HDMI over IP

Control4 Driver User Guide

Version 1.02

Introduction

This driver has been designed to provide two-way control of an Aavara HDMI-over-IP video system, via TCP/IP.
This driver has been written and tested using the following products:

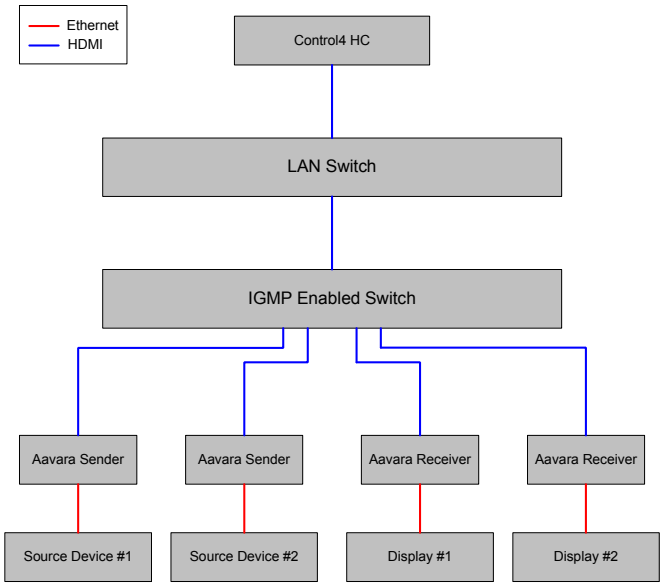
- Aavara Web Interface (v1.0.3)
- Cisco SG500-52P (FW v1.3.0.62)
- Control4 Composer (v2.4.0)
- Control4 HC-800 (v2.4.0.227470)

Note that the driver should run on all Control4 processor models, but it is recommended that the above software versions (or higher) are used.

Driver release version: 1.01

Aavara Switch Configuration

It is recommended that the Aavara system be installed, configured and tested by a suitably qualified engineer, according to Aavara documentation, prior to integration with this driver. The below illustration shows a basic set up:

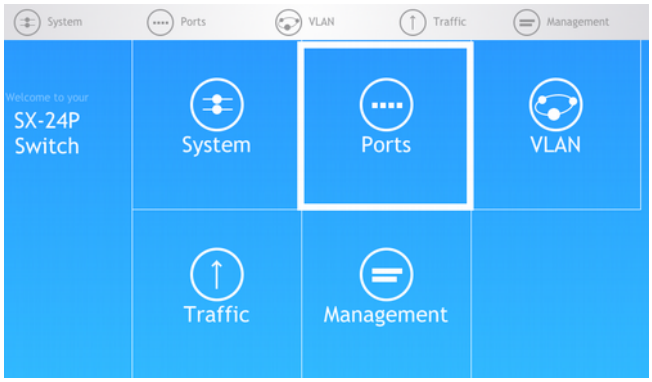


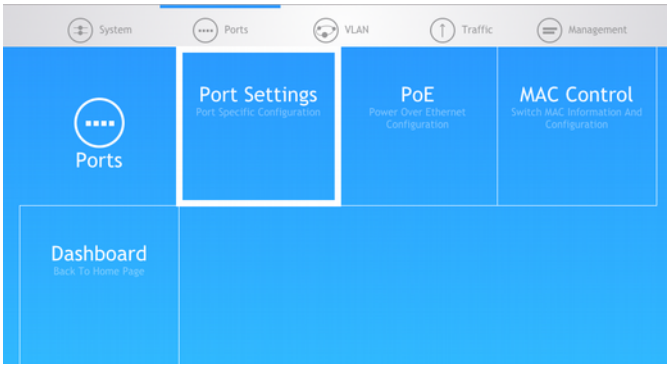
Some additional, specific configuration is required to ensure correct operation of the driver.

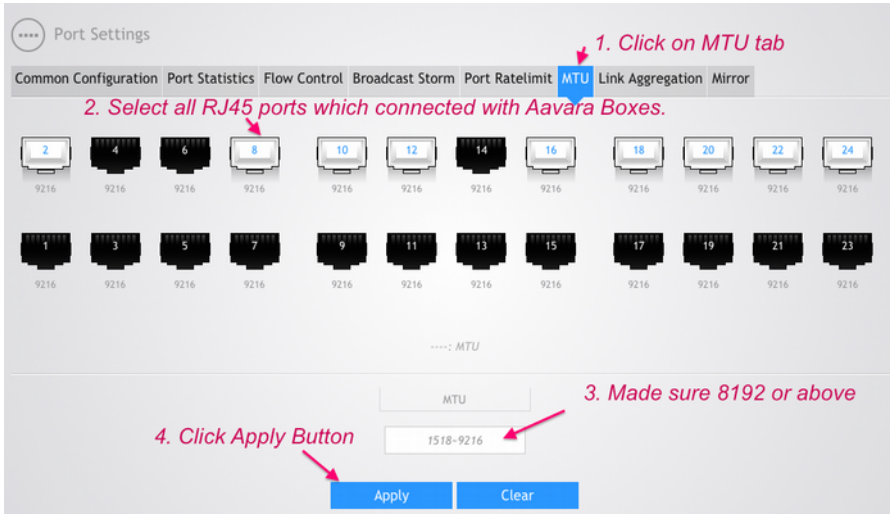
For Pakedge SX series switches:

The following instructions describe the process for configuring a Pakedge Ethernet switch so that it can be used in conjunction with an Aavara HDMI over IP system, and this driver.

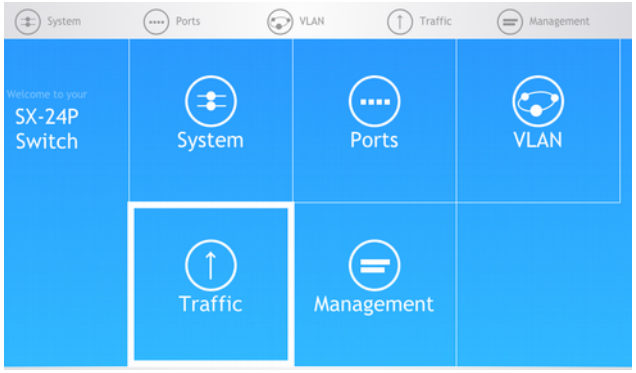
1. Access the web server used to configure your Pakedge switch, and log in.
2. From the main menu or Top menu, Choose **Port** > **Port Setting > MTU** tab > Select all RJ45 ports which connected with Aavara Boxes > Change **MTU** size to **8192 or above** and click **Apply Button**.

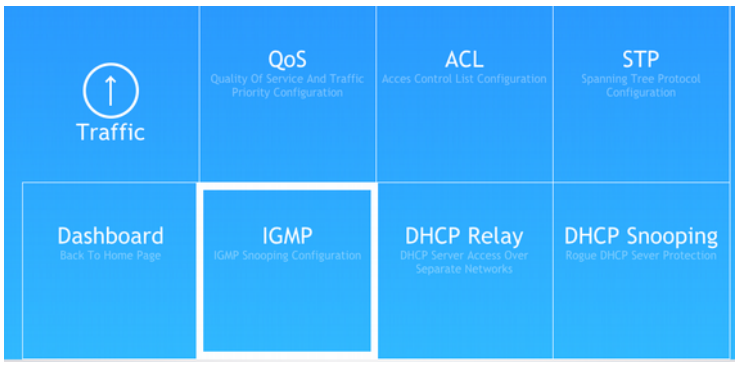




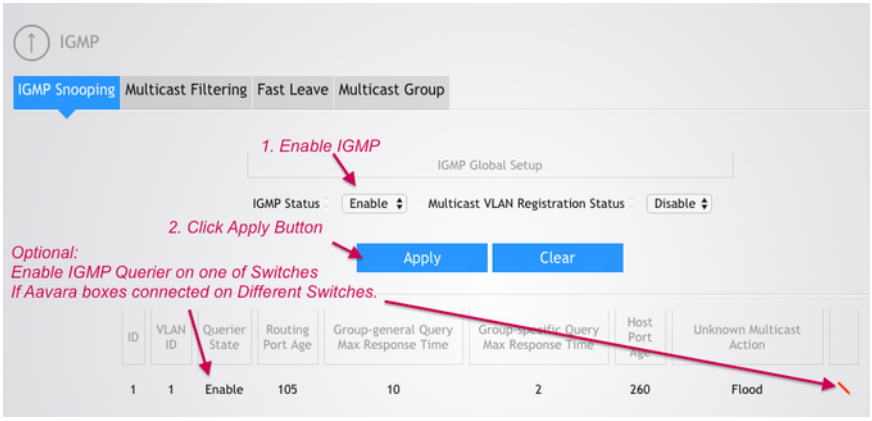


3. **From the main menu or Top menu, Choose Traffic> IGMP > Enable IGMP**

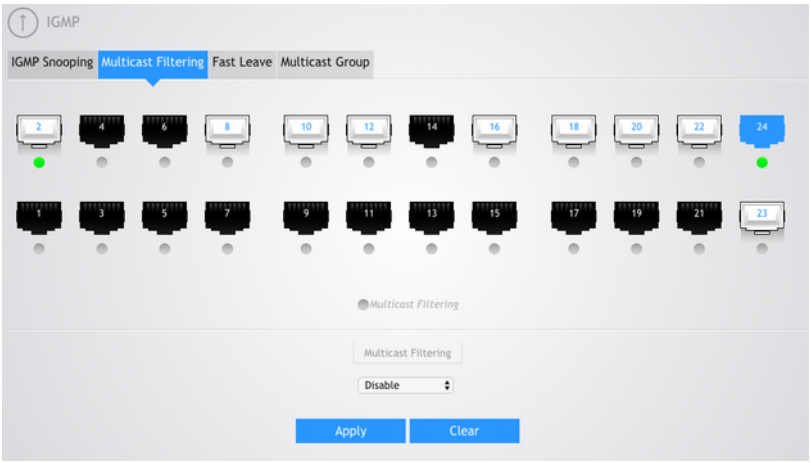




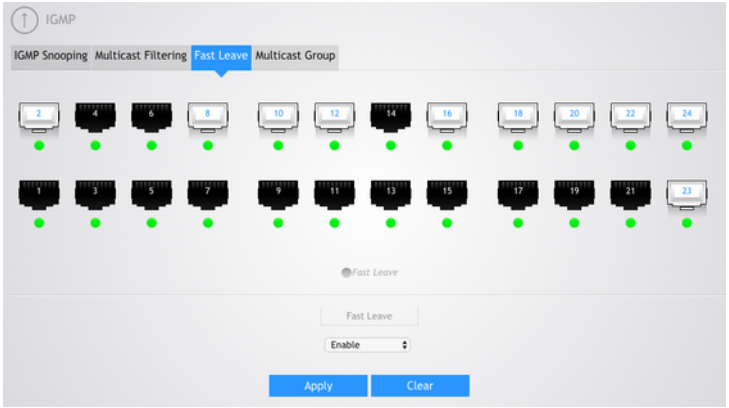
Optional: Enable IGMP Querier on one of switches, if Aavara boxes connected at different switches in network.



4. **Choose Traffic> IGMP > Multicast Filtering** Tab, Select all RJ45 ports that Aavara Boxes connected, and **Disable Multicast Filtering.**
   For RJ45 ports connected to non-Aavara boxes, or connected to Wifi AP/Router or C4 controller, Enable Multicast Filtering.



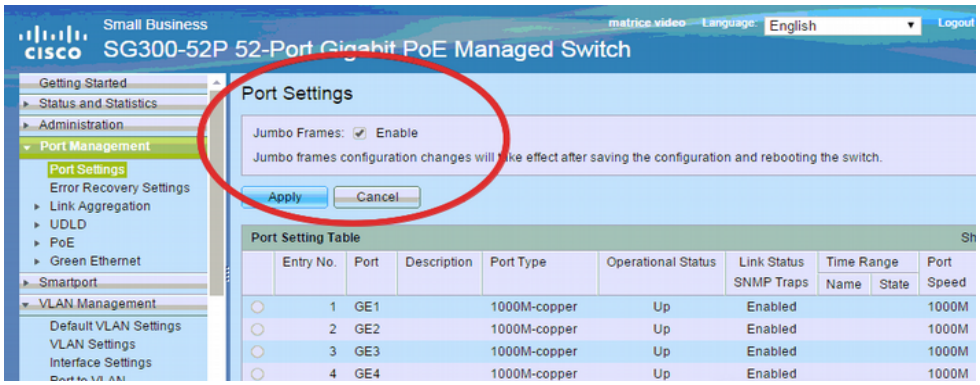
5. **Choose Traffic> IGMP > Fast Leave** Tab, Select all RJ45 ports that Aavara Boxes connected. If all Aavara Boxes on same switch, **Enable Fast Leave**. If Aavara Boxes on different switches, **Disable Fast Leave**.



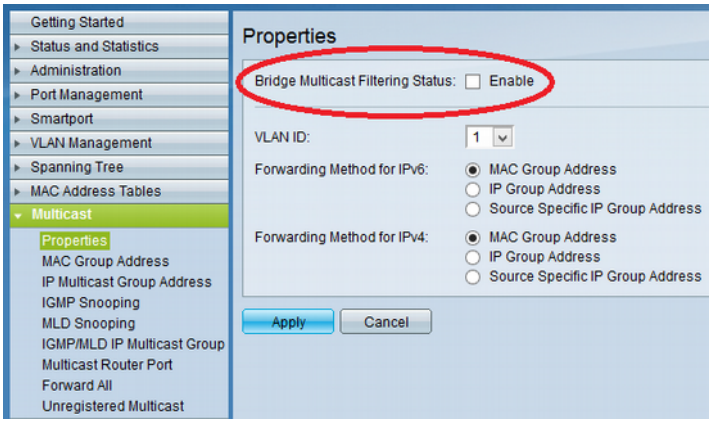
For Cisco SG series switches:

The following instructions describe the process for configuring a Cisco SG series Ethernet switch so that it can be used in conjunction with an Aavara HDMI over IP system, and this driver.

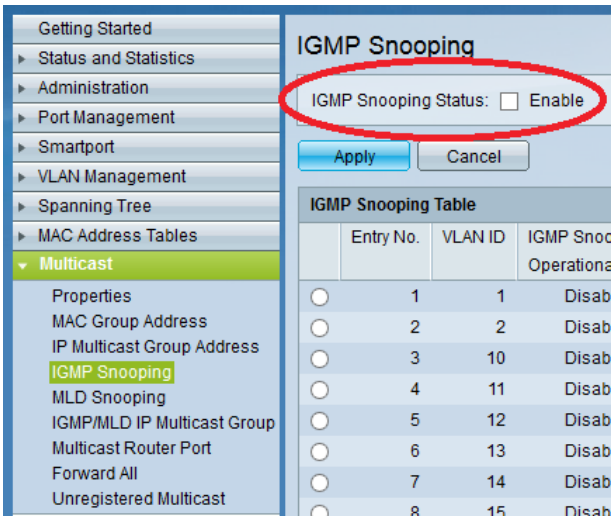
6. Access the web server used to configure your Cisco switch, and log in.
7. From the side menu, Choose **Port Management**> **Port Settings**, check the box labeled **Jumbo Frames Enable** and click **Apply**.



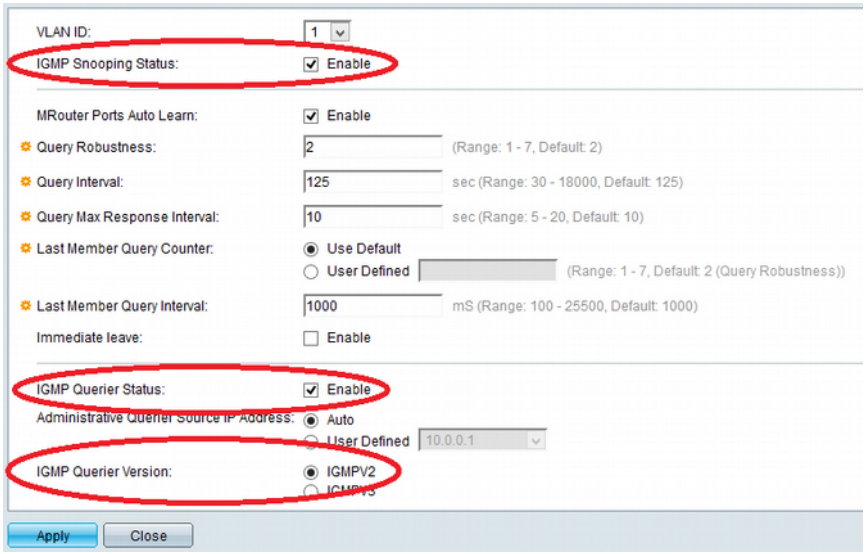
8. Choose **Multicast** > **Properties**, check the box labeled **Bridge Multicast Filtering Status** and click **Apply**.



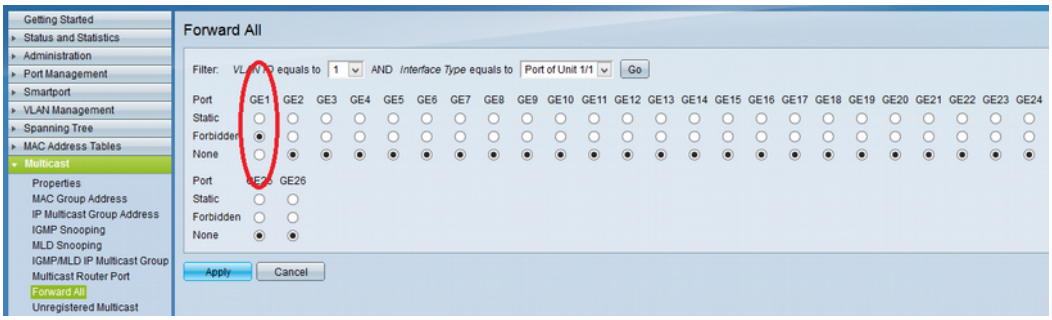
9. Next, choose **Multicast** > **IGMP Snooping** and check the box labeled **Enable IGMP Snooping Status**.



10. Still on the same page, select the VLAN to which the Aavara system is connected and click the **Edit** button to open the **Edit IGMP Snooping** settings. **Enable IGMP Snooping Status** and **IGMP Querier Status** and set the **IGMP Querier Version** to **IGMPV2**, before clicking **Apply**.



11. In order for the driver to communicate with the Aavara system, it is necessary to ensure at least one port on the network switch has IGMP disabled, and that this port is used to connect to the same LAN as the Control4 processor. Navigate to **Multicast** > **Forward All** and set your chosen port to **Forbidden**.



12. Ensure that settings are saved to the boot configuration, to avoid losing your changes when the switch is next rebooted.

For HP ProCurve switches:

When using an HP ProCurve the switch, you can use the following CLI command to enable IGMP, enable Jumbo Frame and block IGMP on the port which is to be connected to the control system:

ProCurve 2510G-24# **config** *(Enter configuration mode)*
ProCurve 2510G-24(config)# **vlan 1** *(to select the correct VLAN which all senders and receivers belong to, VLAN 1 mean all RJ45 ports on switch)*
ProCurve 2510G-24(vlan-1)# **ip igmp** *(Enable IGMP)*
ProCurve 2510G-24(vlan-1)# **jumbo** *(Enable Jumbo packet/frame)*
ProCurve 2510G-24 (vlan-1)# **ip igmp blocked 24** *(to block IGMP on RJ45 port 24 which connecting to Control 4 controller)*
ProCurve 2510G-24(vlan-1)# **exit** *(Exit VLAN 1 configuration)*
ProCurve 2510G-24(config)# **exit** *(Exit configuration mode)*
ProCurve 2510G-24# **write memory** *(To save all changes)*

Aavara IP Configuration

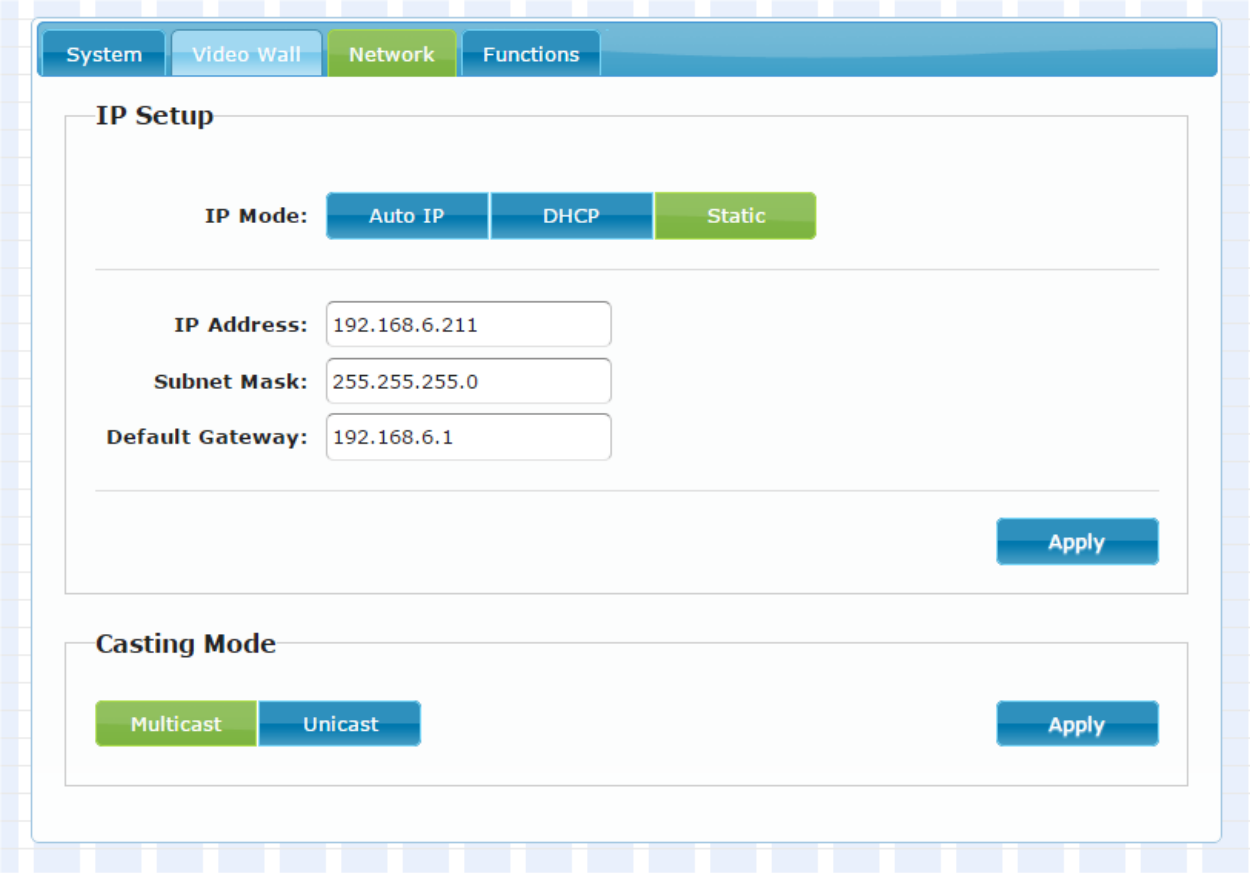
For the driver to function successfully, the Aavara units must have IP addresses that are accessible from the Control4 unit (i.e. usually on the same IP address range and subnet) and which do not change. This can either be done using a simple initialization process provided with the Aavara system or by configuring each unit by hand.

Advanced IP Address Initialization

Having fixed addresses can be done either by using DHCP and configuring the DHCP server to reserve IP addresses for the units, or by giving the units static IP addresses. Either way, the IP address configuration of each unit is accessed via a web browser:

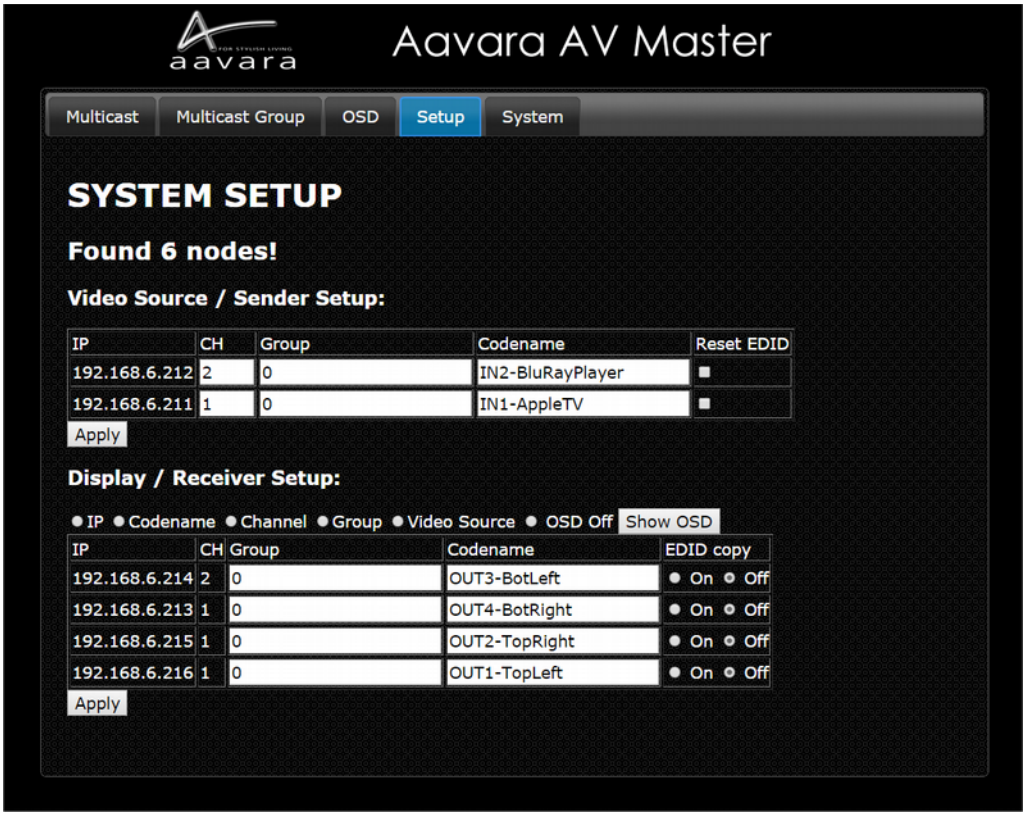
http://<current Aavara IP address>/cfg.html

Then go to the **Network** tab and enter the appropriate information and press **Apply**. Once the information has been entered, go to the **System** tab, expand the **Utilities** section and click on **Reboot** to have the settings taken into use.



Aavara Device Initialization

Once all units have had their IP addresses configured, it is additionally necessary to configure channels for each sender and codenames for each sender and receiver. To do this, browse to the home page of one of the sender units and click on the Setup tab:



For senders you need to configure the channel (**CH**) and **Codename**. For receivers just the **Codename**. Set the channel to match the input number that you want to assign to the unit in the driver's switch configuration. Then assign code names as follows:

For sender (input) devices: *IN[number]-[name] (number will be same as channel)*
For receiver (output) devices: *OUT[number]-[name]*

It is important that each name begins with "IN" or "OUT", which is then followed by the input or output number. You can then optionally add a hyphen (-) followed by an appropriate description for the device (note that no spaces are allowed). For example, in the screenshot above, the first input is named *IN1-BluRayPlayer,* equally valid is just *IN1.*

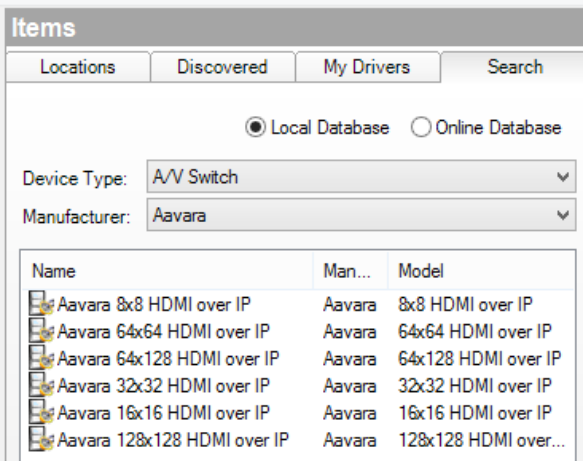
Additionally, you may wish to create groups of receivers by entering a name in the **Group** field for each device. The driver can then be used to switch all outputs within a group, using a single command. Note that when the "Create Video Wall" command is used, this effectively creates a new group and should therefore not be used for outputs already assigned to a group.

Note that you have to configure the senders and press the Apply button for them and then configure the receivers and press the Apply button for them.

Driver Installation & Configuration

Copy the .c4i files from the zip package to My Documents\Control4\Driver and then open Composer. The drivers can be found under:

Device Type: A/V Switch, **Manufacturer:** Aavara, **Model:** *nxm* HDMI over IP

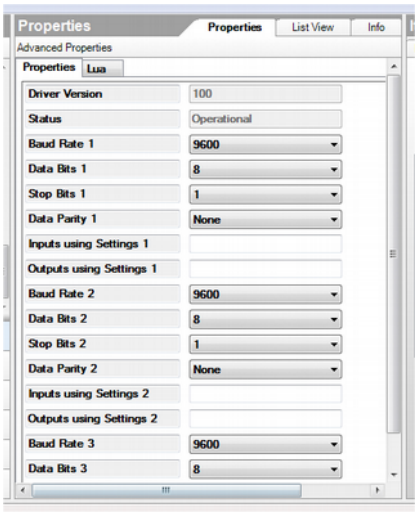


…where "*nxm*" is the number of inputs and outputs. Choose the version that most closely matches your needs. The drivers are all effectively the same; differently sized versions are provided to avoid cluttering your project with unwanted inputs and outputs.

The installed driver will appear as **Aavara *nxm* HDMI over IP** as below:

To configure the driver's access to the Aavara system, go to the **Connections** section and set up your input and output connections according to Control4 standard practice. There are also serial connections representing the serial ports on the transmitters and receivers; these can be linked to any equipment that is going to be controlled via the unit's serial port. Then go to the **Network** tab and select the driver from the list. Add the IP address of one of your Aavara transmitters. The driver should now automatically connect to the Aavara system and initialize itself.

The driver features a number of properties that report status or control configuration. Note that the Serial Port Settings Types provide a way of defining the settings for a serial port, which can then be applied to the serial ports of multiple inputs and outputs.



Property	**Description**
Driver version	The version of the driver. Should be **101** for version 1.01.
Status	Should be **Operational** when actually in communication with the Aavara system and **Idle** when not. Any other status indicates a connection problem of some sort.
Serial Port Settings type *x*	**Baud Rate x** - the baud rate in bits per second. **Data Bits x** – the number of data bits. **Stop Bits x** – the number of stop bits. **Data Parity x** – the parity bit setting. **Inputs using Settings x**, **Outputs using Settings x** – the transmitter and receiver units that should have their serial port configured to use these settings. Inputs and outputs can be specified as a comma separated list of numbers or number ranges, e.g. **1,2-5,7**
Debug Settings	**Debug Mode** – support use only **Debug Subsystems** – support use only **Debug Level** – support use only

Driver Commands

The driver features a number of device-specific commands used for control. Wherever a list of inputs or outputs is required, these can be comma separated (e.g. **1,2,3,4**) or defined as a range (e.g. **1-4**), or a combination of the two (e.g. **1,2-4**).

Command	**Description**
Create Video Wall	Define a video wall using a single host (input).

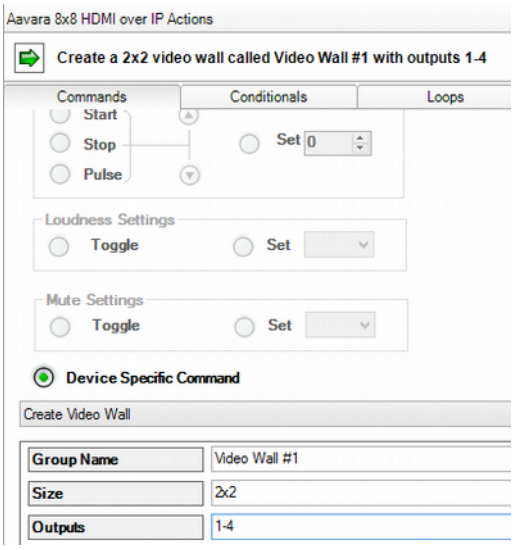
	Group Name Choose a wall name (this is important as other commands refer to this name). **Size** The video wall screen configuration expressed as ***w,h*** or ***wxh***. *F*or example **2x2** creates a 2 x 2 (4 screen) video wall. **Outputs** The output numbers used to create the video wall. This field must contain a number of outputs equal to the amount defined in the **Size** field.
Disable Video Wall	Removes the given outputs from the wall configuration, i.e switches them back to showing the whole video source rather than a portion of it. The outputs remain part of the named group and so sending a **Switch Output Group** command will still switch these outputs. Use **Create Video Wall** and set the group name to 0 to remove the output from the wall completely. **Outputs** The outputs numbers to disable. List of numbers and ranges.
Switch Output Group	Switches all outputs that have been defined as part of the named group using a **Create Video Wall** command to the given input **Input** input to show **Group Name** group of outputs to switch
Set Bezel Gap	Define the size of the TV frame (video edge) to correct for large bezel screens in video wall mode. **Outputs** specify the outputs for which the bezel gap should be set (this will usually be the same list of outputs you used in **Create Video Wall**). **Screen Outside Width, Height** – the overall size of the television in mm (e.g. *"600,550"*). **Screen Image Width, Height** – the size of the actual screen in mm (e.g. *"550,500"*).
Display Message	Show a short message overlaid on the screen. **Outputs** list of outputs to show the message **Size** small or big. **Message** the message to show.
Display To All	Display a particular sort of information on all outputs. **Type** One of: **OSD Off** remove all messages **IP** show IP address of each receiver **Channel** show which sender channel is being shown by each receiver **Group** show the group to which each receiver belongs **Codename** show the codename of each receiver **Sender's Codename** show the codename of the sender connected to each receiver (not working in the Aavara firmware at time of writing)
OSD Off	Remove the on screen message (from **Display Message** or **Display to All**) from the given outputs after a certain timeout. **Outputs** list of outputs to show the message **Time (Seconds)** time to wait before removing the message
RS232 Custom Settings	Serial settings are intended to be set using the serial settings properties of the driver. In the unlikely event that there are more than five different sets of serial port settings required in a system, further settings can be sent to the units using this command. Note that changing the settings reboots the unit, so this should probably

	be done once on system startup. Also note that if you send settings to an input or output that is also included in the property settings, the results are undefined. **Inputs** list of inputs for which to set the settings **Outputs** list of outputs for which to set the settings **Baud Rate** the baud rate in bits per second. **Data Bits** the number of data bits. **Stop Bits** the number of stop bits. **Data Parity** the parity bit setting.
RS232 Command String	**Inputs** list of input serial ports to which to send the string **Outputs** list of output serial ports to which to send the string **Command** the string to send
RS232 Hex Command String	**Inputs** list of input serial ports to which to send the string **Outputs** list of output serial ports to which to send the string **Hex Command** the byte string to send specified as a hexadecimal string, e.g. 54455354 corresponds to four bytes: T E S T

EXAMPLE: Creating a Video Wall

To create a 2 x 2 video wall:

In Composer, choose **Programming** and select the Aavara driver in the **Actions** window. Check the box labeled **Device Specific Command** and select **Create Video Wall** from the dropdown box. Enter a name for your wall, the wall size and the outputs to be used and drag the new command into the appropriate script.



The above example will create a new group with the name "Video Wall #1", which will be configured as a 2x2 video wall, using outputs 1, 2, 3 and 4.

Driver Variables

The driver features a number of variables, providing feedback from the Aavara system.

Variable	Description
IN*xxx*_Name	The name defined for a particular input in the Aavara system.
OUT*xxx*_Name	The name defined for a particular output in the Aavara system.

The names are taken from the part after the dash in the codename (see the above section entitled "Channel and codename configuration" for more information).

Troubleshooting

The driver cannot control the Aavara system

- Confirm the Ethernet switch used by the Aavara system is correctly uplinked to the same network as the Control4 processor and the IP addresses and netmasks for the Control4 processor and Aavara units are compatible.
- Confirm that the correct IP address is defined in the network connection setting for the Aavara driver.

Switching commands are failing

- Ensure you have named the devices correctly in the Aavara system. Read the section of this guide entitled "Aavara Configuration" for more information.

The Aavara units are behaving inconsistently

Sometimes the units can get into an inconsistent state and behave oddly, e.g. allowing switching to one input but not another. In the case of suspicion that something is not quite right with a unit, try the following:

- Browse to the following web page on a sender:

  http://<sender ip>/cgi-bin/all_reset.cgi

  which will execute a reset of all devices. Note that following a reset you may need to re-enter the channel and codename information.