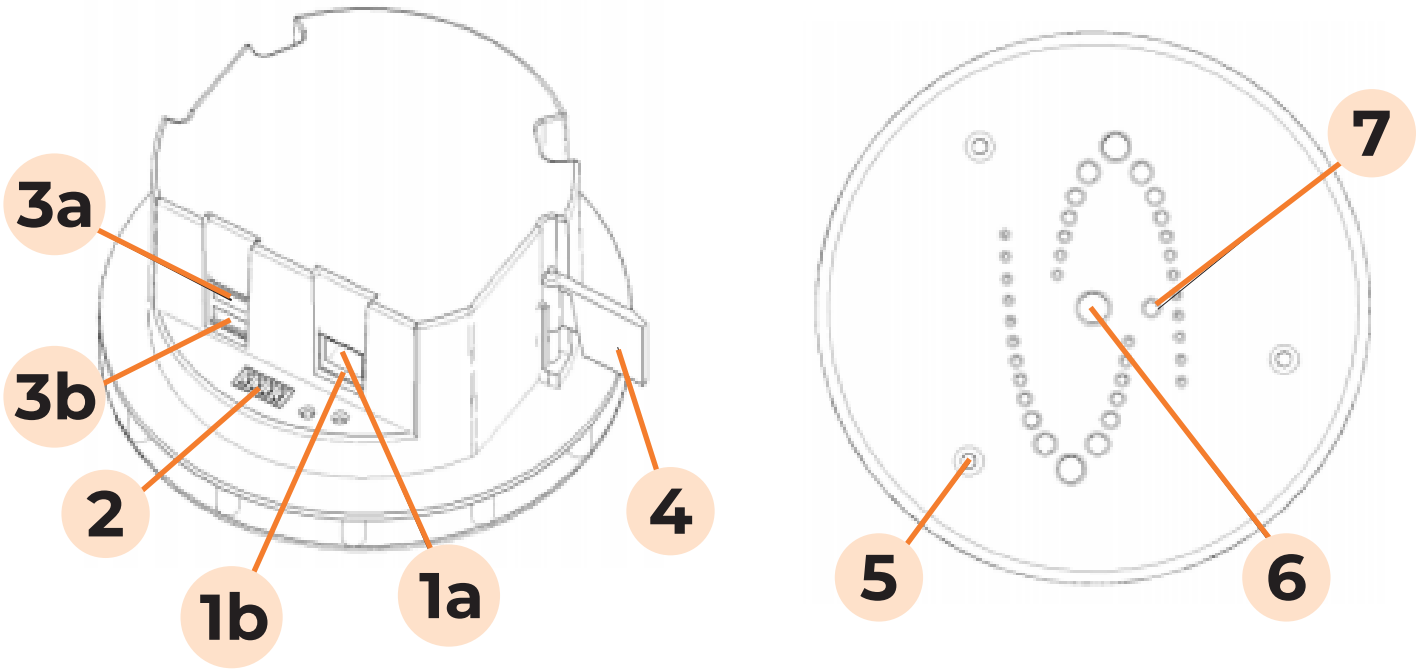
INTRODUCTION

HALO Smart Sensors are IoT devices that detects environmental changes that occur in many locations including privacy concern areas where surveillance cameras can't be installed. HALO Smart Sensors are capable of detecting many things such as vaping, smoke, vaping with THC, specific key words, gunshots, air quality, and aggression in areas a camera cannot be placed. Additional sensors give HALO the ability to monitor air quality index (AQI), temperature, humidity, many hazardous chemicals and more. When the sensor values exceed threshold levels, HALO Smart Sensor can send alerts to responders.

HALO 2.0 AND HALO 2C HARDWARE OVERVIEW

NOTICE The product shall be connected using a shielded network cable (STP). All cables connecting the product to the network shall be intended for their specific use. Make sure that the network devices are installed in accordance with the manufacturer's instructions. For information about regulatory requirements, see Electromagnetic Compatibility (EMC) on page 4.

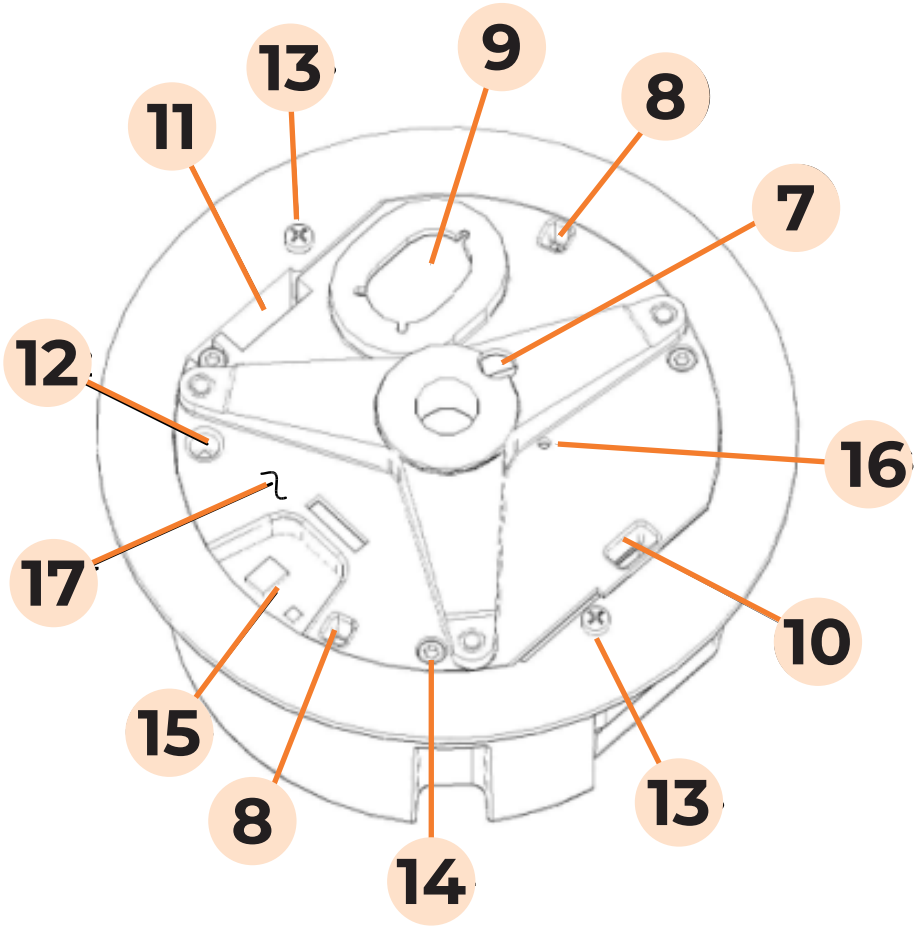
REMARQUER Le produit doit être connecté à l'aide d'un câble réseau blindé (STP). Tous les câbles reliant le produit au réseau doivent être destinés à leur utilisation spécifique. Assurez-vous que les périphériques réseau sont installés conformément aux instructions du fabricant. Pour plus d'informations sur les exigences réglementaires, voir Compatibilité électromagnétique (CEM) à la page 4.



1a. (HALO-V2.0) Network Connection (RJ-45) – requires 802.3af Power over Ethernet
1b. (HALO-2C) USB Ports – currently unused
2. Relay Connection (Plug supplied)
3a. (HALO-V2.0) USB Ports – currently unused
3b. (HALO-2C) Network Connection (RJ-45) – requires 802.3af Power over Ethernet
4. Locking Wing – see installation guide
5. Cover Securing Screws (3) – T10 Torx driver required
6. Multi-color LED Indicator
7. Light Sensor

HALO 2 OUTER COVER REMOVED

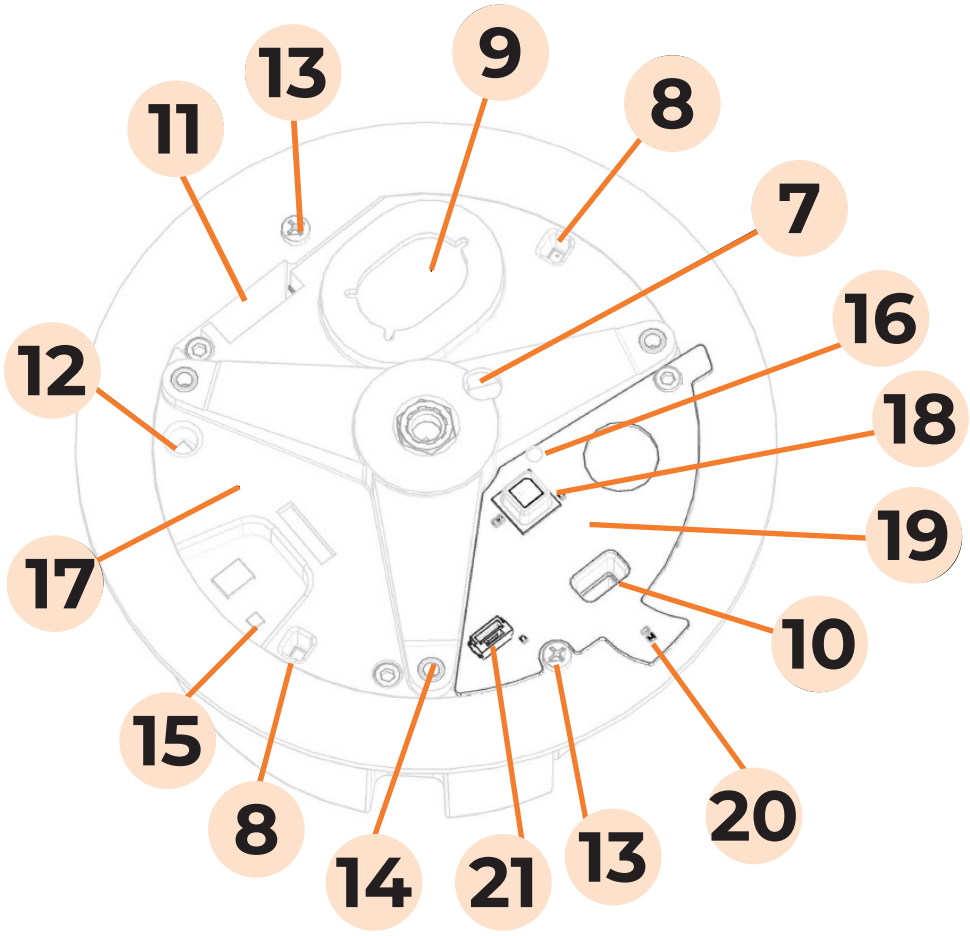
The outer cover must be removed (by removing the three T10 TORX screws [5] with the provided wrench) during installation and to perform a manual factory reset. The figure below shows details exposed when the Outer Cover is removed.



7. Light Sensor on PC board
8. Microphones
9. Loudspeaker
10. Particle Air Intake Port
11. Particle Air Exhaust Port
12. Temperature and Humidity sensor
13. Clamping Screws
14. Inner Cover Mounting Screws (3)
15. Gas Sensors
16. Reset Button on PC Board
17. Inner Cover

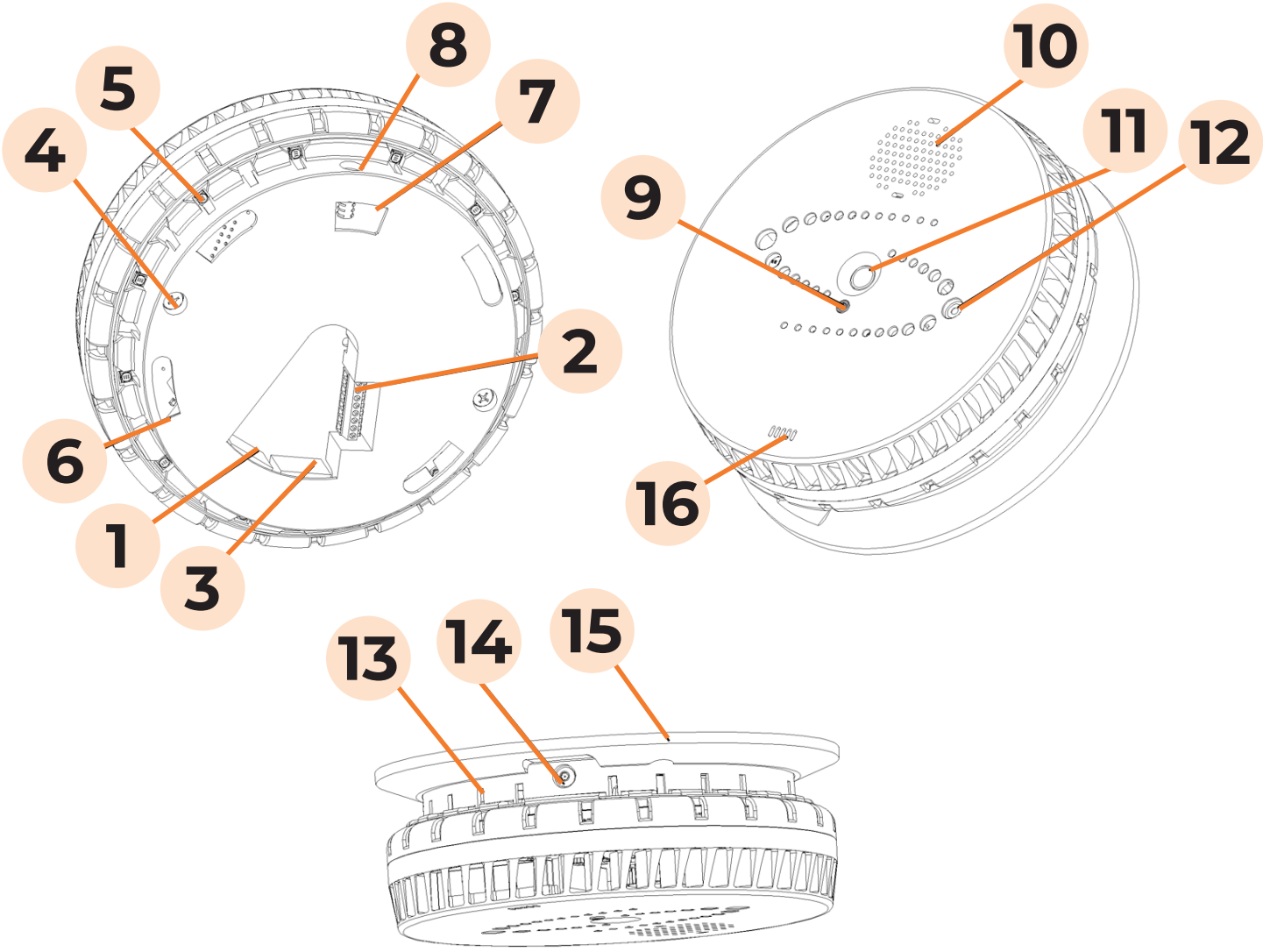
HALO 2C OUTER COVER REMOVED

The outer cover must be removed (by removing the three T10 TORX screws [5] with the provided wrench) during installation and to perform a manual factory reset. The figure below shows details exposed when the Outer Cover is removed.



7. Light Sensor on PC board
8. Microphones
9. Loudspeaker
10. Particle Air Intake Port
11. Particle Air Exhaust Port
12. Temperature and Humidity sensor
13. Clamping Screws
14. Inner Cover Mounting Screws (3)
15. Gas Sensors
16. Reset Button Hole on PC Board
17. Inner Cover
18. Gas Sensor
19. HALO 2C Expansion Board
20. Temperature/ Humidity Sensor
21. Plug Connector

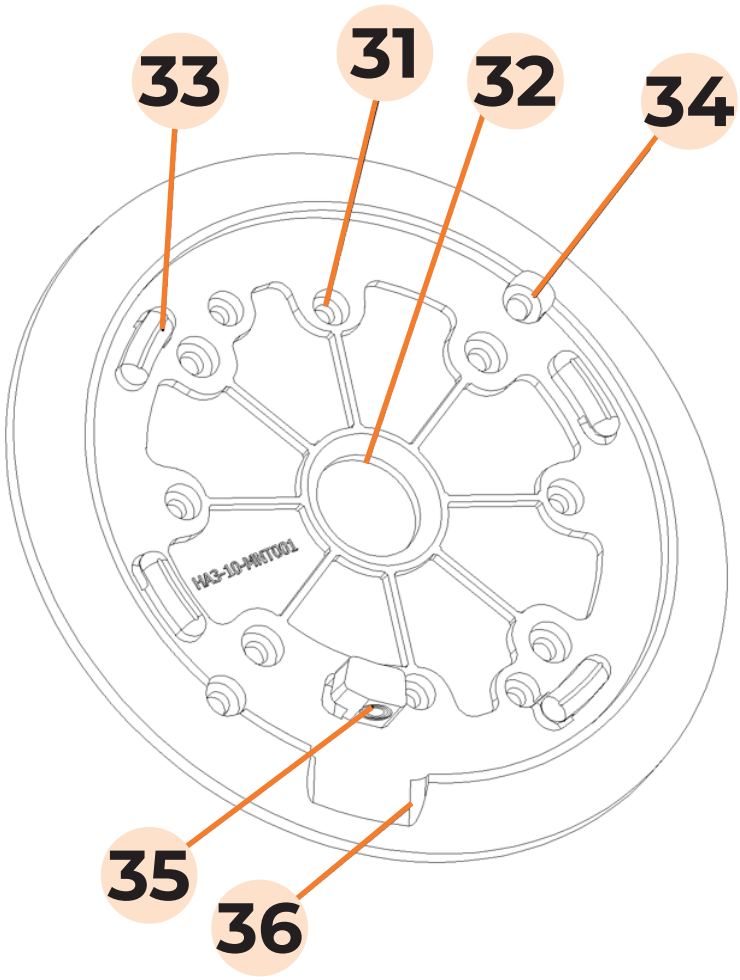
HALO-3C HARDWARE OVERVIEW



1. Input Network Connection (RJ45) – requires 802.3AT or 802.3AF Power over Ethernet
2. External Connector Terminal Block
3. Downstream Network Connection – Supplies 802.3AF Power over Ethernet
4. Screw for Unit Assembly
5. Multi-color LED light (12)
6. Slot for Mounting Plate (4)
7. Slot for Mounting Plate Locking Mechanism
8. Security Screw Slot for Locking Mechanism
9. Lux Sensor
10. Speaker Grill
11. PIR Sensor
12. People Counting Sensor
13. Slot for Air
14. Security Screw Slot for Locking Mechanism
15. Mounting Plate
16. Particle Sensor Port

HALO 3C MOUNTING PLATE REMOVED

The device must be separated into two halves by undoing one security [6] then twist the device apart to perform a manual factory reset. The figure below shows details exposed when the Mounting Plate is removed.



31. Mounting Screw Hole
32. Opening for Ethernet External Connection Wires
33. Mounting Plate Lock
34. Mounting Screw Hole
35. Security Screw Locking Mechanism
36. Clearing for Security Screw

Please refer to the HALO-3C Installation Guide found on https://halodetect.com/resources/manuals-guides/ for more information on installation.

SETUP PREREQUISITES

1. One or more HALO Smart Sensor devices connected to a standard office network where the steps in the HALO Installation Procedure have been followed resulting in confirmation that the device is operating and physically connected to the network.

2. Use one of three ways to find HALOs on the network.
   - Supply at least a temporary DHCP Server to provide an initial IP Addresses
   - Use self-assigned APIPA addresses
   - IPv6 Scan

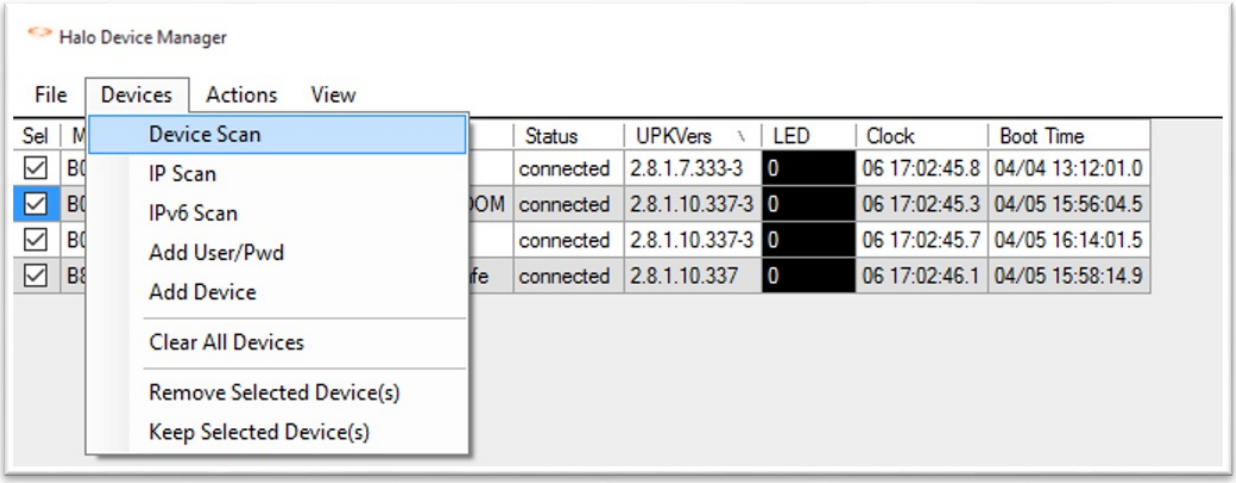
3. If static addressing is planned, then the correct subnet mask, gateway address, and DNS address must be known.

4. An accessible Windows 10 PC connected to the same network with the Chrome web browser installed and must have the HALO Device Manager (HDM) installed, available at:
   https://halodetect.com/resources/firmware-tools/

FINDING HALO SMART SENSORS ON A NETWORK

Start HALO Device Manager (HDM) on the PC by double clicking the program icon. Please refer to the HDM Guide for connection instructions, available at:
https://halodetect.com/resources/manuals-guides/

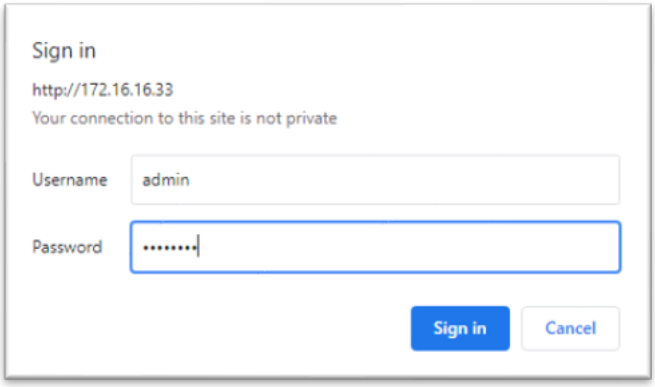
There should be an IP address for each HALO device on the network (for example, 192.168.1.X).



FIRST TIME SETUP

Establishing Connection

Connecting to a HALO device can be done in two separate ways. It can be done with the HALO Device Manager HDM (see HDM Manual) which is the preferred method for setting up multiple HALOs at once.

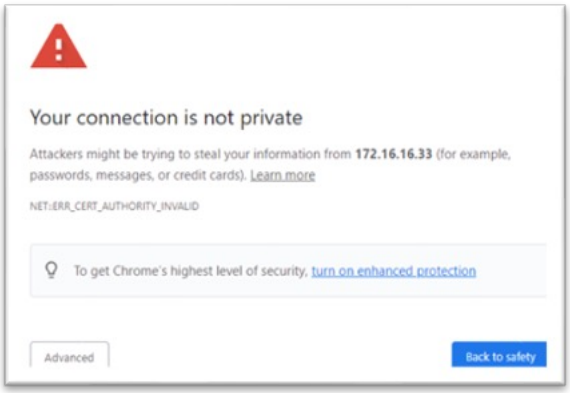


It can also be done by typing the HALO device's IP address in Google Chrome. A popup will appear asking for a username and password. Type "**admin**" for the username and "**changeme**" for the password. Click "Sign in".

Initial Device Setup

The following prompt will pop up. For security reasons it is recommended to click the blue text saying, "Click here". This will ensure passwords are not visible on the network.

If you follow the security recommendations a popup from Chrome will give a warning saying, "Your Connection is not private". The warning means the browser does not know who the server is, but the connection is secure.

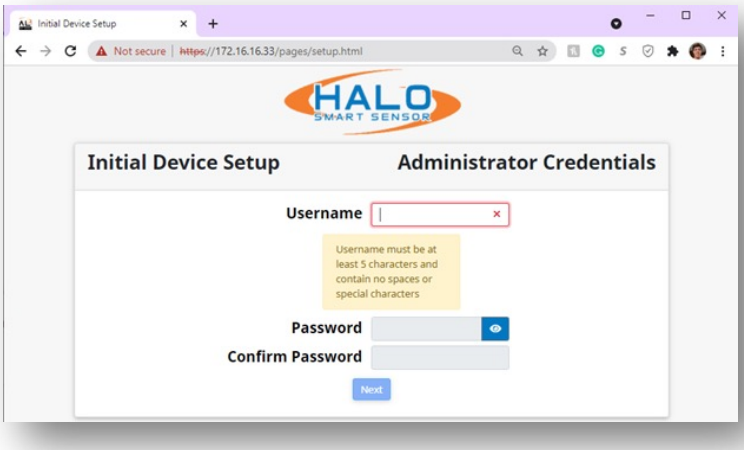


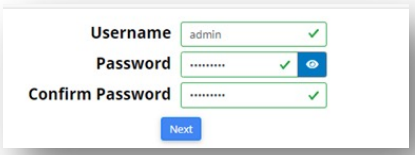
Click "Advance", then click "Proceed to <ip address> (unsafe)".

FIRST TIME SETUP: Initial Device Setup CONTINUED

Administrator Credentials

Type in the username “admin” and “changeme” which was used earlier. Click Next.





NOTE: The search bar will say “Not secure | https”. This is safe and preferred.

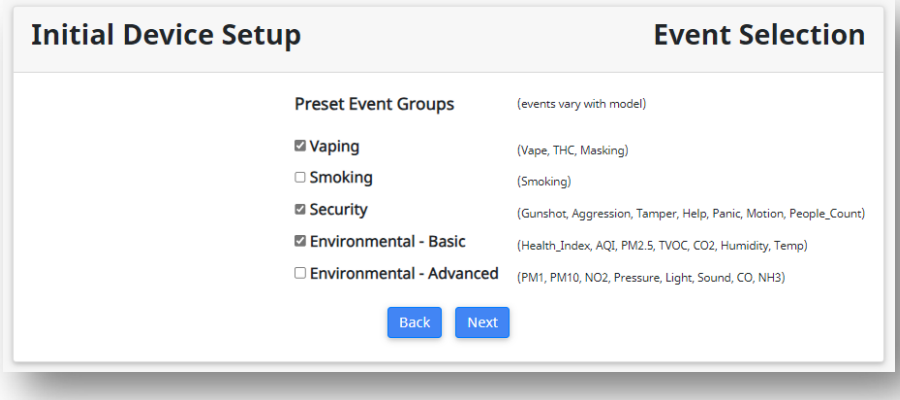
Username must be at least 5 characters and contain no spaces or special characters

Device Name & Timezone

Fill in the Device Name, Timezone, and Country. Click Next

Event Selection

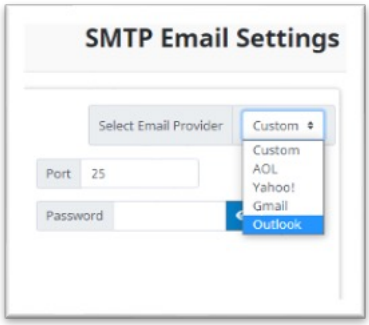
Choose the preset event groups for the initial deployment. Click Next.

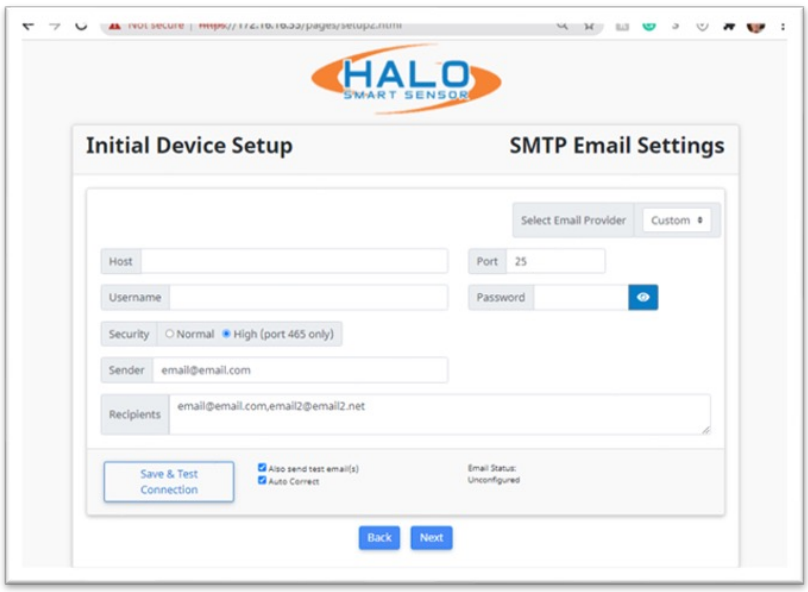


FIRST TIME SETUP

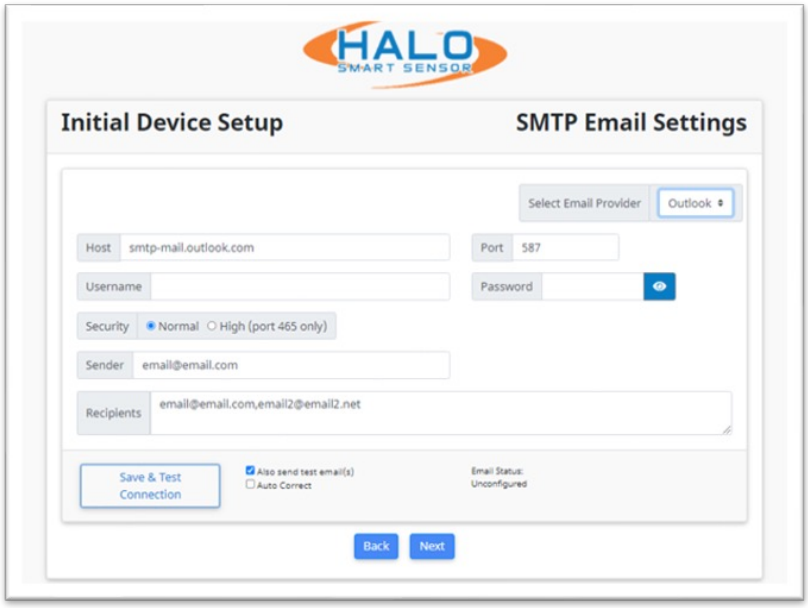
Email Provider

Another Initial Device Setup prompt will appear. This is the last one. Start by clicking “Select Email Provider” in the top right corner and select the email provider to use with the HALO device.





Once an Email Provider is selected, information on Host, Port, Security, and Auto Correct will update. In most cases “Auto Correct” will not be necessary as the server may block the email due to “Auto Correct” trying many ways to find the correct settings. Fill in other requested information then click “Save and Test Connection” then click “Next”.



License Agreements

IPVideo Corporation’s License Agreement and Privacy Policy will pop up next. After reading the following information click “I have read the above” and then “Next”.

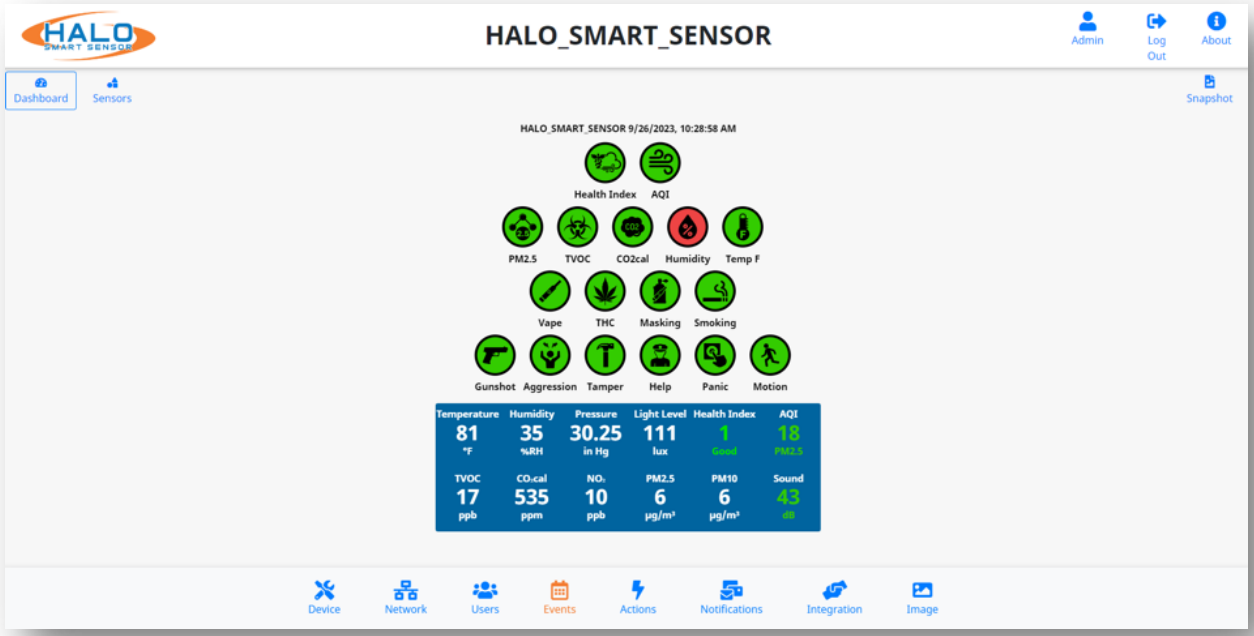
FIRST TIME SETUP

Save Settings & Reboot

Whomever read the last two forms shall fill out the required information. Once filled out click “Save Settings and Reboot Device”. Upon click an information webpage will pop-up to give the user more information on how to effectively use their device. A loading screen will appear of the HALO Smart Sensor rebooting. Once the device is rebooted the webpage will open.

Final Setup

The HALO device has been setup for the first time.

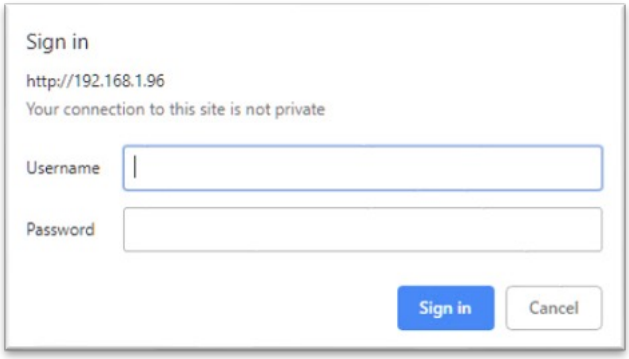


CONNECTION TO A HALO SMART SENSOR

Connect to the desired HALO by either selecting the HALO in HDM and Open Web Page from the Actions drop down menu (Chrome must be default browser) or navigating directly to the IP address in the Chrome web browser.
The default Username is “admin” and the default password is “changeme”.

***If the HALO that is updated from a version prior to 2.2 and has the default password it will change the existing password to “changeme” and require a password change on first login.**

HALO restricts access to the built-in web server by usernames and passwords at two different levels, “admin” and “viewer”.



Username Requirements for Admins:

- 5+ Characters
- No Spaces or Special Characters

Password Requirements for Admins:

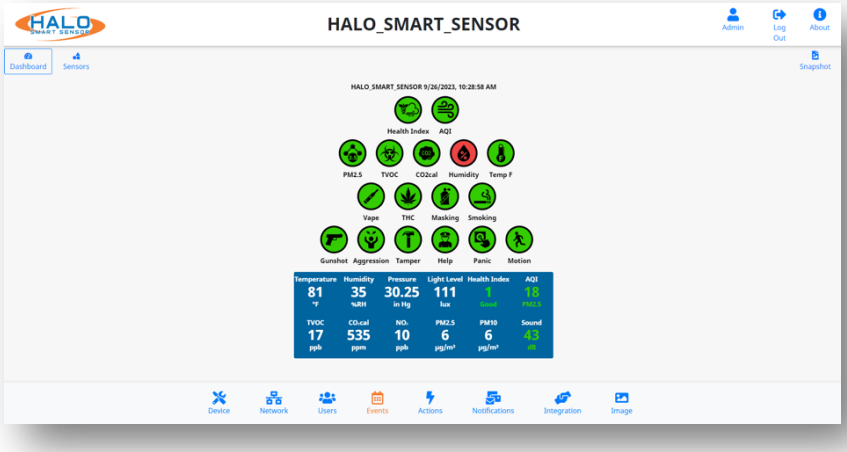
- 8+ Characters
- 1+ Lowercase Letter
- 1+ Uppercase Letter
- 1+ Numeric Character
- 1+ Special Character (!@#$%^&*_- are allowed)
- Cannot Contain Username

An END USER LICENSE AGREEMENT (EULA) has been provided at first login to every HALO to ensure proper utilization of the HALO software and present important terms, restrictions on use, limits on liability of IPVideo to the end-user, and other useful clauses. At logon the user will be required to add the end username, email address, organization and title to acknowledge.

DASHBOARD

From this dashboard you can navigate to various display and configuration pages including:

- Sensors
- About
- Device
- Network
- Users
- Events
- Actions
- Notifications
- Integration
- Image

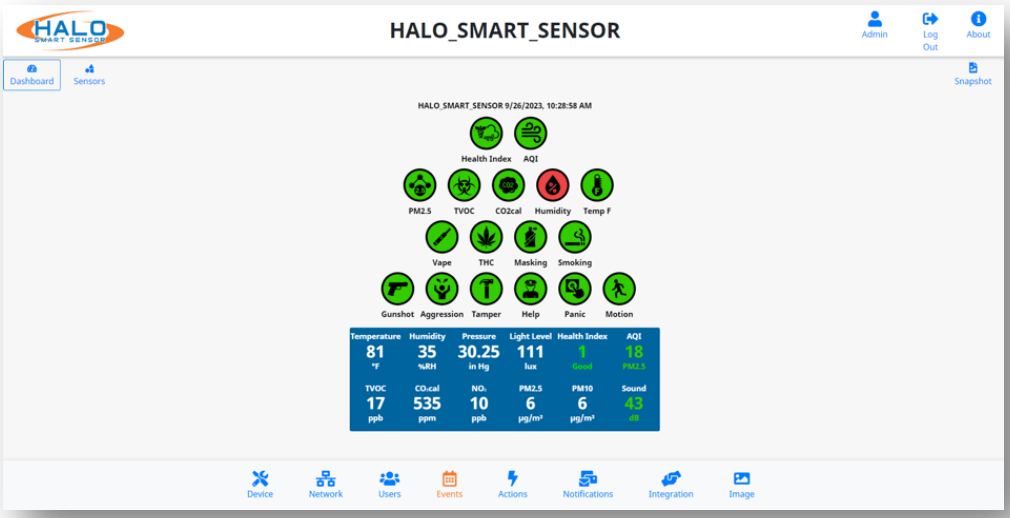


LIVE VIEW

The dashboard has two views for display. These views include Dashboard and Sensors.

Dashboard

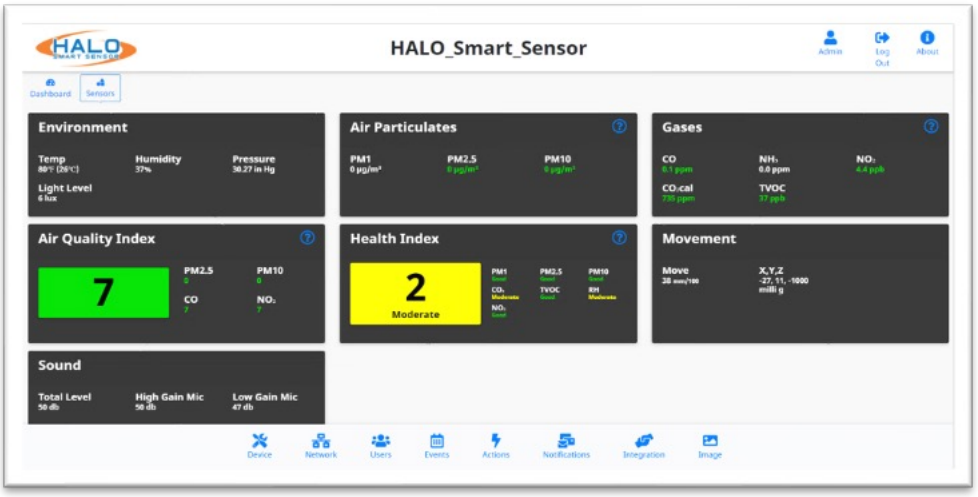
Live information presented including “Normal” and “Alert” state display through color changing indicator icons as well as live readings of specific signatures. This can be configured from the “Image” Tab. More info on next page about Image Tab.



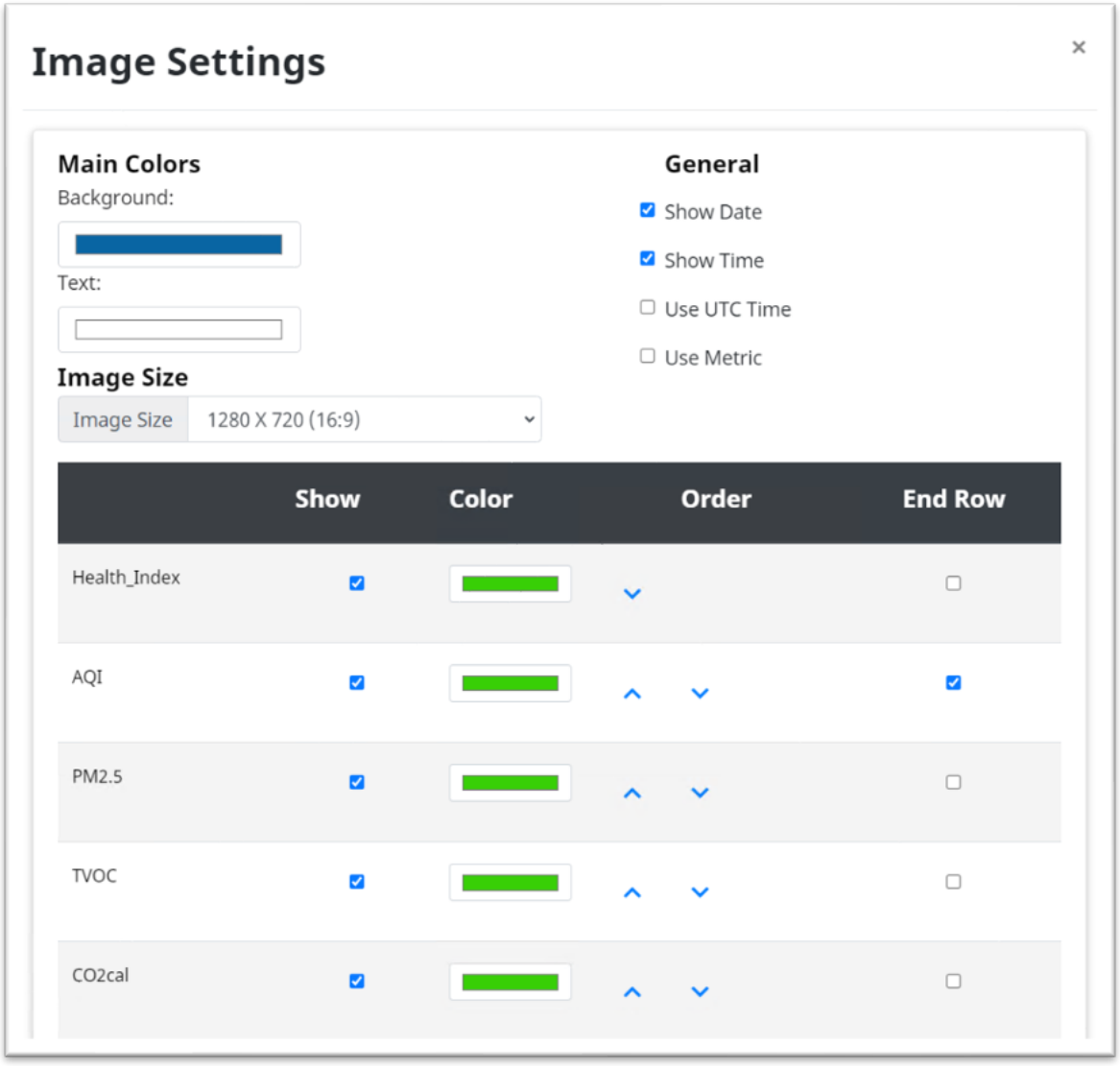
Sensors

The raw sensors displayed in numerical values, including AQI (Air Quality Index).
(Note: AQI is a normalized value generated over a long period of time and will not appear for at least an hour after a reboot or power cycle.)

For HALO 2C & 3C, CO2cal will be displayed instead of CO2eq. The HALO 2C & 3C incorporates a calibrated sensor to accurately detect CO2 levels within a room.



LIVE VIEW CONTINUED

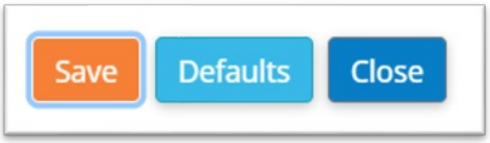


LIVE VIEW GRAPH DISPLAY

Signature icons can be shown or hidden by selecting the checkbox in the “Show” column. Color of the individual signature display can be selected; the signatures can be sorted using the “Order” column sending the selected signature up or down from its current position. Selecting “End Row” will put the signature icon on the dashboard on a new row.

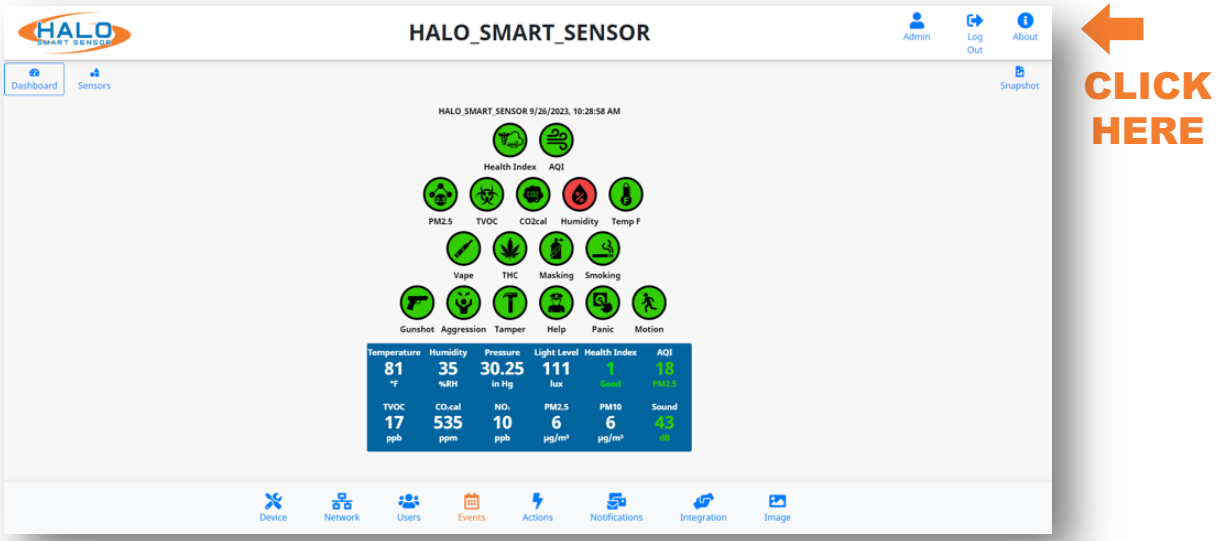
SAVING SETTING CHANGES

All setting changes performed in this section are committed by clicking the “Save Changes” button. Settings can be restored to their default values by clicking the “Defaults” button.



ABOUT

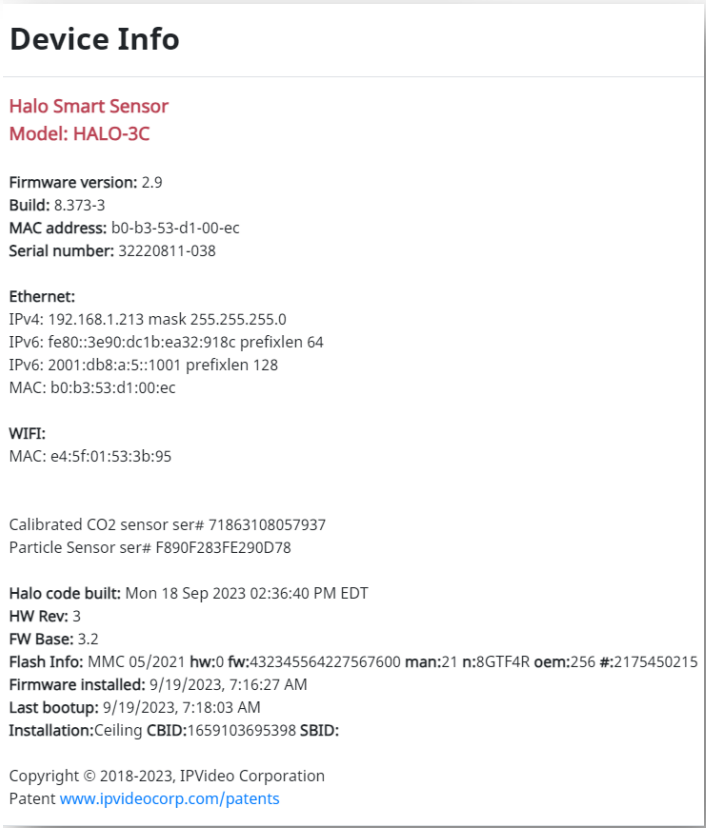
Navigate to the About page, from here the selection options are “Device Info” and “Legal.”



CLICK HERE

DEVICE INFO INCLUDES:

- Model Version
- Firmware Version
- Build
- Device MAC
- Device Serial #
- IPV4 & IPV6 IP Addresses
- Ethernet MAC
- If WiFi is enabled:
  - IP and MAC of Wifi Adapter
- CO2 Serial # (Depending on Model) and calibration status.
- Particle Sensor Serial#
- Firmware Build Date
  - HW Rev and FW Base versions
- Flash Info
- Last Bootup: Date and Time



Device Info

Halo Smart Sensor
Model: HALO-3C

Firmware version: 2.9
Build: 8.373-3
MAC address: b0-b3-53-d1-00-ec
Serial number: 32220811-038

Ethernet:
IPv4: 192.168.1.213 mask 255.255.255.0
IPv6: fe80::3e90:dc1b:ea32:918c prefixlen 64
IPv6: 2001:db8:a:5::1001 prefixlen 128
MAC: b0:b3:53:d1:00:ec

WIFI:
MAC: e4:5f:01:53:3b:95

Calibrated CO2 sensor ser# 71863108057937
Particle Sensor ser# F890F283FE290D78

Halo code built: Mon 18 Sep 2023 02:36:40 PM EDT
HW Rev: 3
FW Base: 3.2
Flash Info: MMC 05/2021 **hw:**0 **fw:**432345564227567600 **man:**21 **n:**8GTF4R **oem:**256 **#:**2175450215
Firmware installed: 9/19/2023, 7:16:27 AM
Last bootup: 9/19/2023, 7:18:03 AM
Installation: Ceiling **CBID:**1659103695398 **SBID:**

LEGAL

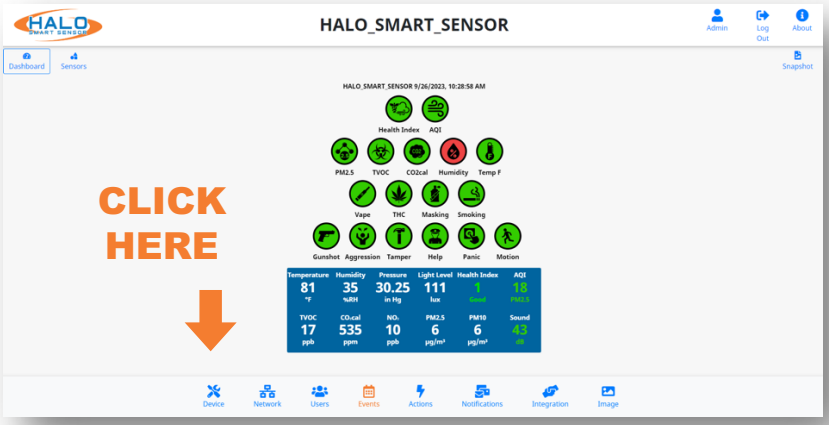
Selecting the “Legal” link will open a pop-up. This pop-up includes a link to “View Licenses” opening a new page to view all third-party licenses.

DEVICE SETTINGS

The Device Settings tab provides access and adjustment to Date and Time, Device Name and Additional Information Fields, Presets, Reset Config, Reboot Device, Country, Firmware Upload, Language.

Server Config Upload and Download, Temperature Offset.

Device Logs and Data Logs Download.

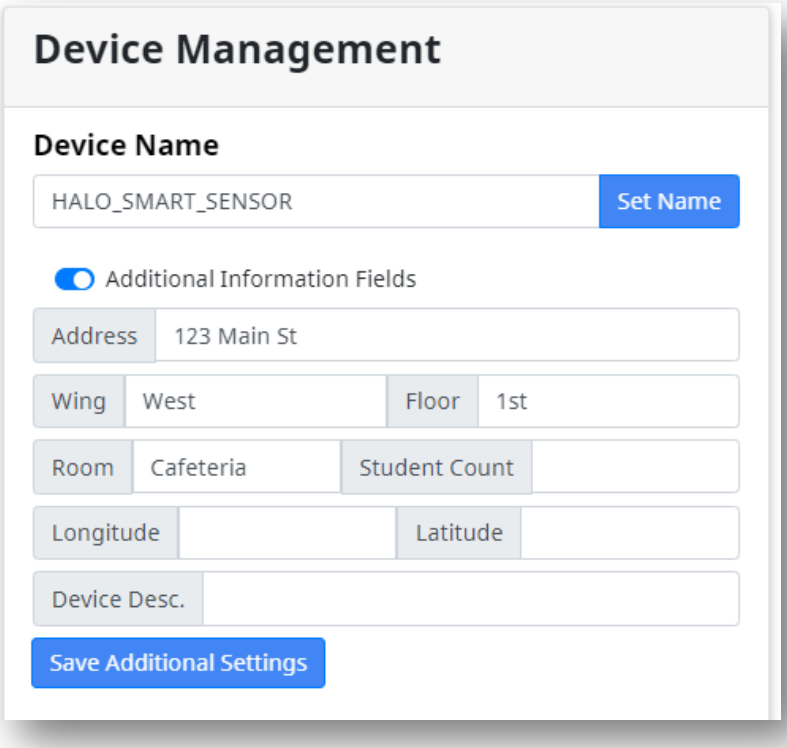


Device Management

The Device Name by default is going to appear in every notification and can be used to identify the location of the HALO.

The Additional Information Fields are available to add more detail about the device.

The Additional Information Fields can be defined by “keyword” to customize Notification, Integration and Heartbeat messages.
See the sections on Notification, Integration and Heartbeat for more information.

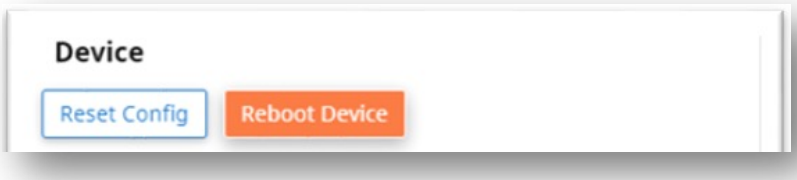


Reset Config

Resets the HALO back to the current firmware default settings.

Reboot Device

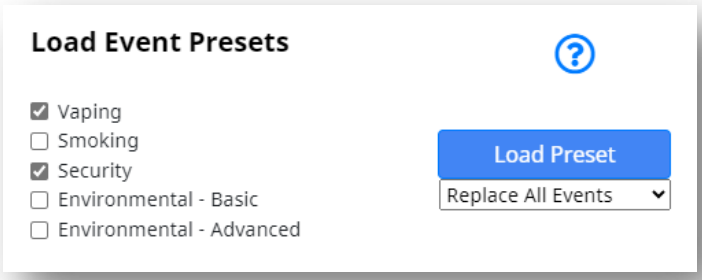
Reboots the HALO Device. Do NOT remove power while Halo is rebooting.



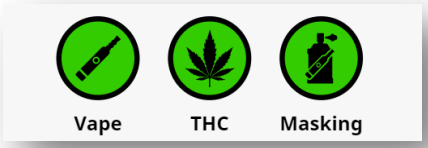
Presets

Presets are default configurations used to enable sets of functionality in the Live View, Events, and Action pages. Following a firmware update new presets may be available to enable new features. The secondary selection dropdown can be used to limit the changes made when loading a preset.The HALO must be equipped with the required hardware to make use of the preset's configuration.

Loading preset values will erase any custom Live View, Events, and Actions made prior.

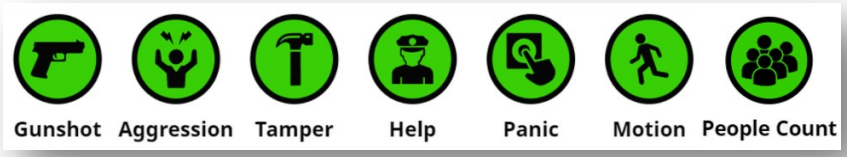


Vaping (Vape, THC, Masking)

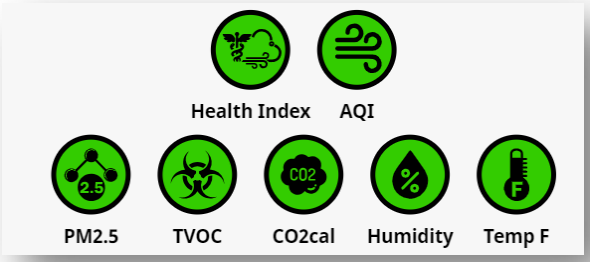


Smoking (Smoking)

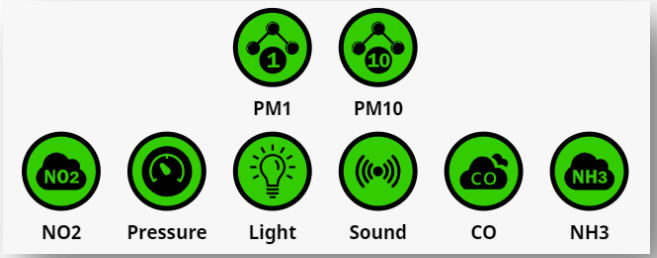
Security (Gunshot, Aggression, Tamper, Help, Panic, Motion, People Count)



Environmental – Basic
(Health Index, AQI, PM2.5, TVOC, CO2, Humidity, Temp)



Environmental – Advanced
(PM1, PM10, NO2, Pressure, Light, Sound, CO, NH3)



Firmware

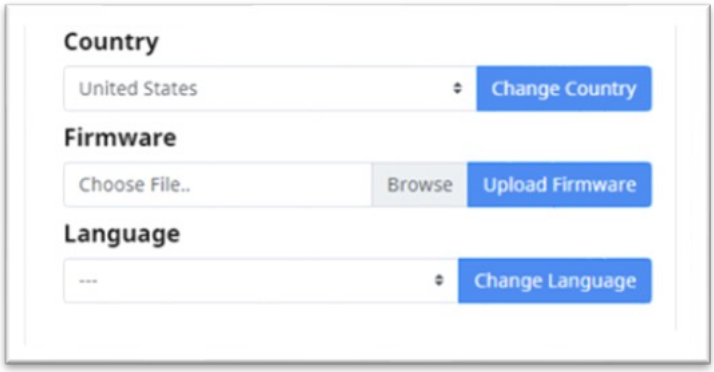
Prior to updating firmware, it is best practice to document any changes made to thresholds and advanced conditions.* These changes can be re-programmed into HALO once the update is complete. Choose the current firmware file and select “Upload Firmware,”.
Firmware can be downloaded from: https://halodetect.com/resources/firmware-tools/.

Please refer to the previous page if it is necessary to load preset after the firmware upgrade.

NOTE: Firmware can be updated to multiple HALOs at once using the HALO Device Manager, see separate HDM guide and download the tool from https://halodetect.com/resources/firmware-tools/.

Country

Sets the HALO to standards for selected Country

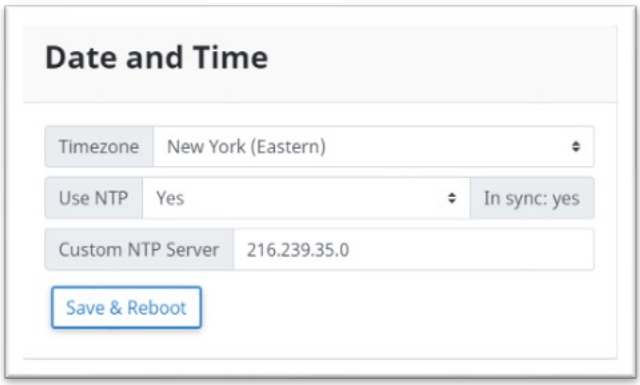


Language

Depending on which Firmware the HALO device is running, English, Japanese, and other languages are available.

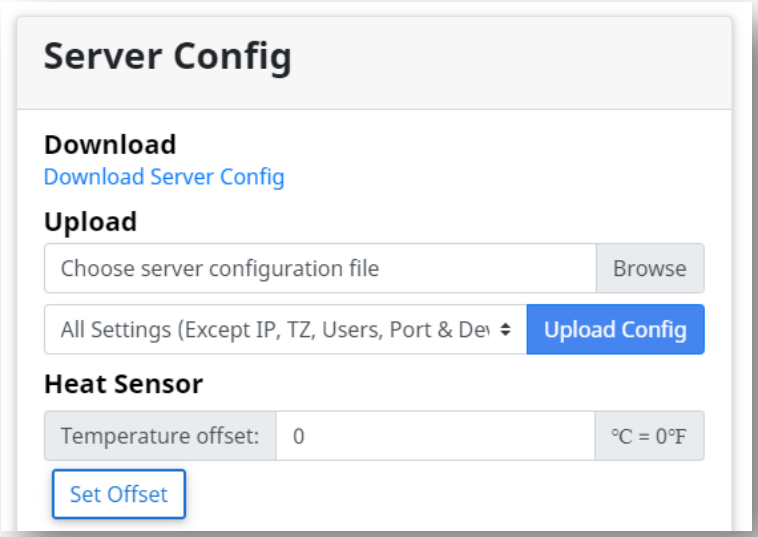
Date and Time

Setting the date and time can be done by manually setting it or using an NTP server. If that server is online the HALO must have internet access. Once settings are input, select the “Save & Reboot” button to commit the settings and reboot the HALO.



Server Config

The “Download Server Config” button will download all HALO settings except User, Time Zone, and IP information to a file. This file can be used as a backup or template for other HALO’s. The “Upload Config” button will load selected settings from a file that was previously downloaded from a HALO. Choosing from the settings dropdown will identify what is loaded into the HALO from that file.



Heat Sensor

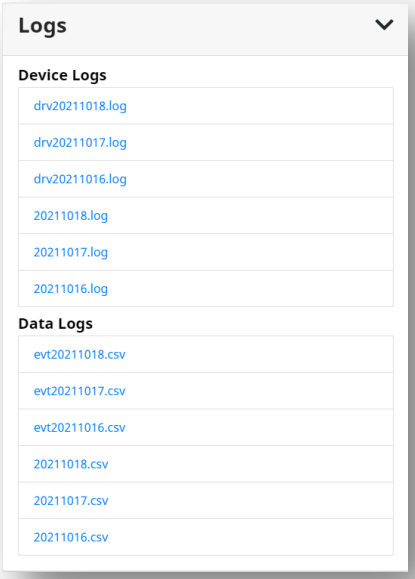
Used to offset temperature displayed, measured in Celsius. Positive or negative numbers can be used. Commit the value by selecting “Set Offset.”

For HALO-2C units placed in the ceiling, it is strongly advised to add a temperature offset too more accurately reflect the room temperature. Air circulation is less prominent on ceilings which allows warmer air to pool around the sensor.

Device Logs

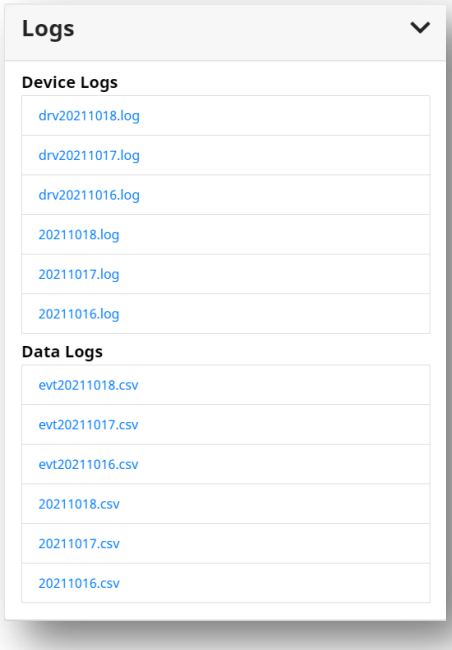
All logs are saved as csv files. They are kept for two days and deleted on the third, hence every type of log file has three downloads for three separate days. These files are stored in the volatile memory so they will be lost if power is removed from the device. Log files are named with the Year, Month, and Date for when the data was saved.

Under “Device Logs” there is data saved at “drvYYYYMMDD.log” for sensor driver log files and “YYYYMMDD.log” for main HALO log files.



Data Logs

Data Logs save data from every sensor and every signature. Data logs with the "evt" prefix will display a record of data every second and is converted to an easy-to-read format. Each of the three files contains 24 hours of data and is composed of over 1 million data points. The log files without the "evt" prefix are made of raw data, their recording interval is every 15 seconds by default. These are typically going to be used for diagnostic review as they are not as easily interpreted. Signatures contain a "Set" column next to the core data point indicating if the threshold was met for that event.



Set Values:

The set column in data logs is useful for quick analysis of events. It is next to the sensor reading in an evtYYYYMMDD.csv log and tells the user if the value passed its threshold to trigger an event. The possible values for the set column are 0, 1, 3, 4, or 8 for a real event.

Threshold for PM2.5 is 60, Vape is 58

Time	Timestam	e-PM2.5	e-PM2.5-set	e-Vape	e-Vape-set
10/27/202	1.64E+12	72	3	57.23	0
10/27/202	1.64E+12	71	3	59.13	1

- If there is no event the set value equals **"0"** for **no event.**
- If an event goes off the set value equals **"1"** for **start of event.**
- After an event goes off the set value equals **"3"** for **continue.** This lasts 30 seconds and is in place to make it hard to miss an event when watching the data during a live view.
- If an event is occurring for more than 30 seconds the set value equals **"4"** for **stretched event.**
- Once an event ends the value equals **"8"** for **end.**

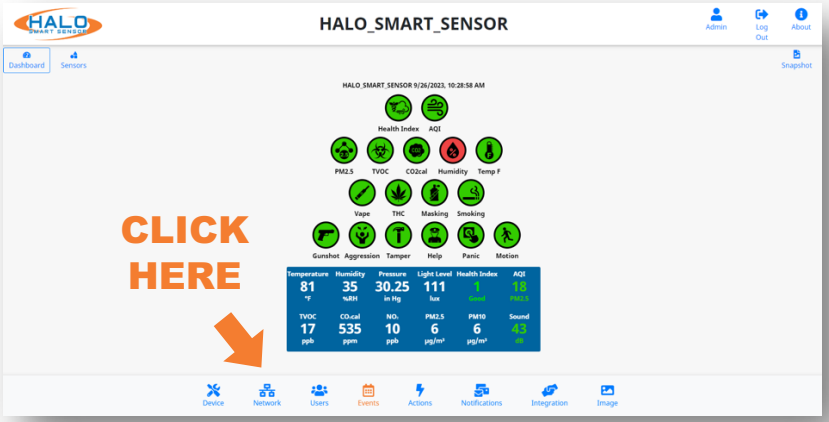
Test Set Values:

It is possible to test an event as seen in the "Actions" settings discussed later on page __. For a test event, the set value will be ten times the value of a normal event. For example, when a test occurs the set value "10" will indicate a "test event has started". Even though tests only last 10 seconds the value 30 for "continued test event" will last 30 seconds. As stated earlier this is to give someone viewing the data live enough time to see data changes. There will never be a 40- set value for a test event because tests end after 10 seconds but there will be an "80" value for the "end of a test event".

If a real event happened to occur at the same time as a test event the regular value and the test value will be added together. For instance, if an event and test happened to start at the same time the value would be 11 (10 + 1). If a true event occurred while a test event was underway the value would be 31, then 33 or 83 a second later.

NETWORK

The Network Configuration tab provides access and management of Ethernet, WiFi, HTTP / HTTPS, Certificate, Ethernet Out, Panic Buttons and Cloud settings.



Ethernet

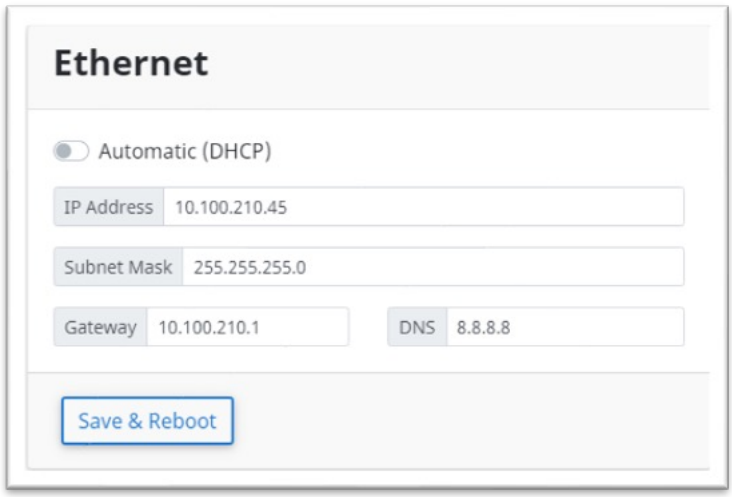
If the facility network requires the use of Static IP Addresses, obtain the IP address, Sub-net Mask, Gateway, and DNS to be used for this specific Device, and follow these steps.

Set the Automatic (DHCP) to Off to enable use of a Static Address

Enter the desired IP Address, Netmask (Sub-net Mask), & Router (Gateway) in the format shown.

Enter the DNS Server IP Address or Domain in the format shown.

Click “Save & Reboot” to commit these settings.

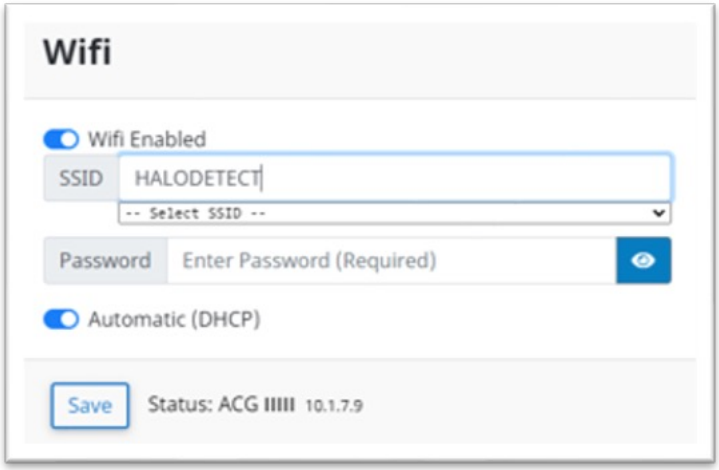


Wi-Fi

WiFi is turned off by default and can be enabled, this can be set up as Automatic (DHCP) or Static. SSID can be from selected via dropdown.

Click “Save & Reboot” to commit these settings.

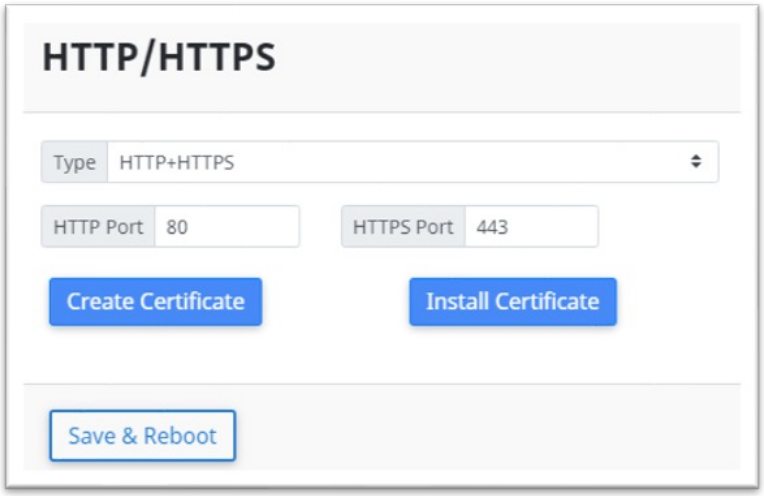
If successful connection to a WiFi network is completed, the “About” Page will show an assigned IP address for WiFi.



HTTP / HTTPS

HTTP / HTTPS settings specify the communication port for the devices webpages and the Authentication protocol used to secure the connection. All browser connections and API calls will have to adhere to these definitions.

HTTP Port 80 is defined by default and HTTPS Port 443 is defined by default; however, these settings can be edited to define the preferred Port.



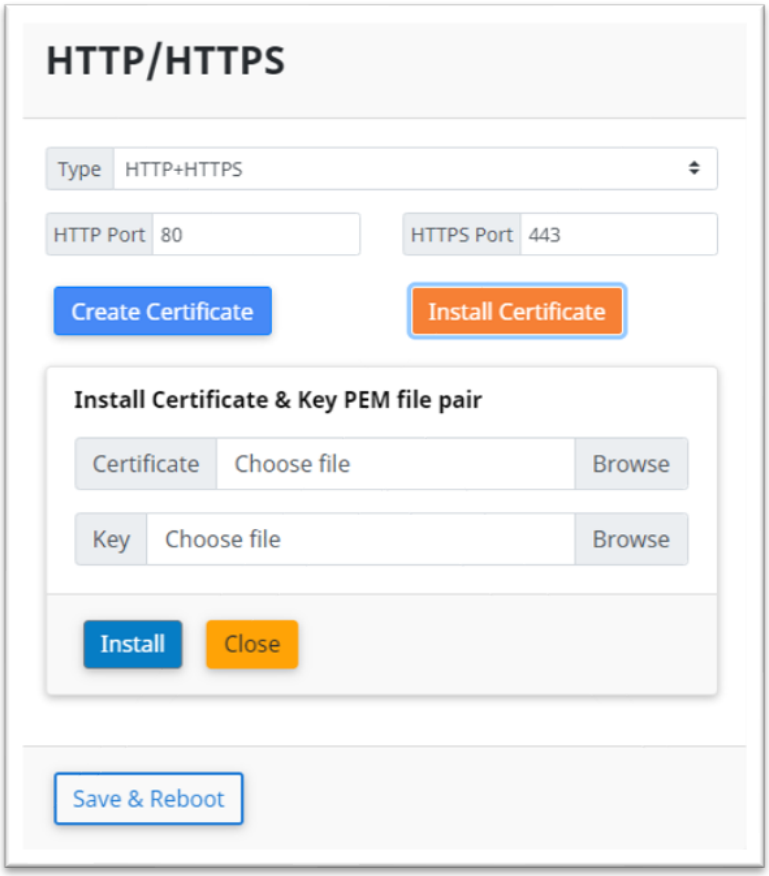
Selecting the HTTPS or HTTP+HTTPS Type reveals the Create Certificate and Install Certificate buttons.

Create Certificate

HALO will always create a self-signed certificate, so HTTPS is available. The certificate contains IPv4 and IPv6 addresses, and the HALO device name. Create Certificate updates the certificate in case the HALO device name or IP addresses change.

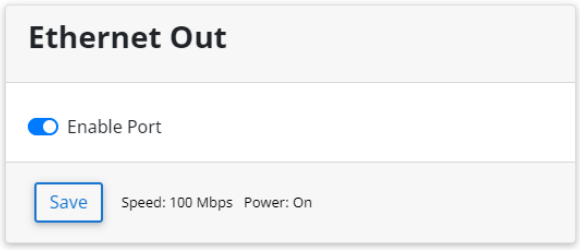
Install Certificate

Install Certificate allows user to upload a certificate and private key PEM file pair.



Ethernet Out (Downstream PoE)

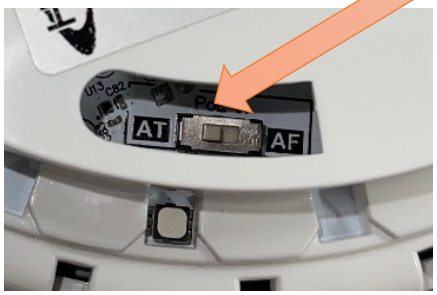
The HALO-3C provides a port which supplies 802.3af power and network to a downstream device. Toggle the “Enable Port” switch and click Save to enable downstream PoE.



The downstream device won’t power up until the upstream HALO-3C has initialized. This can be confirmed by checking the Ethernet Out status.

Manual AT/AF switch.

To ensure PoE downstream allocation, confirm the dip switch is set to AT power on the upstream HALO-3C. If It is necessary to toggle the switch in either direction be certain to **REMOVE THE DEVICE FROM POWER.**



With the upstream HALO-3C in AT power mode, you can connect an ethernet cable from the output RJ45 into an 802.3 af PoE device.

NOTE: In a rare case, if a power source does not recognize an AT PoE request. This will require the manual switch to be set to AF on the HALO.

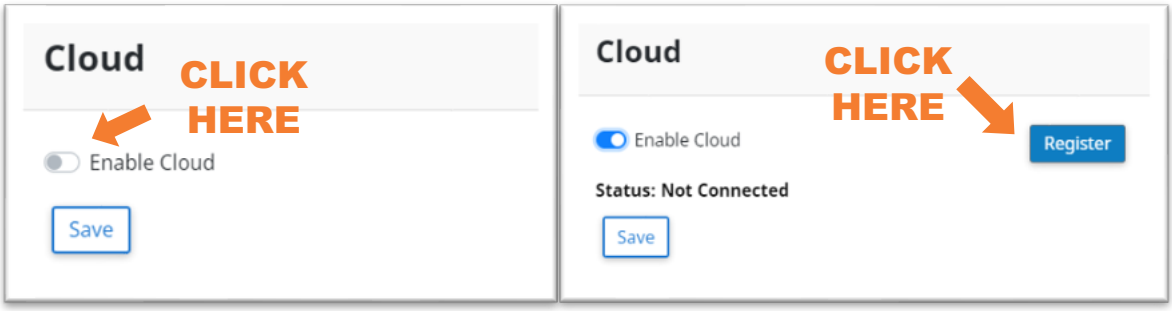
NOTE: If the upstream HALO-3C is set to AF it does not support downstream PoE devices.

*Check to be sure the downstream device is 802.3af compliant.

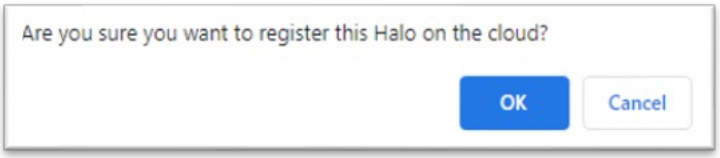
CLOUD REGISTRATION

To connect the HALO to the Cloud Portal, contact your Authorized Reseller to register the HALOs.

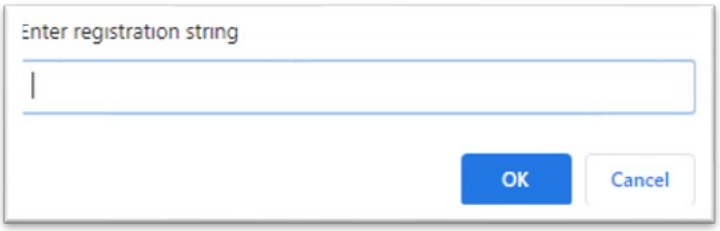
1. Once you receive your Registration String via email use the steps below to connect.
2. Click “Enable Cloud”
3. Click “Register”



4. Confirm Pop-up “Are you sure you want to register this HALO on the cloud?” by pressing “OK”



5. Enter the “Registration String”. Click “OK”

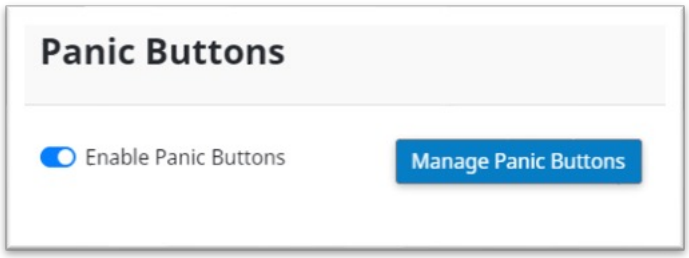


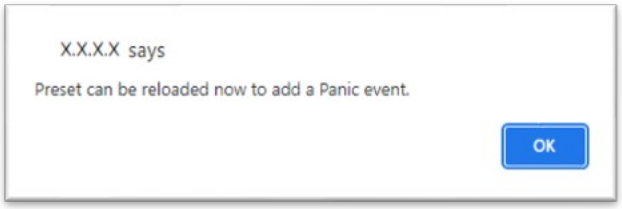
6. A popup will appear notifying you the registration is successful. Click “Save”
7. All HALOs that are part of a single site would share the same HALO Registration String.
8. Repeat for all HALOs that are being enrolled (this can be done using HDM as well to multiple HALOs at one time).
9. Initial Login Information and instructions will be sent to you.

IPANIC BUTTON

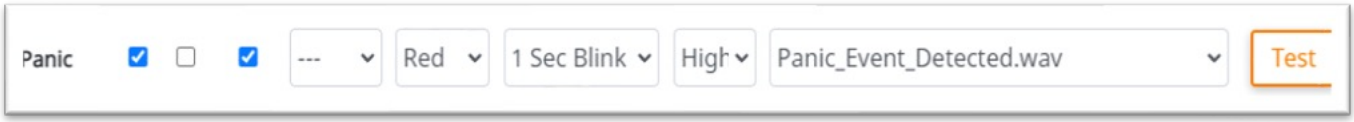
As of v2.8 HALO can be used as a panic alarm receiver when used with IPVideo iPanic Buttons. When ON the HALO unit will detect a panic alert if one is broadcasting within range.

1. In the Panic Buttons section toggle the Enable Panic Buttons switch to ON.
2. A message will pop-up indicating “Preset can be reloaded now to add Panic Event” Click OK
3. Next, to reload the preset, navigate to the Device Tab.
4. Under Preset section select “Security_And_AQI” preset with option dropdown “Add New Events” Click Load Preset.





To confirm Panic Event and Action have been created navigate to the Events Tab to find Event Identifier “Panic” then navigate to the Actions tab to find Actions Event ID “Panic”. The Action can be customized but is ok to leave set to default.

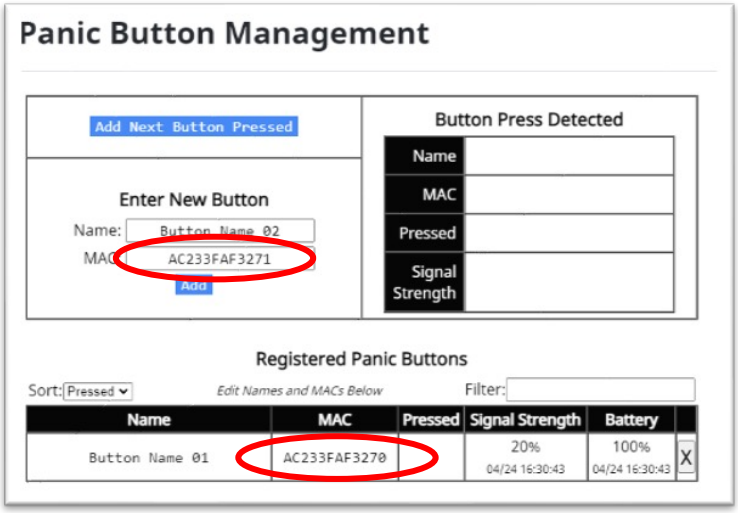


IPANIC BUTTON CONTINUED

Return back to the Network tab and click on Manage Panic Buttons to setup or manage panic buttons.

There are 2 options to add a button:

1. Add Next Button Pressed
   - Select Add Next Button Pressed
   - Wait for the button to change to 'PRESS NEW PANIC BUTTON'.
   - Double-Press a button to add it to the list.
2. Enter New Button:
   - Type in a name for the button
   - Enter the MAC Address of the button.
   - Click Add



Only Registered Buttons are recognized when a panic message is detected. Name and MAC can be edited in the list.

To the right is an example of the IPVideo iPANIC Button. When adding a button, the MAC Address can be found to the bottom left of the back.

To activate a button Double-Press the power symbol on the front. It will then send out a panic message for 15 seconds. Any HALO in range of the button will activate their alarm.

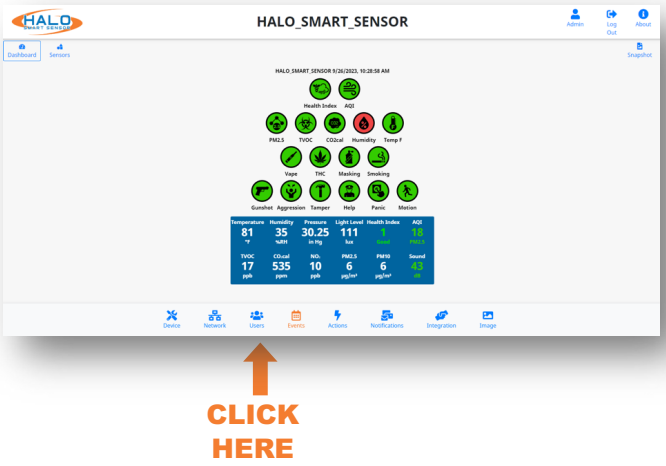
It will passively send out its battery level and signal strength every 2 seconds.

"Keyword" can be used to customize Notification, Integration and Heartbeat messages.

See the sections on Notification, Integration and Heartbeat for more information.

USER MANAGEMENT

The “Users” page is where users can be added and removed. The user-name and password assigned here will be required to access the HALO. If the admin user-name and password is forgotten, a factory reset must be done for recovery. Users can be assigned either the role of Admin or Viewer. Selecting the role will indicate the username and password requirements. The default Username is “admin”, and the default password is “changeme”. HALO contains a security feature that requires a user to generate a new means of authentication before access is granted to the device for the first time.



Admin:

Full Control, can make any configuration changes.

Viewer:

Can view Dashboard, Graphs, and Sensors only. Cannot make any configuration changes. Snapshots and limited view of the “About” page are also available.

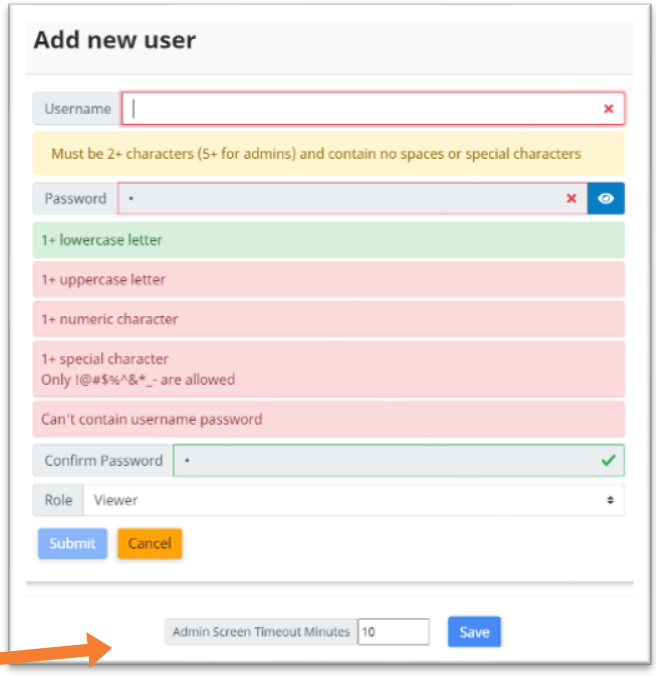
HALO restricts access to the built-in web server by usernames and passwords at two different levels, “Admin” and “Viewer”.

Username Requirements for Admins:

- 5+ Characters
- No Spaces or Special Characters

Password Requirements for Admins:

- 8+ Characters
- 1+ Lowercase Letter
- 1+ Uppercase Letter
- 1+ Numeric Character
- 1+ Special Character (!@#$%^&*_- are allowed)
- Cannot Contain Username

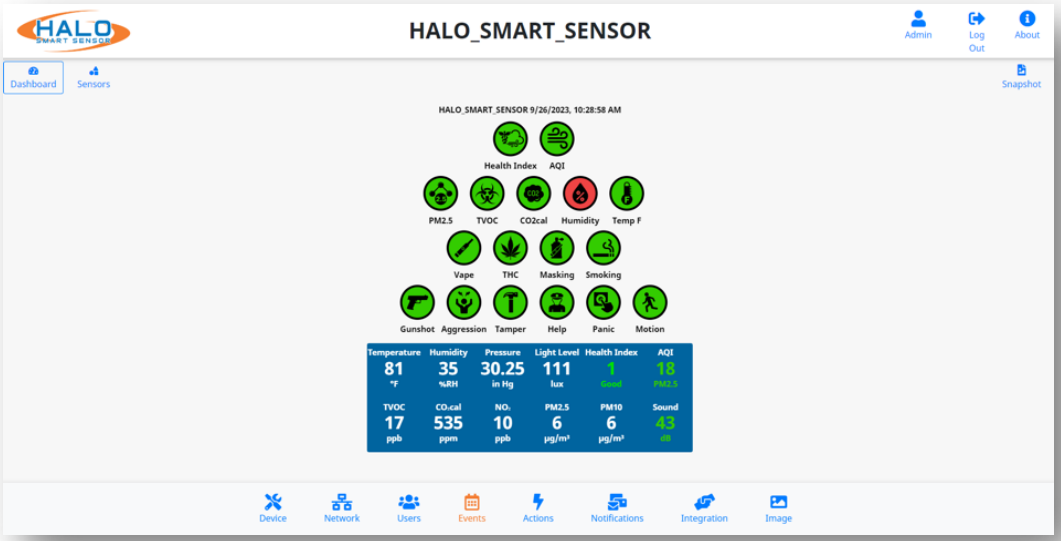


Administrator Timeout:

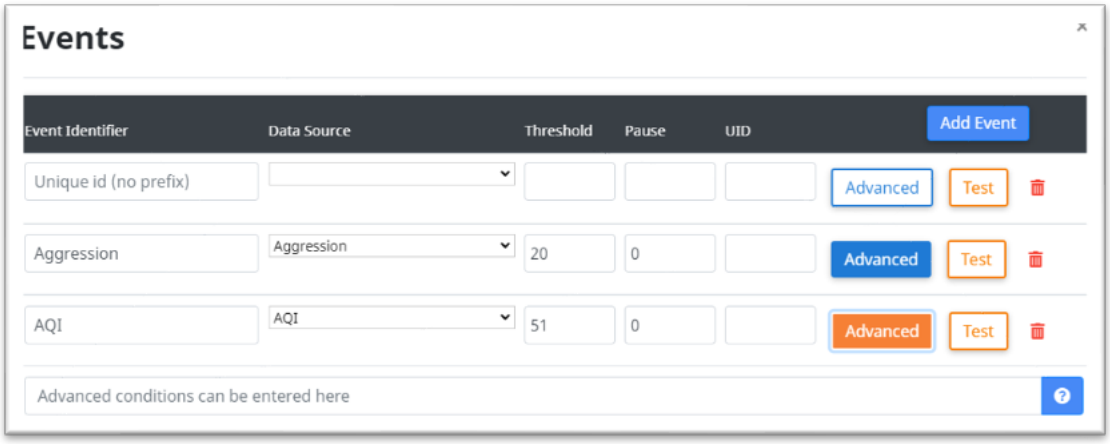
Administrators are automatically timed out with no activity after a specified time period set in “User Management.” This field is measured in minutes and is defaulted to “10” minutes. Changing this field to “0” will disable the timeout feature.

EVENTS

The “Events” page is where event signatures are added, removed, and adjusted. Signatures are created from individual or multiple data sources, thresholds, timing, and machine learning algorithms.



Adding a new event is done by Clicking “Add Event” > Fill in an event identifier “Unique ID” > Selecting a data source from the drop down > Setting a “Threshold” > “Click “Save Changes” to apply. The Event Identifier “Unique ID” must not contain special characters or spaces.



Each event has a corresponding advanced condition associated to it. When the ”Advanced” button is filled in blue, the event has an existing condition applied. Click the blue question mark to reveal a detailed guide on available conditions. These can be edited and allow for filtering and combining values numerically and logically. “Click “Save Changes” to apply.

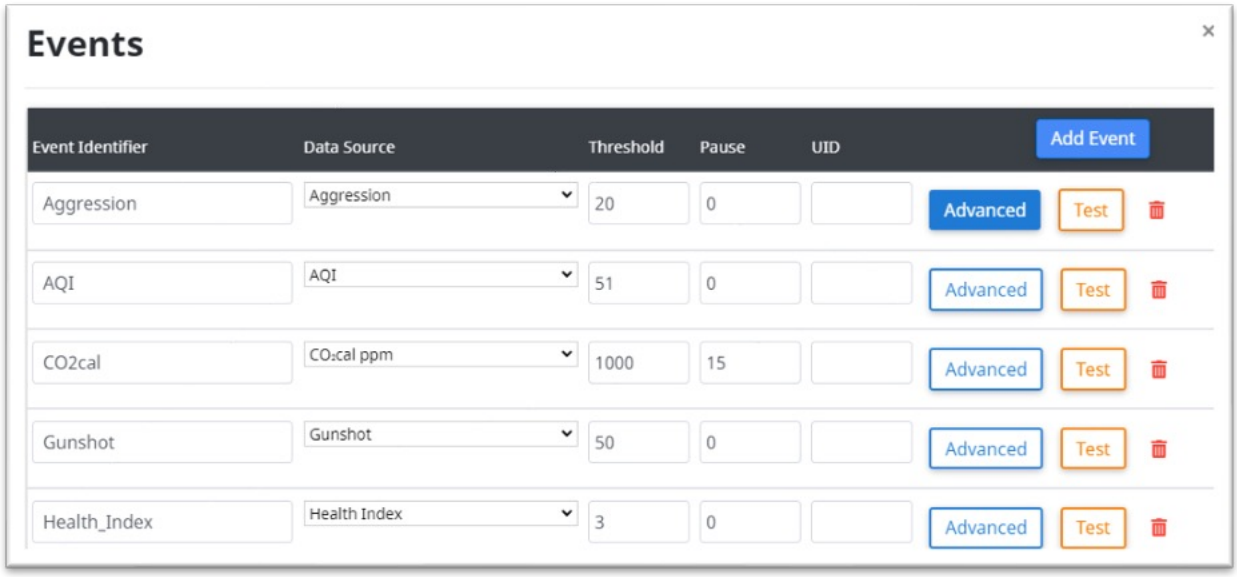
EVENTS CONTINUED

Pause Option

A Pause option has been introduced to the Events Menu. This will allow users to define a pause value (in minutes) between a reoccurring event caused by teetering above and below the set threshold. CO2cal has a pause value set to 15. The event will not trigger a 2nd time until the value drops below the threshold for 15 minutes.

UID

The UID string can be used as an alternate event identification instead of the event name; Defined on the Events tab the string can be used on Email and/or Integration (Primary or Secondary) messages. The %UID% keyword will insert the event UID string, as well as %EID% to insert the event name when events fire or stop.

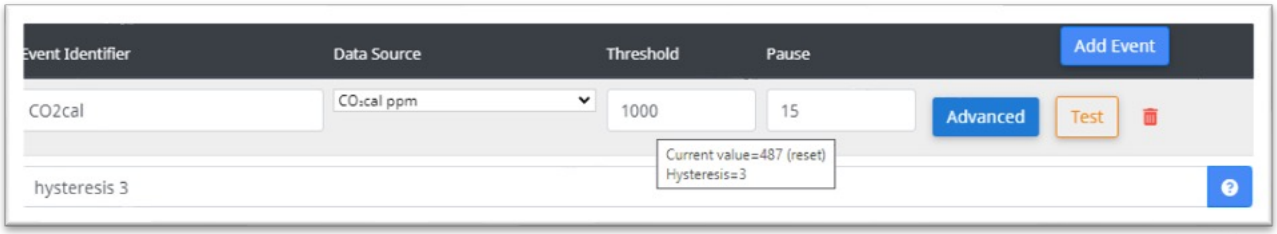


Hysteresis

Further aiding in the reduction of repeating teetering events a default hysteresis for each sensor type has been implemented in the Events Menu. Once an event is triggered a new event will not occur until the sensor value drops below the trigger value minus the hysteresis value and then once again exceeds the trigger value.

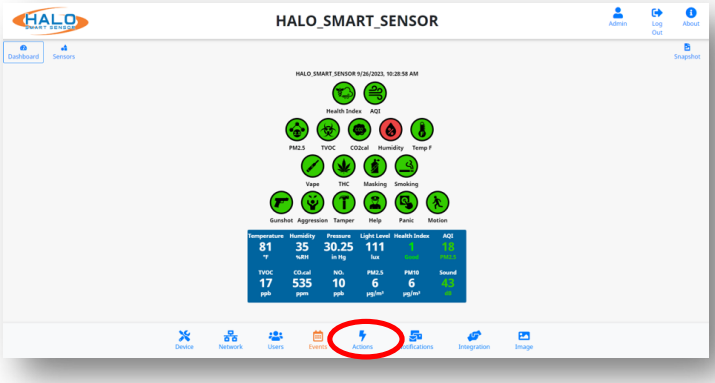
Examples:

- hysteresis 0 (prior versions): CO2cal threshold 1000 triggers when value is >= 1000, stops when < 1000.
- hysteresis 3: CO2cal threshold 1000 triggers when temp is >= 1000, stops when value < 997.



ACTIONS

The “Actions” page is used to create an action plan for each event. Each event has an individual action plan. Check the box or drop-down to activate each action.



Event Identifier	Email Set	Email Reset	Integration Set	Integration Reset	Cloud Enable	Relay	LED Color	LED Pattern	LED Priority	Sound	Actions
Aggression	☑	☐	☑	☐	☑	---	White	Steady	High	---	Test
AQI	☑	☐	☐	☐	☑	---	---	Steady	High	---	Test
CO2cal	☑	☐	☐	☐	☑	---	---	Steady	High	---	Test
Gunshot	☑	☐	☐	☐	☑	---	Blue	Strobe	High	---	Test
Health_Index	☑	☐	☐	☐	☑	---	---	Strobe	High	---	Test

Email Set (SMTP): Notification via email (or text) that a signature met the threshold.

Email Reset (SMTP): Notification via email (or text) that a signature has receded below the threshold.

Integration Set (TCP / HTTP): Message to 3rd party system that a signature met the threshold.

Integration Reset (TCP / HTTP): Message to 3rd party system that a signature has receded below the threshold.

Relay 1 or 2: Select for the relay to change state when the threshold is met. Options include “ON” for the duration of the threshold being met or a selected time period ranging from 5 – 60 seconds.

LED Color / Pattern / Priority: Set the color that the multicolor LED on the front of HALO changes to and the behavior of the LED pattern.

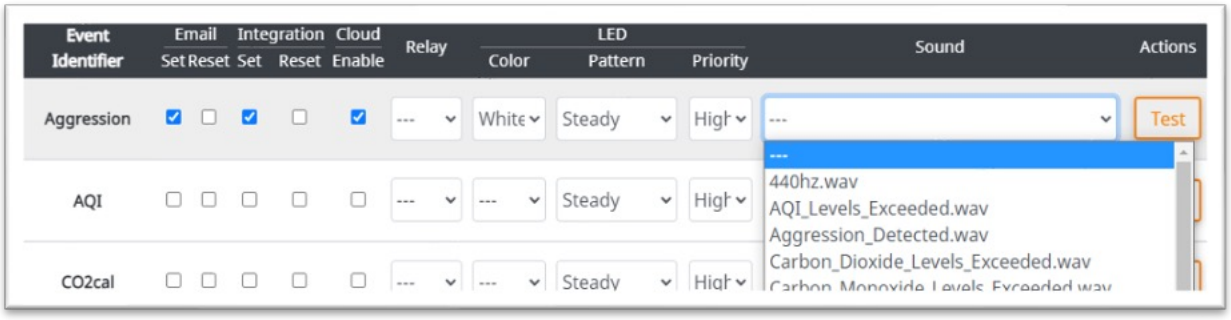
Sound: Select a preloaded .wav sound file or upload a custom .wav file for selection. Speaker volume can also be selected here, this setting applies to all actions.

Cloud: Notification via cloud portal that an event has occurred.

NOTE: Cloud column is only available when the HALO is actively registered and connected to the Portal.

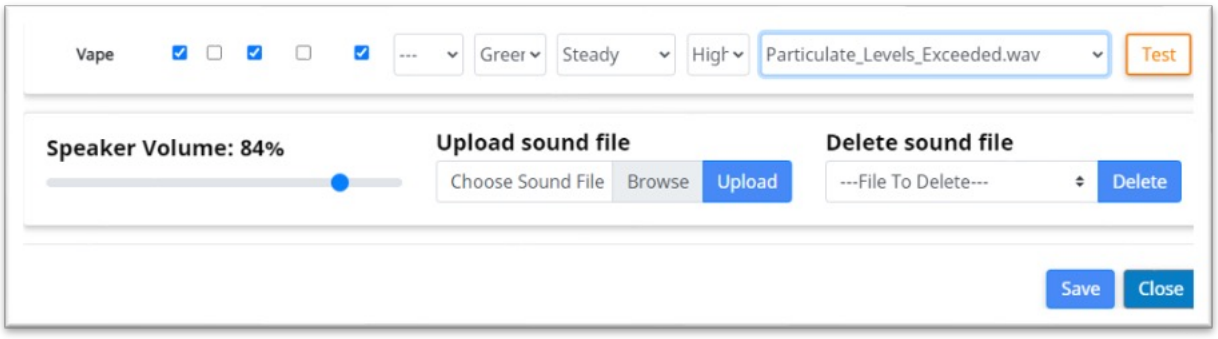
WAV FILES MANAGEMENT

Wav files can be played when an event is triggered. Not every event will have this set by default. Wav files can be chosen by selecting the pulldown under Sound. NOTE: the wav file will play from the HALO device.



CUSTOM WAV FILE

HALO can accommodate custom wav files. At the bottom of the Actions page at Upload Sound File select Browse to import a custom wav file.



Speaker volume can be adjusted, and custom sound files can be uploaded or deleted. Sound files must be in .wav file format.

PEOPLE COUNT

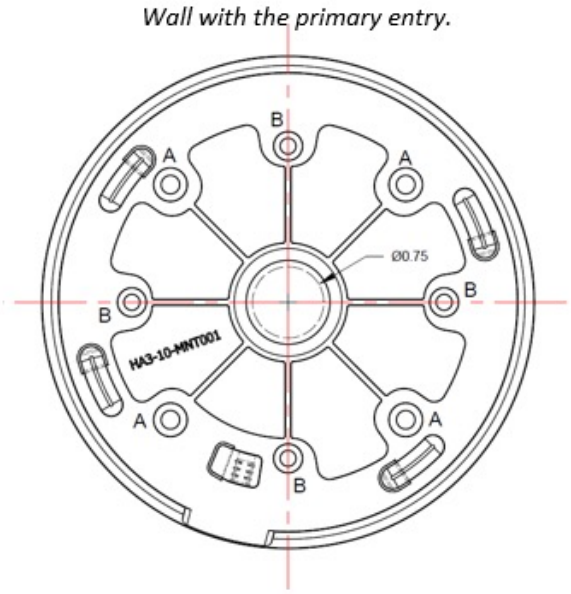
People Count works by registering disturbances in a room's thermal signature which HALO then interprets to find if it is an occupant within the sensor's field of vision.
*This feature is available on model HALO-3C-PC

Special Notes:

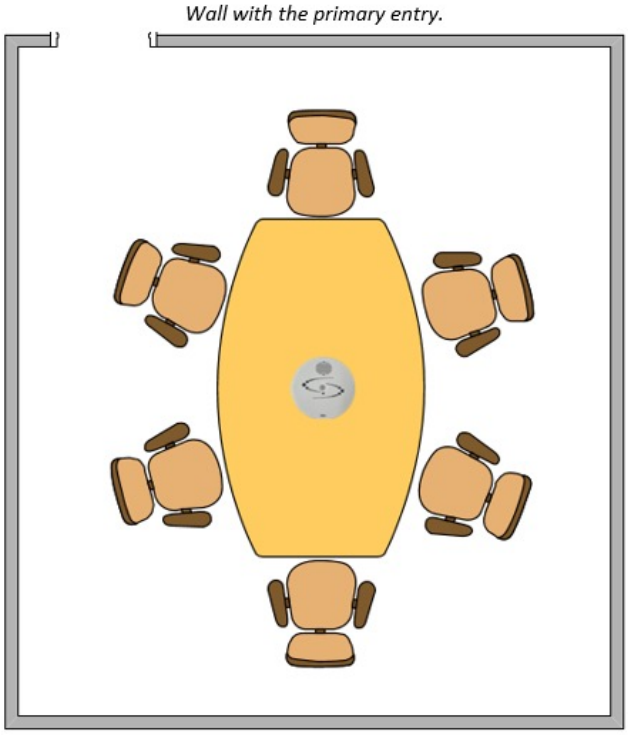
Proper placement and orientation of the HALO is important to make use of the sensor's visible range. Refer to the HALO Install and Placement Guide https://halodetect.com/resources/manuals-guides/
It is recommended that no people be in the same room as the HALO upon bootup. This allows the sensor to acclimate to the environment.

Installation

Ensure that the HALO ceiling mount is aligned so that the sensor will be perpendicular to the room. Please refer to the Thermal Sensor Mount Alignment guide below. If possible, make use of a laser level to assist.



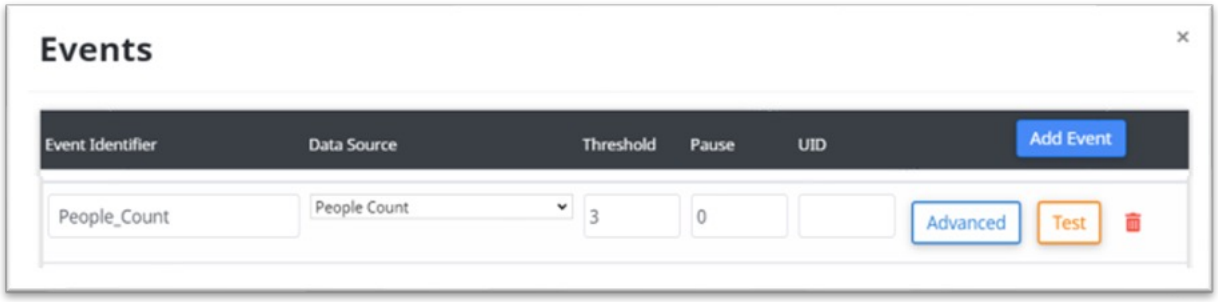
Thermal Sensor Mount Alignment



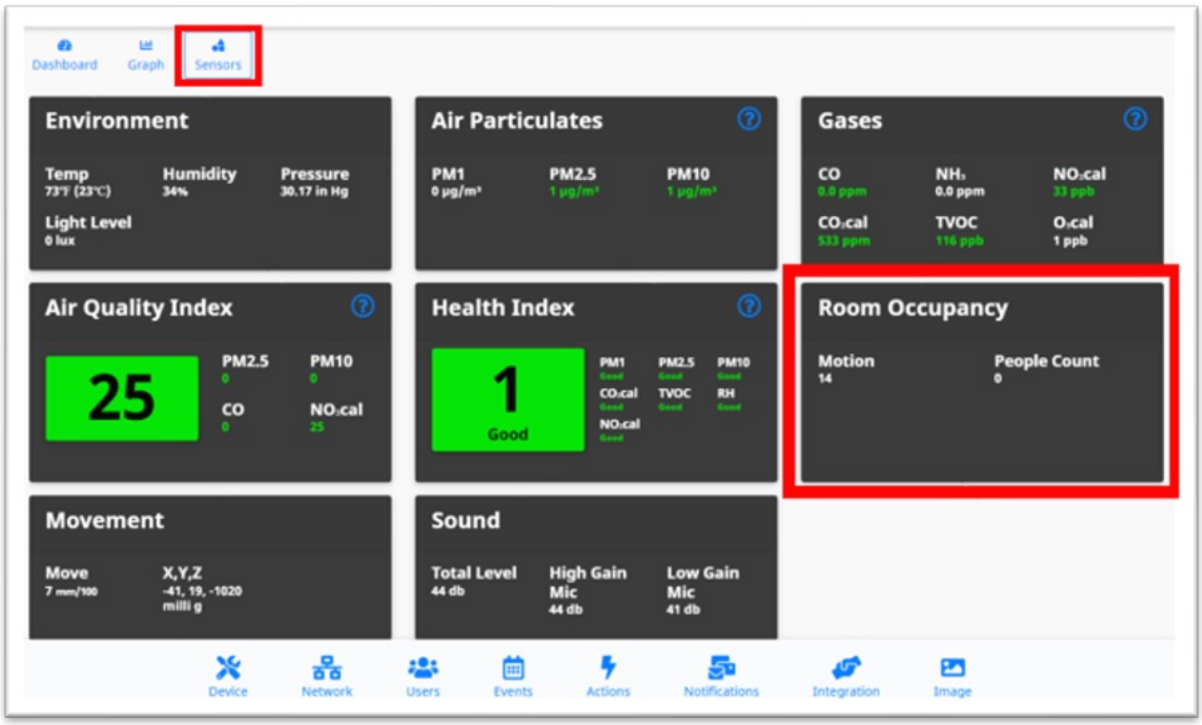
Ceiling height is also a factor for the range of the sensor. For example, a HALO that is attached to an 8-foot ceiling will have an effective range of 7-feet from the sensor.

People Counting Events

To setup an Event for People Count click Events on the bottom navbar, click Add Event, and select the People Count data source. Name this event People_Counting and set the threshold to however many people are allowed in the room. From here you may assign any action to this event under the Actions menu.



The current room occupancy figure that the people count sensor detects can be found in the Room Occupancy card under the Sensors tab.



LED PATTERN

LED Patterns can be displayed when an event is triggered. Not every event will have this set by default. LED Patterns can be chosen by selecting the pulldown under LED Pattern.

Steady: The LED stays on for the duration of the event

1, 2, 5 Sec Blink: The LED flashes on and off every 1,2,5 seconds

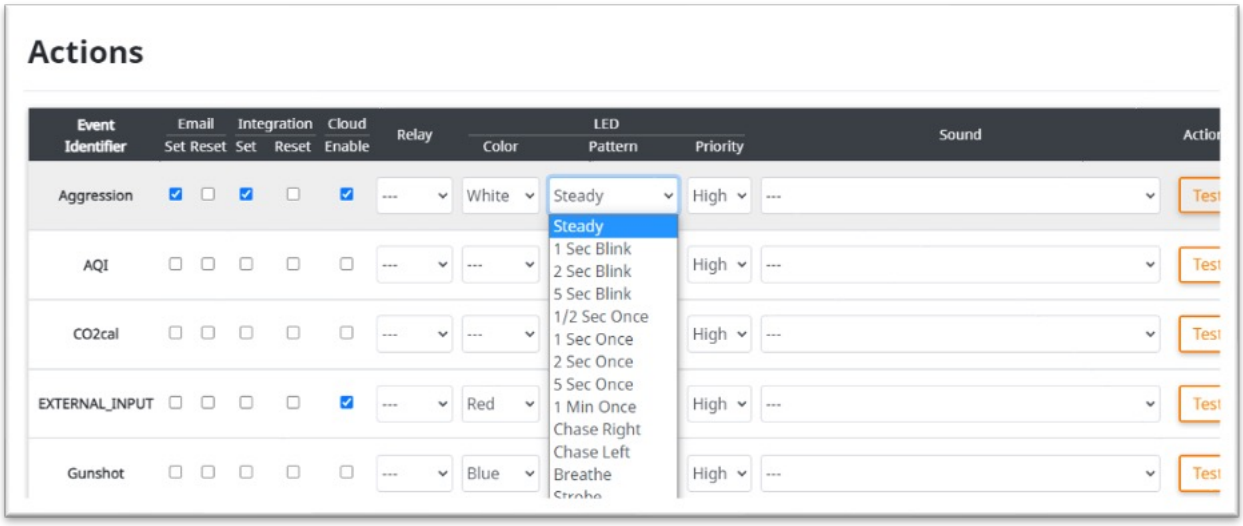
1/2, 1, 2, 5 Sec, 1 min Once: The LED flashes once for 1/2,1,2,5 seconds and then turns off

Chase Right: The LED spins in a clockwise circle with a fading tail. **(HALO-3C exclusive)**

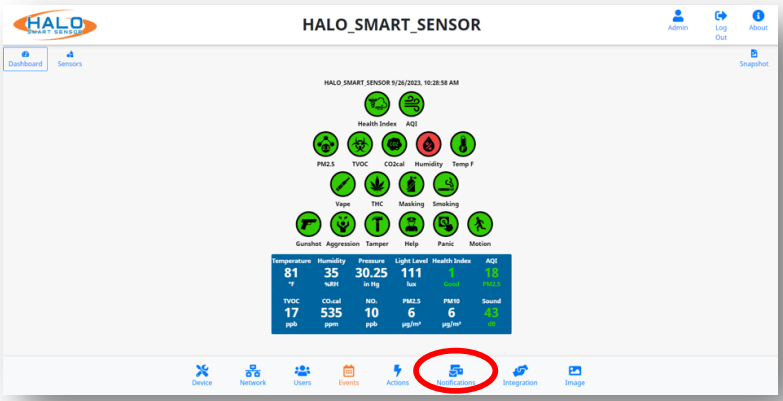
Chase Left: The LED spins in a counter-clockwise circle with a fading tail. **(HALO-3C exclusive)**

Breathe: The LED fades on and off in a smooth curve. **(HALO-3C exclusive)**

Strobe: The LED flashes on for a fraction of a millisecond every second. **(HALO-3C exclusive)**

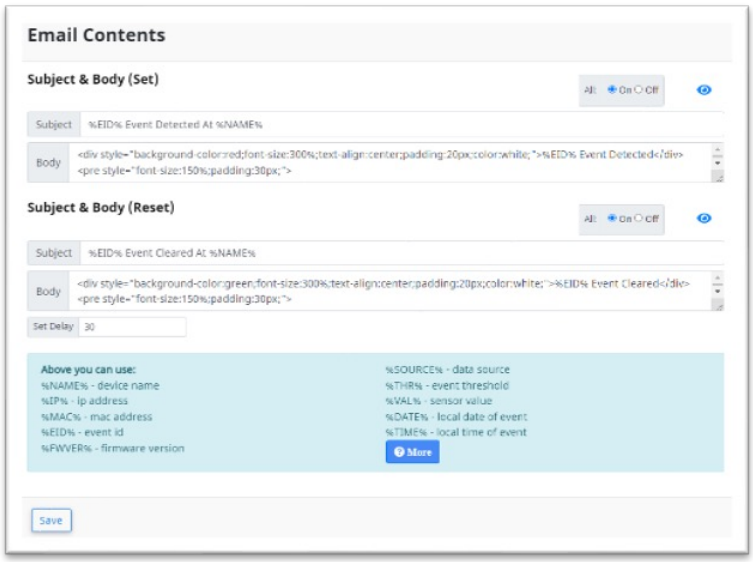


NOTIFICATIONS



The “Notifications” page has all fields necessary to edit email contents and connect to an email account using SMTP. The Email Contents section dictates what the notification will look like when sent via email and email to text.

The Subject and Body fields can be populated with information to be extracted from the HALO upon an event and can also include character for character information. By placing the specified fields in “%” it will select them and place the current value in that position.



The **Set Delay** (measured in seconds) will reduce the possibility of getting multiple messages around the same event. The measured values must recede below the established threshold for this time period and then increase above the threshold again for a 2nd alarm.

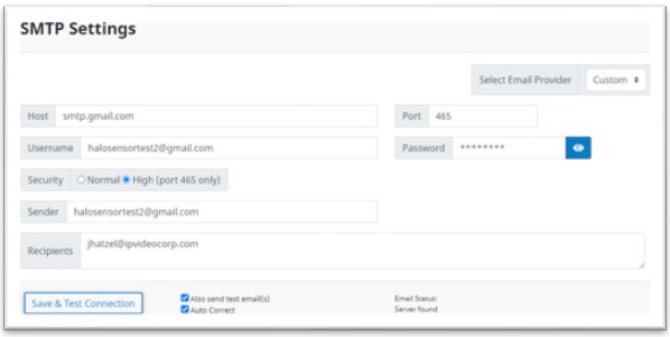
The HALO uses SMTP (simple mail transfer protocol) to send out alarms.

- We recommend using your own email providers SMTP.
- If you are a Gsuite user, we recommend using the SMTP relay service.
    - https://support.google.com/a/answer/176600?hl=en

Do not use your personal email for SMTP username. Having or creating a new email address to send the emails for this purpose is recommended.

If you cannot make an SMTP account through your email provider. There are several different free SMTP providers. Gmail currently has a free SMTP account with several different restrictions. See section “*Use the Gmail SMTP server*” section here https://support.google.com/a/answer/176600?hl=en.

One of the restrictions is that less secure apps will turn off when Gmail sees it’s not in use for a certain period https://myaccount.google.com/lesssecureapps



The HALO uses SMTP (simple mail transfer protocol) to send out alarms.

- Select the email provider you use to see if there is a template to help fill out information.
- You can use your internal SMTP server.
- If you are using an external SMTP server, please follow their SMTP setup documentation. If you are a GSuite user, we recommend using Google SMTP relay service.
- If your SMTP service is set for port 25 (usually no credentials) be sure to leave username and password clear.
- Recipients can be comma-separated and can be emails or phone numbers:, If you have issues sending SMS or MMS over SMTP, please make sure the number and format is correct. Contact the cell provider if you still have issues.
  ex: example@gmail.com, example2@gmail.com
  ex: HALO@ipvideocorp.com, 9171231234@txt.att.net

Provider Email-to-SMS Address Formats:

AT&T: number@txt.att.net (SMS) **AND** number@mms.att.net (MMS)
Sprint: number@messaging.sprintpcs.com (SMS) **AND** number@pm.sprint.com (MMS)
T-Mobile: number@tmomail.net (SMS **AND** MMS)
Verizon: number@vtext.com (SMS) **AND** number@vzwpix.com (MMS)

Check “Also Send Test Email(s)” and click “Save & Test Connection.“ If test passes, you should get email/text, if test failed look at the options below.

- Firewall is blocking the communication between HALO and SMTP server.
- SMTP setting parameters are wrong.
- HALO might not have internet access (external SMTP)
- IMAP is disabled on your Gmail account (external SMTP)
- Gmail is suspicious of login. Simply login into Gmail and confirm that it was you that signed in.
- HALO has bad / wrong DNS, router, gateway, IP

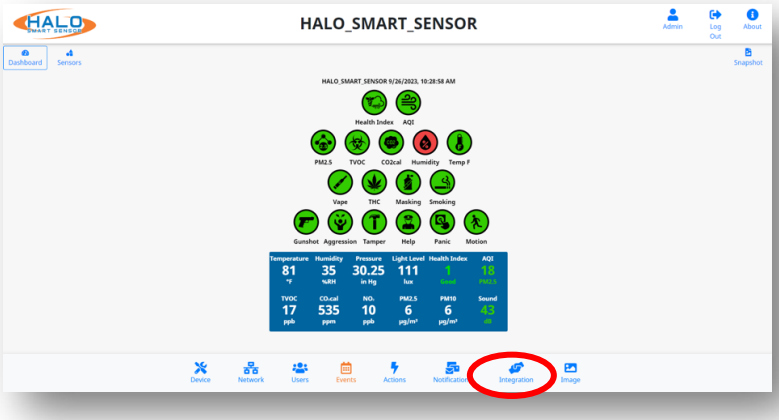
Email Contents

Administrators can choose to enter their own specific text in the Subject and Body fields and use the built-in placeholders to automatically generate informative messages. The placeholder strings that can be used are:

%NAME% Device name as specified in device settings
%IP% IP address assigned to HALO Smart Sensor unit
%EID% The event ID as specified on the event tab
%THR% The threshold of the event that was surpassed (numerical value)
%VAL% The sensor value
%DATE% Current date of the event
%TIME% Local time of the event

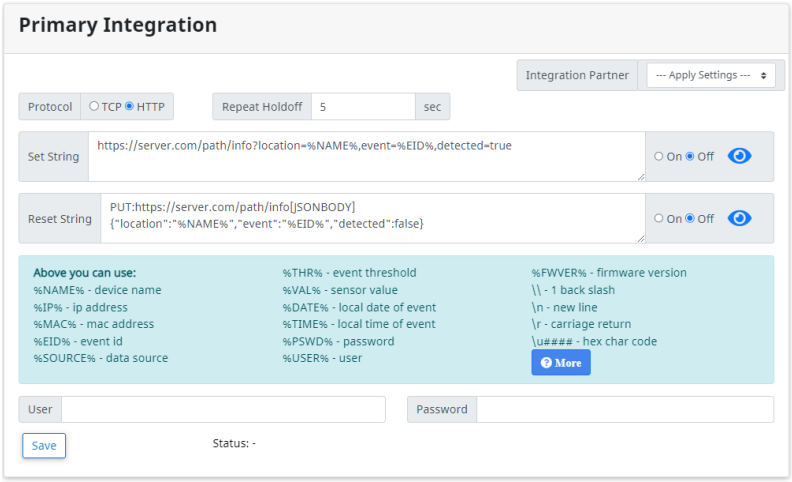
INTEGRATION

The “Integration” page is where HALO makes connections to 3rd party products.



HALO has an open API and works with many 3rd party products including Surveillance, Access Control, Cloud, Building Management Systems, LED Lighting, Network Switching and many others. More details can be found in “Basic API and Advanced API documents”.

Integration works with the connections to 3rd party products and sends specified information upon an event. Individual product guides are available on the “Partner Integration Guides” section of the website.



HALO Smart Sensor can send ASCII Messages via TCP/IP Socket or HTTP to supported 3rd party platforms, as a method of triggering defined “Events,” and associating HALO Smart Sensor “Events” with other products such as cameras.

Select a template under **Partner Integration Templates** to input product specific settings such as Port and Protocol making the integration process easier.

Repeat Holdoff prevents multiple messages being sent from the same event. Its default value is 5 seconds so an event will not cause a message to be sent if it occurs less than 5 seconds from the start of a previous event.

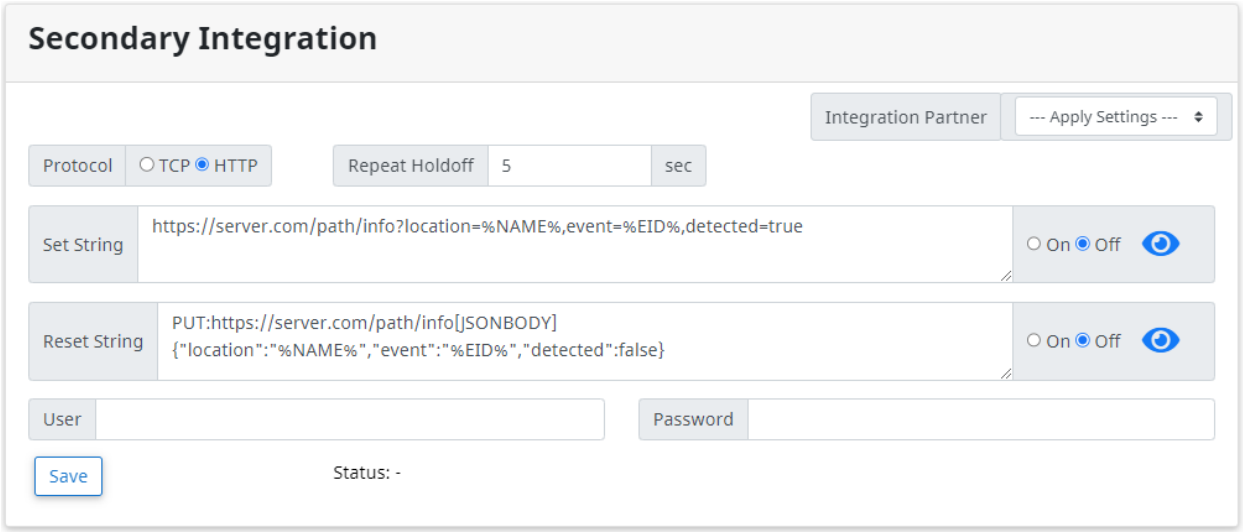
Enter a **Set String** and click the **On** or **Off** radio button to enable or disable this notification. The **Set String** should identically match one that is defined in the 3rd party product. This will send a notification to the 3rd party product that an “Event” has been triggered.

Enter a **Reset String** and click the **On** or **Off** radio button to enable or disable this notification. The **Reset String** should identically match one that is defined in the 3rd party product. This will send a notification to the 3rd party product that a sensor(s) defined in an Event has been reset.

Enter the IP Address of the 3rd party product in the **Address** field.

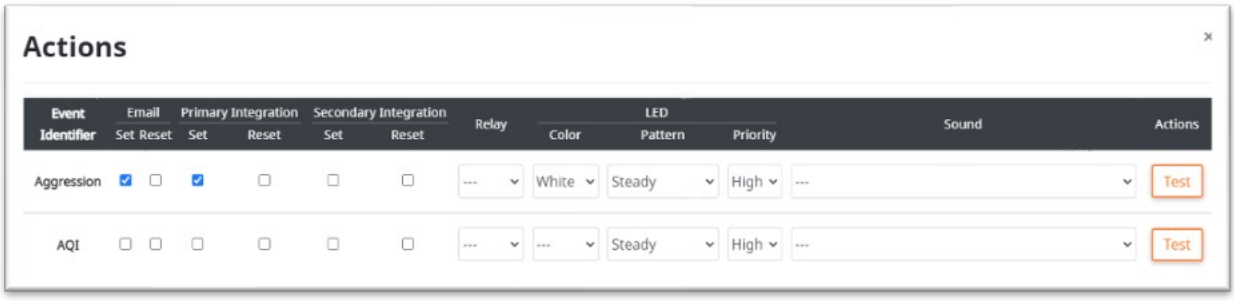
SECONDARY INTEGRATION

The “Integration” page also has an option for a second integration. Criteria is same as Primary Integration noted on the page before.



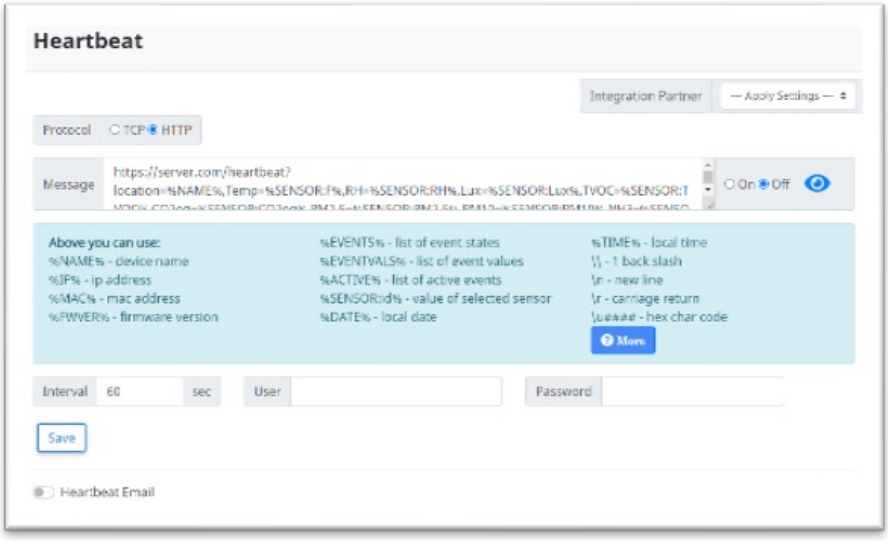
Actions

Once the settings are saved on the Integration Tab the Action settings can be setup. A column for Primary and/or Secondary Integration will now be available on the Actions tab



HEARTBEAT

Heartbeat works with the connections to 3rd party products and sends specified information on a specified time interval. Individual product guides are available on the "Partner Integration Guides" section of the website.



Specify the **Protocol** used to transmit the event notification by clicking the TCP or HTTP radio buttons.

Using Keywords:

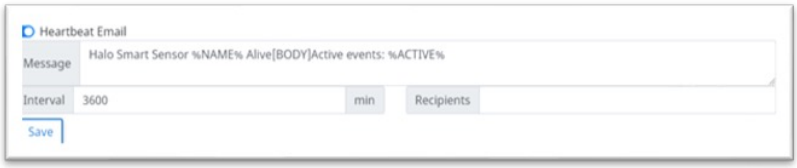
Enter a **Message** to be sent, using the wildcards as listed below:

%NAME%	Device name as specified in device settings
%IP%	IP address assigned to HALO Smart Sensor unit
%MAC%	MAC address of the HALO Smart Sensor
%EVENTS%	List of current event states
%DATE%	Current date of the event
%TIME%	Local time of the event

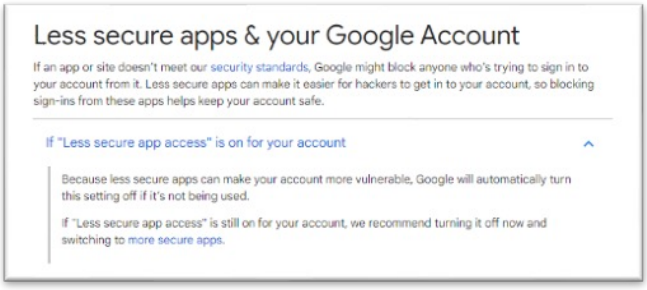
Enter the Interval Seconds. This setting determines the frequency at which the Heartbeat message is sent, default value is 60 seconds.

Enter the IP Address of the Destination (listening) Server in the **Address** field.

Enter the **Port** that is set to listen to events on the Destination (listening) Server.



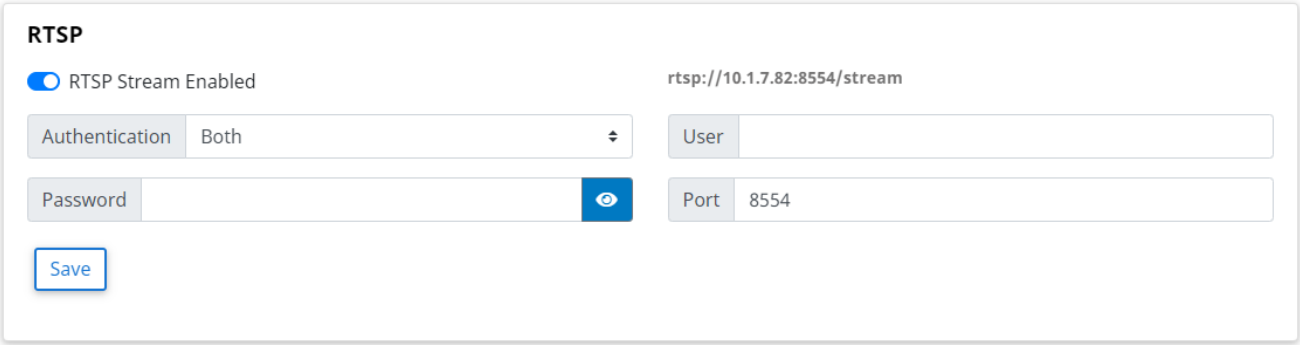
Turning on **Heartbeat Email** sends the user an update daily by default. This is in place for those who want to be constantly updated. It is also in place because certain email providers such as Gmail turn off less secure apps after an extended period with no email connection. As stated under Notifications, Gmail accounts need less secure apps turned on for email notifications. Heartbeat Email turned on prevents the connection from dying.



RTSP

RTSP (Real Time Streaming Protocol) can be used to stream the Live View to an RTSP supported platform.

- Click the button for “RTSP Stream Enabled” to turn on this feature.
- Select from the “Image” drop down menu either “Graph” or “Dashboard”. This will select the stream that will be sent over RTSP.
- Select a port number that is not already in use, default is “8554”.
- If authentication is desired, choose a “User” and “Password”.



AUTHENTICATION

The options for Authentication are:

- None (Unsafe)
- Basic
- Digest
- Basic and Digest

Digest Authentication communicates credentials in an encrypted form by applying a hash function to the Username, the Password, a server “supplied once” value, the HTTP method, and the requested URI.
Basic Authentication should generally only be used where transport layer security is provided such as HTTPS.

Click the “Save & Reboot” button to retain any settings changes.

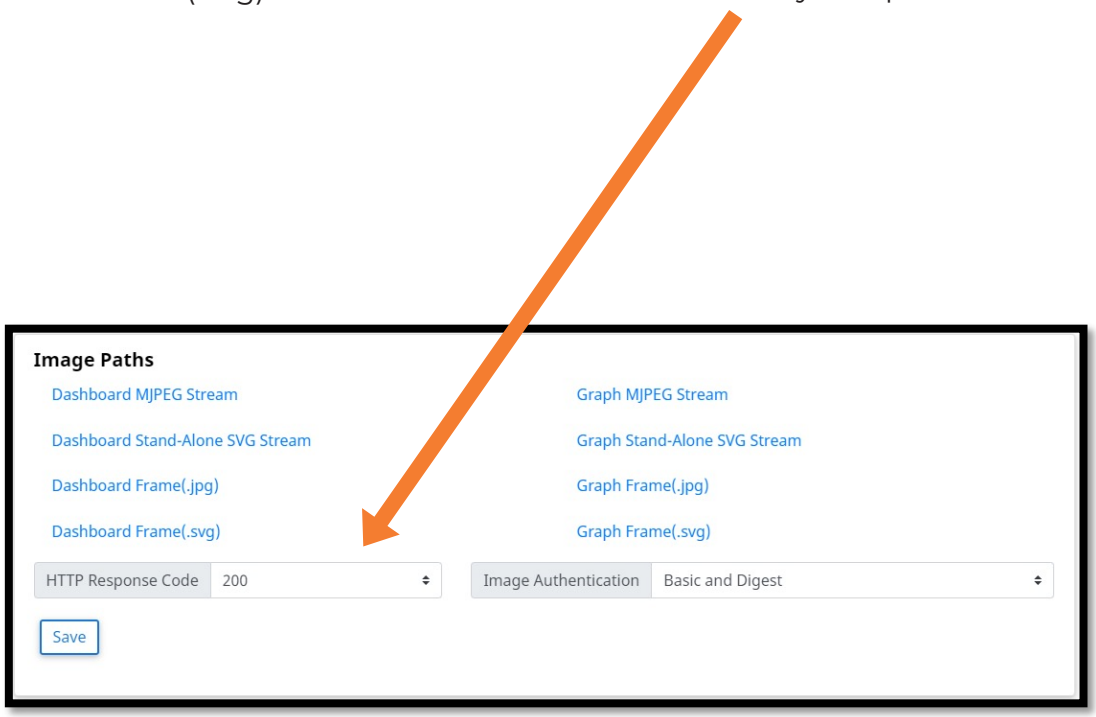
PATHS

The defined paths will create a new tab in the web browser that will include the indicated stream or frame. These file paths can be used for streaming to other locations or devices. They include the links below:

- Dashboard MJPEG Stream
- Dashboard Stand-Alone SVG Stream
- Dashboard Frame (.Jpg)
- Dashboard Frame (.Svg)

HTTP Response Code

Indicate whether an HTTP request has been successfully completed.



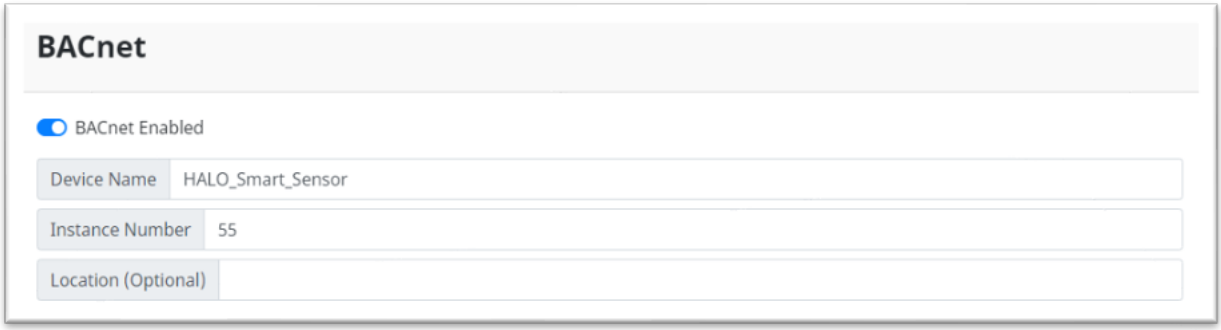
Saving Setting Changes

All setting changes performed in this section are committed by clicking the "Save Changes" button. Settings can be restored to their default values by clicking the "Defaults" button.

BACNET

BACnet is a data communication protocol for building automation and control networks.

To enable BACnet, navigate to the Integrations Tab and scroll down to the BACnet section. Toggle BACnet Enabled to open the configuration menu.

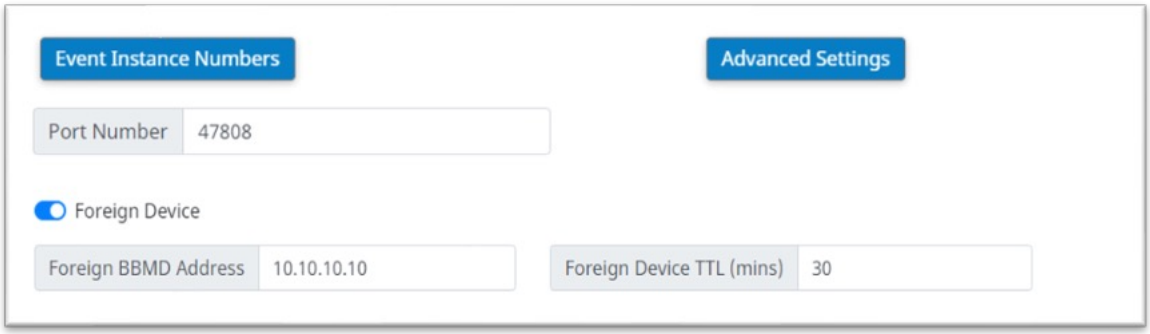


Device Name: The Device Name must be configured as a unique value within your BACnet deployment and should not be left blank.

Instance Number: The device Instance Number must be configured as a unique value within your BACnet deployment and should not be left blank.

Location: This is an optional field for reference.

Event Instance Numbers: The Event Instance Number are unique static event values to HALO. Custom event values should not overlap existing Event values. (see next page)



Advanced Settings:

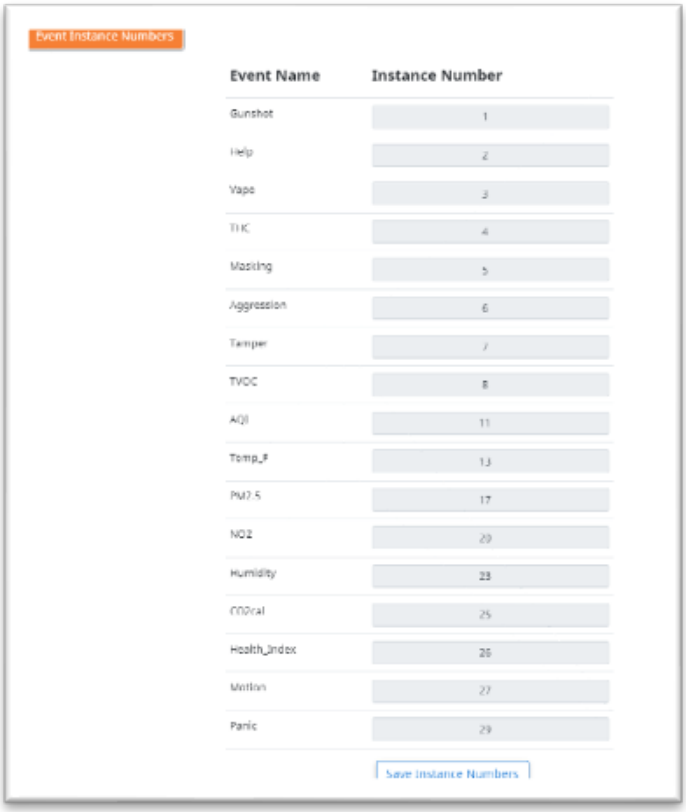
- Port Number: A custom port number is supported. Qualifying range: 47808-47817
- Foreign Device: For implementation requiring foreign device support enter the ip address of the Foreign Device BBMD

A BBMD forwards messages from one subnetwork to another, so communications can be broadcast locally.

BACNET CONTINUED

Event Instance Numbers

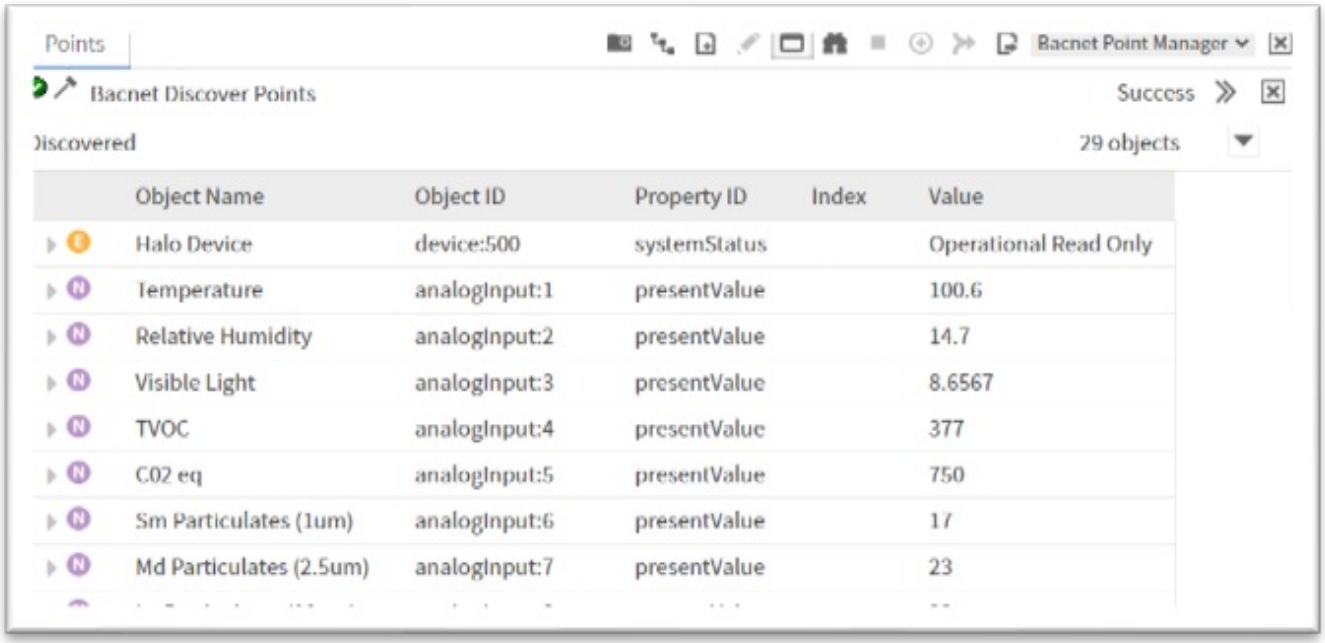
To view HALO's default BACnet "Point Instance Numbers" or add custom "Points" click "Event Instance Numbers."



This list shows how HALO's default events are mapped to BACnet "Points."

A dropdown will appear with your default event "Points" starting at 1 and increasing sequentially. Instance numbers added after the default instances will begin at 128 and increase sequentially from there. After making changes, press the "Save Instance Numbers" button to confirm. Then the "Save" button to confirm the BACnet configuration.

After clicking "Save" on the BACnet tab, you will be able to discover the HALO on your existing BACnet network. Custom events and changes in the BACnet tab will require a rediscovery of the device in the BACnet network.



Shown above is an example of a HALO Discovery on a JACE BACnet Controller

BACNET PROTOCOL IMPLEMENTATION CONFORMANCE (PIC) STATEMENT

ANNEX A - PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (NORMATIVE)
(This annex is part of this Standard and is required for its use.)

BACnet Protocol Implementation Conformance Statement

Date: December 14, 2022
Vendor Name: IPVideo Corp
Product Name: HALO Smart Sensor
Product Model Numbers: 2.0, 2C and 3C
Application Software Version: 0.18.0
Firmware Revision: 2.7 or higher
BACnet Protocol Revision: 14

Product Description:

HALO Smart Sensors are IoT devices that detects environmental changes that occur in privacy concern areas where surveillance cameras can't be installed. A HALO Smart Sensor is capable of detecting vape, smoke, THC and shouting in areas a camera cannot be placed. Additional sensors give HALO the ability to monitor air quality for temperature, humidity, hazardous chemicals and more. When the sensor values exceed normal levels, a HALO Smart Sensor can send alerts to security personnel

BACnet Standardized Device Profile (Annex L):

☐ BACnet Operator Workstation (B-OWS)
☐ BACnet Advanced Operator Workstation (B-AWS)
☐ BACnet Operator Display (B-OD)
☐ BACnet Building Controller (B-BC)
☐ BACnet Advanced Application Controller (B-AAC)
☐ BACnet Application Specific Controller (B-ASC)
■ BACnet Smart Sensor (B-SS)
☐ BACnet Smart Actuator (B-SA)

List all BACnet Interoperability Building Blocks Supported (Annex K):

DS-RP-B Data Sharing – Read Property B
DS-RPM-B Data Sharing – Read Property Multiple-B
DM-DDB-B Device Management – Dynamic Device Binding B
DM-DOB-B Device Management – Dynamic Object Binding B
DM-DCC-B Device Management – Device Communication Control B

Segmentation Capability:

☐ Able to transmit segmented messages Window Size: _____
■ Able to receive segmented messages Window Size: 1024

Standard Object Types Supported:

Object Type Supported	Can Be Created Dynamically	Can be Deleted Dynamically
Analog Input	No	No
Binary Value	Yes	Yes
Multi State Value	No	No

Data Link Layer Options:

■ BACnet IP, (Annex J)
■ BACnet IP, (Annex J), Foreign Device
☐ ISO 8802-3, Ethernet (Clause 7)
☐ ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
☐ ATA 878.1, EIA-485 ARCNET (Clause 8), baud rate(s): _____
☐ MS/TP master (Clause 9), baud rate(s):_____
☐ MS/TP slave (Clause 9), baud rate(s):_____
☐ Point-To-Point, EIA 232 (Clause 10), baud rate(s):_____
☐ Point-To-Point, modem, (Clause 10), baud rate(s):_____
☐ LonTalk, (Clause 11), medium:_____
☐ BACnet/ZigBee (ANNEX O)
☐ Other:_____

Device Address Binding:

Is static device binding supported? (This is currently necessary for two-way communication with MS/TP slaves and certain other devices.) ☐ Yes ■ No

Networking Options:

☐ Router, Clause 6 - List all routing configurations, e.g., ARCNET-Ethernet, Ethernet-MS/TP, etc.
☐ Annex H, BACnet Tunneling Router over IP
☐ BACnet/IP Broadcast Management Device (BBMD)
Does the BBMD support registrations by Foreign Devices? ■ N/A
Does the BBMD support network address translation? ■ N/A

Network Security Options:

■ Non-secure Device - can operate without BACnet Network Security
☐ Secure Device - can use BACnet Network Security (NS-SD BIBB)
☐ Multiple Application-Specific Keys:
☐ Supports encryption (NS-ED BIBB)
☐ Key Server (NS-KS BIBB)

Character Sets Supported:

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

- ■ ISO 10646 (UTF-8)
- ☐ ISO 10646 (UCS-2)
- ☐ IBM™/Microsoft™ DBCS
- ☐ ISO 10646 (UCS-4)
- ☐ ISO 8859-1
- ☐ JIS X 0208

If this product is a communication gateway, describe the types of non-BACnet equipment/ networks(s) that the gateway supports: N/A

BACnet IP Mapping:

Name	Object Type	Instance ID	Units	Raw Sensor Ranges
Temperature (F)	AnalogInput	1	Degrees Fahrenheit	-40 – 185 °F
Temperature (C)	AnalogInput	17	Degrees Celsius	-40 – 85 °C
Relative Humidity	AnalogInput	2	% Relative Humidity	10 – 100% rh (between 0 and 60 °C)
Visible Light	AnalogInput	3	Luxes	0 – 30,000 Lux
TVOC	AnalogInput	4	ppb	0 – 60,000ppb
CO2 eq	AnalogInput	5	ppm	400 – 60000ppm (eq)
Sm Particulates (1um)	AnalogInput	6	µg/m^3	0 – 500 µg/m^3
Md Particulates (2.5um)	AnalogInput	7	µg/m^3	0 – 500 µg/m^3
Lg Particulates (10um)	AnalogInput	8	µg/m^3	0 – 500 µg/m^3
Ammonia	AnalogInput	9	ppm	0.5 – 100 ppm
NO2	AnalogInput	10	ppb	40 – 7,000 ppb
CO	AnalogInput	11	ppm	0.1 – 500 ppm
Noise Level	AnalogInput	12	dB	20 – 130dB SPL
High Gain Mic	AnalogInput	13	dB	20 – 100dB SPL
Low Gain Mic	AnalogInput	14	dB	50 – 130dB SPL
AQI	AnalogInput	15	No Units	
Pressure	AnalogInput	16	Inches of Mercury	9 – 33 inHg
CO2 Cal	AnalogInput	18	ppm	400 – 2000ppm (eq)
Health Index	AnalogInput	19	No Units	
People Count	AnalogInput	20	No Units	
Motion	AnalogInput	22	No Units	

BACnet IP Mapping: CONTINUED

Preset Binary Value Points:

Name	Object Type	Instance ID
event_Gunshot	BinaryValue	1
event_Help	BinaryValue	2
event_Vape	BinaryValue	3
event_THC	BinaryValue	4
event_Masking	BinaryValue	5
event_Aggression	BinaryValue	6
event_Tamper	BinaryValue	7
event_TVOC	BinaryValue	8
event_CO2eq	BinaryValue	9
event_AQI	BinaryValue	11
event_Temp_F	BinaryValue	13
event_PM2.5	BinaryValue	17
event_NO2	BinaryValue	20
event_Humidity	BinaryValue	23
event_CO2cal	BinaryValue	25
event_Health_Index	BinaryValue	26
event_Motion	BinaryValue	27
event_People_Count	BinaryValue	28
event_USER_EVENT_1	BinaryValue	1000
event_USER_EVENT_2	BinaryValue	1001

Additional Binary Value Points Associated with Other Presets:

Name	Object Type	Instance ID
event_CO	BinaryValue	10
event_Help000	BinaryValue	12
event_Temp_C	BinaryValue	14
event_Light	BinaryValue	15
event_PM1	BinaryValue	16
event_PM10	BinaryValue	18
event_NH3	BinaryValue	19
event_Noise	BinaryValue	21
event_Pressure	BinaryValue	22

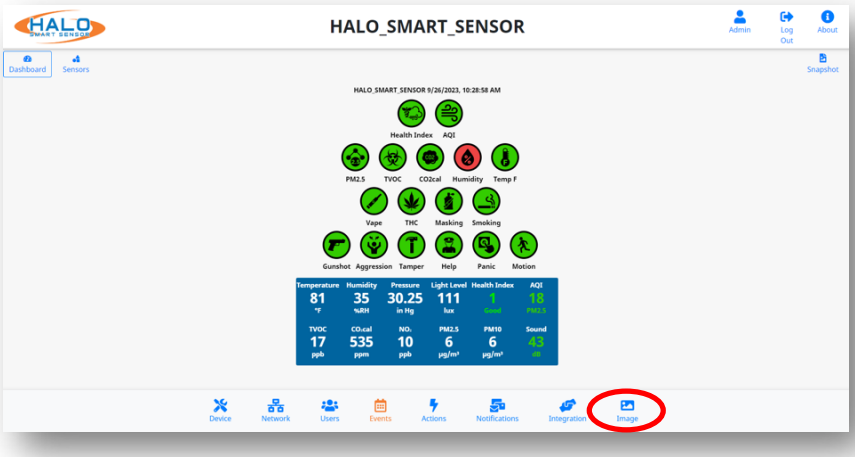
Preset Multi State Value Points:

Name	Object Type	Instance ID	Description	State Values
AQI Source	MultiStateValue	1	Largest Value Contributing to Air Quality Index	Unavailable,PM2.5, PM10, CO, NO2

IMAGE SETTINGS

Navigate to the image page, from here the Live View page can be altered. Some of the alterations available include:

- Choose Stream Resolution
- Color Options
- Show / Hide Info
- Signatures
  - Show / Hide
  - Graph Scale
  - Color
  - Order



Show / Hide Info

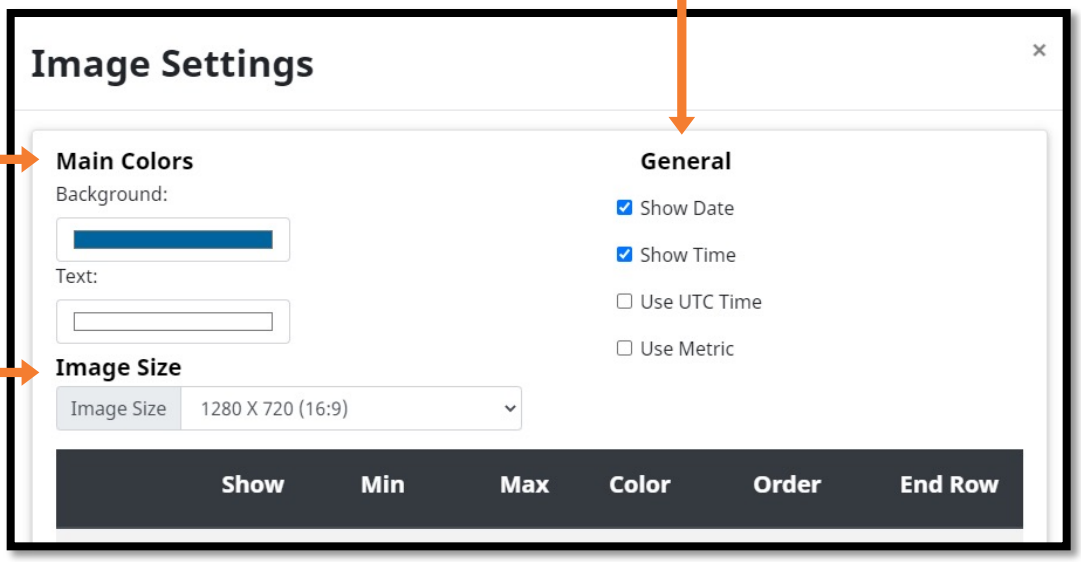
Information can be added or removed from the Live View stream including Date, Time, UTC Time, and a choice of showing temperature in Celsius.

Color Options

Colors for both background and text can be selected.

Image Size

Select from the drop down to change the displayed resolution of the Live View stream.



Saving Setting Changes

All setting changes performed in this section are committed by clicking the "Save Changes" button. Settings can be restored to their default values by clicking the "Defaults" button.

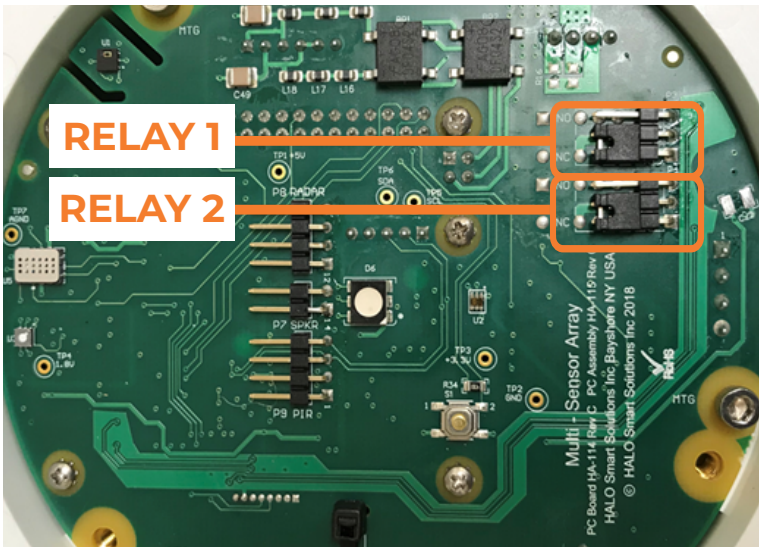
EXTERNAL CONNECTIONS

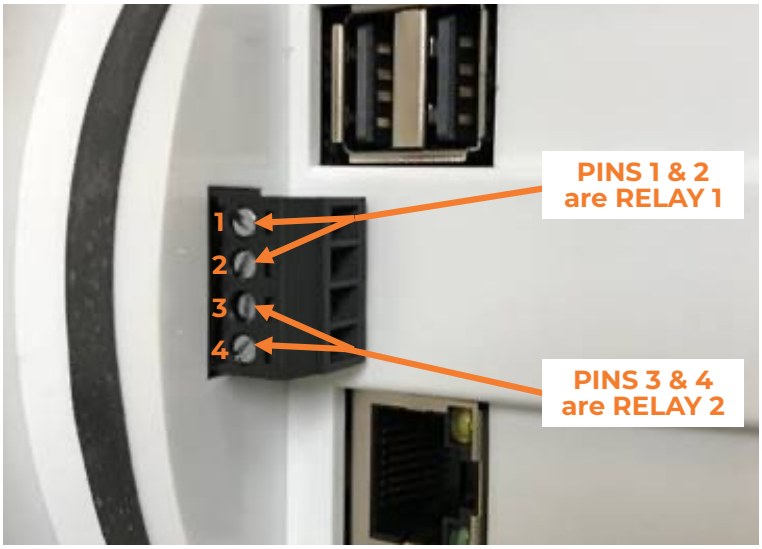
Relays for HALO-V2.0 and HALO-2C

HALO Smart Sensor features two relay controllers that can trigger an external system upon an Event.

The relay controls are set to Normally Closed “NC” by default. The ports can be switched to Normally Open “NO” by switching jumper pins. The Jumper Pins are located on the board. The top two covers of the HALO Smart Sensor need to be removed to expose the Relay Jumper Pins.

Once exposed, the default state of each relay can be adjusted independently by moving the jumpers from NC to NO.





Relays for HALO-3C

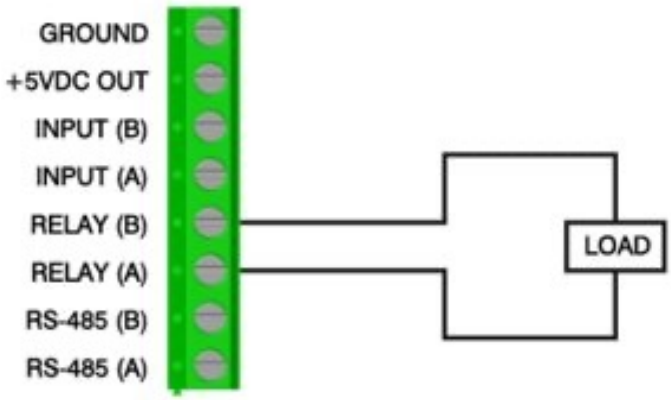
The HALO-3C contains a single solid state relay which uses Relay (A) & Relay (B) to open and close the circuit loop. By default, the relay is in a closed state meaning the loop is closed. Once an event triggers the relay, it will open the circuit.

Example: By default, current will be flowing through the load due to the closed state.

Connections:

8. GROUND
7. +5VDC OUT
6. INPUT (B)
5. INPUT (A)
4. RELAY (B)
3. RELAY (A)
2. RS-485 (B)
1. RS-485 (A)

Once the HALO event triggers with the relay set, the relay will open the circuit.

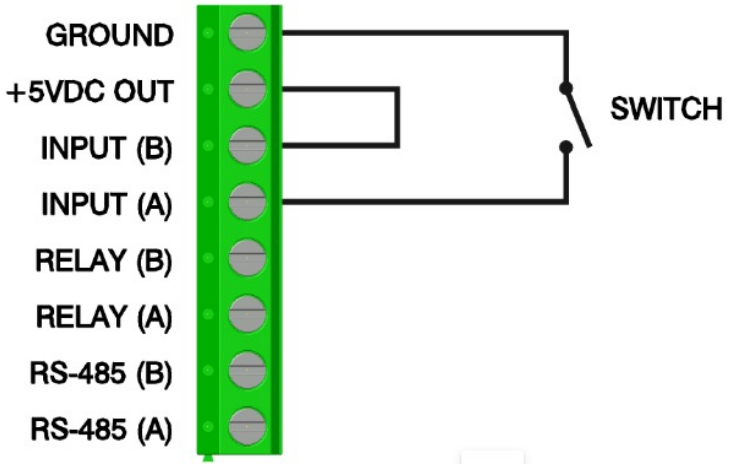


External Input for HALO-3C

HALO-3C has the ability to read HIGH/LOW voltage signals from outside devices to trigger events on the device. Voltage potential is limited to 24V between the two connections. Once a voltage is seen across the two connections, the event will trigger on the HALO GUI.

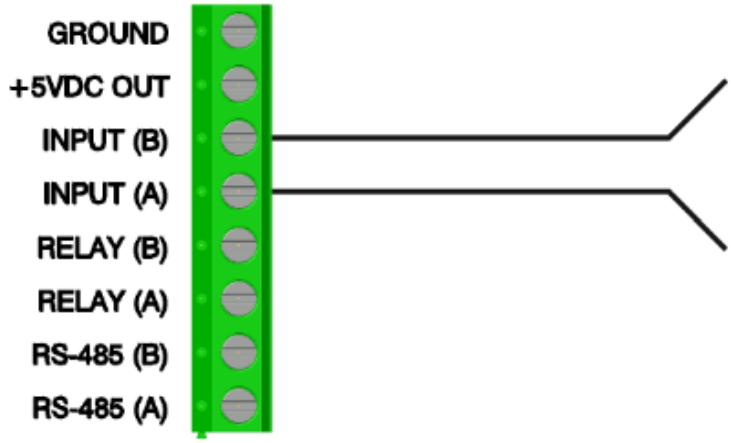
Example 1

CONNECT PIN 8 GROUND TO PIN 5 (INPUT A) WITH A SWITCH. THE SWITCH WILL ACT AS A METHOD TO TRIGGER THE EVENT. CONNECT PIN 7 (+5VDC OUT) TO PIN 6 (INPUT B)

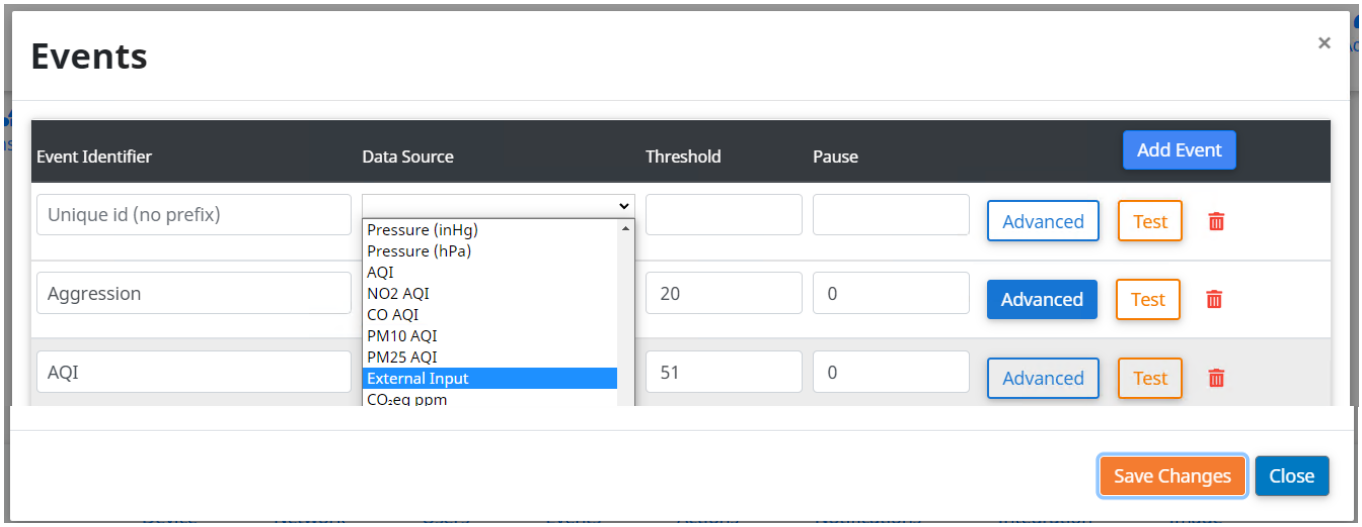


Example 2

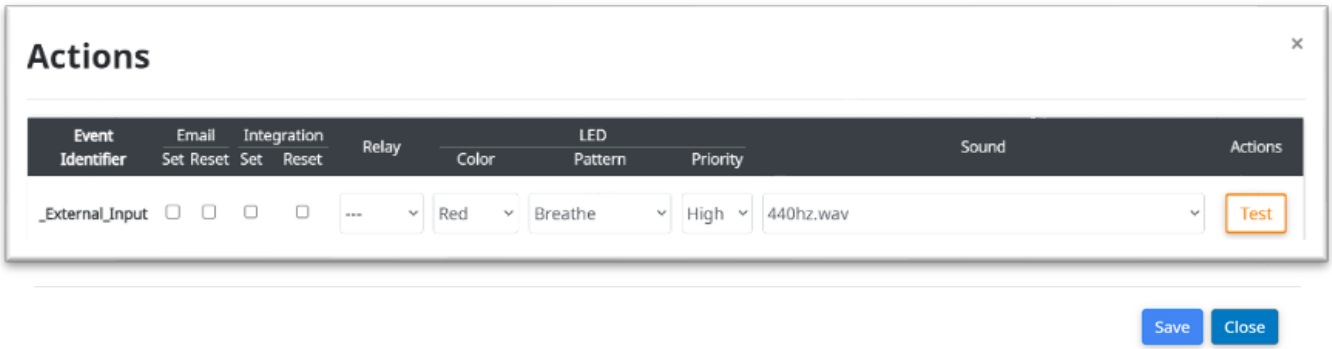
APPLY VOLTAGE TO (INPUT A) WITH COM/GND TO (INPUT B).
5V - 25V DC non polarized required to trigger an event.



Under the Events Tab select Add Event.
From the dropdown select External Input. Name your Event under Event Identifier.
Set the Threshold to 50 and Pause to 0. Save Changes and Close.



Under the Actions Tab locate the new added event.
From here you can set an Action the HALO can take upon trigger of the event.
Save any changes and test your external input.

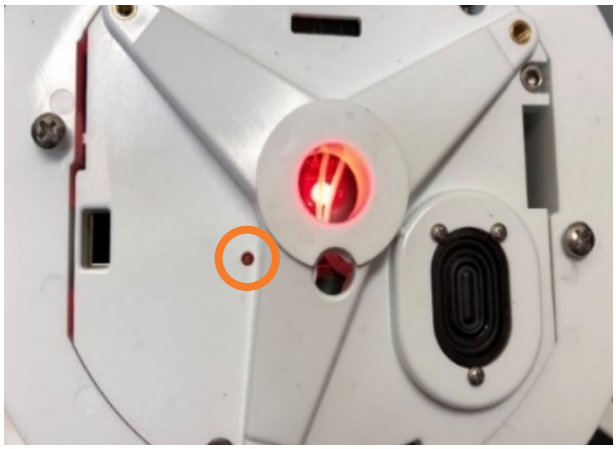


HALO V2.0, 2C, & 3C FACTORY RESET

HALO Smart Sensor includes a hard-reset button that can revert the settings to the Factory Defaults. Please note that the outer cover of the HALO Smart Sensor must be removed to expose the reset button.

- After device has been on for more than 30 seconds, use a paperclip or micro screwdriver to engage button.
- Press and hold the button until the LED turns violet to remove all users and reboot.
- Press and hold the button until the LED turns green to remove all users, switch to DHCP and reboot.
- Press and hold the button until the LED turns red to remove all users, switch to DHCP, clear all configuration files and reboot.

HALO 2.0 Variable Reset Button



HALO 2C Variable Reset Button

To factory reset HALO-3C contact support at support@ipvideocorp.com or 1-866-797-1300 Opt2. Have your warranty information prepared to confirm ownership.

MAINTENANCE

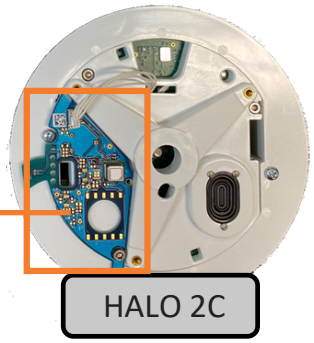
HALO is an environmental sensor and as such, proper maintenance will keep your HALO operating at peak levels. This guide will give you recommended best practices for your HALO maintenance.

Notify appropriate staff of alarms that will be activated during cleaning or disable alerts via the HALO GUI interface or HALO Device Manager. **NOTE: Levels of some of the sensors may read high levels for apx 3 – 5 minutes.**


HALO 2

HALO-V2.0 / 2C

- Remove only the first front cover using T10 torx wrench. Do not remove the next cover.
  - Wipe the cover that was removed on both sides with a 75% Saturated Alcohol Wipe.
  - HALO-V2.00: Wipe the inside surface with a 75% Saturation Alcohol Wipe.
  - HALO-2C. Wipe HALO with a 75 % Saturation Alcohol Wipe **avoiding the blue exposed sensor board.**
- Screw back in the front cover.



HALO 2C

HALO-3C

- It is recommended to use an ESD Safe vacuum to pull dust from within.
- Wipe the outside with a slightly damp cloth.
- DO NOT open HALO-3C for maintenance.
- DO NOT use detergents or alcohol.


HALO-3C

HALO is an environmental sensor and as such, proper maintenance will keep your HALO operating at peak levels. This guide will give you recommended best practices for your HALO maintenance.

Interval of Cleanings

- Frequency for cleaning is based on the environment and amount of sediment collecting on the HALO housing.
- It is recommended to clean the HALO at least every 90 days.

Maintaining Your Thresholds

- Environments change over time. Periodic review of your environmental conditions will ensure that your thresholds are set appropriately, and you can receive notifications of events.
  - Review active events signatures in your HALO.
  - Use the CLOUD Analytics or HALO log to establish average levels of the events and signatures you are using.
  - Adjust the thresholds of your active signatures and events to appropriate levels.

DO NOT FORCIBLY PUSH THE WIPE INTO ANY OF THE HOLES ON THE HALO WHERE IT WOULD COME IN DIRECT CONTACT WITH A SENSOR OR CIRCUIT BOARD.*

TESTING

Note: The following LED responses are defined in the "Presets" of firmware 2.3 or newer.

Vape Detection Test:

- **Testing Product:** Cirrus Wind Indicator
- **Process:** Activate cartridge and pump for 10 seconds from directly below HALO Smart Sensor at 5' height.
- **Results:** Vape Alarm, Green LED Indicator

Keyword Test:

- **Process:** Clearly speak the active keyword from directly below HALO at slightly elevated speaking volume. Word options include (Note, typically only 1 of the following may be active):
  - Emergency Help
  - Help Nine One One
  - Help One One One
  - Help Triple Nine
  - Help Triple Zero
- **Results:** Help Alarm, Violet LED Indicator

Tamper Detection Test:

- **Process:** Knock on the HALO Smart Sensor 3-5 times.
- **Results:** Red LED Indicator

Particulate, CO2, & TVOC Test:

- **Testing Product:** CRC Smoke Test, canned
- **Process:** Sprayed directly at HALO from 2' away for 2-3 seconds as directed.
- **Results:** PM2.5 Rise 200+ µg/m^3, PM 10 Rise 500+ µg/m^3, CO2eq (or CO2cal) Rise 8,000+ppm, TVOC Rise 4,000+ppb. (Observed in "Sensors" view, confirmed in event logs)
- **Alerts:** Masking event (Detected using revised HALO v2.3 Masking Advanced conditions), Yellow LED Indicator

Temperature Test:

- **Testing Product:** FLUKE-62 MAX Infrared Thermometer
- **Process:** Aim thermometer directly at HALO. Compare to HALO displayed values.
- **Calibration:** Under the "Device" tab under "Heat Sensor" input temperature offset to calibrate. The values are in Celsius and (+) and (-) values are accepted.

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