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Huddle Hub One / Huddle Hub One+

Configuration Guide

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1 Introduction

1.1 Huddle Hub

Huddle Hub™ product family is the answer to the needs of modern teamwork, which is increasingly based on content presentation and video-conference. Thanks to Huddle Hub, these activities can be performed everywhere in your organization, in traditional meeting or huddle rooms, but also in offices, open-space areas, or even lounges. Every place in your company / organization - whether AV equipped or not - can be used as a huddle room:

- Taking advantage of existing large displays and webcams, but also using only individual devices. Or combining the two.

- With no cables for the TV, and no cables for the webcam.

- Running up to four concurrent sessions on a single Huddle Hub unit.

- Experiencing a smooth integration between Huddle Hub and your favorite video-conference software.

The Huddle Hub solution is made of two components:

- The Huddle Hub unit, currently available in two versions: Huddle Hub One (`HHO`) and Huddle Hub One+ (`HHO+`);

- The Huddle Hub App (`HHApp` or simply `App`), a companion software available for Windows, MacOS, iOS and Android devices. Though HHApp is the best way to unleash all the power of the Huddle Hub solution, presentations can also be received on any web browser without the need of installing any app.

The two models HHO and HHO+ are identical except for network connectivity: both models allow `wired connection`, but Huddle Hub One+ also embeds a `wireless network adapter` for Wi-Fi connectivity, thus supporting a `dual-network configuration`.

Given that HHO+ includes all the functionality of HHO, when this guide refers to HHO it means HHO or HHO+. HHO+ specific features will be highlighted with the "HHO+ only" marker.

1.2 Documentation

HRT provides a thorough and exhaustive documentation, consisting of the following manuals:

- `Quick Start Guide`: a very short guide that contains the essential steps to start using HHO and HHApp. Available in the box of the product and in the support section of HRT website (www.hrt.website).

- `Specification, Safety and Conformity`: describes all the technical specifications, the safety precautions and the conformity of HHO to national/internationals rules and certification requirements. Available in the box of the product and in the support section of HRT website (www.hrt.website).

- `User Guide`: shows the user how to use and get the most from Huddle Hub App. Available in the

support section of HRT website (www.hrt.website).

- **Installation Guide**: from unpacking to deployment, a short guide to install your HHO unit and choose among different network configurations. Available in the support section of HRT website (www.hrt.website).

- **Configuration Guide**: directed to IT Managers or IT staff members, it explains how to configure HHO to better suit the company needs. Available in the support section of HRT website (www.hrt.website).

- **Network Security Guide**: contains recommendations for the IT Manager or Network Security Manager, aimed at designing and implementing a secure deployment of HHO units in the organization's infrastructure. Available in the support section of HRT website (www.hrt.website).

- **FAQ**: the support section of HRT website (www.hrt.website) contains also a dynamically updated knowledge base with the answer to the Frequently Asked Questions.

Before consulting our documentation, please check that the product version printed on the cover page of your manual matches your HHO and HHApp versions, and that the manual version is the latest one. Manual numbering follows the following scheme:

<Manual name> <Product version> - <Manual version> . pdf

For example, "User Guide 2.3-1.pdf" means that this version of the User Guide covers all product versions staring with "2.3" (e.g. 2.3.1, 2.3.5 etc) and it's version 1 of the manual itself.

HRT supports only the latest release of its software, which is always available free of charge. Users and IT Managers are invited to keep their HHApp and HHO units up to date, and to download the most recent version the manuals from the support section of HRT website.

2 Understanding Huddle Hub

2.1 Rooms, Sessions and Roles

Rooms and Sessions

For our purposes, a `session` is the sitting together of a group of people, with the intent of either making or assisting to a presentation, or to perform a video-conference.

A session happens in a `room`, which usually corresponds to a physical place where the participants meet. However, HHO extends the concept of room to the group of participants that join the same session, wherever they are.

HHO supports `up to 4 rooms per unit`, each one able to host one fully independent session. Each room is identified by a name, that can be set to match a specific place (e.g. "Main meeting room", "1st floor huddle room" etc.) or a group of users it's reserved for (e.g. "Marketing dept.", "IT Demo", etc.) or any other criteria that meets your needs.

A session starts when the first participant connects to a room, and ends when the last participant closes his connection.

The following example portraits the situation of a company that has two HHO units, each one with four enabled rooms:

- HHO Ground Floor
  - Lobby
  - Huddle room 1
  - Huddle room 2
  - Admin & Finance
- HHO First Floor
  - Board room
  - CEO's virtual huddle room
  - Sales department
  - Production department

Each room can host `up to 150 participants per session` (depending on its configuration and on bandwidth availability).

Hub room and Virtual rooms

The place where the HHO unit is physically present and installed is called **hub room**, while the other three rooms are called **virtual rooms**.The existence of the hub room is optional, because you can decide to install HHO in your company data center and not to connect to any device except the

company LAN. In this case all the four rooms will be "virtual".

Passcode

Sessions can be protected with a `passcode`, which ensures the privacy of your meeting. The passcode is a 4 digits random number, generated when the session starts, that is visible on the TV screen or in the toolbar of the participant that started the session or in the one of the participants that already joined it. Passcode protection can be disabled.

Roles

During a session, we identify the following `roles`:

- `Participant`: anyone who is connected to the session.

- `Presenter`: any participant who is currently sharing his/her screen with the other participants.

- `Viewer`: any participant who is receiving the presenters' screen.

- `Host`: we call "host" the presenter that starts a video-conference using the Huddle Hub Virtual Driver as camera, thus sharing the VC software screen with the other participants.

- `Active Speaker`: during a video-conference based on the Multicam Feed, and with Multicam layout set to *Active speaker*, the participants whose camera stream is in the main frame of the layout.

2.2 TV, Wireless Webcam and Multicam

TV Sets and Projectors

In a typical scenario, your HHO unit will be installed in a meeting room, huddle room or another shared space, and will be `connected to a large TV set with an HDMI cable`. We've defined this room as `hub room`, while the remaining HHO rooms are called `virtual rooms`. What happens in those virtual rooms? How do the participants see the presentation?

There are a few possible options:

- Individual devices: any participant can `receive the presentation on his/her own device`, either a PC, a tablet or a smartphone.

- TV set: `Smart TVs` can receive the presentation through a `web browser`. `Android TVs` can receive the presentation like any other Android device can. They just need to have the Huddle Hub Android TV app installed. Other TVs need and `Android dongle or set-top box` attached to one of their HDMI ports.

- Mixed mode: some participants look at the presentation on their individual device, and the others on the TV. This is always possible in the hub room

Welcome screen

In case your HHO unit is connected to a display through its TV port, when no session is in progress it will show a *Welcome Screen*, which contains instructions about downloading the Huddle Hub App and about accessing the session. This Welcome Screen can be customized.

Wireless Webcam

HHO can also connect a **USB Webcam**. This is possible **only in the hub room**, because it has to be plugged to the unit.The HHO unit will make this webcam available to the HHApp clients connected to the hub room, through a virtual camera driver, with no need of any cable.

Multicam

When a room webcam is not available, or when you decide not to use it, you can enable the feature called **Multicam**, which allows the participants of a video-conference to use the cameras of their own devices: their streams get captured and combined into a single one, to send to the video-conference software of your choice, thus realizing a true multi-camera video-conference system. Multicam is available only in the hub room and is alternative to Wireless Webcam.

2.3 Reaching a Room

Whether you want to present your screen to the other participants, or to receive their presentation on your device, you have to **connect to a room**. To achieve this, you have to:

1. Connect your device to the same network HHO is connected to.

2. Select the room you want to use for your presentation.

Network connection

The network to use can be either the company LAN or HHO+ embedded access point (*HHO+ only*).

LAN connection

The task of installing and configuring HHO to make it visible to all users on the LAN is your Network Administrator's responsibility. Under this configuration, your device will be able to access HHO through the standard network configurations you already use to access your company LAN, and when you start your HHApp, you will see a list of all the available rooms associated with the connected HHO units.

Warning: *Although HHO and devices are properly configured to access the same LAN, in complex network configurations you may experience problem in reaching the active rooms. If this happens, contact your network administrator or consult the Configuration Guide.*

Embedded Access Point connection (HHO+ only)

You can directly connect to your HHO+ unit, provided that you are in the range of its embedded Wi-Fi access point and that it's been configured to allow such a connection. To do so, on your device select the Wi-Fi name (SSID) of the HHO+ you want to connect to. By default, the SSID is "huddlehub" and the password is "huddlehub", but they may have been changed (recommended!). Ask your Network Administrator for the HHO+ Wi-Fi credentials .

Using this approach, you can reach only the rooms that belong to the HHO+ unit you are directly connected to.

Mixed connection (HHO+ only)

Both the methods described above can be used at the same time, and any session may have participants connected either ways.

Discovering the room to connect to

Automatic Discovery Service

If both HHO and your device have been properly configured, at its start HHApp will show the list of the available rooms. This list is prepared and presented to you through a network `discovery service`. When the service is enabled (and allowed by local network configurations), HHApp can automatically search for HHO rooms on the network.

Manual Search

In some network configurations, the automatic discovery service may not be able to reach all the HHO units and show all their available rooms. For these cases, HHApp offer a *Find Rooms* function, that you can use to reach the rooms through the IP address of the HHO unit that hosts them (see next chapter about finding the IP address of a HHO unit).

2.4 Finding the IP address of a HHO unit

There are cases when you need to know the IP address your HHO unit:

- to download HHApp from the unit;
- to configure HHO unit with its Web Console;
- to attend a session using your web browser;
- to connect to a room that cannot be reached through the *discovery service*.

When HHO is connected to the company LAN, its IP address is either dynamically assigned by the DHCP server of the network or statically assigned during its configuration.

- If the unit is connected to a TV or a monitor, and no presentation is in progress, you can read its IP

address on the welcome screen. HHO+ units may have two IP addresses: one for the wired connection and one for their embedded Wi-Fi network adapter.

- If other participants already entered that room, you can ask them to read the IP address they are connected to (⋮ > **Settings** > **Room info**).

- If none of the previous methods is possible, you have to contact your Network Administrator to get the IP address of the HHO unit you want to connect to.

2.5 Performances

HHO is capable of amazing performances. However, what you are actually able to do with it depends not only on the unit itself, but also on its configuration and on the IT infrastructure it's inserted into, and on the performances of the computer and devices HHApp is installed on:

- Up to 4 rooms per unit: this feature is always available.

- Up to 150 participants per room, totaling 600 participants per unit: the actual maximum number of participants depends on Huddle Hub room configuration and on the available bandwidth of your network, in particular on those of the involved access points: type, available channels and frequencies.

- Up to 6 concurrent presentations on the same TV screen. This is possible only in the hub room and the actual maximum number of concurrent presentations depends on the Huddle Hub room configuration .

- Multicam Feed: it allows up to 4 devices to combine their cameras into a single video stream, to be sent to any video-conference software through the Huddle Hub virtual driver. This feature is available only when enabled in HHO configuration. Performances are strictly dependent on the performances of the computer that is running the video-conference software and on those of the devices whose camera stream is being captured.

3 Connecting to the Web Console

The tool you use to configure your HHO unit is the Web Console, accessible using any common web browser, like Chrome, Edge, Safari, Firefox and many others. From the Web Console, you can manage every parameter of your HHO.

To use the Web Console you have to connect to the HHO unit you want to configure.

Before you start your first HHO connection and configuration, we recommend that you read the Network Security Guide, that contains important information about the secure deployment of HHO and HHO+ units.

3.1 Connect via Ethernet Interface

To access your HHO through its Ethernet interface, the unit must be switched on and connected to the company LAN using an Ethernet cable. For security reasons, during your first configuration you should configure your HHO unit using a standalone network, that is a network that is not connected to your corporate network (see Huddle Hub One Network Security Guide).

1. Connect HHO to the network by plugging its Ethernet connector.

2. Switch the unit on.

3. HHO ships with Ethernet interface and DHCP enabled, so the unit will receive an IP address. The IP address of HHO depends on your company LAN address family (e.g. 192.168.1.x), on your DHCP server and in general on your network configuration.

4. Get the IP address of the HHO unit, either attaching an HDMI display to its port (the IP address appears in the welcome screen) or using a network tool to discover which IP address it's been assigned (see also Finding the IP address of a HHO unit 8).

5. Type the IP address in a web browser and access the Web Console of your HHO unit. Both HTTP and HTTPS connections are available; for security reasons HTTPS is the suggested mode.

3.2 Connect via Wireless Interface (HHO+ only)

You can access the Web Console using a wireless direct connection to the Wi-Fi network of your HHO+. To ensure maximum security, during your initial configuration you should configure your HHO+ unit without connecting it to your corporate network (see Huddle Hub One Network Security Guide).

1. Move to the room where HHO+ has been installed and make sure the unit is switched on.

2. Open the wireless network selection screen on your device and connect it to HHO+ network. The factory default parameters are:

   ▪ SSID: huddlehub

   ▪ Security: WPA2

   ▪ Password: huddlehub

   ▪ Wi-Fi band: 5 GHz

3. Once connected to the wireless network of HHO+, get its IP address, either attaching an HDMI display to its port (the IP address appears in the welcome screen) or using a network tool to discover which IP address it's been assigned. The default IP address of HHO+ on its own wireless network is 10.3.2.1, but it may have been changed by a previous configuration (see also Finding the IP address of a HHO unit 8).

4. Type the IP address in a web browser and access the Web Console of your HHO+ unit. Both HTTP and HTTPS connections are available; for security reasons HTTPS is the suggested mode.

4 Using the Web Console

When you know the IP address of the HHO unit you want to configure, you have to type it in the address bar of your browser, and press Enter.
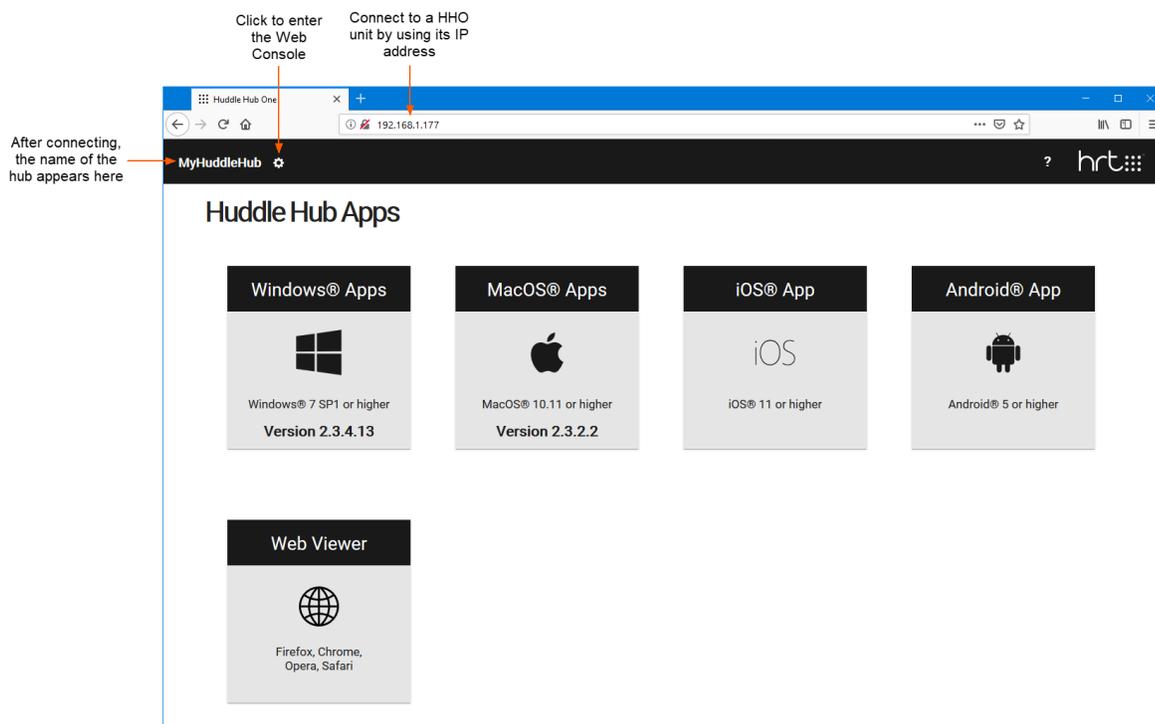
To enter the Web Console, click the gear icon at the top. You need to type the administration password in the login dialog:
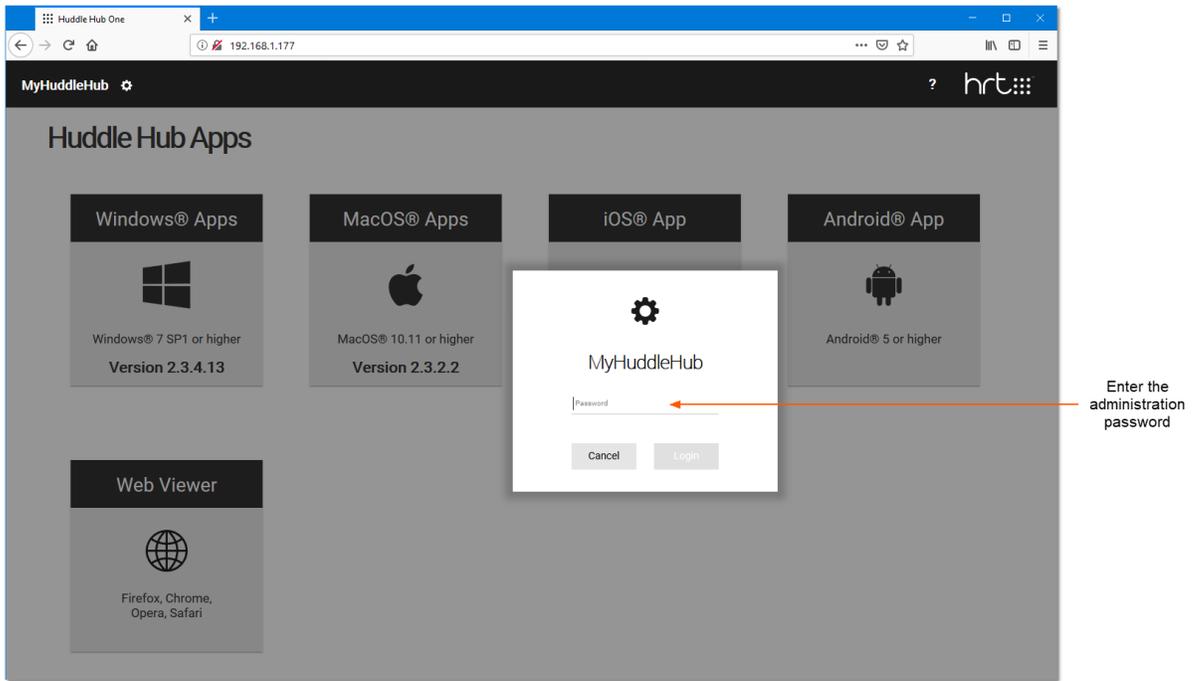
The factory default password is "admin".

Tip: *for security reasons, changing the administration password should be your very first configuration task.*

The Web Console has four areas: *Hub selection bar*, *Sidebar*, *Top bar* and *Body*:

Hub Selection Bar

Sidebar

The HHO unit you are connected to is underlined

Click to show the IP addresses

Click to stop all the running sessions

Click to reboot the unit

Click to logout

Click to go to HRT's website help page

Top bar

Body

Hub-B

MyHuddleHub

Venezia_Hub

▼

Status

Huddle Hub

Rooms

Network

Stop sessions

Reboot

Logout

General   Welcome Screen   TV 🗔   Webcam ◉   Discovery

Hub name: MyHuddleHub
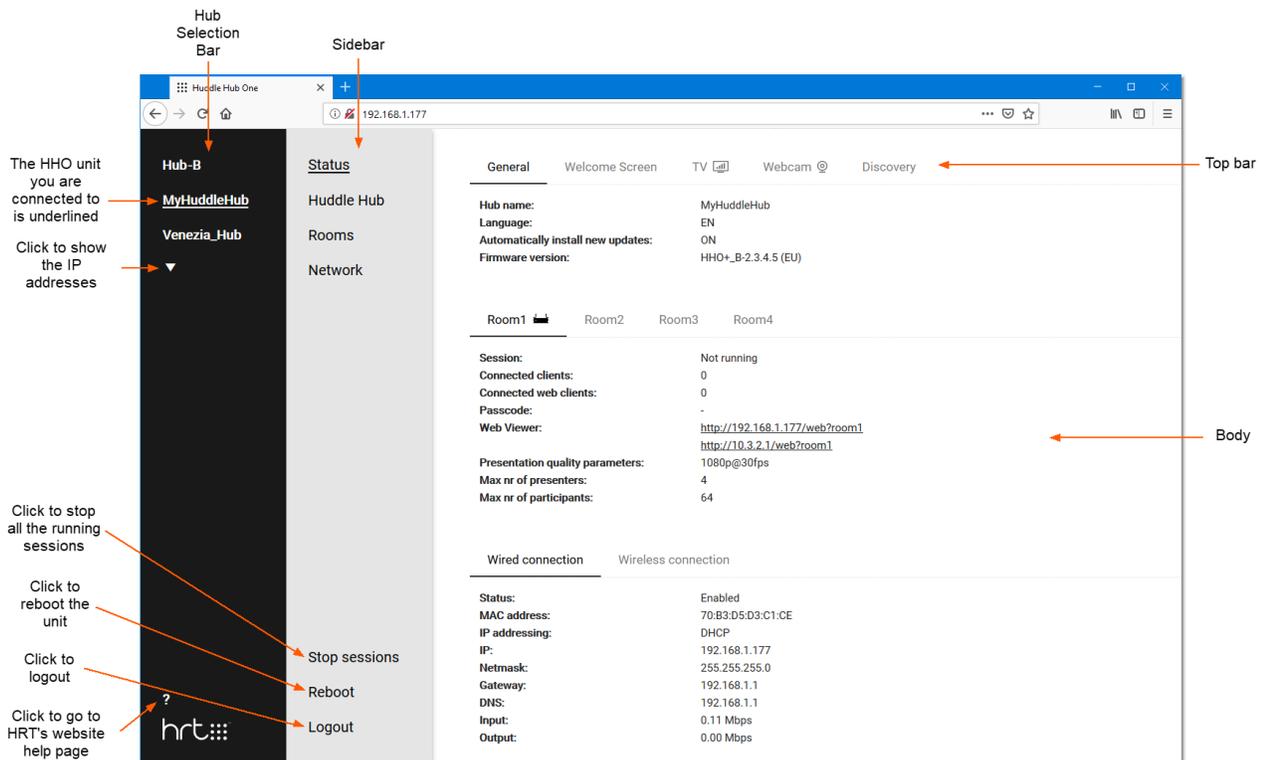Language: EN
Automatically install new updates: ON
Firmware version: HHO+_B-2.3.4.5 (EU)

Room1 🛏   Room2   Room3   Room4

Session: Not running
Connected clients: 0
Connected web clients: 0
Passcode: -
Web Viewer: http://192.168.1.177/web?room1
                                       http://10.3.2.1/web?room1
Presentation quality parameters: 1080p@30fps
Max nr of presenters: 4
Max nr of participants: 64

Wired connection   Wireless connection

Status: Enabled
MAC address: 70:B3:D5:D3:C1:CE
IP addressing: DHCP
IP: 192.168.1.177
Netmask: 255.255.255.0
Gateway: 192.168.1.1
DNS: 192.168.1.1
Input: 0.11 Mbps
Output: 0.00 Mbps

Hub selection bar

This is the leftmost column of the web page, and allow selecting the unit you want to examine or configure. The unit currently in use is underlined.

By clicking the small arrow at the bottom of the list you can see the IP addresses of the units next to their names.

The question mark at the bottom is a link to HRT's support page (which opens in a new tab of your browser).

Sidebar

Located next to the *Hub selection bar*, it allows navigation through the various configuration sections:

- *Status* is a read-only page that recaps all the parameters.
- *Huddle Hub*, *Rooms* and *Network* take you to the pages where you can change the corresponding group of parameters.

At the bottom of the *Sidebar* you find three controls:

Stop sessions - This item is visible only if at least one of the HHO rooms is hosting a session. When clicked, it closes the sessions and disconnects the participants. A dialog asks you to confirm (or cancel) the operation.

Reboot - This button asks for a confirmation and then reboots HHO. This operation has the same effect as turning off and on the device using the power button. The Reboot procedure closes the current session and disconnects all the users connected to HHO.

Logout - It disconnects you from the Web Console and brings you back to the login page.

Top bar

Each configuration section has two or more pages, use the Top bar to navigate through them.

Body

It contains the parameters to examine or configure.In the pages that allow changing the values, you find three buttons at the bottom:

Apply - It saves the changes. Some modifications affect the possibility to access the Web Console (for example, if the connection is through the Wi-Fi network and you disable the Wi-Fi interface of HHO+). For this reason, when you apply the changes with the Apply button, the system shows the instructions to access the console again and confirm the changes.

Cancel - This button discards the changes.

Default - It loads the factory defaults of the current configuration section.

The *Body* can contain other section-specific buttons, which will be explained in the following chapters.

5 Configuring Huddle Hub One

5.1 Status section

The *Status* page is a read-only area that recaps all the parameters, useful when you want to have a look at the entire configuration without making any change.

This is the only available section when HHO is hosting one o more sessions, as reported by the message "Session is running. Modifications disabled".

Please see the following chapters for a detailed description of the parameters.

5.2 Huddle Hub section

This section contains HHO general configuration parameters.

5.2.1 General

Hub name

This is the name of the device and identifies your HHO unit. To avoid confusion, please assign unique names when you have multiple HHO units connected to the same network. Name can be from 4 to 16 characters long: numbers, uppercase and lowercase letters, underscore and dash can be used; special characters and spaces are not admitted.

When starting, if a HHO unit finds another unit with the same name in the network, it will add a post-fix number to its name to make it unique.

Admin password

The password field contains the keyword to access the Web Console. It can be from 5 to 48 characters long: numbers, uppercase and lowercase letters, underscore and dash are admitted; special characters and spaces are not allowed. The default value is "admin". The checkbox *Show password* makes your password visible while typing.

Language

Select the user interface language for the HHO Web Console and for the welcome screen.

Automatically install new updates at boot

If this checkbox is active, at every power-on or reboot HHO connects to the HRT software repository to search for firmware updates, and automatically installs the latest release. The automatic update requires a network connection with access to Internet.

Additional buttons

Load firmware - By pressing this button, a dialog appears that allow you to load a HHO firmware file. This feature is useful in case your HHO is not able to connect to the software repository to download the updated version itself. Firmware files are available at HRT website.

Check for updates - Pressing this button, HHO connects to the HRT software repository to check if a new firmware update is available. In case the system finds a new release, a dialog asks you to confirm (Update) or abort (Cancel) the operation.

Warning: HHO may appear unresponsive for a few minutes after power-on or reboot. The effective time required for the update operation depends on the speed of the Internet connection.

5.2.2 Welcome Screen

HHO features a sophisticated, highly customizable welcome screen that appears on the display connected to the unit when no session is in progress.

Background

This group of parameters is about the image to show in the main area of the Welcome Screen.

Select if you want a static *Image*, a *Slideshow* or an image taken from an *URL*.

White overlay color

Some text will be shown on top of your background image. This text is, by default, black. Tick this checkbox if you want to render it white.

Text shadow

Tick this checkbox to add a light shadow to the overlay text.

Time zone

Select your UTC time zone. This setting is needed for the clock that appears in the welcome screen. This clock needs Internet connection to be set, if not available the clock will not be shown.

12-Hour clock

By default the clock is in 24-Hour format, tick this checkbox if you want it in 12-Hour format.

Image

This control appears if you chose *Image* in the first radio button. Either select one of the provided images or *Custom*. In this second case, the **Load image** button appears and by clicking it you open a file selection dialog. Supported formats are JPEG and PNG. The image will be squeezed, if necessary, to fit into the available area.

Slideshow type

This control appears if you chose *Slideshow* in the first radio button. Select one of the listed themes, or All if you want images taken from all of them.

Slideshow timing

Enter the interval between the slides, in seconds.

Selected URL

This control appears if you chose *URL* in the first radio button. Enter the IP address of the image you want to show in the background.

Band

This tab appears only if you chose *Image* or *Slideshow* in the first radio button of the Background tab. It's about configuring the information area that appears on the left of the welcome screen.

Transparent band

Tick this checkbox to make the band slightly transparent.

Hide HRT logo

Tick this checkbox to remove the HRT logo from the band.

Weather widget

Tick this checkbox to include weather situation and forecasts in the band.

Location

Enter the location you want the weather reported for.

Valid formats are:

- City name and country code divided by comma.
- Zip code and country code divided by comma.

Use ISO 3166 country codes. If not specified US il be used by default.

Examples:

```
London,UK
94040,US
```

Type of view

Select your favorite weather view.

Forecast days

Select the forecasting horizon.

Units

Select the unit of measure for the weather widget.

5.2.3 TV

TV mode

When set to *Auto* (the default setting), HHO scans the available resolutions of your TV; if Full-HD mode is available, HHO selects it, otherwise it selects the resolution that the TV set identifies as "favorite".

Available resolutions

In *Manual* mode, you can select the mode you prefer from a list of *Available resolutions* (the star icon next to one of the items identifies the favorite mode of the TV). When you click an item in the list, a **Try** button appears, which allow you to test if the selected mode actually works. If it does, you can safely click **Apply** to confirm the changes you made.

5.2.4 Webcam

Mode

Webcam: select this mode if a webcam is plugged in to your HHO unit. It will be made available to the HHApp clients connected to the hub room, through a virtual camera driver, with no need of any cable.

Multicam: when a room webcam is not available, or when you decide not to use it, you can enable the feature called Multicam, which allows the participants of a video-conference to use the cameras of their own devices: their streams get captured and combined into a single one, then sent to the video-conference software of your choice, thus realizing a true multi-camera video-conference system.

None: no webcam is plugged in and multicam is disabled.

Webcam

If mode Webcam has been chosen, and if you have multiple webcams connected to the HHO unit, select the one you want to use.

Microphone

If mode Webcam has been chosen, and if you have multiple microphones connected to the HHO unit, select the one you want to use.

Speaker

If mode Webcam has been chosen, and if you have multiple speakers connected to the HHO unit, select the one you want to use.

5.2.5 Discovery

HHApp features a discovery service whose purpose is to reach all the HHO units in the same network, get their rooms and prepare a list of all the available rooms.

In complex network environments, with multiple hubs connected to different sub-nets, the units of a sub-net are not able to reach the units of another one, and the clients connected to a sub-net would see only the hubs on the same network.

This may be a desired configuration, with sub-nets totally separated.

In the case you want to make the HHApp clients able to reach HHO units on other networks, you can designate one hub as *Primary* and make the other hubs reach it, thus sharing their rooms list and the corresponding IP addresses. In this way the clients will see the list of all the rooms whose hosting hubs are connected to the primary one.

Primary hub

Tick this checkbox if you want to make the current hub the primary one.

Primary hub IP address

Current hub is not the primary one: enter here the IP address of the hub that has been defined as primary.

Share all rooms to secondary hubs

Current hub is not the primary one: tick this checkbox to make any secondary hub connected to this primary receive the rooms list of all the other secondary hubs connected to the same primary.

If not checked, the secondary hubs will receive only the rooms list of the primary.

5.3 Rooms section

Every HHO unit can enable up to four rooms, each one hosting an independent session.

The `hub room` is the one where the TV and webcam - if any - are installed and connected to the unit. It is also the only room where the Multicam feature can be enabled. In the *Rooms* page the hub room is always the leftmost one, and is identified by a small HHO icon after its name.

The **Create new** button creates a new room, and the **Delete room** button removes an existing room (except the hub room, which cannot be removed).

Each room can be configured with the following parameters:

Room name

The name that will appear in the Huddle Hub App clients when the participants choose a room to start or join a session. Max 16 characters of any kind.

Passcode protection

When checked, a passcode is required to join a HHO session. The passcode is a random four digits number, automatically generated by the system when session starts. Every new participant must type in the passcode to join the session.

Force passcode request to the first participant

This flag is available only in the hub room. If checked, even the first participant is required to enter the passcode when starting a session, which is visible on the welcome screen.

Do not activate this option if there is no screen connected tho the HDMI port of the unit, because in that case the first participant has no way to know the passcode.

Web viewer on HTTPS

When viewing a presentations with a web browser, a HTTP connection is used. By enabling this checkbox you allow an HTTPS connection also.

While connecting to a room with HTTPS, you may receive a security warning from your browser. This happens because the SSL certificate provided by the HHO web server is self-signed, and this is a normal situation with secure servers located on embedded systems. You can confirm you want to proceed.

Presentation quality parameters

Select the resolution (Full HD = 1080p, HD = 720p) and frame rate (30 or 10 frames per second).

The combination of those two parameters determines the maximum number of connected participants and - for the hub room - the maximum number of simultaneous screens sent to the display.

5.4 Network section

5.4.1 Wired connection

This configuration section manages the behavior of the wired connection to the company LAN.

DHCP mode

When the wired connection works in *DHCP* mode, the IP address of the Ethernet interface and the configuration of the wired network is assigned by the DHCP server of the connected company LAN.

DNS from DHCP

If this checkbox is active, the DNS (Domain Name System) address is assigned by the DHCP server, otherwise a *DNS* field must be filled with the DNS server address.

Static mode

When in *Static* mode, the static IP address and the network parameters of the wired interface must be set.

IP

This is the static IP address of HHO on the wired network. It's important to use private address spaces to avoid conflict with public addresses. Possible private networks are 10.0.0.0, 172.16.0.0 and 192.168.0.0.

Netmask

The netmask identifies the address range of the local subnet.

Gateway

The gateway is the address of the computer who manages all the traffic external to the local subnet.

DNS

In static mode, the DNS server address must be configured.

Disabled mode

When disabled, the wired connection doesn't work. It's not possible to disable both the wireless (_HHO+ only_) and wired interfaces.

5.4.2 Wireless connection (HHO+ only)

The Wi-Fi functionality of HHO+ can be configured to work in _Access point_ or _Station_ (client) mode.

It can be disabled, also, but you cannot disable both the wired and wireless connections.

Access Point mode

When configured in _Access point_ mode, HHO+ creates its own wireless network and works as a common Wi-Fi access point.

SSID

This is the Wi-Fi SSID of HHO+ and corresponds to the _Hub name_ as defined in the _Huddle Hub - General_ page.

Password

The password field contains the keyword for the wireless connection to HHO+. The admitted password follows the industry standard 8 to 63 characters specification. The default value is "huddlehub".

Show password

Tick this checkbox to make your password visible.

Hide SSID password in status

Tick this checkbox to hide your password from status page of HHO+.

Hide SSID password in TV welcome screen

Tick this checkbox to hide your password from the welcome screen in case a TV is connected.

Share mode

This parameter manages the connection between HHO+ wireless and wired interfaces:

- _Routing + NAT_: in this case HHO+ manages the NAT (Network Address Translation), lets the Wi-Fi clients reach the company LAN resources connected, including Internet, through HHO+ Ethernet port by natting the clients addresses to the Ethernet interface. From the company LAN to HHO+

wireless network, the connection must be managed by route tables, forwarding the traffic to HHO+ Ethernet interface. There's no firewall isolation between the two sub-nets, wired and wireless.

- *Routing*: the system only routes the Wi-Fi traffic to the Ethernet interface, without natting the addresses. Even in this case there's no firewall isolation between the wired and wireless sub-nets and the dialog between the two interfaces is managed by the company LAN route tables only.

- *Bridge*: the system creates its Wi-Fi network as an extension of the company LAN, using the same address family, for example on the same 192.160.1.0 sub-net. With this configuration, the IP address of HHO+ Wi-Fi interface is the same of the wired network interface. In Bridge mode, being HHO+ Wi-Fi network an extension of the company LAN, the Wi-Fi clients are virtually on the same company LAN. For this mode, the correct Wi-Fi operation depends on HHO+ wired interface settings.

- *None*: means no connection between HHO+ Wi-Fi clients and the company LAN resources.

LAN access to session participants only

In the sharing modes *Routing + NAT* and *Routing*, when this option is active, only the participants of HHO+ work session can access the company LAN resources. Other users wirelessly connected to HHO+ but not in a session cannot access the company LAN.

Client isolation option should be checked, to protect connected clients from being accessed by other connected clients.

Block access to private networks

In the sharing modes *Routing + NAT* and *Routing*, when this option is active (recommended), clients connected to the Wi-Fi adapter will not be permitted to reach private IPv4 addresses, defined by the following ranges:

- 10.0.0.0 – 10.255.255.255

- 172.16.0.0 – 172.31.255.255

- 192.168.0.0 – 192.168.255.255

IP

This is the static IP address of HHO+ on the wireless sub-net. The default is 10.3.2.1, a private address from the 10.0.0.0 family of private addresses, designed to be used for local networks.

Warning: use private address spaces only, to avoid conflict with public addresses. Other possible private networks are 172.16.0.0 and 192.168.0.0.

Country

Every HHO+ unit is configured at factory level for a specific Wi-Fi region, because of the different laws that regulate the radio emission in every country. Every Wi-Fi region has a list of admitted countries

and the country where HHO+ is used must be selected from this list. The Wi-Fi region of your product is visible on the product label. See also Wi-Fi Regions, Channels and Frequencies [29].

Frequency

HHO+ is a non-concurrent dual band Wi-Fi device. It can operate at 2.4 or at 5 GHz and this parameter allows you to change the operating band. For further information please see Wi-Fi Considerations [28].

IEE 802.11ac

In case of 5GHz band, the 802.11ac standard can be enabled or disabled. The 802.11ac standard complies with the previous standards, but some 802.11n devices experience problems with the ac. As a general rule, keep the 802.11ac enabled for maximum performances and disable it in case of compatibility problems with older devices.

Channel

The Channel parameter allows to configure the operating Wi-Fi channel among the list of available channels, which depends on the Wi-Fi region.

By selecting Auto, the system will choose the best performing option at the moment of the configuration and every time system gets switched on or rebooted. For further information please see Wi-Fi Considerations [28].

Channel width

Channel width should be chosen considering the compatibility with the connected devices. Not every device will work at higher values, especially for the 2.4GHz band. A good rule of thumb is to use 20MHz for the 2.4GHz band and 40MHz for the 5GHz band. Use higher values whenever your devices support them, and lower ones for compatibility with older devices.

Select Auto if you want the system to choose the best performing option at the moment of the configuration and every time system gets switched on or rebooted.

For further information please see Wi-Fi Regions, Channels and Frequencies [29].

Secondary channel

The channels in the 2.4GHz band are spaced 5MHz apart. The 5GHz band channels have 20MHz bandwidth available. Whenever the channel width selected is bigger than the available "room" of the configured channel (for example >20MHz for 5GHz), adjacent channels will be affected.

The secondary channel selector allows to configure the direction of the adjacent channel to be used. It gets forced to *Below* (automatic) when the primary channel is at the beginning of the range, forced to *Above* (automatic) when the primary channel is at the end of the range, and you can manually select *Below* or *Above* when the primary channel is in the middle of the range.

DHCP server

Tick this checkbox to enable the internal DHCP server of HHO+. This DHCP server automatically assign the IP address and configure the network parameters of the connected clients.

DHCP range

The DHCP range delimits the available addresses to be automatically assigned to the connected clients.

Authentication

The available authentication standards for the Wi-Fi clients are WPA and WPA2. The WPA/WPA2 option lets the system negotiate the standard with the client.

SSID broadcasting

Tick this checkbox to enable the broadcasting of the SSID and make it visible to Wi-Fi scanners. Hiding the SSID is possible, but all the available technical literature explains that this practice is not recommended.

Client isolation

Tick this checkbox to prevent devices wirelessly connected to HHO+ from reaching each other.

Station mode

When configured in *Station* mode, HHO+ connects to the company Wi-Fi network (WPA2-PSK) exactly as any other Wi-Fi client device. Station mode is useful to connect an HHO unit to the company LAN when no cable is available or, in a dual network configuration, to connect it a secondary company LAN dedicated to guests.

Connect to a hidden network

By ticking this checkbox, you make HHO+ able to reach a hidden SSID. In this case you have to manually specify the name of the desired network.

SSID

This is the SSID of the network to connect with. Unless you want to connect to a hidden network (see above), the connection procedure is the same used for any wireless device:

1. press the **Search AP** button to scan for the available wireless networks;
2. click on the list of found Wi-Fi networks, and select the SSID you want to connect to;

3. insert the password.

Password

The Password field contains the keyword for the Station mode connection to the desired wireless network. The admitted password follows the industry standard 8 to 63 characters specification.

Show password

Tick this checkbox to make your password visible while typing.

Hide SSID password in TV welcome screen

Tick this checkbox to hide your password from the welcome screen in case a TV is connected. Disable this option only when using a dual network configuration, with the wireless adapter connected to a guest LAN, to make the password visible in the welcome screen as a courtesy to the guests.

Country

Every HHO+ unit is configured at factory level for a specific Wi-Fi region, because of the different laws that regulate the radio emission in every country. Every Wi-Fi region has a list of admitted countries and the country where HHO+ is used must be selected from this list. The Wi-Fi region of your product is visible on the product label. See also Wi-Fi Regions, Channels and Frequencies 29.

IP Addressing

When in *Station* mode, HHO+ can acquire the whole network configuration from the DHCP server of the connected network. Otherwise, it's possible to specify the static *IP address* and the other network parameters, like the *network mask*, the *gateway* and the *DNS*.

6 Wi-Fi Considerations (HHO+ only)

For optimal performances, HHO+ requires the right choice of frequencies and channels. The subject would require a treatment which is beyond the scope of this manual; however, we will provide some hints that will assist you in small-scale installations, while we recommend that HHO+ be installed by professional integrators on larger-scale situations.

Frequency

The Wi-Fi standard currently offers two frequencies: 2.4 GHz and 5 GHz. 2.4 GHz frequency band is usually very crowded, and given that HHO+ has 5 GHz capability also, we recommend using this frequency band instead (*Network page > Access point mode parameters > Frequency*).

Channels

HHO+ supports auto selection of the best performing channel: by selecting Auto, (*Network > Access point mode parameters > Channel*) the system will choose the best option at the moment of the configuration and every time system gets switched on or rebooted. To get the most from this feature, we suggest you reboot the system periodically, or at least when changes in the Wi-Fi environment happen.

If you prefer to manually select the channel, we recommend using a Wi-Fi channel analysis tool to understand which channels are already occupied and which are not. Select a free channel, or a channel that contains only weak signals from other access points.

The Web Console will allow only channels legally permitted by the country regulations of the region the HHO+ unit has been configured for (see also Wi-Fi Regions, Channels and Frequencies 29).

7 Appendices

7.1 Wi-Fi Regions, Channels and Frequencies (HHO+ only)

Regions

HHO+ Wi-Fi adapter conforms to the IEEE 802.11 n/ac standard.

Every HHO+ unit is configured at factory level for a specific Wi-Fi region, because of the different laws that regulate the radio emission in every country. Every Wi-Fi region has a list of admitted countries and the country where HHO+ is used must be selected from this list. The Wi-Fi region of your product is visible on the product label.

The product labeled WW (World Wide) is limited to the subset of frequencies accepted in every country.

Channels

The channels in the 2.4GHz band are spaced 5MHz apart. The protocol requires 25MHz of channel separation, which means that it is possible for adjacent channels to overlap and then interfere with each other. For this reason, only channels 1, 6, 11 are typically used in the US to avoid interference. In the rest of the world, the four channels 1, 5, 9, 13 are typically recommended. The 2.4GHz frequency band is usually heavily crowded because most devices operate on that band.

The 5GHz band channels have 20MHz bandwidth available. Unlike the 2.4GHz band, the channels are non-overlapping, therefore all channels have the potential to be used in a single wireless system.

Channel width

Channel width should be chosen considering the compatibility with the connected devices. Not every device will work at higher values, especially for the 2.4GHz band. A good rule of thumb is to use 20MHz for the 2.4GHz band and 40MHz for the 5GHz band. Use higher values whenever your devices support them, and lower ones for compatibility with older devices.

7.2 Restore and Reset procedures

Reset procedure

This procedure resets the configuration to the default parameters, discarding all current settings. The internal software is not reinstalled and the firmware version does not change.

How to reset:

1. make sure Huddle Hub is up and running;

2. locate the Restore button on the back of the unit;

3. press the Restore button and keep pressed for 5 seconds;

4. the unit will now reboot with default parameters.

Restore procedure

This procedure completely wipes the current firmware and does a full firmware re-installation. The firmware version changes to the one originally installed on the unit (and it's then updated if connected to the internet).

How to restore:

1. make sure Huddle Hub is off;

2. locate the Restore button on the back of the unit;

3. switch on Huddle Hub by plugging the power cable or pressing the Power button (without pressing Restore);

4. now press the Restore button and keep pressed for 5 seconds;

5. the unit will now reboot and reinstall the system, please allow a few minutes for this operation.

7.3 Default values

General

Hub name: "huddlehub"

Admin password: "admin"

Language: EN

Automatically install new updates: Yes

Background: Image

Image: Default (Huddle Hub)

TV mode: Auto

Webcam mode: Webcam

Rooms

Room names: Room 1, Room 2, Room 3, Room 4

Passcode protection: Yes

Web viewer on HTTPS: No

Presentation quality parameters: 1080p@30fps

Network

Wired connection

Mode: DHCP

DNS from DHCP: Yes

Wireless connection

Mode: Access point

SSID: "huddlehub"

Password: "huddlehub"

Hide SSID password in status: Yes

Hide SSID password in TV welcome screen: Yes

Share mode: None

IP: 10.3.2.1

Country:

        label EU: IT

        label NA: US

        label JP: JP

        label CN: CN

        label IN: IN

        label AE: AE

Frequency: 5GHz

IEEE 802.11ac: Yes

Channel: Auto

Channel width: Auto

DHCP server: Yes

DHCP range start: 2

DHCP range end: 254

Authentication: WPA2

SSID broadcasting: Yes

Client isolation: Yes

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