Configuring Network Settings of the Ethernet Switch & MuxLab AV over IP Devices

Overview

The MuxLab AV over IP Devices can be used with or without the help of software. When use in an environment without software the configuration can be manage locally using the Device DIP Switches. When used with the software, all management functions may be performed remotely. Independent of the manner in which the product is controlled, a gigabit Ethernet Switch is required. This manual explains how to correctly setup the Ethernet Switch, how to manage the system manually, and how to use the MuxLab Management Software.

Applicable AV over IP Devices

The following AV over IP Devices are applicable to this document as of this writing, and will be referred to throughout this document as "AV over IP Device(s)".

500752: HDMI over IP Extender with PoE 500753: HDMI / RS232 over IP Extender with PoE 500754: Video Wall over IP Extender with PoE 500755: Audio / RS232 over IP PoE Transceiver 500756: 3G-SDI / RS232 over IP Extender with PoE 500757: HDMI over IP H.264 PoE Extender 500758: HDMI 4K over IP PoE Extender 500759: Video Wall 4K over IP PoE Extender

Note: This document may be updated from time to time to include new AV over IP Devices as they become available.

Configuration of the Ethernet Switch

It is assumed that the Ethernet Switch bandwidth is reserved for only the audio & video transport of the AV over IP Device signals, and will not be shared with other LAN intensive traffic, including daily LAN traffic within the building. This is required in order to maximize the system performance and to be able to expand the system as needed.

When the AV over IP Devices are used in a matrix configuration (multipoint-to-multipoint) it is required that the Ethernet Switch support the following capabilities: Gigabit Ethernet, DHCP Server and IGMP. AN Ethernet Switch with "Jumbo Frame" support is also required when utilizing the 500758 and 500759 models. MuxLab recommends using the Cisco SG300 Series of gigabit Ethernet Switches. The following section explains how to correctly configure the DHCP Server and enable IGMP and Jumbo Frame on the Cisco Ethernet Switch. If you are using a different brand Ethernet Switch please look at the corresponding product user manual on how to perform these steps.

There are two methods offered for configuring the Cisco Ethernet Switch, a Quick Method (via a script provided by MuxLab with default settings) and a Detailed Method (with manual entry allowing for default or custom settings).

Quick Method of Configuring the Cisco Ethernet Switch

Establishing communication with the Cisco Ethernet switch

- 1. Connect your computer directly to the Cisco Ethernet Switch using an Ethernet patch cord. Note: The Cisco SG300 Ethernet Switch comes configured from the factory with a Static IP address of 192.168.1.254 and in order to communicate with this unit you must configure your computer to have a Static IP address in the same subnet.
- 2. Set a Static IP address on your computer network interface card, such as 192.168.1.2 along with the following mask 255.255.255.0 Reference your computer operating system manual on how to accomplish this.
- 3. Using a standard browser connect to the Cisco Ethernet Switch. Enter the Cisco Ethernet Switch Static IP address in the address bar and press **Enter**. For example <u>http://192.168.1.254</u> The Default User ID and Password for the unit is "cisco".
- 4. Go to Administration→File Management→Download/Backup Config. Set the "Transfer Method" to "via HTTP/HTTPS", and set the "Save Action" to "Download", type the file name for the script file (which is "SC-000119-B" as of this writing, although the last letter may have changed to version C, or D, etc. depending on the revision). Set the "Destination File Type" to "Startup Configuration File". Click the "Apply" button and wait for the automated configuration process to complete.

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Getting Started Status and Statistics Administration System Settings Console Settings	Download/Backup Configuration/Log Transfer Method: Image: State of the state o	Via HTTP/HTTPS
 Management Interface User Accounts Idle Session Timeout Time Settings System Log File Management 	Save Action:	SC-000119-B
Upgrade/Backup Firmwa Active Image Download/Backup Confi Configuration Files Prop Copy/Save Configuration	Destination File Type: Startup configuration file Backup configuration file Cancel Cancel	Startup configuration file
DHCP Auto Configuration Reboot Diagnostics Discovery - Bonjour Discovery - LLDP Discovery - CDP	Click Apply	
Ping Traceroute > Port Management > Smartport		
VLAN Management Spanning Tree MAC Address Tables Multicast UII		
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5. Go to Administration→File Management→Reboot, and click on the "Reboot" button to reboot the Ethernet switch.

small Business cisco SG300-10P 10-Por	t Gigabit PoE Managed Switch	cisco Language: <mark>English –</mark> Logout About	Help
Management Interface User Accounts Udle Session Timeout Time Settings System Log File Management Upgrade/Backup Firmware/Language Active Image Download/Backup Configuration/Log Configuration Files Properties	Reboot To reboot the device, click the "Reboot button. Reboot Date Jan v 01 v Time 00 v 00 v HHJMM In 00 v Days 00 v Hours 00 v Minutes Restore to Factory Defaults		
Copyrsave Comiguration DHCP Auto Configuration Plagnostics Discovery - Bonjour Discovery - LLDP Discovery - CDP Ping Traceroute Port Management	Clear Startup Configuration File		
Smartport VLAN Management Spanning Tree			
MAC Address Tables Multicast IP Configuration Security Access Control Quality of Service SNMP			
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6. That completes the configuration of the Ethernet Switch; you can now use it with the MuxLab AV over IP solution.

Note: The script changed the Cisco Ethernet Switch Static IP address to 192.168.168.1. If you need to access the Web interface of the Ethernet Switch via web browser you need to use this address. The User-ID and Password are still "cisco".

Detailed Method of Configuring the Cisco Ethernet Switch

Establishing communication with the Cisco Ethernet Switch

- 1. Connect your computer directly to the Cisco Ethernet Switch using an Ethernet patch cord. Note: The Cisco SG300 Ethernet Switch comes configured from the factory with a Static IP address of 192.168.1.254 and in order to communicate with this unit you must configure your computer to have a Static IP address in the same subnet.
- 2. Set a Static IP address on your computer network interface card, such as 192.168.1.2 along with the following mask 255.255.255.0 Reference your computer operating system manual on how to accomplish this.
- 3. Using a standard browser connect to the Cisco Ethernet Switch. Enter the Cisco Ethernet Switch Static IP address in the address bar and press **Enter**. For example <u>http://192.168.1.254</u> The Default User ID and Password for the unit is "cisco".

Enabling IGMP Protocol

The IGMP Protocol is mandatory when more than one AV over IP Transmitter Device is present on the same network. Without IGMP the audio/video may freeze from time to time.

1. Go to Multicast→Properties. Enable the "Bridge Multicast Filtering Status" by "check-marking" the related selection box and clicking on "Apply".

Getting Started Status and Statistics	Properties	_	Check-mark this selection	
Administration Port Management	Bridge Multicast Filtering Statu	is: 🔽 Enable	box and click 'Apply'.	
Smartport VLAN Management	VLAN ID:	1		
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Multicast Properties MAC Group Address IP Multicast Group Address (GMP Snooping MLD Snooping MLD Snooping MLD Snooping Multicast Group Multicast Group Multicast Group Long Glacend Multicast	Forwarding Method for IPv4:	Source Specific MAC Group Add IP Group Addres Source Specific	in Stoup Address S IP Group Address	
IP Configuration				
Access Control				
Quality of Service				
• SNMP				

2. Go to Multicast→IGMP Snooping. Enable the "IGMP Snooping Status" by "check-marking" the related selection box and clicking on "Apply".

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✓ Mullcast	-			Operational Status	IGMP Version	Auto Learn	Robustness	Interval (sec)	Interval (sec)	Query Count
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3. In the "IGMP Snooping Table", "tick mark" (enable) the radio button and click on "Edit". In the resulting window "check-mark" the related selection box for "IGMP Snooping Status" and then click on "Apply".

Verify that the "Immediate Leave" selection box under the section "Last Member Query Interval" is "check-marked" (enabled).

Getting Started		and the second
 Status and Statistics 	IGMP Snooping	
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Multicast Router Port	1. ((
Forward All	button and click Edit	
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Enabling Jumbo Frame (required for MuxLab 500758 and 500759 models)

Jumbo Frame support is required when using the MuxLab 500758 and 500759 models. Without Jumbo Frame supported and enabled, these units will not perform as intended and video output will be negatively affected.

1. Go to Port Management→Port Settings. Enable "Jumbo Frames" by "check-marking" the related selection box and clicking on "Apply".

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Status and Statistics	Por	t Setting	s		Check-mark	this selection							
Administration			1	- 1-1-	box and clic	k 'Apply'.							
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Port Settings	Jur	nbo frames	configura	ation changes	will take effect after	saving the configuration	in and rebooting	g the swit	ich.				
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► PoE		Entry No.	Port	Description	Port Type	Operational Status	Link Status	Time R	ange	Port	Duplex	LAG	F
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 VLAN Management 	0	2	GE2		1000M-Copper	Up	Enabled			1000M	Full		U
 Spanning Tree 	0	3	GE3		1000M-Copper	Down	Enabled						U
MAC Address Tables	0	4	GE4		1000M-Copper	Up	Enabled			100M	Full		U
Multicast	0	5	GE5		1000M-Copper	Up	Enabled			100M	Full		U
IP Configuration	0	6	GE6		1000M-Copper	Up	Enabled			100M	Full		U
 Security 	õ	7	GE7		1000M-Copper	Down	Enabled						U
 Access Control 	õ	8	GE8		1000M-Copper	Down	Enabled						U
 Quality of Service 	0	9	GE9		1000M-ComboC	Down	Enabled						U
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Configuring the DHCP Server

The Ethernet Switch DHCP Server will automatically configure all the IP addresses of each AV over IP Device, eliminating any conflict between devices.

Note: If DHCP Server functionality is supported by your Ethernet Switch skip to step 1 below, otherwise you need to use the MuxLab Management Software to assign Static IP addresses to each AV over IP Device. However, before using the Management software, you need to configure a Static IP address on your computer within the same subnet as on the AV over IP Devices, we recommend using 192.168.168.2

To set the Ethernet Switch Static IP address to the same subnet as the AV over IP Devices, go to Administration→Management Interface→IPv4 Interface. Set the "IP Address Type" to Static, and enter the IP Address, we recommend using 192.168.168.1 and set the Network Mask to 255.255.255.0 After applying these settings you need to change the IP address on your computer network interface card to the same subnet just set above, we recommend 192.168.168.2 Reconnect with the Cisco Ethernet Switch Web Interface using HTTP://192.168.168.1 as was configured above.

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Getting Started Status and Statistics	IPv4 Interface		
Administration System Settings Console Settings Management Interface IPv6 Global Configuration IPv6 Global Configuration IPv6 Addresses IPv6 Addresses IPv6 Addresses	Management VLAN: IP Address Type: IP Address: Address: Address:	1	Need to provide the IP Address Type (Static), IP Address and Mask
IPv6 Tunnel IPv6 Routes User Accounts Idel Session Timeout Idel Session Timeout System Log File Management Reboot Discovery - Bonjour Discovery - LDP Discovery - LDP Discovery - LDP Traceroute	Administrative Default Gateway: Operational Default Gateway: Renew IP Address Now: Auto Configuration via DHCP: Apply Cancel	C User Defined C None Enable Enabled	
Port Management Snantport VLAN Management VLAN Management Multicast Multicast IP Configuration 2010-2013 Clsico Systems, Inc. All Rights Reserved	ved		

2. Go to IP Configuration \rightarrow DHCP Server \rightarrow Network Pools. Click on the "Add..." Button.

Small Business SG300-10P 10-Port	Gigabit PoE Managed Switch
Getting Started Status and Statistics Administration Port Management Spanning Tree MAC Address Tables Multicast • IPV4 Management and Interfaces ARP • DHCP Snooping/Relay • DACess Control • Quality of Sence • SINIP	Network Pools Network Pool Table Multab 25525555 192188.188.10 192168.250 Infinite 8 Add Edit Detete Details. Click the 'Add'
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3. In the window provided, set the "Pool Name", the "Network Mask" (255.255.255.0), the "Address Pool Start" (192.168.168.10), and the "Address Pool End" (192.168.168.250). An example is shown below. Verify that you allocate enough IP addresses for all Transmitters and Receivers present on the network.

© Pool Name: Subnet IP Address:	Muxlab	(6/32 Characters Used)	Need to provide the Pool Name,
S Mask:	Network Mask 25 Prefix Length 24	5.255.255.0 (Range: 8 - 30)	Network Mask, Address Pool Start and Address Pool End
Address Pool Start:	192.168.168.10	7	Start and Address 1 001 End
Address Pool End:	192 168 168 250	-	
Lease Duration:	 Infinite 		
	C Days 1 Ho	urs 00 💌 Minutes 00 💌 (Defaul	t 1 Day)
Default Rauter IR Address (Option 2):	Г	-	
Delault Router IP Address (Option 3).			
Domain Name Server IP Address (Option 6):	None 💌	-	
Domain Name (Option 15):	1	(0/32 Characters Used)	
NetBIOS WINS Server IP Address (Option 44):			
NetBIOS Node Type (Option 46):	 Hybrid Mixed Peer-to-Peer Broadcast 		
SNTP Server IP Address (Option 4):	None 💌		
File Server IP Address (siaddr):			
File Server Host Name (sname):	[(0/64 Characters Used)	
Configuration File Name (file):	1	(0/128 Characters Used)	

 Go to IP Configuration→IPv4 Management and Interfaces→DHCP Server→Properties. Enable the "DHCP Server Status" by "check-marking" the related selection box and clicking on "Apply".

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Cisco SG300-10P 10-Port Cetting Stated Status and Statistics Administration Port Management Sanarport VLAN Management Sanarport MacAddress Tables Hutlicast PiPorniguration Froentics ARP DHCP SanopingRelay DHCP Severt Froentics Addresses Static Hosts Addresses Static Hosts Address Binding Comain Name System Access Control Coulity of Service SMMP	Gigabit POE Managed Switch Properties DHCP Server Status: Cancel Check this selection box and click 'Apply'.		
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5. Go to Administration→File Management→Copy/Save Configuration. "Tick-mark" (enable) "Running Configuration" and "Startup Configuration" as shown below and save all changes made thus far by clicking "Apply".

Small Business cisco SG300-10P 10-Port	Gigabit PoE Managed Switch
Getting Started Getting Started Administration System Settings Console Settings Management Indepen	Copy/Save Configuration All configurations that the switch is currently using are in the running configuration file which is volatile and is not retained between reboots. To retain the configuration between reboots, make sure you copy the running configuration file to the startup configuration file after you have completed all your changes.
User Accounts Idle Session Timeout > Time Settings > System Log	Source File Name: C Running configuration C Startup configuration C Backup configuration C Mirror configuration
 File Management Upgrade/Backup Firmware/Language Active Image 	Destination File Name: C Running configuration C Startup configuration C Backup configuration
Download/Backup Configuration/Log Configuration Files Properties Copy/Save Configuration DHCP Auto Configuration	Sensitive Data: C Exclude C Encrypted C Plaintent Available sensitive data options are determined by the current user's SSD rules
Reboot > Diagnostics Discovery - Bonjour > Discovery - LLDP	Save Icon Blinking. Enabled Apply Cancel Disable Save Icon Blinking
Discovery - CDP Ping Traceroute Description	
Smartport	
► VLAN Management	
Spanning Tree	
MAC Address Tables	
► Multicast	
IP Configuration	
Access Control	
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6. Go to Administration→File Management→Reboot, and click on the "Reboot" button to reboot the Ethernet switch.



7. If needed you can configure your computer network interface card to obtain an IP address automatically and you can reconnect with the Cisco Ethernet Switch via a browser and using the IP address 192.168.168.1

Using the AV over IP Device with DIP Switches (Manual Method)

Before installing the AV over IP Device in the intended operating location it is recommended that you first configure the Dip Switch address of each Transmitter and Receiver unit.

- 1. Configure each AV over IP Transmitter Device with a unique DIP Switch address setting. There are 16 unique possibilities and thus you are allowed up to 16 Transmitters on a given local network (subnet). Note that it is very important that each Transmitter have a unique DIP Switch address.
- 2. Configure the DIP Switches of each Receiver to match a corresponding Transmitter address (in order that they communicate with each other). More than one Receiver can have the same DIP Switch setting of a given Transmitter (for point-to-multipoint configurations).
- 3. Follow the above procedure to install the remaining AV over IP Devices, and reference the AV over IP Device Installation Guide for additional setup information.

Using the product with the MuxLab Management Software

- 1. Reference the AV over IP Device Installation Guide to correctly setup and install all Devices.
- 2. Install the software on a computer that is connected on the same subnet as the AV over IP Devices.

Note: The computer network interface card should be configured to use DHCP if a DHCP Server is present, otherwise configure the computer network interface card to use the same subnet as the AV over IP Devices, such as 192.168.168.2

3. Run the MuxLab Management Software. Click on "Yes" to perform a full network scan.

	sectings	neip
🥥 : Video Sig	nal Detected 🛛 💐 : Monitor Power 'C	N' Detected
DISPLAY	Availab X Do you want to perform a full network scan 1 (fine, the last known configuration wile to loaded) <u>Yes</u> <u>bp</u>	SOURCE
	Αρρίγ	

4. The first time the software is executed you will receive a warning that all the devices have DIP Switches enabled. Click on "Yes" and then on "Proceed", to allow the software to override the DIP Switch settings.

agnostics				- 10
		<u>Diagnosti</u>	<u>c Report</u>	
WARNING #	MAC address	J device(s) hav	Device name	
	00-08-79-00-70-1A	102 169 169 16		
	00-0B-78-00-70-1A	192.108.108.10	BX1	
	00-0B-78-00-70-23	192.168.168.15	BX1	
	00-0B-78-00-70-9F	192.168.168.11	TX1	
	00-0B-78-00-70-58	192.168.168.14	TX1	
	00-0B-78-00-70-D9	192.168.168.12	TX1	
ACTION:	Let the software automatically disable Dip Switch for the device(s) listed above			
	ⓒ Yes (recommended) ○ No			
		PRO	CEED	

5. Select the "Matrix Connection" tab to perform the desired connections between AV over IP Devices (Transmitters and Receivers).

Note: For further information on how to operate the MuxLab Management Software, please download the software from the MuxLab website, and reference the MuxLab Management Software Manual.

Troubleshooting

The following table describes some of the symptoms, probable causes and possible solutions in regard to the installation of the AV over IP Devices:

Symptom	Probable Cause	Possible Solutions
Freezing Audio or	IGMP not enable or not	• Check the Ethernet Switch configuration
Video	working properly.	and enable the IGMP protocol.
DIP Switches not	Unit DIP Switches have	• Use the MuxLab Management Software to
working	been disable via software.	perform the connection or to re-enable the
		DIP Switches.
No Audio or Video	IP Address Conflict.	• Check the Ethernet Switch configuration
		and enable the DHCP Server.
Software cannot detect	Computer not on the same	• Check that the computer is connected to
the AV over IP Device	network or wrong IP	the same Ethernet Switch as the AV over
	address.	IP Device.
		• Verify that the computer network
		interface card is set to obtain an IP
		address automatically.
Software updates are	Too much traffic on the	• Turn off all the sources during software
very slow	network.	update.

If you still cannot diagnose the problem, please call MuxLab Customer Technical Support at 877-689-5228 (toll-free in North America) or (+1) 514-905-0588 (International).



8495 Dalton Road, Mount Royal, Quebec, Canada. H4T 1V5 Tel: (514) 905-0588 Fax: (514) 905-0589 Toll Free (North America): (877) 689-5228
E-mail: <u>videoease@muxlab.com</u> URL: <u>www.muxlab.com</u>