Just Add Power

Just Add Drivers

Installation and configuration of a system using a Cisco SG300/SG500, Netgear 7000 series and Pakedge S24x switches

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INTRODUCTION

Just Add Power High Definition over IP Transmitters and Receivers are a flexible way to distribute high definition video from multiple video sources to multiple video displays. The switch is used as a virtual HDMI matrix, connecting video inputs to designated outputs e.g. televisions, monitors and projectors.

This document describes how to use the Just Add Drivers Configuration Tool (JAD Config) to configure a supported switch and all JAD devices in the system. The following switch families are supported: Cisco SG300 series, Cisco SG500 series, Netgear GSM and Pakedge 24X. This document also covers the installation, configuration and operation of switching and Serial-Over-IP (SOIP) modules for the following supported control systems: AMX, Crestron, Control4 and RTI.

The illustration below shows an example system configuration incorporating an unstacked Cisco SG series switch and a Control4 control system:
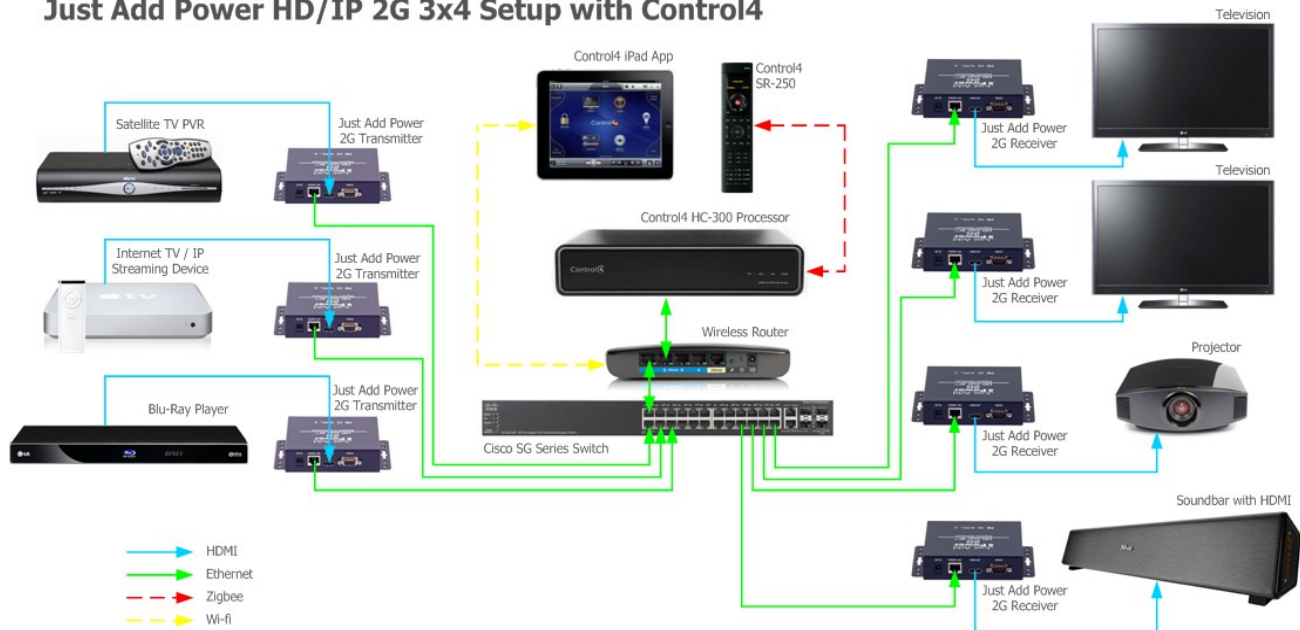
Patching Scheme for managed switches

All managed switches must conform to the following patching scheme where n is the number of Transmitters and m is the number of Receivers:

- Port 1   - control port
- Port 2 to port n+1   - Transmitter section
- Port n+2 to port n+ m+1   - Receiver section
- Remaining ports   - user defined or unused

Port 1 of your managed switch must be connected to your primary LAN or directly to your Router device. The next port section is reserved for the Transmitters. The Transmitter section is directly followed by the Receiver section – there should be no port gaps between the Transmitter and Receiver sections. The remaining ports can be defined by the user or left as unused.

As an example, a managed switch with 24 ports, 7 Transmitters and 7 Receivers would be configured as follows :

- Port 1   - control port

- Port 2 to port 8   - Transmitter section

- Port 9 to port 15   - Receiver section

- Ports 16 to 24   - user defined or unused

The Just Add Drivers configuration tool is used to configure the ports according to the patching scheme described.

Layer 3 switch – Cisco SG 300, SG 500 Series

The Cisco SG series are true Layer 3 switches, meaning that we are able to configure the switch so that the JAP devices are on isolated VLANs, and yet able to communicate with the control system via interVLAN routing in the switch. The control system will be able to access all Transmitters and all Receivers connected to the switch. The Just Add Drivers Configuration tool section will explain how to configure the managed switch for this purpose.

The Cisco switch can also be used in conjunction with the Just Add Drivers SOIP/CLIP module (SOIP=Serial Over IP and CLIP = Command Line Over IP) to send serial commands to 3rd party devices attached to the Just Add Power Transmitters and Receivers RS232 ports or console control commands directly to the Just Add Power device (i.e. CEC, Video Wall App, On Screen Display, etc.). The Cisco switch will be configured to have a control port on port 1, a number of Transmitters and a number of Receivers.

Layer 2 switches – Netgear 7000 series, Pakedge S24x

The Netgear and Pakedge switches are only Layer 2 – they do not support Layer 3 routing capabilities. They can be configured for JAP usage in the following modes:

"**no Receiver access**" - the JAP devices will be on isolated VLANs and unable to communicate with the control system. In this mode, no control SOIP/CLIP commands can be sent.

"**Receiver access**" - the control system system will have access to Receivers. The SOIP/CLIP commands can be sent to Just Add Power Receivers in this mode. Note that due to the way the VLANs are configured in this mode, the Receiver doesn't have direct access to the Transmitter, and consequently when switching sources to a source that has mostly static content, it is possible that the video display will take a short while to fully display (needs to build up image from the data it receives, rather than requesting a complete frame from the Transmitter). In practice on moving images this isn't noticeable. When set up in this mode, the control system has access to the JAP Receivers for SOIP / CLIP (and without having to set up a static route on the network router).

In both modes, the switch will be configured to have a control port on port 1, a number of Transmitters and a number of Receivers.

NOTE: If the video source is changed and the new video content is mainly static, there may be a delay in the video monitor response. However, if the new video content is mainly dynamic, the video monitor image will be updated quickly. This effect occurs due to the video protocol used to transmit the video images. Response updates are faster for images with dynamic changes rather than static images.

JUST ADD DRIVERS CONFIGURATION TOOL

Introduction

Thank you for choosing the Just Add Drivers configuration tool to configure your Just Add Power video distribution system. This application is designed to make the initial configuration of your chosen switch and Just Add Power devices both quicker and easier.

The below illustration shows the patching scheme for a 4x4 Just Add Power system, using a 20 port switch:

The Just Add Power system works by integrating with your existing LAN (Local Area Network) to distribute video signals from centralised sources to multiple display devices. All devices on your existing LAN can communicate directly with each other; the JAP system creates separate VLANs (Virtual Local Area Networks) for each of the video transmitters and then manipulates which ports on the switch belong to which VLAN. Layer 3 switches additionally allow IP routing between VLANs (effectively acting as a router), allowing inter-VLAN communication.

In the above example, port 1 is reserved for the Control VLAN, acting as the link between your primary LAN and the JAP system. Ports 2-5 have been designated as Transmitter ports, and ports 6-9 as Receiver ports. Note that Transmitter ports will always be assigned by the driver from port 2 onwards, and Receiver ports will follow on from the last assigned Transmitter port. The remaining ports (coloured blue in the above illustration) can be defined by the installer. A common use for the remaining ports is to define them as part of the Control VLAN, making them usable as standard LAN ports.

NOTE: It is important to remember that the numbering system on the switch ports will be different to the numbering of the JAP Transmitter and Receiver ports as assigned by the driver (i.e. Transmitter 1 is in Port 2).

Configuring a System with a Single Switch

The Configuration tool can be used to configure systems employing a single switch (this is know as an "unstacked" system), multiple switches (a "stacked" system), or to perform firmware updates on JAD devices only (with no switch configuration). This section of the guide describes configuration of an unstacked system.

STEP 1: Connecting Your Switch

You must first make the necessary connections between your devices. In order to configure the switch, a serial connection is required between your PC and your switch. Many switches come with the correct cable, but you may need an adaptor if your computer is not equipped with a built-in serial port. You may also need a null modem to make this RS232 connection (especially if you have misplaced the original console cable that came with the switch). The appropriate port on most network switches is often labelled *Console*. The serial connection is required for initial configuration only.

Next, it is essential that your computer is connected to your Local Area Network. The Just Add Drivers configuration tool uses the network settings assigned to your computer to correctly configure devices.

To complete the configuration process, it is also necessary to connect port 1 of your network switch to the primary network (NOTE: this must be the same network that your computer is connected to).

WARNINGS

1. IT IS CRITICAL THAT NO VIDEO SOURCES ARE CONNECTED TO THE TRANSMITTERS DURING CONFIGURATION. IT IS BEST TO UNPLUG THE HDMI CABLES FROM THE TRANSMITTERS.

2. IF ANY CONTROL SYSTEMS CONNECTED TO THE NETWORK HAVE THE SWITCHING MODULE INSTALLED, ENSURE THE MODULE IS DISABLED (OR THE CONTROL SYSTEM SWITCHED OFF) BEFORE RUNNING THE CONFIGURATION TOOL.

STEP 2: Choosing Your Switch

When you first run the JADConfig.exe application you will be presented with the introduction screen:
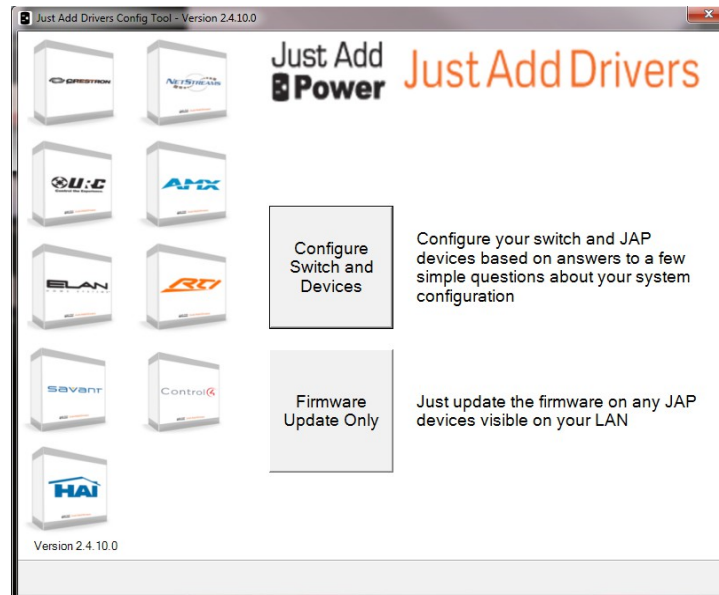
- Choose **Configure Switch and Devices** to proceed.

The switch selection screen is now displayed:

You will need to make some selections relating to your switch and serial connection:

Network Interface	If your PC has multiple network interfaces, select the one you want to use.
COM Port	Choose the COM port on your computer to which the switch console port is connected.
Switch Family	Choose the make/model range to which your chosen switch belongs.
User Name	Refer to the documentation accompanying your switch for the user name required for administrative access.
Password	Refer to the documentation accompanying your switch for the password required for administrative access.
Enable Password	Refer to the documentation accompanying your switch for the enable password required for administrative access (this option only appears for Netgear switches).

- Press **Next** to continue.

STEP 3: Choosing the Configuration For Your Switch

On the next screen you must make some selections relating to your desired switch configuration:

Transmitter Ports	Choose the number of switch ports to allocate for Transmitters (video sources, e.g. BluRay player).
Receiver Ports	Choose the number of switch ports to allocate for Receivers (video displays, e.g. Television).
Default Transmitter	Select the Transmitter port to which all Receivers will connect by default when the system starts.
Unused Port Mode	The unused ports on your switch are automatically assigned to the **Control VLAN**, making them available as standard ports on your primary network.
Switch IP Address	Enter the IP address to use for the switch itself. This MUST be a vacant address on your existing network that can be statically assigned.
Default Route	This field displays your network gateway and is editable only in **Advanced** mode.
InterVLAN Routing	This is enabled by default and uneditable.
JAP LAN	Choose an IP range from the list to use for your JAP devices. Only compatible ranges will be displayed.

NOTE: The application will automatically populate the **Switch IP Address** with an appropriate (and currently vacant) address. If you are unsure about the configuration of your LAN, use this default address.

Advanced Configuration

Advanced configuration is only recommended for users familiar with the configuration of VLANs. Click the **Advanced** check box and a number of new options appear, or become editable:

Unused Port Mode	If you wish to manually configure the unused ports on your switch choose **User Defined**, otherwise choose **Control VLAN**.
Switch Netmask	Define the netmask for the switch.
Default Route	Edit this option to define your own network gateway.
InterVLAN Routing	This is enabled by default and uneditable.
JAP LAN Address / Netmask	If you prefer not to use one of the default LANs, enter your own JAP LAN address and netmask.
Management IP Address / Netmask	This is the address of VLAN 1 and is not used by the JAP system, but does require configuration. Only change this address if it conflicts with an address on your LAN.

- When all configuration options are set, press **Next** to proceed and the application will display a screen detailing your chosen configuration.

- Press **Next** to continue, or **Back** to change the configuration.

The application will perform the switch configuration process, which may take several minutes. The switch may reboot multiple times, so please be patient.

STEP 4: Configuring and Connecting Your Just Add Power Devices

The next screen displays an image illustrating how the ports on your switch are now configured:
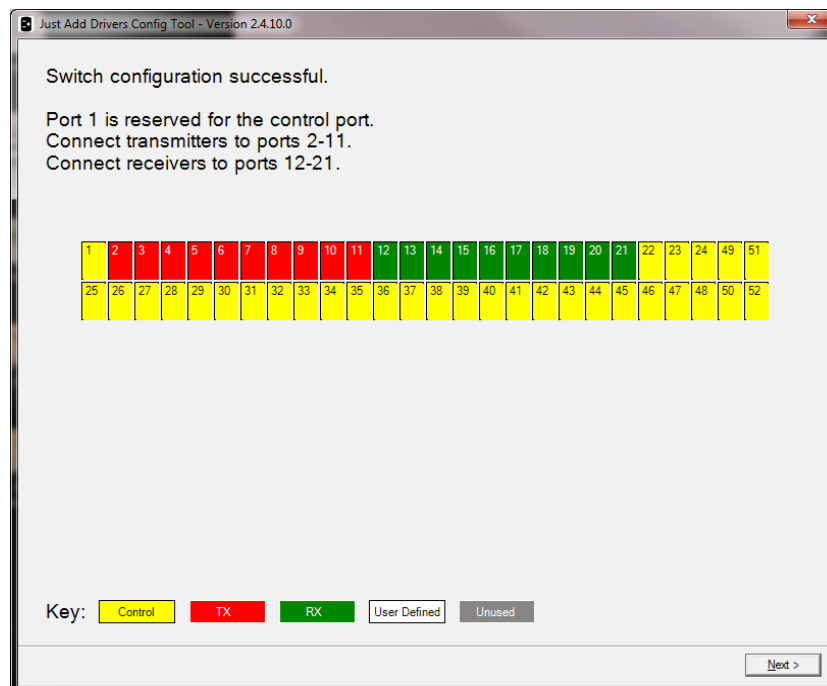
- Connect your JAP devices accordingly and then press **Next** to proceed. In this 10 Transmitter X 10 Receiver example, Transmitter 1 is connected to Port 2, Transmitter 10 is connected to port 11, Receiver 1 is connected to Port 12, and Receiver 10 is connected to port 21. You must use the ports as indicated by the JAD Config tool.

The configuration tool will now attempt to discover your JAP devices. The next screen reports information about your JAP devices, including how they are connected and the firmware revisions they are currently running:

If some of your devices do not appear in the list of discovered devices, check the connections and press **Rescan**. In the event of errors, correct the patching as instructed.   If you see a question mark displayed in the **Firmware** field, this may be due to duplicate IP addresses on two or more JAP devices. In this scenario, proceed with the configuration as the tool will resolve any such conflicts.

The **Choose Image** button will open a browse window allowing you to choose an image file to be displayed as a background image by the Receivers when no signal is present (only supported on Just Add Power devices with firmware revision 5.13d or later).

- Click **Next** to continue.

The next screen allows you to upload new firmware to your JAP devices:

If you prefer to keep the currently installed version, choose "Don't Update Firmware". If you want to re-install the same firmware version currently installed, check the box labelled "Force firmware reload even if already on chosen version".

- Click **Next** to configure the devices.

The application will now configure the devices and update the firmware according to the selections you have made. This process may take some time, depending on the number of devices. When this process is complete, the switch will reboot.

The final screen of the application confirms the success of the configuration process:

In addition, it also details the information required to set up the "static route" (consisting of a **Network** address, **Netmask** and **Gateway**). Be sure to note these down. A text file detailing the configuration is automatically saved in the installation directory where JAD Config is located on your PC (for example, *C:\Program Files (x86)\Just Add Power\JADConfig\Reports*). You can also manually generate this report by clicking **Export**. This information is **VERY IMPORTANT** and will be needed to complete the driver installation on the control system.

- Click **Finish** to exit the wizard.

NOTE: The final stage requires you to manually add a Static Route into your router's configuration. Refer to the section in this guide entitled *Adding a Static Route to Your Router* for more information.

Configuring a System with Multiple Switches

The Just Add Drivers configuration tool can also be used for configuration of larger systems, containing multiple switches in a "Stack" arrangement. Currently, only the Cisco SG500 Series of switches is supported for stacking. The drivers and JAD Config support up to 8 SG500 switches in a stack. This section of the guide describes the process for configuring a stacked SG500 system.

STEP 1: Connecting Your Master Switch

You must first make the necessary connections between your devices. In a stack configuration, the first switch to be configured is known as the *Master,* all subsequent switches are referred to as *Slaves*. In order to configure the master switch, a serial connection is required between your PC and the switch. Many switches come with the correct cable, but you may need an adaptor and perhaps a Null Modem if your computer is not equipped with a built-in serial port. The appropriate port on most network switches is often labelled *Console*. The serial connection is required for initial configuration only.

Next, it is essential that your computer is connected to your Local Area Network. The Just Add Drivers configuration tool uses the network settings assigned to your computer to correctly configure devices.

To complete the configuration process, it is also necessary to connect port 1 of your master switch to the network (NOTE: this must be the same network that your computer is connected to).

No connections are required to the slave switch(es) as this stage.

WARNINGS

1. IT IS CRITICAL THAT NO VIDEO SOURCES ARE CONNECTED TO THE TRANSMITTERS DURING CONFIGURATION. IT IS BEST TO UNPLUG THE HDMI CABLES FROM THE TRANSMITTERS.

2. IF ANY CONTROL SYSTEMS CONNECTED TO THE NETWORK HAVE THE SWITCHING MODULE INSTALLED, ENSURE THE MODULE IS DISABLED (OR THE CONTROL SYSTEM SWITCHED OFF) BEFORE RUNNING THE CONFIGURATION TOOL.

STEP 2: Choosing Your Switch

When you first run the application you will be presented with the introduction screen, followed by the Switch Selection page:

You will need to make some selections relating to your switch and serial connection:

Network Interface	If your PC has multiple network interfaces, select the one you want to use.
COM Port	Choose the COM port on your computer to which the switch console port is connected.
Switch Family	Choose *Cisco SG500 Series (Stacked)*.
User Name	Enter the user name required for administrative access (by default, this is "cisco").
Password	Enter the password required for administrative access (by default, this is "cisco").

- Press **Next** to continue.

STEP 3: Configuring the Stack

The Stack Configuration screen offers three options:
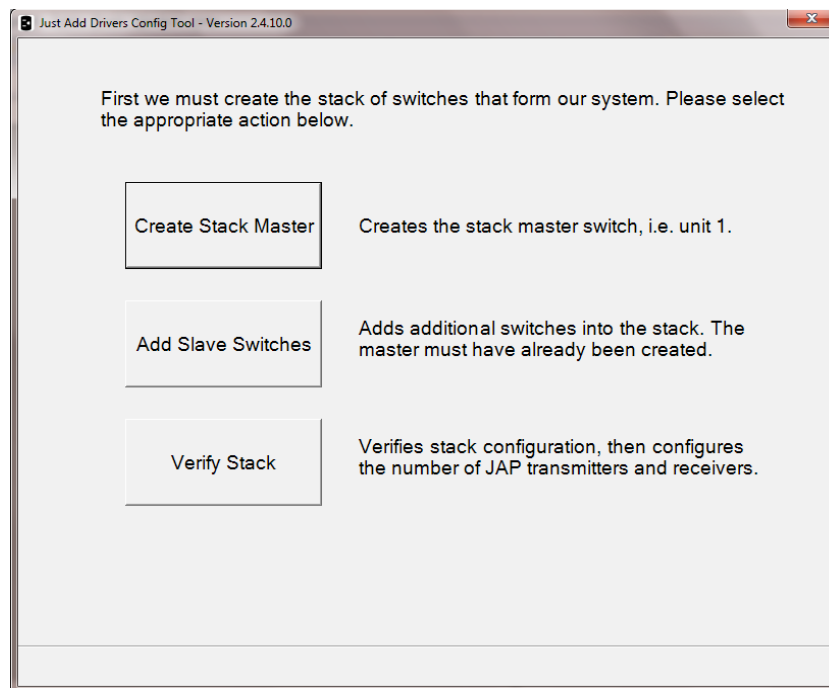
STEP 3a: Creating the Stack Master

- Choose **Create Stack Master.**

The following screen instructs you to connect your PC's serial port to the master switch.

- Click **Next** to continue**.**

Next, you must choose the stack connectivity type:
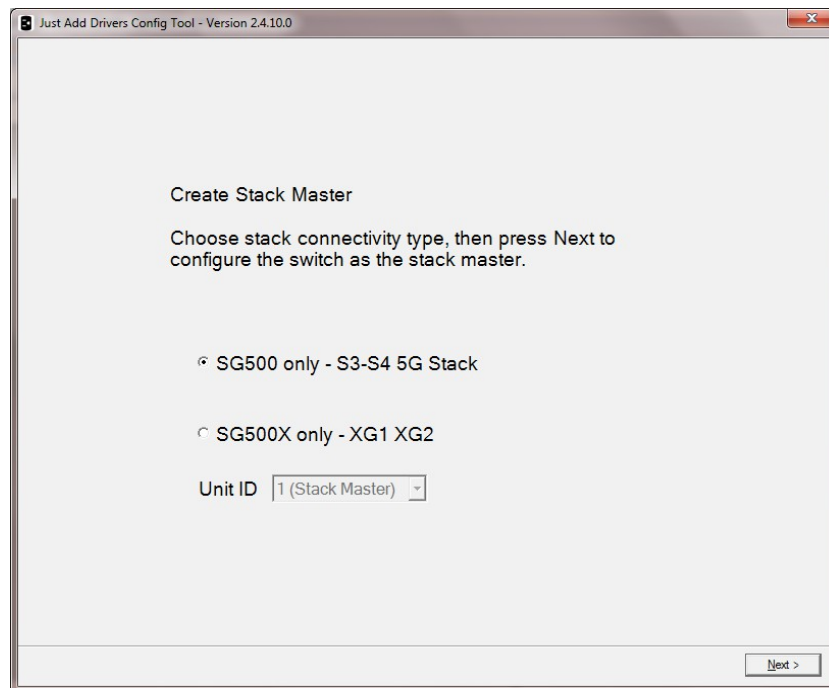
Choose between "SG500" and "SG500X" depending on your Cisco switch model type.

- Click **Next** to continue**.**

The next screen should confirm successful configuration of the stack master. If, for any reason, it has not been possible to configure the stack master, follow the instructions on the screen to re-attempt.

STEP 3b: Adding Slave Switches

- From the Stack Configuration screen, Choose **Add Slave Switches.**

The following screen instructs you to connect your PC's serial port to the switch that is to become a slave.
Ensure the new switch is not connected to the master switch, or to the network and press **Next** to continue.
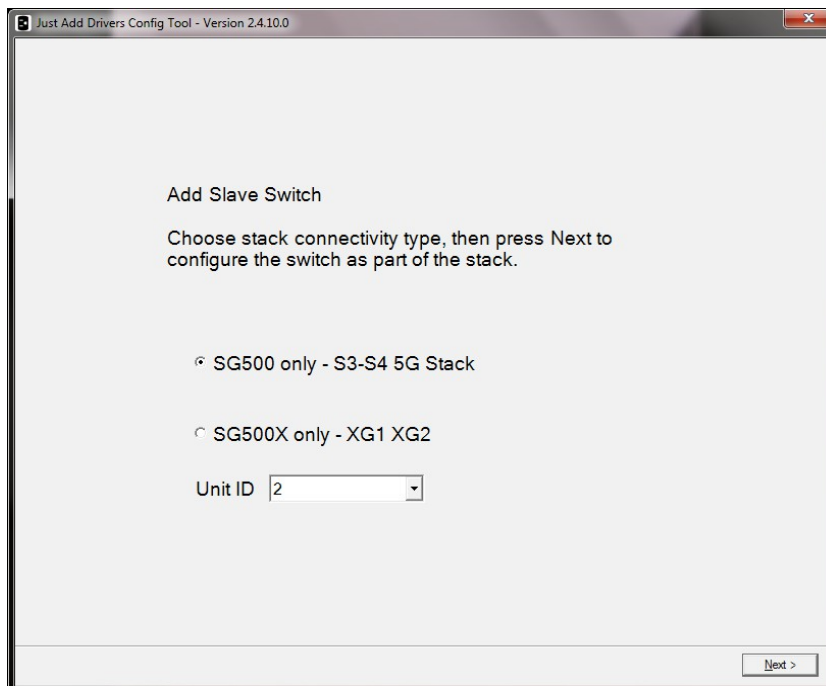
Choose between "SG500" and "SG500X" depending on your Cisco switch model type. Next, select a **Unit ID** for the Slave switch.

Note: each slave switch you add must have a unique Unit ID. Up to 8 switches can be configured in total (1 x master + 7 x slaves).

The next screen should confirm successful configuration of the slave switch. Follow the instructions on the screen and connect the switches together via their stacking ports. If you are using an SG500 model, the stacking ports are labelled **S3** and **S4**; use either port. If you are using the SG500X model, these are labelled **XG1** and **XG2**; again, either stacking port can be used.

If, for any reason, it has not been possible to configure the slave switch, follow the instructions on the screen to re-attempt.

- Press **Next** to return to the Stack Configuration screen.

- Choose **Add Slave Switches** again to repeat the above process and add more slave switches to the stack.

STEP 3c: Choosing the Configuration for the Stack

- From the Stack Configuration screen, Choose **Verify Stack.**

You can use the **Verify Stack** option to simply confirm the current configuration of the stack, to configure a new stack, or to re-configure an existing stack. The following screen instructs you to connect your PC's serial port to the master switch and to ensure that all configured slaves are connected via their stacking ports.

- Press **Next** to continue to a screen detailing the current stack configuration.

- If the stack configuration information is correct, press **Next**, otherwise press **Back** and wait 3 minutes before re-selecting the **Verify Stack** option.

On the next screen, you must make some selections depending upon the configuration of your Just Add Power system:

Transmitter Ports	Choose the number of switch ports to allocate for Transmitters (video sources, e.g. BluRay player) on each stack unit.
Receiver Ports	Choose the number of switch ports to allocate for Receivers (video displays, e.g. Television) on each stack unit.
Default Transmitter	Select the Transmitter port to which all Receivers will connect by default when the system starts.
Unused Port Mode	The unused ports on your switches are automatically assigned to the **Control VLAN**, making them available as standard ports on your network.
Switch IP Address	Enter the IP address to use for the master switch. This MUST be a vacant address on your existing network that can be statically assigned.
Default Route	This field displays your network gateway and is editable only in **Advanced** mode.
InterVLAN Routing	This is enabled by default and uneditable.
JAP LAN	Choose an IP range from the list to use for your JAP devices. Only compatible ranges will be displayed.

NOTE: The application will automatically populate the **Switch IP Address** with an appropriate (and currently vacant) address. If you are unsure about the configuration of your LAN, use this default address.

Advanced Configuration

Advanced configuration is only recommended for users familiar with the configuration of VLANs. Click the **Advanced** check box and a number of new options appear, or become editable:

Unused Port Mode	If you wish to manually configure the unused ports on your switch choose **User Defined**, otherwise choose **Control VLAN**.
Switch Netmask	Define the netmask for the master switch.
Default Route	Edit this option to define your own network gateway.
InterVLAN Routing	This is enabled by default and uneditable.
JAP LAN Address / Netmask	If you prefer not to use one of the default LANs, enter your own JAP LAN address and netmask.
Management IP Address / Netmask	This is the address of VLAN 1 and is not used by the JAP system, but does require configuration. Only change this address if it conflicts with an address on your LAN.

- When all configuration options are set, press **Next** to proceed and the application will display a screen detailing your chosen configuration.

- Press **Next** to continue, or **Back** to change the configuration.

The application will perform the switch configuration process, which may take several minutes.

STEP 4: Configuring and Connecting Your Just Add Power Devices

The next screen displays an image illustrating how the ports on your switches are configured:
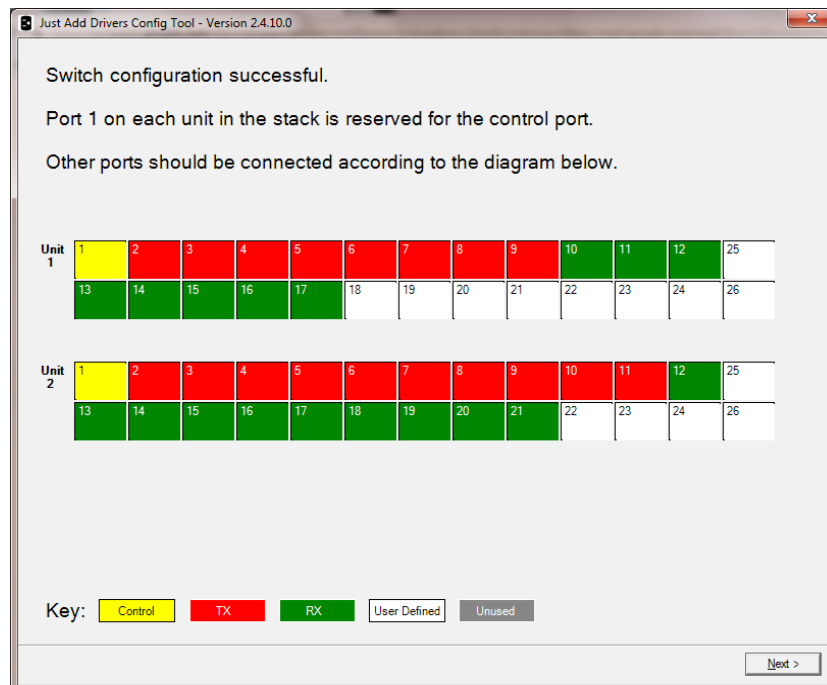
Connect your JAP devices accordingly.

- Press **Next** to proceed.

The configuration tool will now attempt to discover your JAP devices. The next screen reports information about your JAP devices, including how they are connected and the firmware revisions they are currently running:

If some of your devices do not appear in the list of discovered devices, check the connections and press **Rescan**. In the event of errors, correct the patching as instructed. If you see a question mark displayed in the **Firmware** field, this may be due to duplicate IP addresses on two or more JAP devices. In this scenario, proceed with the configuration as the tool will resolve any such conflicts.

The **Choose Image** button will open a browse window allowing you to choose an image file to be displayed as a background image by the Receivers when no signal is present (only supported on Just Add Power devices with firmware revision 5.13d or later).

- Click **Next** to continue.

The next screen allows you to upload new firmware to your JAP devices:

If you prefer to keep the currently installed version, choose "Don't Update Firmware". If you want to re-install the same firmware version currently installed, check the box labelled "Force firmware reload even if already on

chosen version".

- Click **Next** to configure the devices.

The application will now configure the devices and update firmware according to the selections you have made. This process may take some time, depending on the number of devices. When this process is complete, the switch will reboot.

The final screen of the application confirms the success of the configuration process:

In addition, it also details the information required to set up the "static route" (consisting of a **Network** address, **Netmask** and **Gateway**). Be sure to note these down. A text file detailing the configuration is automatically saved in the installation directory where JAD Config is located on your PC (for example, *C:\Program Files (x86)\Just Add Power\JADConfig\Reports*). You can also manually generate this report by clicking **Export**. This information is **VERY IMPORTANT** and will be needed to complete the driver installation on the control system.

- Click **Finish** to exit the wizard.

NOTE: The final stage requires you to add a Static Route into your router's configuration. Refer to the section in this guide entitled *Adding a Static Route to Your Router* for more information.

Adding a Static Route to Your Router

It is necessary to establish a communication link between the JAP VLAN and your primary network. This is achieved by the manual addition of a "static route" to your router. If you have chosen one of the suggested IP ranges for your JAP LAN, your static route should be configured according to the table below:

	Class A (10.x.x.x)	Class B (172.16.x.x)	Class C (192.168.100.x)	Class C (192.168.200.x)
Destination IP	10.0.0.0	172.16.0.0	192.168.100.0	192.168.200.0
Subnet mask	255.0.0.0	255.255.0.0	255.255.255.0	255.255.255.0
Gateway IP	Switch IP	Switch IP	Switch IP	Switch IP

The procedure for adding the static route will vary depending on the make/model of your router. Below we detail three examples of common routers. Note: at the time of writing, Apple Airport routers and BT Home Hub routers do not support the addition of static routes, so they can NOT be used for a Just Add Power system.

Example #1: Linksys E900

- Enter the IP address of the router into a browser (by default, this is 192.168.1.1)

- When prompted, enter the user name and password required for access, by default these are as follows:

User name	admin
Password	admin

A web page will display available configuration options for the router.

- Choose **Setup** > **Advanced Routing**, to display the following options on the screen:

Enter the static route information from the final screen of the Just Add Drivers application into the **Destination IP Address**, **Subnet Mask** and **Gateway** fields.

- Enter "10" in the **Hop Count** field.

- Click **Save Settings**.

Example #2: Netgear N200

- Enter the IP address of the router into a browser (by default, this is 192.168.1.1)

- When prompted, enter the user name and password required for access, by default these are:

User name	admin
Password	password

The Router Manager screen is displayed. A list of options will be displayed on the left hand side.

- Choose **Advanced** > **Static Routes**

The below screen is displayed:

Enter a name for the static route (in the example, this is "JAP").

Enter the static route information from the final screen of the Just Add Drivers application into the **Destination IP Address**, **IP Subnet Mask** and **Gateway IP Address** fields.

- In the **Metric** field, enter "10".

- Click **Apply**. When prompted, re-enter the user name and password.

Example #3: Draytek Vigor 2830

- Enter the IP address of the router into a browser (by default, this is 192.168.1.1)

- When prompted, enter the user name and password required for access, by default these are as follows:

User name	admin
Password	admin

The management screen is displayed. A list of options will be displayed on the left hand side.

- Choose **LAN** > **Static Route.**

- Next, choose **Index 1** from the routing table (or the next available unconfigured route).

The below screen is displayed:

Enter the static route information from the final screen of the Just Add Drivers application into the **Destination IP Address**, **Subnet Mask** and **Gateway IP Address** fields.

- Ensure the **Enable** check box is ticked.

- Click OK. If prompted, re-enter the user name and password.

Updating Just Add Power Device Firmware Only

The Just Add Drivers Configuration Tool can be used to update the firmware on Just Add Power devices only. To do this manually (the process below), the Just Add Power devices must be connected to the same LAN as your PC (preferably via an unmanaged switch). If you are wanting to update the firmware on an already configured system, you will first need to manually force all of the switch ports connected to the Transmitters and Receivers onto the same VLAN as your PC.

TIP: If you are an installer wishing to update firmware on JAP devices currently installed in a previously configured system, you should simply re-run JAD Config as if you are setting up a new system. This will let you avoid the manual configuration process suggested above.

Run the JADConfig.exe application to display the first screen of the wizard:
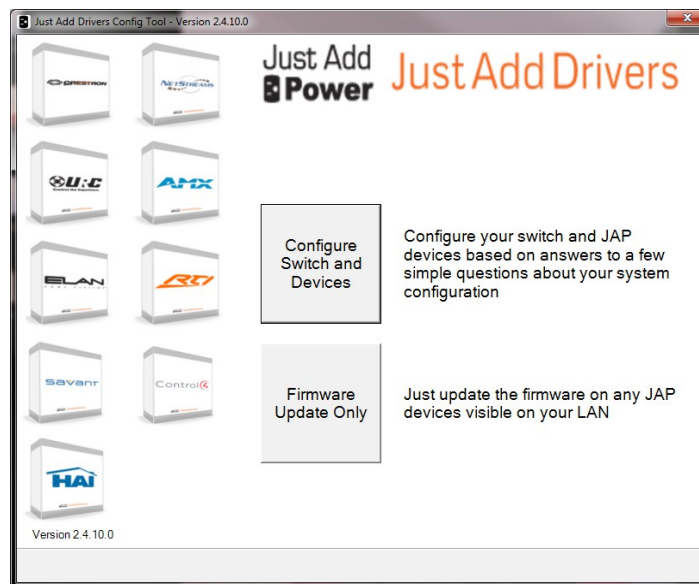
- Choose **Firmware Update Only**.
- Note the warnings in the pop up and click OK.
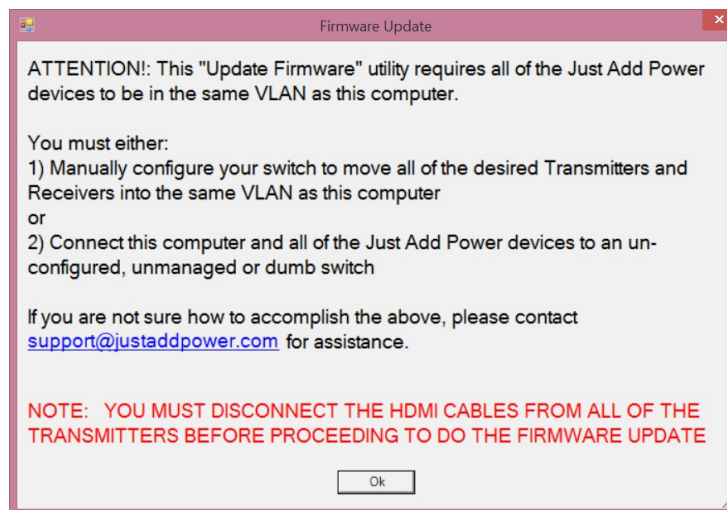
It is most important that you **UNPLUG THE HDMI CABLES** from the Transmitters. Failure to do so will likely "brick" some parts of your system, which will require you to ship those pieces back to Just Add Power to be repaired. This self-inflicted system failure is easily avoided by simply unplugging the Transmitter HDMI cables.

The next screen will list all discovered Just Add Power devices and detail their current firmware versions:

- Click **Next** to select a firmware revision.

If you want to re-install the same firmware version currently installed, check the box labelled "Force firmware reload even if already on chosen version".
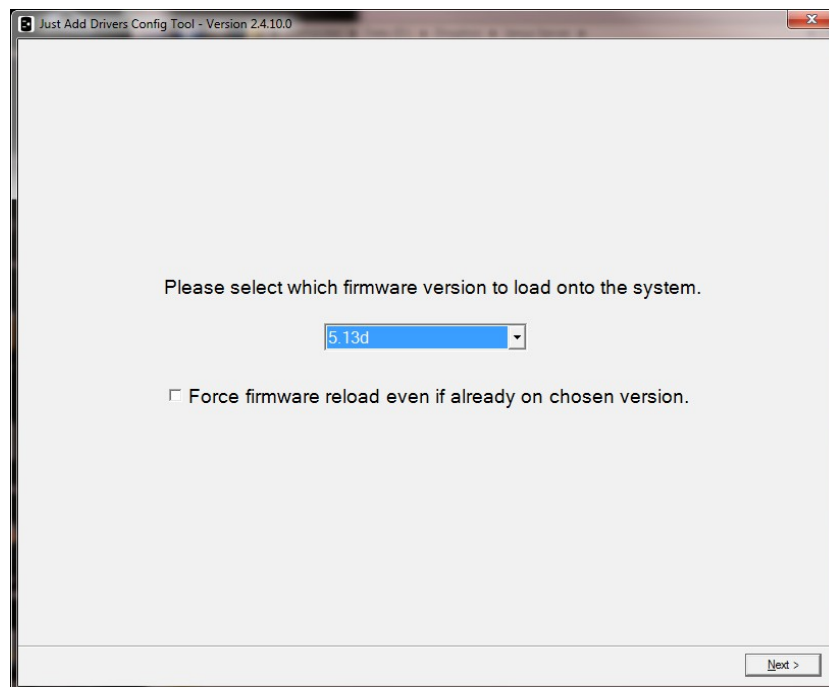
- Click **Next** to configure the devices.

The application will update firmware according to the selections you have made. This process may take some time, depending on the number of devices. When this process is complete, the final screen of the application confirms the success of the firmware upgrades and displays the new versions:
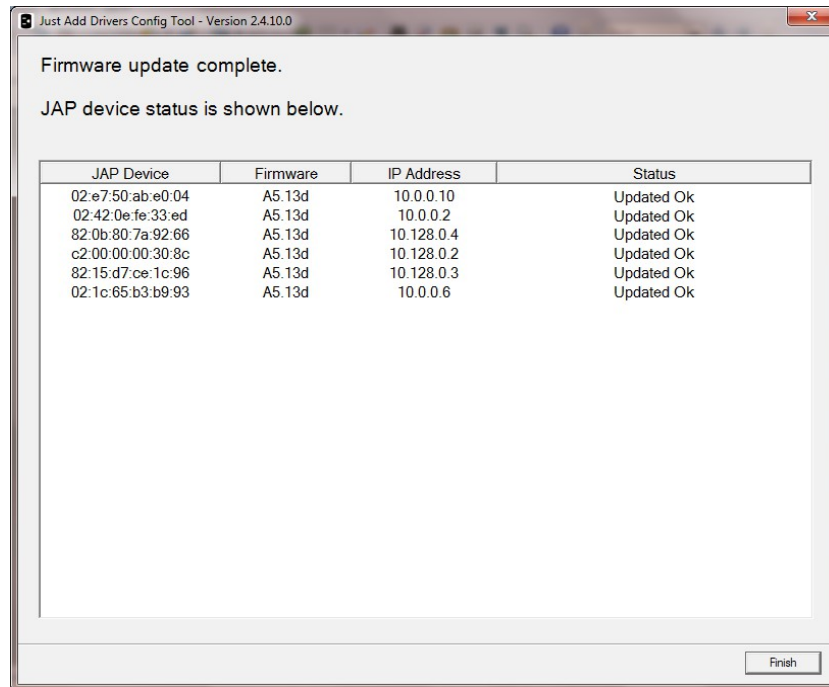
- Click **Finish** to close the application.

- If you manually forced the Transmitters and Receivers onto the PC VLAN, rebooting the switch will restore your original JAD Config settings on the switch.

AMX SWITCHING MODULE

Just Add Power High Definition over IP Transmitters and Receivers are a flexible way to distribute high definition video from multiple video sources to multiple video displays. The switch is used as a virtual HDMI matrix, connecting various video inputs to designated outputs e.g. televisions, monitors and projectors.

Add the module to your project

The module will be called "JAP_AVSwitch_[switch brand][Version number].tko". Copy this file from the zip package to your project folder and then add it to your project. Next, add parameter definitions and a define_module line to your master source file similar to the following:

```
define_device
dvJAP_SWITCH   = 0:4:0
vdvJAP_SWITCH  = 33001:1:1

...

// Configuration parameters for the JAP switch

// example module

char JAP_SWITCH_IP[15] = '192.168.3.51';

char JAP_SWITCH_USERNAME[15] = 'admin';

char JAP_SWITCH_PASSWORD[15] = 'admin';

char JAP_SWITCH_PRIVILEGED_PASSWORD[15] = 'admin';

char JAP_SWITCH_LICENCE_KEY[256] = 'licence_key';

...

define_module 'JAP_AVSwitch_Netgear' JAP_SWITCH( vdvJAP_SWITCH, dvJAP_SWITCH,
  JAP_SWITCH_IP, JAP_SWITCH_USERNAME, JAP_SWITCH_PASSWORD,
  JAP_SWITCH_PRIVILEGED_PASSWORD, JAP_SWITCH_LICENCE_KEY);


// example cisco module

char JAP_SWITCH_IP[15] = '192.168.3.51';

char JAP_SWITCH_USERNAME[15] = 'cisco';

char JAP_SWITCH_PASSWORD[15] = 'cisco';

char JAP_SWITCH_PRIVILEGED_PASSWORD[15] = '';

char JAP_SWITCH_LICENCE_KEY[256] = 'licence_key';

persistent Char favourite[][1000] =

{'', '', '', '', '', '', '', ''};

...

define_module 'JAP_AVSwitch_Cisco' JAP_SWITCH( vdvJAP_SWITCH, dvJAP_SWITCH,
  JAP_SWITCH_IP, JAP_SWITCH_USERNAME, JAP_SWITCH_PASSWORD,
  JAP_SWITCH_PRIVILEGED_PASSWORD, JAP_SWITCH_LICENCE_KEY, JAP_FAVOURITES);
```

Configure Module Parameters

The parameters to the module are as follows:

vdvJAP_SWITCH	The virtual device representing the switch module. Define a device in the virtual device range.
dvJAP_SWITCH	The physical device for the switch (an IP device). Define a device in the IP device range.
JAP_SWITCH_IP	The IP address of the Cisco switch as a string.
JAP_SWITCH_USERNAME	The user name with which to log in to the switch. If you have not reconfigured the switch, the default user name is 'cisco'.
JAP_SWITCH_PASSWORD	The password for the user name. The default password is 'cisco'.
JAP_SWITCH_PRIVILEGED_PASSWORD	The privileged password for the user. The default privileged password is an empty string. Not required for Cisco switches.
JAP_SWITCH_LICENCE_KEY	If you have been supplied with a driver licence key, define it as a string here. If you have not yet received a licence key, the module will limit the switch to operating in a restricted demonstration mode as a fixed 3x3 switch. See below for how to obtain a licence.
*JAP_FAVOURITES	Persistent char array containing preset configurations of the switch saved as "favourites". Persists after reboot.

*Cisco specific parameter
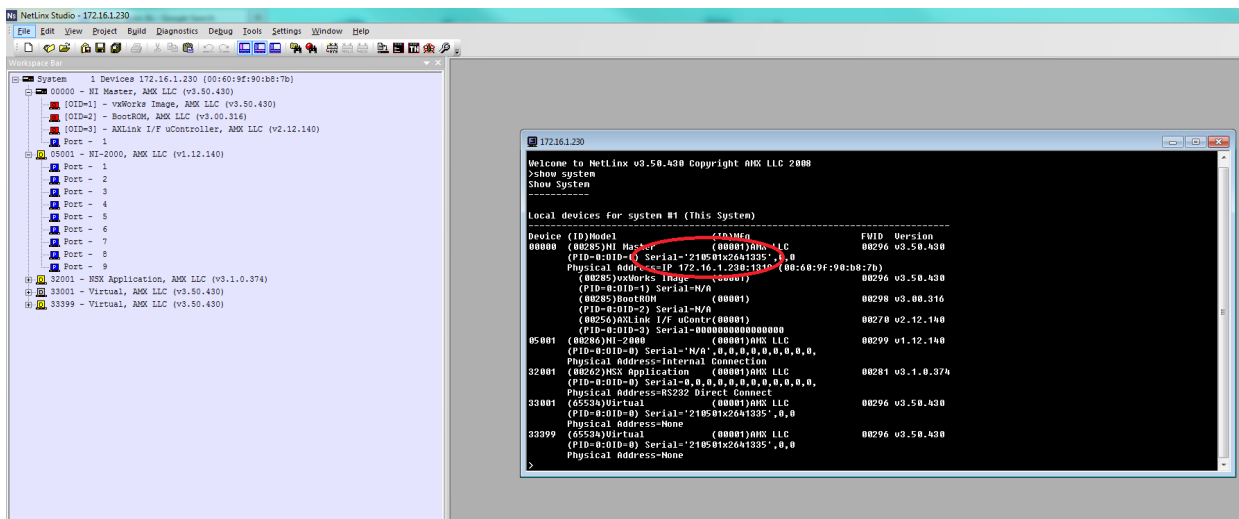
Obtaining a Licence Key

To obtain a licence key you will need to know the serial number of your AMX processor. This can be found printed on the underside of the unit itself, or by using NetLinx Studio.

Open your project file in NetLinx Studio.

- Go to **Tools > Telnet Session**.

- Once the session is established, type "show system".

The following information is displayed:

Note down the serial number as highlighted above and send it to drivers@justaddpower.com in order to obtain your key. Note that if you do not obtain a licence key, the driver will operate in demonstration mode, allowing a maximum of 3 Receivers and 3 Transmitters (the driver will allow you to assign more than three ports, but only the first three will function).

Once you have received the licence key, assign it to the JAP_SWITCH_LICENCE_KEY constant as a string, recompile and download to the master. The switch will then restart in full operational mode. If the switch is still in DEMO mode more than a minute after you downloaded the new code, check that you have entered the licence key correctly.

Interfacing with the Module

For a complete example of the usage of the module, see the demonstration project that is shipped with this module.

Commands

The module supports the following commands, sent to it using **send_command**, for instance:

send_command vdvJAP_SWITCH, 'SW 1,3,4,5=7;';

….switches outputs 1, 3, 4 and 5 to input 7.

Command	Explanation
SN?	Query the serial number of the AMX switch. Returns the serial number of the AMX switch. See the feedback section.

SW [<output-list>=<input>;]+	Requests the switch to perform a routing. <output-list> is a comma-separated list of outputs to switch (ascending, no breaks). <input> is the input to switch them to. Input 0 is a special input to switch the output(s) off, i.e. they are guaranteed not to receive data from any input. Multiple switch requests can be chained together, each ending in a semi-colon. All the following are valid:
	
	SW 4=1;
	SW 1,2,3=2;
	SW 2,3=7;5=3;
	
	The space after SW and the trailing semi-colon are always required!

*SW [<output-list>=<input>;]+	Requests the switch to perform a routing. <output-list> is a comma-separated list of outputs to switch. <input> is the input to switch them to. Input 0 is a special input to switch the output(s) off, i.e. they are guaranteed not to receive data from any input. Multiple switch requests can be chained together, each ending in a semi-colon. All the following are valid:
	
	SW 4=1;
	SW 1,6,9=2;
	SW 2,3=7;5=3;
	
	The space after SW and the trailing semi-colon are always required!

SW?	Requests the switch to report the current routing. This will generate a SW report string for each output port. See the feedback section.

Command	Explanation
VERSION?	Returns a version string. See the feedback section.
*FAV [<selected output-list>=<favourite>;]	Requests the switch to save the configuration of an output or list of outputs as a favourite (up to a maximum of 8 individual favourites can be stored). For example: FAV 4=1; ...saves the current configuration of output 4 as favourite number 1. FAV 1,7,19=5; ...saves the current configuration of outputs 1, 7 and 19 as favourite number 5. Note: attempting to save a configuration as a favourite that has already been defined will overwrite the existing information.
*POE [<stack number>,<port number>=<action>;]	Enables Power-Over-Ethernet (on compatible switches) for a particular port on a particular switch within a stack. For example: POE 1,1=OFF; ...disables POE on switch 1, port 1. POE 2, 14=ON; ...enables POE on switch 2, port 14. Note: If using a single switch in standalone mode, the switch number is always defined as 1.
*RECALL [<favourite>;]	Recalls a favourite by number, which has been defined using the FAV command. For example: RECALL 5; ...recalls the configuration stored as favourite number 5.
*SAVE	Save the current configuration of the switch or stack as the default configuration, to be applied upon reboot.
MODE?	Requests the configuration of the input/output configuration of the switch.

*Cisco specific command

Feedback

The module supplies the following feedback sent as strings to the module virtual device. Each keyword is followed by a space.

String	Explanation
SN <serial number>	Reports the serial number of the AMX switch. This is needed for obtaining a full licence for the module.
SW <output>=<input>;	Reports that the given output has been switched to the given input. Input 0 indicates that the output has been switched off. Note that although switch requests can be chained together (see the Commands section), feedback is always sent separately for each output.
VERSION <version>	Returns a version string.
MODE	Reports the current input/output configuration of the switch or stack.
ERROR =<error message>;	Reports the status of any error states. For example: ERROR =0; ...no errors are present. ERROR =Please run JAD CONFIG again; ...a bad configuration error, requiring reconfiguration of the switch using JAD Config.

Troubleshooting

The current status of the module is reported through MODE feedback messages. Always allow a minute for the status to settle after the NetLinx master has restarted (e.g. after a download), or after refreshing or updating anything. After a minute, the last MODE message received should have been one of the following messages:

DEMO 3x3	The switch is in demonstration mode as a valid licence has not yet been entered
n x m	The switch is in full operational mode with n inputs and m outputs

Any other message indicates a possible problem. The possible messages are:

Not connected	This should only be seen temporarily during the module settling period. If this message is seen for more than 1 minute, contact your supplier for support.
Connecting	The module is attempting but failing to connect to the switch. Check that you have correctly configured the IP address for the switch, that port 1 of the switch is connected to your management network and that the switch and the NetLinx master have been configured with compatible IP addresses and net masks.
Logging in	This should only be seen very briefly after the module has connected to the switch. If this message is seen for more than 1 minute, contact your supplier for support.
Invalid user name or password	The user name and/or password properties do not match those configured on the switch. Check the values of these properties. If the password is supposed to be blank, make sure that the property value is completely empty (that is, there are no spaces).
Connected	This should only be seen briefly after the module has logged in to the switch. If this message is seen for more than 1 minute, contact your supplier for support.
Configuring	This should only be seen temporarily while the module sets up the initial switch configuration. If this message is seen for more than 1 minute, contact your supplier for support.
*RESTART	The module has detected an unusable configuration on the switch and will restart.
*ERROR	The module has detected an unusable configuration, restarted the switch and the configuration is still unusable.

*Cisco specific messages

CONTROL4 SWITCHING MODULE

This Control4 driver was written and tested using Control4 Composer and an HC-1000 V2/V3 controller. Note that using a version of Composer earlier than version 2.2.2 is not recommended as it crashes if more than 16 inputs or outputs are specified.

Add the driver to your project

Copy the .c4i file from the zip package to:

- •   My Documents\Control4\Drivers (Windows XP)

- •   Documents\Control4\Drivers (Windows 7/8)

Open Composer

The driver can be found under:

- •   **Device Type – A/V Switch**

- •   **Manufacturer – Just Add Power**

Double click on it to install the driver. It will appear with the default name "JAP Switch" as below:
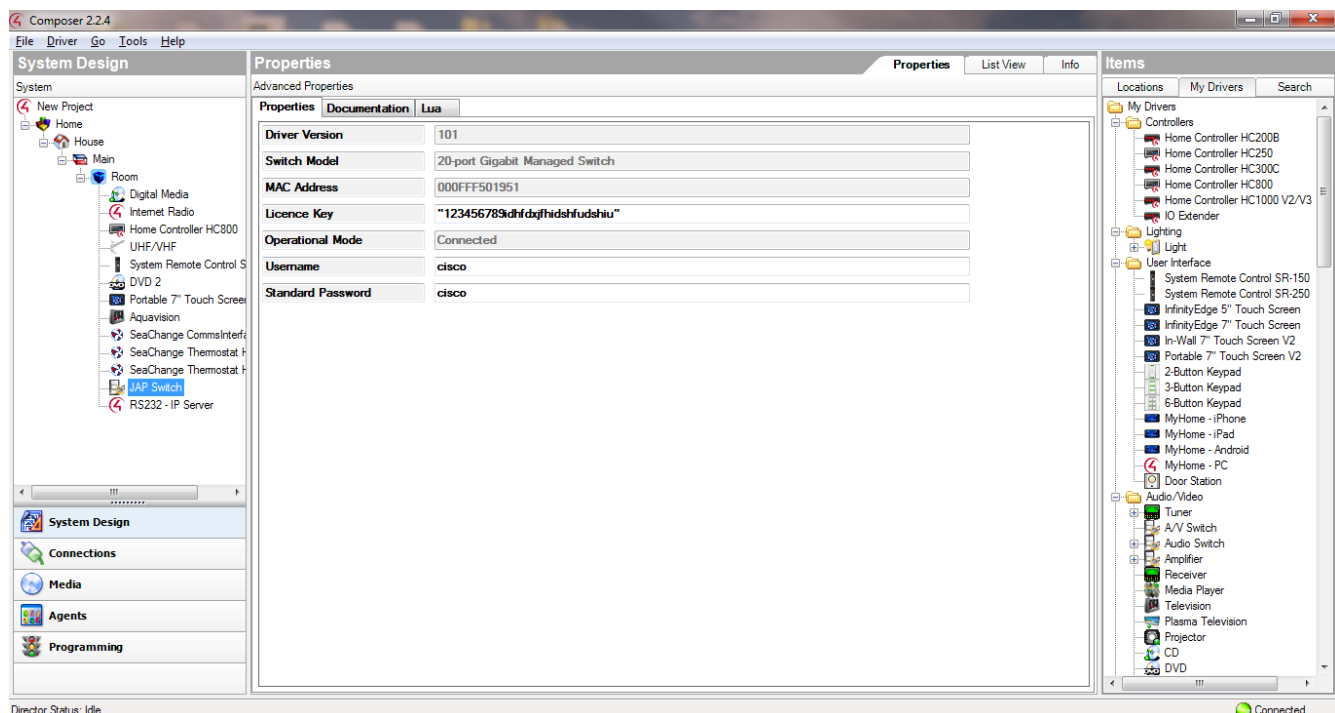
Configure Properties

If you have been supplied with a driver licence key, enter it in the **Licence Key** property. If you have not yet received a licence key, the driver will limit the switch to operating in a restricted demonstration mode allowing 30 minutes of use before a driver reload is required. See below for how to obtain a licence.

Unless you have made any changes yourself to the switch, the **User name** and **Password** values will be the correct default values. If you have changed any of these values on the switch, enter the matching values here. No further properties need to be entered.

Configure Network Connection

Go to the **Connections** pane and choose the **Network** sub-panel. Click on the new A/V Switch entry and add the IP address for the switch. The driver will now connect to the switch. Note that the driver waits for 30 seconds after installation and after any properties are changed before reconnecting to the switch (to allow the user to complete all the changes they want to make) so allow a minute for the switch to be fully operational. The current operational status of the switch is shown in the **Operational Mode** property; when ready to go it will show the current switch configuration and license status, for example "12x7_Licensed".

Configure A/V Connections

Configure the matrix connections as per standard Control4 practice. The driver always presents 64 input and 64 output ports; make connections to as many HDMI input/output ports as the project uses. Note that the switch additionally exposes audio inputs and outputs. These are to be ignored – they are only present so that the driver feeds back the correct status to the test mode.

Double-click the switch in **System Design** and a control window will appear to allow you to test the connections. Note that Composer versions prior to 2.1.1 only support the visualisation of up to 16 inputs and outputs in this test tool. This does not impede the correct operation of the driver.
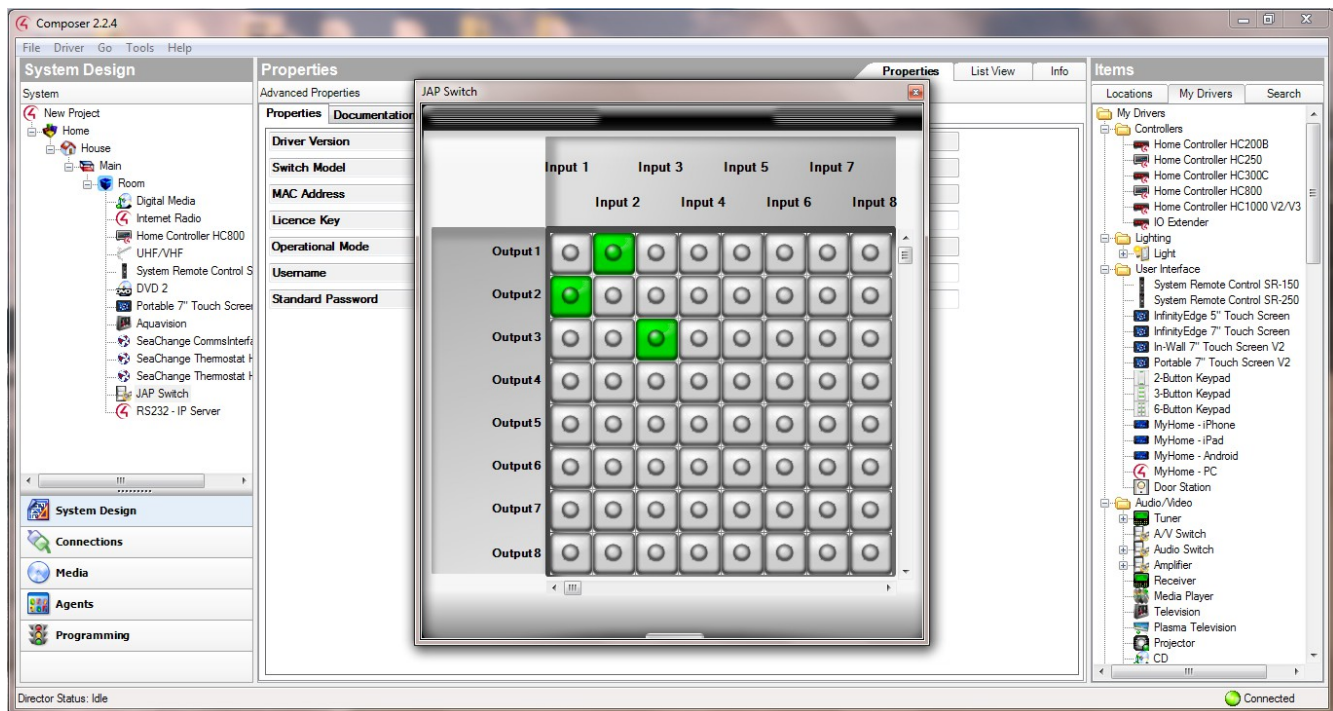
Finally, don't forget to click **Refresh Navigators** to update the user interface.

Advanced Commands (Cisco Switches ONLY)

The driver has a number of advanced commands available to send to the JAP system. Select the **Programming** pane and click on the JAP switch in the **Device Actions** window. In addition to Input / Output switching commands, a number of **Device Specific Commands** are available:

Command	Description
MULTISWITCH	Switches multiple outputs to the same input. For example: "SW 1,2,3,4=3;" switches outputs 1, 2, 3 and 4 to input 3. "SW 3,7=19;SW 16,41=6;" switches outputs 3, and 7 to input 19 and outputs 16 and 41 to input 6.
POE CONTROL	Enables Power-Over-Ethernet on specific ports of compatible switches. For example: UNIT_ID = "1", PORT_ID = "4", ACTION = "ON" will turn power-over-ethernet on for port 4 on the switch with Unit ID 1.
CREATE FAVOURITE	Stores the current configuration of specified outputs as a "Favourite". For example: SELECT_OUTPUT = "1,2,3,4;", SET_FAVOURITE = "1" will save the current configuration of outputs 1, 2, 3, 4 as Favourite number 1. SELECT_OUTPUT = "5,9,13,24;", SET_FAVOURITE = "7" will save the current configuration of outputs 5, 9, 13, 24 as Favourite number 7. Note: setting a favourite already in use will overwrite existing data.
CREATE FAVOURITE WITH ALL OUTPUTS	Stores the current configuration of all outputs as a "Favourite". For example: FAVOURITE_NUMBER = "5" will save the current configuration of all outputs as Favourite number 5. Note: setting a favourite already in use will overwrite existing data.
RECALL FAVOURITE	Recalls a configuration stored as a "Favourite". For example: FAVOURITE_NUMBER = "3" will recall the configuration stored as Favourite number 3.
SAVE	Saves the current configuration of all inputs and outputs as the default configuration on the switch (this is the configuration that will be applied if the switch restarts).

There are also some advanced features available to the installer in the properties of the driver. Select the **System Design** pane, choose your JAP switch and select the **Actions** tab.

Feature	Description
PRINT CURRENT STATUS	Displays current status of all inputs and outputs in the Lua window.
PRINT FAVOURITE TABLE	Displays details for all stored Favourites in the Lua window.

Obtaining a Licence Key

To obtain a licence key, you will need to know the MAC address of your Control4 processor. This is displayed in the Properties tab of the driver in Composer, as highlighted below:
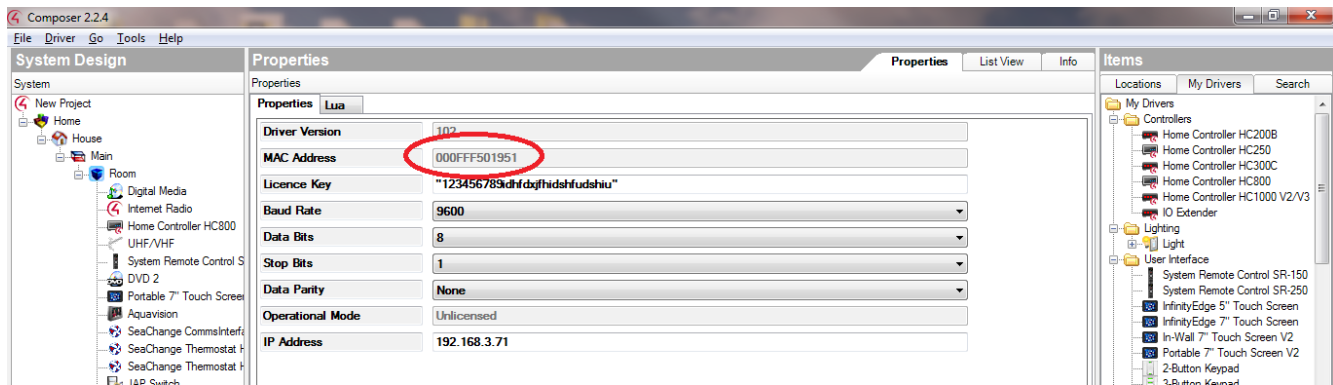
Note down this address and send it to drivers@justaddpower.com in order to obtain your key. Note that if you do not obtain a licence key, the driver will operate in demonstration mode, allowing a maximum of 30 minutes use before a driver reload is required.

Once you have received the licence key, enter it in the **Licence Key** property field. The switch will automatically restart in full operational mode once the licence has been entered. If the switch is still in DEMO mode more than a minute after you entered the licence key, check that you have entered it correctly.

Troubleshooting

The current status of the driver is shown in the **Operational Mode** property on the properties page. Always allow a minute for the status to settle after changing any properties, connections or other project settings, or after refreshing or updating anything. After a minute, the Operational Mode should show one of the following messages:

n x m_Demo	The switch has a configuration of n inputs and m outputs and the driver does not have a valid licence key installed.
n x m_Licensed	The switch has a configuration of n inputs and m outputs and the driver has a valid licence key installed.

Any other message indicates a possible problem. The possible messages are:

Not connected	This should only be seen temporarily during the driver settling period. If this message is seen for more than 1 minute, contact your supplier for support.
Connecting	The driver is attempting but failing to connect to the switch. Check that you have correctly configured the IP address for the switch, that port 1 of the switch is connected to your management network and that the switch and Director have been configured with compatible IP addresses and net masks.
Logging in	This should only be seen very briefly after the driver has connected to the switch. If this message is seen for more than 1 minute, contact your supplier for support.
Invalid user name or password	The user name and/or password properties do not match those configured on the switch. Check the values of these properties. If the password is supposed to be blank, make sure that the property value is completely empty (that is, there are no spaces),
Connected	This should only be seen temporarily while the driver checks the initial switch configuration. If this message is seen for more than 1 minute, contact your supplier for support.
Configuring	If the configuration on the switch does not match that specified in the driver properties then the driver will re-configure the switch. This message is shown during that process. If this message is seen for more than 3 minutes, contact your supplier for support.

CRESTRON SWITCHING MODULE

Introduction

This module is designed to control the switching of sources to displays in a Just Add Power HD Over IP Video System, after the Just Add Drivers configuration tool has been run. This module will connect, collect the current configuration for the switch and produce clean and quick changes between sources.

Crestron Configuration

Adding the module to your project

Open your Crestron Simpl Windows program. Copy the following files to the folder where your program is stored:

JAP AVSwitch [Switch] v*x.yy*.umc
JAP AVSwitch [Switch] v*x.yy*.ush
JAP AVSwitch [Switch] v*x.yy*.usp   ...where [Switch] is Cisco, Netgear or Pakedge.

Click **Tools -> Reload Device and Symbol Libraries from disk**. The JAP AVSwitch module will appear in your Symbol Library under **Project Modules -> Switcher.** The current version of the module is indicated by the v*x.yy* suffix. Add the module to your program.

Configure Properties

Input to module

Name	Type	Explanation
GET_CURRENT_STATUS	DIGITAL	When this input signal goes high it triggers a get current status, updating all OUTPUT_FB outputs to their current states
*SAVE_CURRENT_STATUS	DIGITAL	Restores current output status after switch reboot.
*POE_CMD	STRING	Link the JAP_AVSwitch_POE_Control output (CMD) to this input (NOTE: The POE module is available as an add-on to this module).
OUTPUT_[*particular output*]	ANALOG	When the input changes it triggers the 'change input' sequence to switch that output to the input specified by the analogue number.
*SELECT_ALL	DIGITAL	Select all outputs for multi-switching and favourites.
*CLEAR_ALL	DIGITAL	Clear all outputs for multi-switching and favourites.
*SELECT_OUTPUTS	DIGITAL	Select particular outputs for multi-switching and favourites (e.g. outputs 1, 4, 7, 12).
*CREATE_FAVOURITE	DIGITAL	Create favourite from SELECT_OUTPUTS.
*RECALL_FAVOURITE	DIGITAL	Recall favourite configuration.
*INPUT_MULTI_SWITCH	DIGITAL	Choose input for SELECT_OUTPUTS and process (e.g. switch outputs 1, 4, 7 & 12 to input 5).

*Cisco Specific inputs

Output from module

Name	Type	Explanation
OPERATION$	STRING	Shows the current state of the switch. *See "Troubleshooting".*
MAC$	STRING	MAC address of the switch (once connected)
VERSION$	STRING	Version of the driver
*ERROR_MSG$	STRING	Configuration error message
*POPUP_REBOOT	DIGITAL	Configuration error signal
*FAV_FILE_ERROR	DIGITAL	Favourite file error signal
OUTPUT_FB_[*particular output*]	ANALOG	Current input of that particular output.
*SELECTED_OUTPUTS	DIGITAL	Feedback of selected output(s)

*Cisco Specific inputs

Parameters of Cisco module

Name	Type	Explanation
SWITCH_IP_ADDRESS	STRING	The IP address of the Cisco switch, example: 192.168.5.18
USER_NAME	STRING	The user name you log in to the switch with, example: "cisco"
PASSWORD	STRING	The password you log in to the switch with, example: "cisco"
LICENCE_KEY	STRING	The Licence Key *See below "Obtaining Licence Key"*

Default Cisco Switch Settings

If you have not explicitly changed them, the default login values for the Cisco Switch are:

USER_NAME: "cisco"

PASSWORD: "cisco"

Parameters of Netgear/ Pakedge module

Name	Type	Explanation
SWITCH_IP_ADDRESS	STRING	The IP address of the switch, example: 192.168.5.18
USER_NAME	STRING	The user name you log in to the switch with, example: "admin"
PASSWORD	STRING	The password you log in to the switch with, default: ""
PRIVILEGED_PASSWORD	STRING	The privileged password you log in to the switch with, default: "".
LICENCE_KEY	STRING	The Licence Key *See below "Obtaining Licence Key"*

Default Netgear Switch Settings

If you have not explicitly changed them, the default login values for the Netgear Switch are:

USER_NAME: "admin"

PASSWORD: ""

PRIVILEGED_PASSWORD: ""

Default Pakedge Switch Settings

If you have not explicitly changed them, the default login values for the Pakedge Switch are:

USER_NAME: "pakedge"

PASSWORD: "pakedge"

PRIVILEGED_PASSWORD: ""

Obtaining a Licence Key

To obtain a licence key, you will need to know the MAC address of your Crestron processor. This can be found by viewing **System Info** for your processor in Crestron Toolbox:
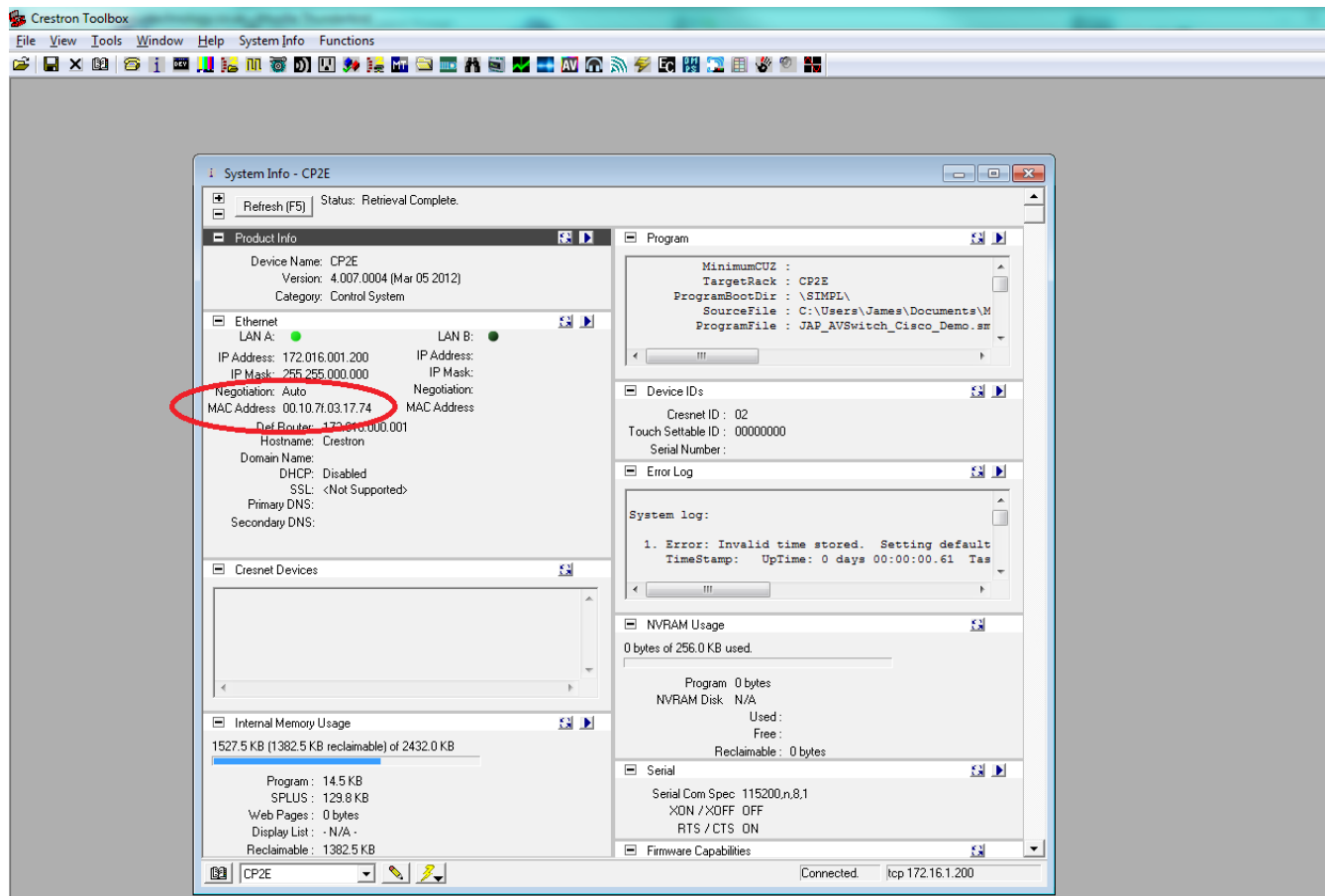
Note down the MAC address as highlighted above and send it to drivers@justaddpower.com in order to obtain your key. Note that if you do not obtain a licence key, the driver will operate in demonstration mode, allowing a maximum of 3 Receivers and 3 Transmitters (the driver will allow you to assign more than three ports, but only the first three will function). Once you have received the licence key, enter it in the LICENCE_KEY parameter field and re-send the project to the Crestron processor. If the switch is still in DEMO mode for more than a minute after you entered the licence key, check that you have entered it correctly.

Configuring Favourites (Cisco Switches Only)

The current configuration of the switch can be saved as a favourite. The driver supports up to 8 favourites. As an example, using the test harness that comes bundled with the driver, navigate to the Favourites page and choose which outputs to save as a favourite, by highlighting them. Click **Create [Num]** to save the chosen configuration, or **Recall [Num]** to restore the configuration of a previously saved favourite. **NOTE:** If you choose to create a new favourite, it will overwrite the existing favourite configuration.
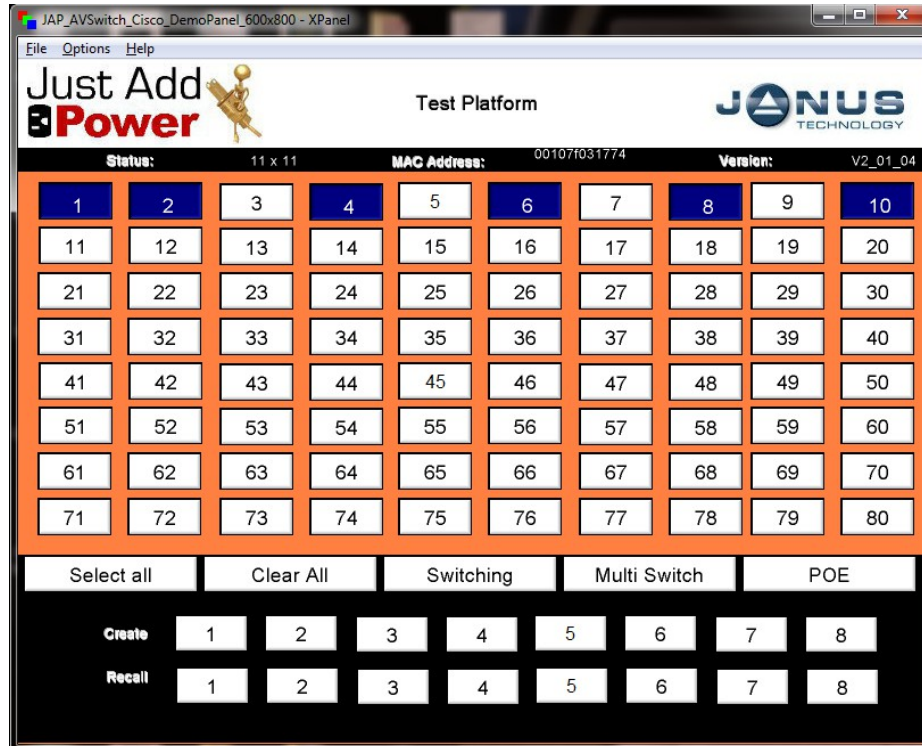
Enabling NVRAM

Favourites are defined in a text file which is stored in the Crestron Processor's NVRAM. It is therefore necessary to enable NVRAM in order for Favourites to function:

- Open Crestron Toolbox.

- Go to **Tools** > **System Info** and choose your processor, ensuring it connects.

- Next, go to **Functions** > **NVRAM Disk...**

- Check **Enable** and click **Apply**.

Troubleshooting

The current status of the module is shown on its OPERATION$ output. Always allow a minute for the status to settle after changing any properties, connections or other project settings, or after refreshing or updating anything. After a minute, the OPERATION$ output should show one of the following messages:

DEMO 3x3	The switch is in demonstration mode as a valid licence has not yet been entered
nxm	The switch is in full operational mode with n inputs and m outputs

Any other message indicates a possible problem. The possible messages are:

Not connected	This should only be seen temporarily during the module settling period. If this message is seen for more than 1 minute, contact your supplier for support.
Connecting	The module is attempting but failing to connect to the switch. Check that you have correctly configured the IP address for the switch, that port 1 of the switch is connected to your management network and that the switch and Director have been configured with compatible IP addresses and net masks.
Logging in	This should only be seen very briefly after the module has connected to the switch. If this message is seen for more than 1 minute, contact your supplier for support.
Invalid user name or password	The user name and/or password properties do not match those configured on the switch. Check the values of these properties. If the password is supposed to be blank, make sure that the property value is completely empty (that is, there are no spaces),
Connected	This should only be seen temporarily while the module sets up the initial switch configuration. If this message is seen for more than 1 minute, contact your supplier for support.
Configuring	This should only be seen temporarily while the module sets up the initial switch configuration. If this message is seen for more than 1 minute, contact your supplier for support.
*FAV_FILE_ERROR	Check NVRAM is enabled on your Crestron processor, as this is where the favourites file is stored.
*POPUP_REBOOT	If the module discovers a bad configuration on the switch upon connection, it will force a reboot of the switch. If the bad configuration persists, re-run JAD Config to reconfigure the switch.

*Cisco Specific messages

CRESTRON JUST ADD DRIVERS POWER-OVER-ETHERNET ADD ON MODULE

Introduction

This add on module is designed to work with the Crestron switching module, giving control over POE ports on compatible Cisco SG series switches.

This Crestron module has been tested with Just Add Power Transmitter and Receiver devices and was written and tested using Crestron Simpl Windows running on series 2 and 3 Crestron Processors.

NOTE: This module is only relevant to Cisco SG series switches that have Power-Over-Ethernet capability.

Add the module to your project

Open your Crestron Simpl Windows program. Copy the following files to the folder where your program is stored:

JAP AVSwitch POE Control v*x.yy*.umc
JAP AVSwitch POE Control v*x.yy*.ush
JAP AVSwitch POE Control v*x.yy*.usp

and then click Tools -> Reload Device and Symbol Libraries from disk. The JAP AVSwitch module will appear in your Symbol Library under Project Modules -> Switcher. The current version of the module is indicated by the v*x.yy* suffix. Add the module to your program.
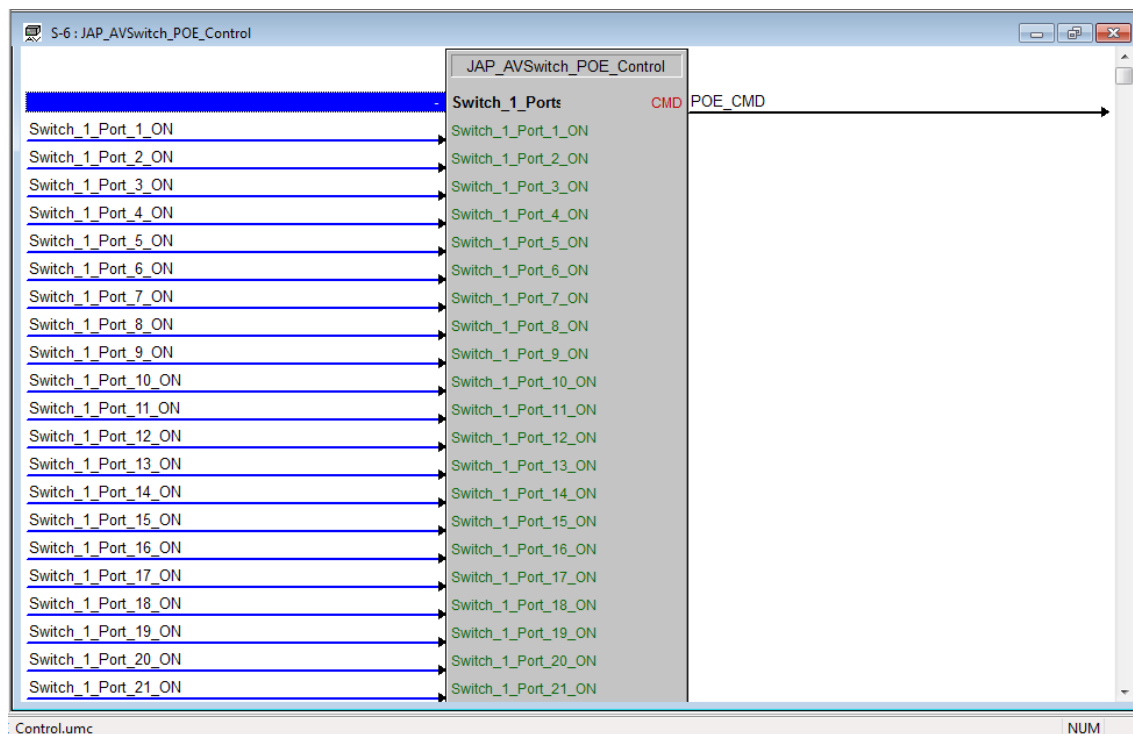
Configure Properties

Name	Type	Explanation
SWITCH_[stack number]_PORT_[port number]_ON	DIGITAL	Specify the switch number (if in a stack configuration) and port number to switch POE on (NOTE: if not in stack configuration, switch number is always "1").
SWITCH_[stack number]_PORT_[port number]_OFF	DIGITAL	Specify the switch number (if in a stack configuration) and port number to switch POE off (NOTE: if not in stack configuration, switch number is always "1").

Name	Type	Explanation
POE_CMD	STRING	Send the POE on or off command to the switching module.

RTI SWITCHING MODULE

This module is designed to allow an RTI control system to control a Just Add Power HD over IP video distribution system using managed switches. The module can route Transmitters (source devices) to Receivers (display devices), trigger macros based on routing events and display variables.

Adding the driver to your project

Open your RTI Integration Designer System file and select your processor from the **System Workplace**.

- Click on the **Drivers** tab of the control system window and select **Add Driver.**

- In the browse window that appears, navigate to the location of the driver file on your PC (entitled *JAD_**Switch**.rtiDriver where **Switch** can be Cisco, Netgear or Pakedge*), select it and click the **Open** button

The Cisco variant will be used as an example in this section. The driver details will be displayed as below:
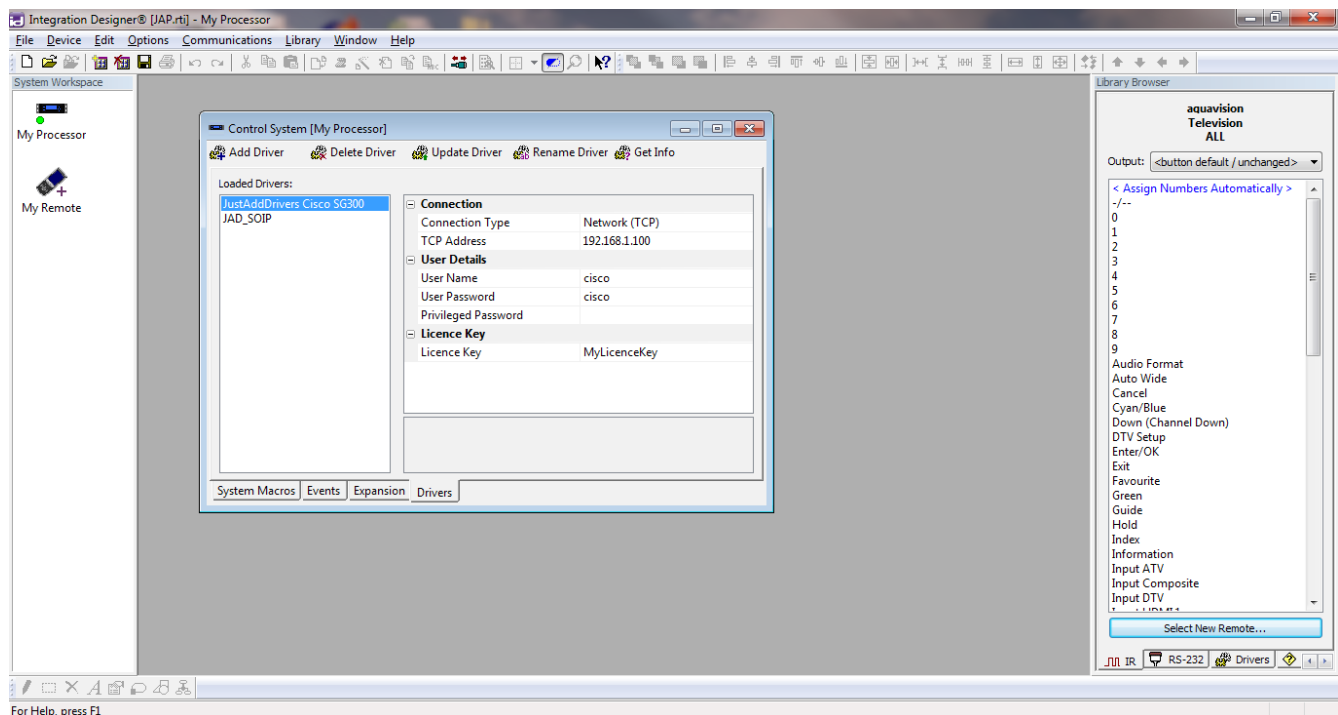
Configuration Settings

There are a number of configuration settings you must ensure are correct before using the driver:

Connection Type	This option is set to "Network (TCP)" by default and is currently uneditable.
TCP Address	Enter the IP address of your switch (e.g. 192.168.1.100).
User Name	Enter the user name required to access the switch (by default this is "cisco")
User Password	Enter the password required to access the switch (by default this is "cisco")
Privileged Password	Not required for Cisco switches
Licence Key	Obtain a licence key and enter it here

- Choose **Device > Save** to save your changes.

Displaying a Variable

There are a number of variables available in the driver, allowing your controller to display information about the status of the Just Add Power system or to change the appearance of buttons based on the current status.

To add information to a button:

- Choose your remote from the **System Workplace,** right click on the button or text field to which you want to add a variable and choose **Edit** Text....

- Click on the **Add Control Variable** button to display the drop down list and select **Just Add Drivers Cisco SGxxx** as in the example displayed below.
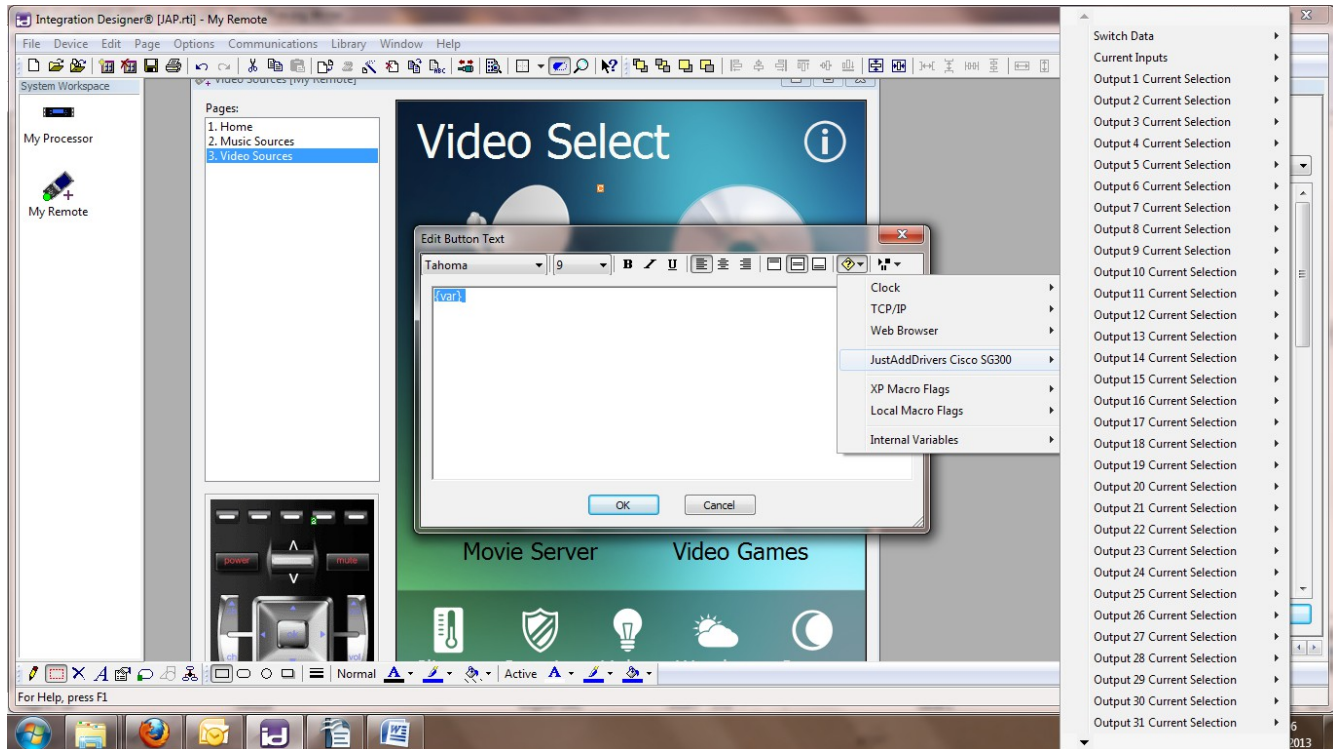
The available variables are as follows:

Switch Data	Display the operational mode or model number of the switch.
Current Inputs	Display the current input routed to a particular output.
Output x Current Selection	Change the appearance of a button according to routing status.

To change a button state based on a variable:

- Right click on the button, select **Edit Properties...** and choose the **Variables** tab.

- Click the arrow button for the button state you want to change and select **Just Add Drivers Cisco SGxxx > Output 1 Selected.**

- Click the **OK** button.

This will now change the button state when output 1 is selected.

Adding an Output Routing Command to a Button

You can add a driver command to a button to switch a particular input to a particular output.

- Choose your remote from the **System Workplace,** right click on the button to which you want to add the command and choose **Edit Properties...**.

- Click on the **Driver Command** tab.

- Click the arrow button on the right hand side and select **Just Add Drivers Cisco SGxxx > Output Routing** as in the example displayed below.
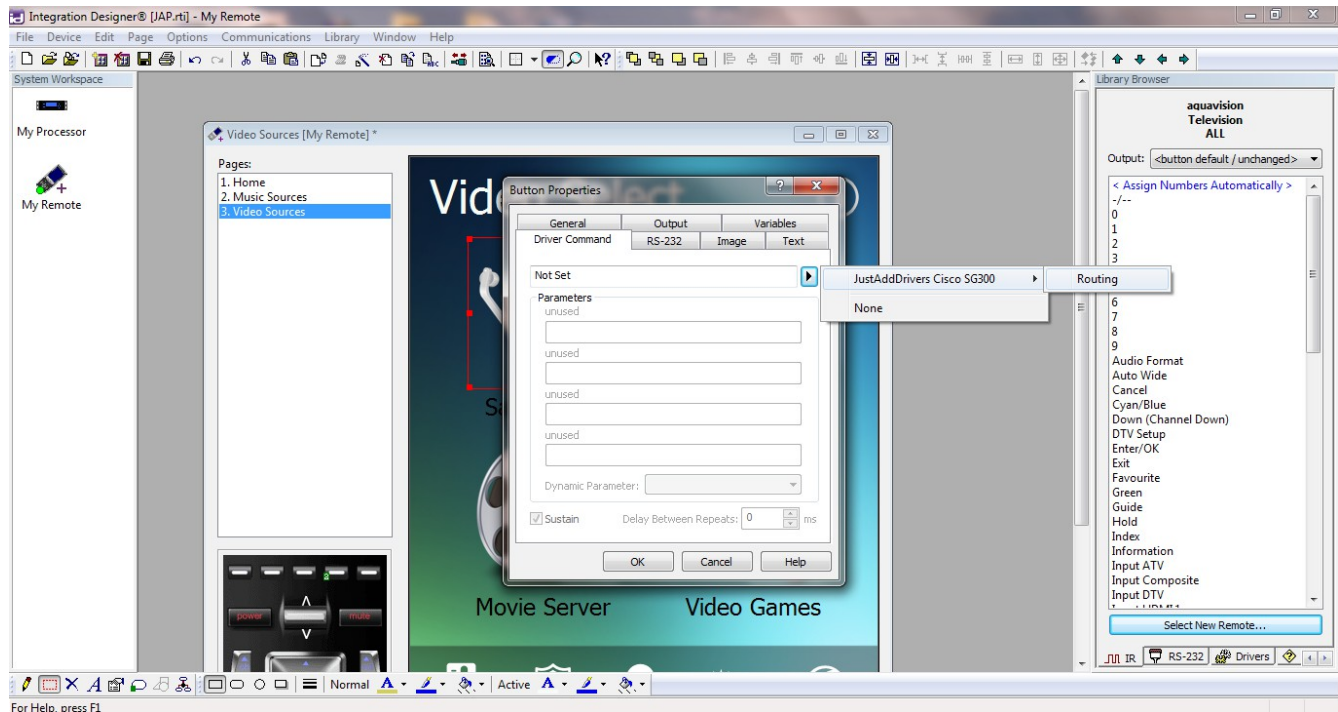
- Choose which combination of **Input** and **Output** parameters you wish to route.

- Click the **OK** button to add the command to the button.

You can also use the driver command **Switch All Outputs** to switch all outputs in your configuration to a specific input. This command will ensure all available display devices will be showing the same images from one selected source. To use this command, you will need to select the command as described above and choose the input source you wish to route to all available outputs.

You can add routing commands to button macros and system macros also.

Adding an Output – Input Selection Command to a Button

You can also use the driver commands from the **Output – Input Selection** to switch outputs to a specific input.

- Choose your remote from the **System Workplace,** right click on the button to which you want to add the command and choose **Edit Properties...**.

- Click on the **Driver Command** tab.

- Click the arrow button on the right hand side and select **Just Add Drivers Cisco SGxxx > Output – Input Selection** command you wish to use.

The following commands are available :

"Select All Outputs"	Selects all available outputs according to the current configuration.
"Clear Output Selection"	Clears the selected outputs so that they are all unselected.
"Select Output"	Allows the user to select one output only.
"Toggle Output"	Allows the user to toggle the output selected state.
"Select Input"	Allows the user to switch all the currently selected outputs to the chosen input.

Using the Output – Input Selection commands in this section is a two step process.

1. You must first select the outputs i.e. display devices, you wish to switch. You can do this in several ways. You can select the outputs on an individual basis using the **Select Output** command or you can use the **Toggle Output** command, which will change the output selected state from off to on and vice versa. You can also use the **Select All Outputs** command to select all available outputs with one button press. Using the displaying variables as described earlier, the button appearance of the selected output can change state according to the current state of the output.

2. You can now select the input source to switch the selected outputs by using the **Select Input** command.

Adding a Preset Selection Command to a Button

You can also use the driver commands from the Preset Selection to store and recall up to 16 switch configurations**.**

- Choose your remote from the **System Workplace,** right click on the button to which you want to add the command and choose **Edit Properties...**.

- Click on the **Driver Command** tab.

- Click the arrow button on the right hand side and select **Just Add Drivers Cisco SGxxx > Preset Selection**

The following selection of commands are available :

- Store Preset (All Outputs) - this command will store the input/output configuration for all outputs of the switch according to the current configuration. A preset identifier will be required in the range 1 – 16.

- Store Preset (Selected Outputs) - this command will store the input/output configuration for the currently selected outputs only. A preset identifier will be required in the range 1 – 16.

- Recall Preset Selection - this command will allow the user to recall a stored switch configuration.

After using the commands in the Output Routing or Output – Input Selection, the switch will be configured with all outputs switched to specific inputs. If you wish to store the input configuration for **all the outputs** on your system, then use the **Store Preset (All Outputs)** command.

If you are configuring a subset of outputs e.g. for a room or seating area, then ensure a subset of outputs are currently selected and have been switched to the particular input source that you require. Use the **Store Preset (Selected Outputs)** command to store the current configuration of the **selected outputs only**. The configuration of the unselected outputs will not be stored.

If you wish to recall a preset selection, use the **Recall Preset Selection** command with the preset identifier parameter you wish to recall. The switch will now be configured according to the stored preset. All available outputs will be switched if the Store Preset (All Outputs) command had been used to store the preset. A subset of outputs will be switched if the Store Preset (Selected Outputs) command had been used to store the preset.

Please note that only 16 stored presets are available.

Adding a Driver Event

The driver supports the addition of events so that macros can be triggered when an Output source is changed.

- Choose your processor from the **System Workplace** and click on the **Events** tab**.**

- Choose **Add Event > Add Driver Event**.

- To create an event when, for example, Output 1 changes source, click on the arrow button and select **Just Add Drivers Cisco SGxxx > Output 1 Changed Source.**

The following screen is displayed:
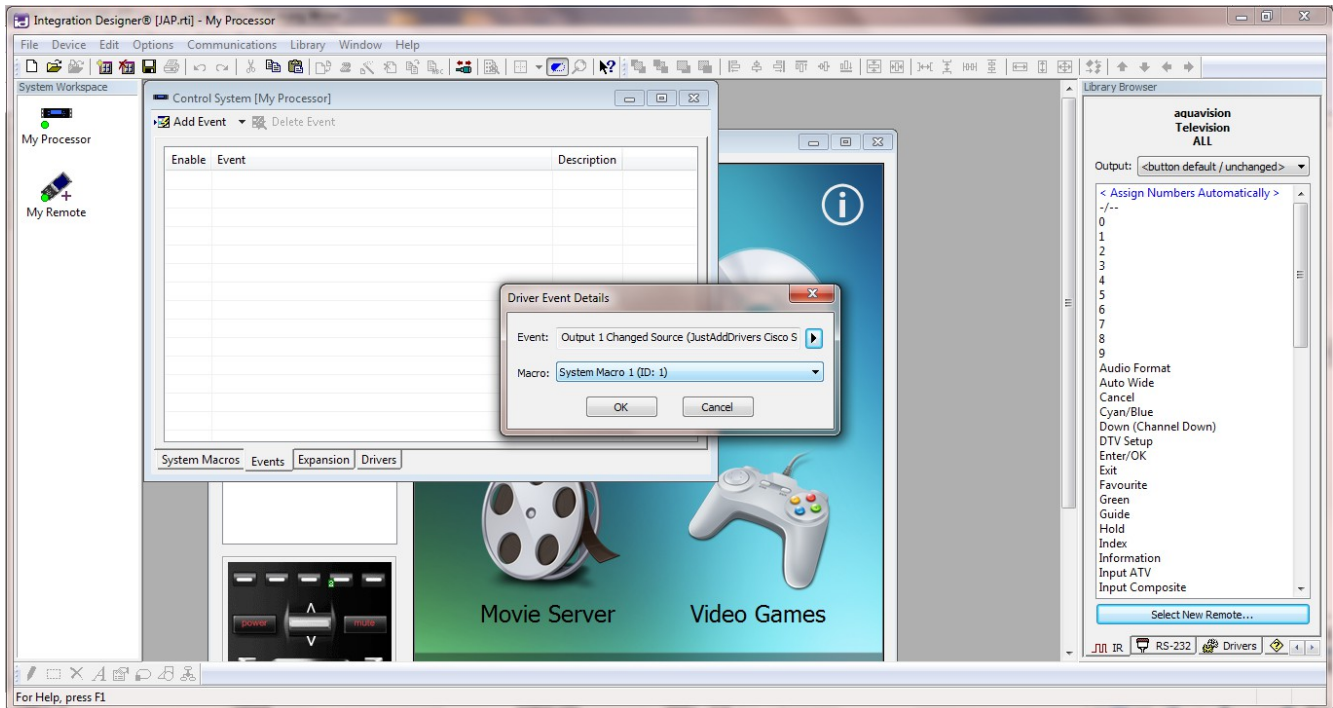
- Choose a macro from the **Macros** drop down list to trigger when the source changes.
- Click the **OK** button.

If the **Enable** check box is ticked (which it is by default) then your event will trigger when appropriate.

Obtaining a Licence Key

To obtain a licence key, you will need to know the MAC address of your RTI processor. This can be found using Integration Designer.

- Open your system file in Integration Designer.

- Choose **Communications > Send to Device…**.

- Click on the **Target** type for your processor (e.g. **USB**)

The below screen is displayed:
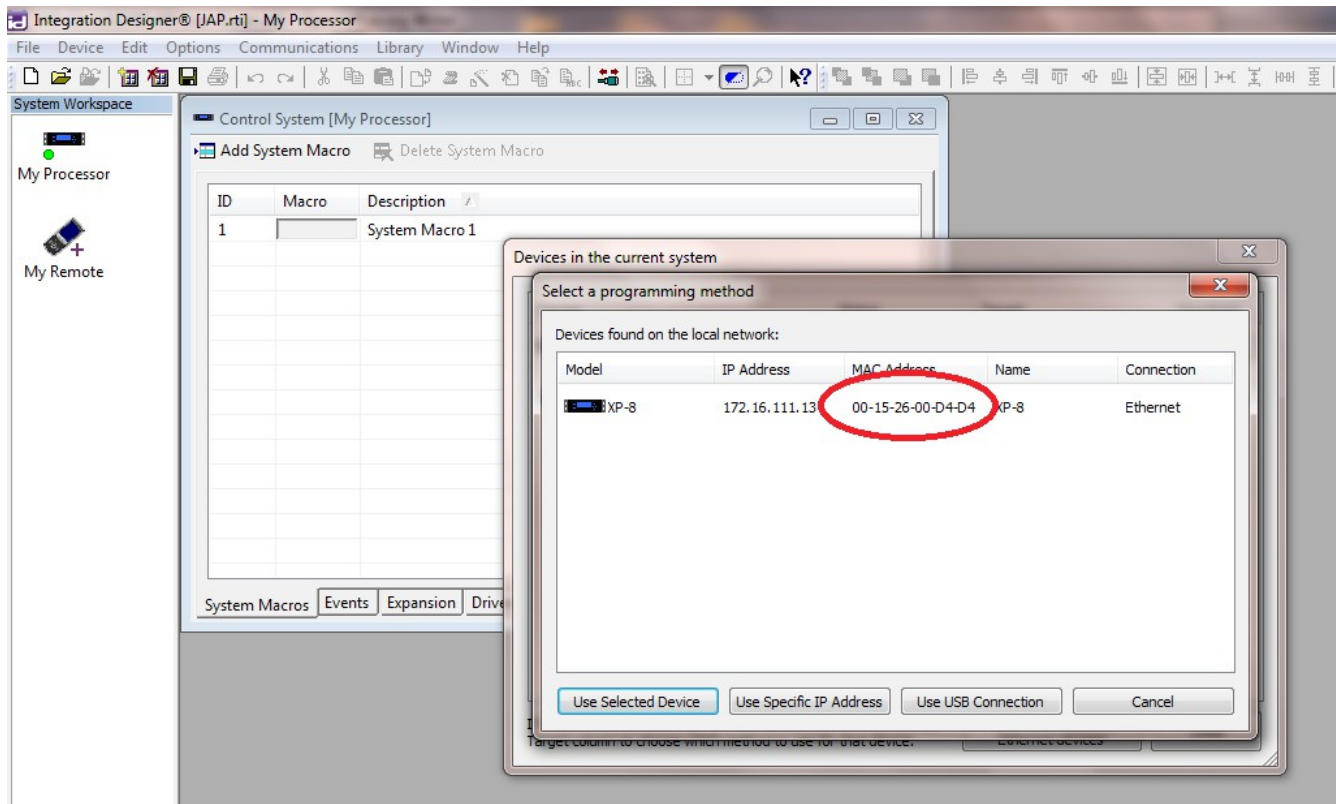
Note down the MAC address as highlighted above and send it to drivers@justaddpower.com in order to obtain your key. Note that if you do not obtain a licence key, the driver will operate in demonstration mode, allowing a maximum of 3 Receivers and 3 Transmitters (the driver will allow you to assign more than three ports, but only the first three will function).

Troubleshooting

The **Operational Mode** variable shows the current status of the driver and can therefore be used to diagnose problems with the configuration.

Always allow 1 minute after making any project changes for the status to be displayed. One of the following two fields should be displayed:

DEMO 3x3	The switch is in demonstration mode as a valid licence key has not been entered.
n x *m*	The switch is fully operational with *n* inputs and *m* outputs.

Any other message displayed in the operational mode variable indicates a problem with the configuration. Possible messages are:

Not Connected	This should only be seen temporarily during the driver initialization period. If this is seen for more than 1 minute, check your network settings as described below for "Connecting". If that does not fix the problem, contact your supplier for support.
Connecting	The driver is attempting but failing to connect to the switch. Check that you have correctly configured the IP address for the switch, that port 1 of the switch is connected to your management network and that the switch and Director have been configured with compatible IP addresses and net masks.
Logging In	This should only be seen very briefly after the driver has connected to the switch. If this message is seen for more than 1 minute, contact your supplier for support.
Invalid User name or Password	The user name and/or password properties do not match those configured on the switch. Check the values of these properties. If the password is supposed to be blank, make sure that the property value is completely empty (that is, there are no spaces).

SERIAL-OVER-IP / COMMAND-LINE-OVER-IP MODULES

Introduction

An SOIP/CLIP module can be added to your system in order to send control commands via a Just Add Power device. The SOIP/CLIP drivers can be used to send console commands to a JAP device, serial commands via the serial port on a JAP device and CEC commands via the HDMI port on a 2G+ JAP device (standard 2G devices do NOT support CEC commands).

The Serial-Over-IP modules have five main modes:

GUEST MODE: provides full, bi-directional serial control, but requires one instance of the driver for every serial port in use. This mode requires two sockets (one for console commands and one for Serial), which can be resource intensive.

CLI (SINGLE): the driver sends a single command to a single Receiver. This mode does not require a second socket connection, so is not as resource intensive as Guest Mode.

CLI (ALL): the driver sends a single command to a all connected Receivers. This mode does not require a second socket connection, so is not as resource intensive as Guest Mode.

DUMB DIRECT: all serial commands sent to a Transmitter are sent to all connected Receivers. This mode also only uses a single socket connection.

NONE: all serial control is disabled in the driver, but other features are still available (console commands, CEC etc).

The full list of SOIP/CLIP commands are described below.

Send Serial Command

A serial command string may be sent via the 2G/2G+ serial port.

Console Commands

The following predefined commands may be sent to control these 2G/2G+ functions:

- Audio Delay Decrease, Audio Delay Increase
- Link restart, Link stop
- Link watchdog enable, Link watchdog disable
- HDMI signal On, HDMI signal Off and HDMI Mute/Darken
- Selecting various Encode/Decode modes, 0, 1 ,2 , 3, and dynamic.
- USB Take Control
- Capture RX EDID from the display connected to the Receiver
- Console reboot
- Watch 1080i content as 1080p or 720p (disabling interlaced output on the source is better).

Console Commands (Advanced)

Any valid console command string may be sent via this option.

Console Audio Delay

An audio delay on the 2G+ stereo output port may be set - a value between 0 and 25.

Console VW Mode Change

The basic video wall may be adjusted by changing the size and location of the video image.

Parameters are number of rows, number of columns, row position and column position - all parameters are integer values between 1 and 16. This allows you to take screens in and out of video wall mode or to create a small video wall within a larger video wall.

Console VW Tear Adjust

The video wall tearing delay adjustment can be modified. The parameter is a value between 0 and 100000.

Console CEC Commands

The following predefined CEC Commands can be sent via the HDMI port:

- CEC Display On
- CEC Display Off
- CEC TV Speaker ON
- CEC TV Speaker OFF
- CEC Force TV to JAP HDMI

Console Send CEC Commands (advanced)

A console CEC HEX byte string may be sent via the HDMI port.

On Screen Display Commands

The following On Screen Display Commands can be sent via the serial port:

- Set OSD Format – setting the size, transparency and colour of the on screen text
- OSD On – used to display on screen text
- OSD Off – used to turn off the textual display

AMX JUST ADD DRIVERS SERIAL-OVER-IP MODULE

This module is designed to control equipment through the RS232 ports on Just Add Power devices. It gives the ability to access the ports from within AMX code as if they were on the AMX controller itself.

This AMX module has been tested using Just Add Power Transmitter and Receiver devices, and was written and tested using NetLinx Studio version 2.7 compiling to run on an NI-2000 controller.

Add the module to your project

Copy the "JAP_Telnet_Serial_Commands.tko" file from the zip package to your project folder and then add it to your project. Then add parameter definitions and a define_module line to your master source file similar to the following:

```
define_device

dvJAP_SERIAL  = 0:4:0
dvJAP_CONTROL  = 0:5:0
vdvJAP_DEV  = 33001:1:1

dvJAP_TP  = 10001:1:1

dvJAP_SERIAL_DEMO  = 5001:1:1

define_variable

// Configuration parameters for the JAP device
char JAP_DEV_IP[15] = '10.128.0.2';
char JAP_DEV_LICENCE[100] = '';
char JAP_DEV_BAUD[15] = '115200';
char JAP_DEV_DATABIT[15] = '8';
char JAP_DEV_PARITY[15] = 'None';
char JAP_DEV_STOPBIT[15] = '1';
char JAP_DEV_CONTROL_FLOW[15] = 'N';
integer SOIP_MODE  = 1; //1 = GUEST MODE 2 = CLI ACCESS 3 = DUMB REDIRECT


define_module 'JAP_Telnet_Serial_Commands' JAP_TERMINAL_SOIP(
  vdvJAP_DEV, dvJAP_SERIAL, dvJAP_CONTROL,
  JAP_DEV_IP, JAP_DEV_BAUD, JAP_DEV_DATABIT,JAP_DEV_PARITY,
  JAP_DEV_STOPBIT, JAP_DEV_CONTROL_FLOW, JAP_DEV_LICENCE, SOIP_MODE );


define_module 'JAP_Telnet_Commands' JAP_TERMINAL(
  vdvJAP_DEV, dvJAP_CONTROL,
  JAP_DEV_IP, JAP_DEV_LICENCE, SOIP_MODE );

define_start
{
  wait 10
  {
    // this command starts the module
    send_command vdvJAP_DEV,"'TelnetEnable'";
  }
}
```

Configure Module Parameters

The parameters to the module are as follows:

vdvJAP_DEV	The virtual device representing the serial over IP module. Define a device in the virtual device range.
dvJAP_DEV	The physical device for the Just Add Drivers Transmitter or Receiver (an IP device). Define a device in the IP device range.
*dvJAP_SERIAL	The Ethernet port for controlling the serial port.
JAP_DEV_IP	The IP address of the Just Add Drivers Transmitter or Receiver as a string.
JAP_DEV_LICENCE	If you have been supplied with a driver licence key, define it as a string here.
*JAP_DEV_BAUD	The baud rate required for the destination serial port.
*JAP_DEV_DATABIT	The number of data bits in each character.
*JAP_DEV_PARITY	The type of parity bit to send.
*JAP_DEV_STOPBIT	The number of stop bits to send.
*JAP_DEV_CONTROL_FLOW	The type of flow control to use.
*SOIP_MODE	The mode of the JAP_Telnet_Serial_Commands module.

*parameters specific to the JAP_Telnet_Serial_Commands module

Obtaining a Licence Key

A licence key can be obtained by sending an email to drivers@justaddpower.com. Once you have received the licence key, assign it to the JAP_DEV_LICENCE constant as a string, recompile and download to the master.

NOTE: With no licence key defined, the driver will not function.

Interfacing with the Module

For a complete example of the usage of the module, see the demonstration project that is shipped with this module.

Commands

The module supports the following commands, sent to it using **send_string**, for instance:

send_string vdvJAP_DEV, 'hello';

….sends the text "hello" to the serial port.

To define the settings for the serial port at runtime, use the following command:

send_command vdvJAP_DEV, 'SET 9600,N,8,1,DISABLE';

…configures the baud rate to "9600", parity bit to "none", data bits to "8", stop bits to "1" and flow control to "disabled".

Command	Explanation
JAD_CONSOLE [number]	Send a console command as referenced in SOIPCommand include file. For example: send_command vdvJAP_DEV, "'JAD_CONSOLE 8'" ...sends "JAD_REBOOT", to reboot the JAD device
JAD_CEC [number]	Send a CEC command as referenced in SOIPCommand include file. For example: send_command vdvJAP_DEV, "'JAD_CEC 1'" ...sends "JAD_DISPLAY_ON", to switch the display on
TelnetEnable	Enables Telnet (must be sent before driver will start, in order to avoid potential overload). For example: send_command vdvJAP_DEV, "'TelnetEnable'"
SOIP ENABLE	Enables the serial port when in Guest Mode.

The SOIP telnet socket is dropped when not in use in order to save on system resources. The SOIP ENABLE command is used to re-enable the telnet port upon starting the module. If multiple instances of the module are in use, it is important to stagger start up to avoid overloading the system.

NOTE: it is the responsibility of the AMX programmer to ensure appropriate TCP "keepalive" messages are sent.

Feedback

Feedback comes via the virtual device and accessed thought the string **data.text**:

data_event [vdvJAP_DEV]

{

  string:

  {

    data.text

  }

}

CONTROL4 JUST ADD DRIVERS SERIAL-OVER-IP MODULE

This Control4 driver was written and tested using Control 4 Composer and an HC-1000 V2/V3 controller.   The driver is designed to work with managed switches and is designed to control equipment through the RS232 ports on Just Add Power devices. Note that one instance of the driver is required for each serial port that is to be controlled.

Add the driver to your project

Copy the .c4i file from the zip package to:

- My Documents\Control4\Drivers (Windows XP)

- Documents\Control4\Drivers (Windows 7/8)

Open Composer

The driver can be found under:

- **Device Type – Others**

- **Manufacturer – Just Add Power**

Double click on it to install the driver. It will appear with the default name "RS232 – IP Server" as below:
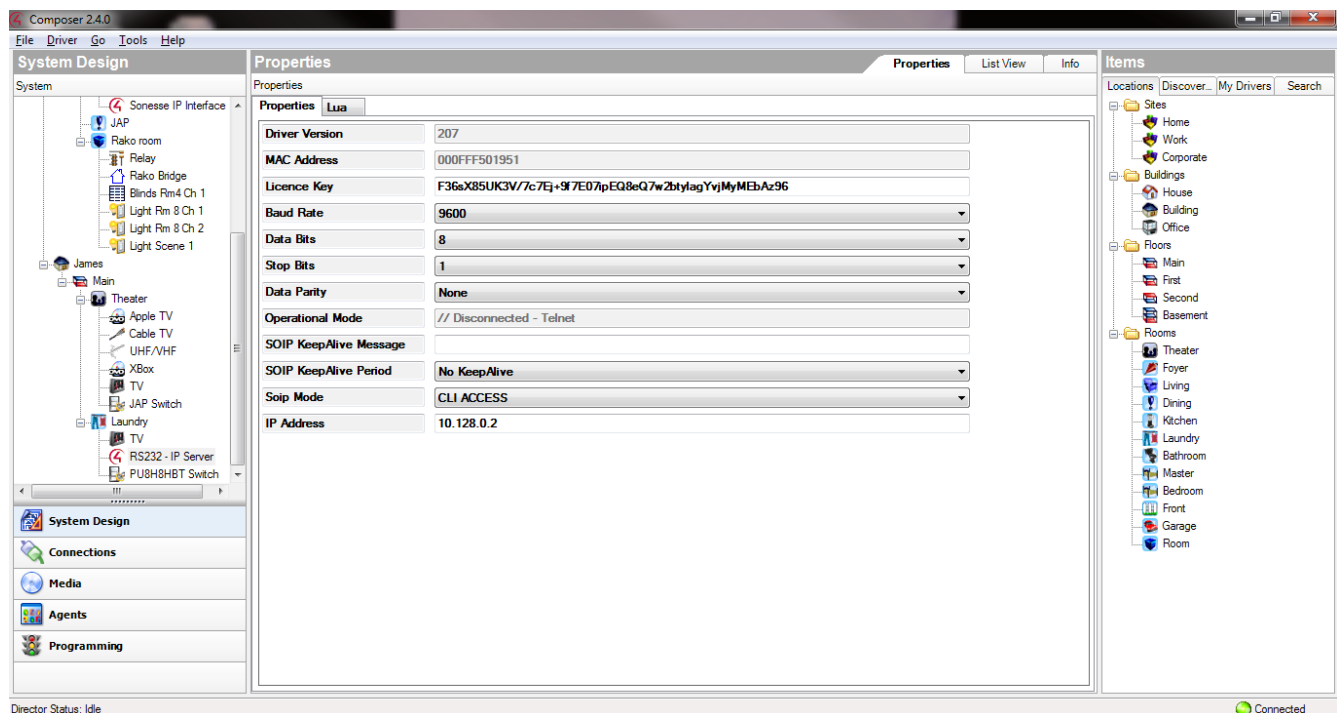
Configure Properties

Driver version	The release version of the driver
MAC Address	The MAC address of the Control4 processor
Licence Key	Obtain a licence key and enter it here
Baud Rate	Choose the baud rate of the destination serial port
Data Bits	Choose the number of data bits in each character

Stop Bits	Choose the number of stop bits to send
Data Parity	Choose the type of parity bit to send
Operational Mode	The connection and licence status of the driver
SOIP KeepAlive Message	Enter a message to be used as the keepalive for the TCP connection
SOIP KeepAlive Period	Choose a period for sending the keepalive message
Soip Mode	Choose the mode by which the driver communicates with the devices
IP Address	The IP address of the Just Add Power device

Configure Serial Control

Configure the serial connections as per standard Control4 practice. In **Connections > Control/AV**, choose a device to control and the newly configured serial port will appear under **Control Inputs** just like a standard Control4 serial port.

Programming Commands

Choose the **Programming** pane, and in the **Actions** area select the "RS232 – IP Server." A number of commands are available by as **Device Specific Commands**:

Command	Description
Console Command	Choose a console command to send
Console Command (Advanced)	Enter a console command to send (or choose form the list)
Set Audio Delay	Enter delay (in milliseconds)
Basic Video Wall Mode Change	Enter number of rows and columns and their positions
Basic Video Wall tear Adjust (microseconds)	Enter delay (in microseconds)
CEC Command	Choose a CEC command to send
CEC Bytes	Enter a CEC command (or choose from the list)

See section *SERIAL-OVER-IP MODULES > Console Commands* for a full list of commands.

Obtaining a Licence Key

Licence keys can be obtained by emailing the MAC address of your Control4 processor to drivers@justaddpower.com. Once you have received the licence key, enter it in the **Licence Key** property field. One licence key enables one serial port. To use multiple serial ports, you must obtain multiple licences.

CRESTRON JUST ADD DRIVERS SERIAL-OVER-IP MODULE

Introduction

This module is designed to control equipment via the RS232 ports on Just Add Power devices. It gives the ability to access the ports from within Crestron code as if they were on the Crestron controller itself.

This Crestron module has been tested with Just Add Power Transmitter and Receiver devices and was written and tested using Crestron Simpl Windows running on a CP2e Crestron Processor.

Add the module to your project

Open your Crestron Simpl Windows program. Copy the following files to the folder where your program is stored:

JAP SOIP v*x.yy*.umc
JAP SOIP v*x.yy*.ush
JAP SOIP v*x.yy*.usp

and then click Tools -> Reload Device and Symbol Libraries from disk. The JAP AVSwitch module will appear in your Symbol Library under Project Modules -> Switcher. The current version of the module is indicated by the v*x.yy* suffix. Add the module to your program.
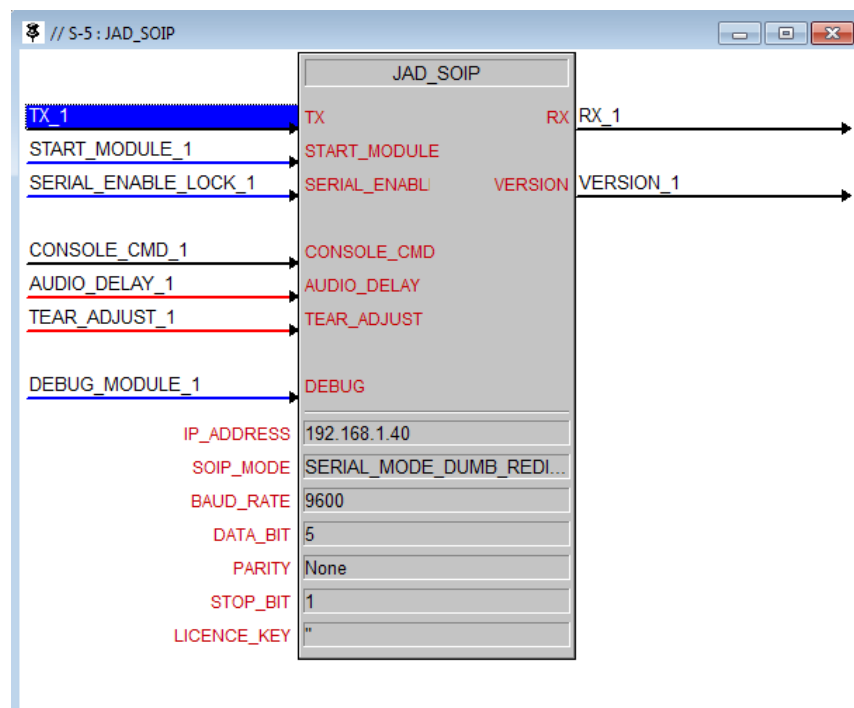
Configure Properties

Name	Type	Explanation
TX	STRING	String that gets transmitted and comes out of the JAD serial port
START_MODULE	DIGITAL	High starts the module. This signal is useful for staggering start up if multiple instances of the module are in use. Refer to JAD_SOIP_DEMO.smw for an example.
SERIAL_ENABLE*	DIGITAL	High turns the module on Low turns the module off
CONSOLE_CMD	STRING	Sends a console command to the JAD device. See section *Serial-Over-IP-Modules > Console Commands* for a complete list of available commands.
AUDIO_DELAY	ANALOG	Used to adjust the Audio Delay setting in Just Add Power devices (refer to Just Add Power documentation for more information)
TEAR_ADJUST	ANALOG	Used to adjust the Tear Adjust setting in Just Add Power devices (refer to Just Add Power documentation for more information)
DEBUG	DIGITAL	Service only

*Only relevant to Guest Mode.

Name	Type	Explanation
RX	STRING	String received from the serial port.
VERSION	STRING	Driver version number.

Name	Type	Explanation
IP_ADDRESS	STRING	The IP address of the JAD device.
SOIP_MODE	STRING	Specifies the mode by which the module will communicate with the devices.
BAUD_RATE*	STRING	Baud rate for the JAP serial port.
DATA_BIT*	STRING	Number of data bits for the JAP serial port
PARITY*	STRING	Parity for the JAP serial port
STOP_BIT*	STRING	Baud rate for the JAP serial port
LICENCE_KEY	STRING	The licence key *See below "Obtaining Licence Key"*

*Only relevant when SOIP_MODE is set to SERIAL_GUEST_MODE, SERIAL_CLI_ACCESS_MODE or SERIAL_CLI_ACCESS_ALL_MODE.

The SOIP telnet socket is dropped when not in use in order to save on system resources. The SERIAL_ENABLE command is used to re-enable the telnet port upon starting the module. If multiple instances of the module are in use, it is important to stagger start up to avoid overloading the system.

NOTE: it is the responsibility of the Crestron programmer to ensure appropriate TCP "keepalive" messages are sent.

Obtaining a Licence Key

The licence key will be the same licence key that you received for the main Crestron module. If you purchased the Serial-Over-IP module as a later upgrade, you will be issued with a revised licence for both drivers.

RTI JUST ADD DRIVERS SERIAL-OVER-IP MODULE

This driver enables commands to be sent over InterVLAN routes of a Just Add Power system, to be directed to the serial port on a JAP Receiver or Transmitter device.

Note that the system must have been previously set up with the Just Add Drivers configuration tool to ensure that the InterVLAN routes are set-up correctly. This includes any necessary configuration of the router to ensure that a valid IP route exists between the RTI control system and the JAP VLAN.

Adding the driver to your project

Open your RTI Integration Designer System file and select your processor from the **System Workplace**.

- Click on the **Drivers** tab of the control system window and select **Add Driver.**

- In the browse window that appears, navigate to the location of the driver file on your PC (entitled *JAD_SOIP.rtiDriver*), select it and click the **Open** button.

The driver details should be displayed as below:
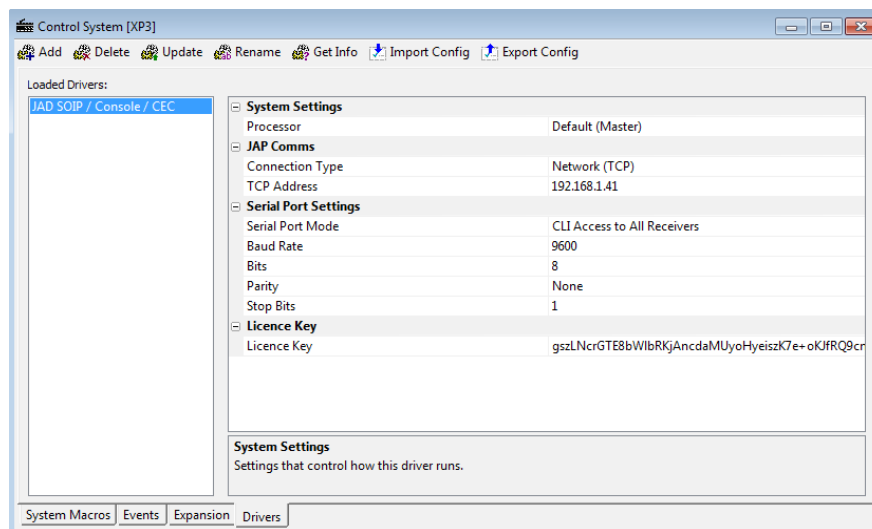
Configuration Settings

Processor	Choose the processor from which commands will be sent.
Connection Type	This option is set to "Network (TCP)" by default and is currently uneditable
TCP Address	Enter the IP address of the JAP device (e.g. 172.16.0.47)
Serial Port Mode	Choose the mode by which the driver will communicate with the devices.
Baud Rate	Choose the baud rate of the destination serial port
Bits	Choose the number of data bits in each character
Parity	Choose the type of parity bit to send
Stop Bits	Choose the number of stop bits to send
Licence Key	Obtain a licence key and enter it here

- Choose **Device > Save** to save your changes.

Available Commands

The below table lists all available commands. Note that, due to the nature of RTI programming interface, all commands will always be selectable but may not function depending on the Serial Port mode selected for a particular device.

Command	Description
Send Serial Command	Enter string and select destination ("single Receiver" or "all Receivers")
Send Console Command	Select command to send
Send Console Command (Advanced)	Enter command to send
Audio Delay	Enter delay (in milliseconds)
Basic Video Wall Mode Change	Enter number of rows and columns and their positions
Basic Video Wall tear Adjust	Enter delay (in microseconds)
Slideshow	Enter number of slides and duration per slide (in seconds)
IR Manager Control	Enter IR Bank and IR Command and choose Operation ("Learn" or "Emit")
Send CEC Command (standard)	Choose a command to send
Send CEC Command (advanced)	Enter a CEC command as HEX bytes (e.g. "0xE0 0x0C")
Set OSD Format	Set size, colour and transparency level of the OSD font
OSD On	Switch the OSD on and display the text entered
OSD Off	Switch the OSD off

NOTE: When sending serial commands, in addition to sending ASCII characters, you can also send binary characters, by escaping them with a "\x", followed by the ASCII code represented as two hex digits.

For example:

hello\x0D

....sends "hello" followed by a carriage return (ASCII code 13 = hex 0D).

Obtaining a Licence Key

The process for obtaining a licence key is the same as the RTI Switching Module as detailed in the RTI Switching Module section of this document.