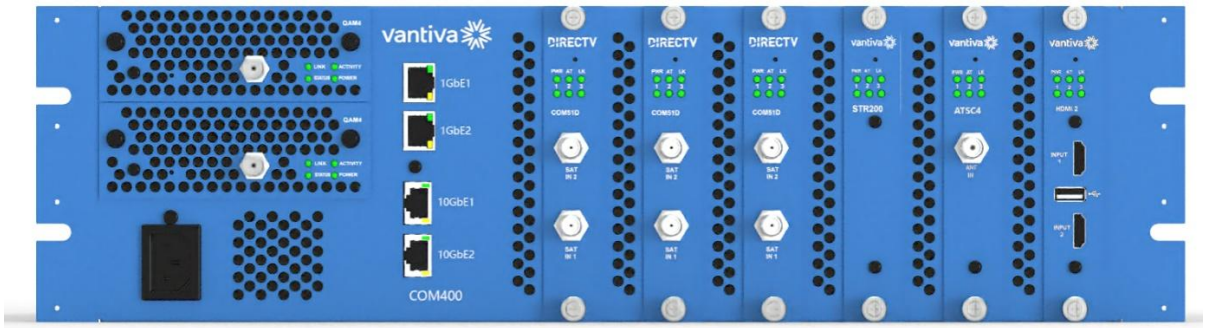
COM3000 INTEGRATOR'S INSTALLATION MANUAL



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INTRODUCTION

This document describes the Vantiva COM3000 System and related configuration procedures. It is recommended that you read the entirety of the manual before working with the system.
This manual assumes the reader is familiar with the following:

- DirecTV standards for MFH2 satellite installation
- National and Local Electric Codes
- Industry standards for RF coaxial distribution
- Networking skills including IGMP networking of multicast video streams.

Commercial Use
This product is designed to go into areas that are not accessible to the public at large and are not for home use. Vantiva COM3000 Products provide Head-End systems for distribution solutions for the DIRECTV Commercial and Lodging and Institutions (L&I) markets.

Warning
Class 1 Equipment. This equipment must be earth grounded. The power plug must be connected to a properly wired earth ground socket outlet. An improperly wired socket outlet could place hazardous voltages on the accessible metal parts.

IT Room warning message:
Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.

RAL warning message
The device can only be used in a fixed location such as a lab or a machine room. When you install the device, ensure that the protective earth ground connection of the socket-outlet is verified by a skilled person.

Note to System Installer
This reminder is provided to call the SMATV systems installer's attention to Section 820-93 of the National Electric Code which provide guidelines for proper grounding and specify that the Coaxial cable shield shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

COMPATIBILITY WITH PREVIOUS HARDWARE

Chassis	COM360	COM400	Notes
Equipment			
COM46	X	X	See note below
COM51D	X	X	
QAM6	X		No QAM6 in COM400
QAM4		X	No QAM4 in COM360
Note: COM400 chassis will support COM46 cards, however one COM51D is required to program QAM4.			

TRAINING AND SUPPORT

It is recommended that installation technicians have completed the COM3000 system and MFH2 training.

Primary support for all Vantiva products is provided by the distributor who sold the product.

The Vantiva website is a valuable resource for information.

https://www.vantiva.com/video-multi-client-solutions-documentation-library/

The website contains product documentation and software.

REQUIRED TOOLS

In addition to normal hand tools required for Coaxial and Ethernet installations, the technician will need the following tools:

DIRECTV Advanced Installation Meter (AIM)

Digital RF (QAM) signal level meter

Laptop computer

#10 Torx driver

All required personal protective equipment as required by OSHA and/or local requirements.

SITE SURVEY

It is recommended practice to complete a site survey before the installation.

COMPONENT ASSEMBLY

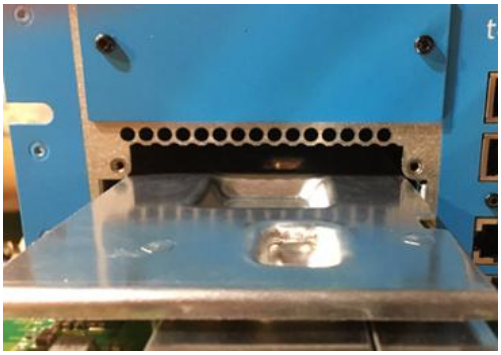
If you purchased an assembled system from your distributor, you may skip this section.

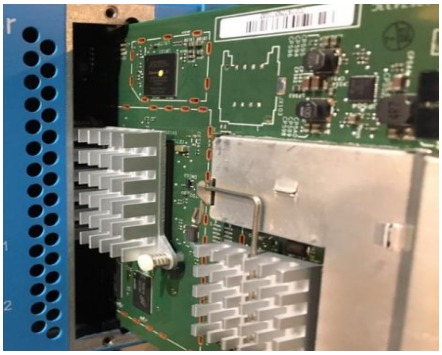
Carefully unpack and install the QAM4 and COM51D cards in the COM400/421 Chassis as shown below. Be sure to line up the cards with the guides in the chassis.

After inserting the COM51D card, finger tighten the two thumb screws to secure the card in the chassis.

QAM4 should mount in the lower QAM port of the chassis.

A #10 Torx driver is required to secure the QAM4 in the chassis.





SETTING UP MULTIPLE CHASSIS (COM400 ONLY)

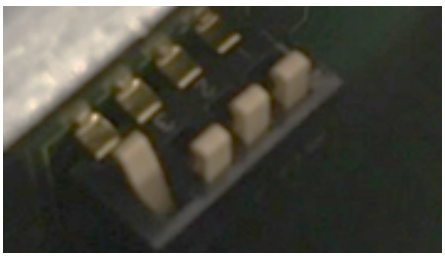
For multi-chassis COM400 installations, each chassis will need to be assigned a unique chassis ID.

COM421 are set to chassis one by default, there is no dipswitch as multiple 421 chassis are not recommended.

The COM400 chassis has a default setting as chassis one.

Chassis identification is configured via a dipswitch on the backplane circuit board.

To access the switch, you will need to remove the access door on the top panel of the COM400 chassis as shown below:



Facing the back, dipswitches are 1-4 from the right to the left as shown below:
Dipswitch numbers as shown below are added to the photo. They are not actually labeled.

The default IP address of each COM51D card in a system is determined by the chassis ID and slot number. The formula for determining this address is 192.168.3.[1 + (chassis ID X 16) + slot number]. Example for chassis one:
1 + (16*1) + 1 = 18 IP address of chassis one slot one is 192.168.3.18
The table below details COM400 chassis dipswitch settings and the corresponding IP address.

Chassis ID	Switch1	Switch 2	Switch 3	Switch4	Default IP
1	UP	DOWN	DOWN	DOWN	192.168.3.18
2	DOWN	UP	DOWN	DOWN	192.168.3.34
3	UP	UP	DOWN	DOWN	192.168.3.50
4	DOWN	DOWN	UP	DOWN	192.168.3.66
5	UP	DOWN	UP	DOWN	192.168.3.82
6	DOWN	UP	UP	DOWN	192.168.3.98

INSTALLATION

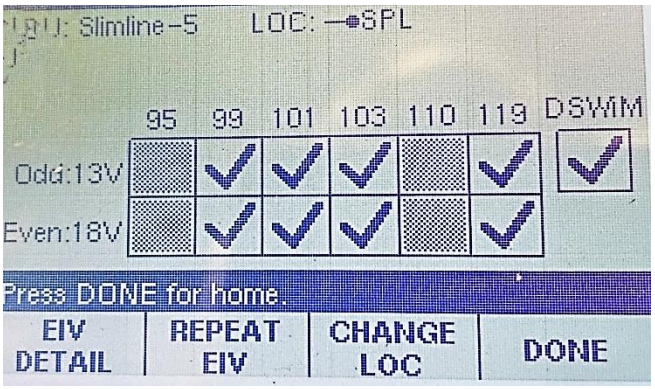
SATELLITE SIGNAL INPUT

COM51D Card requires two inputs from a digital SWiM 30 as part of a DirecTV approved MFH2 trunk. Input signal levels must be between -30 and -45dBm with SnR 11 or higher. It is recommended that signal levels be attenuated to a level between -30 - 35dBm. An approved attenuation device is a DirecTV directional coupler. If an attenuator is not installed between the SWiM and the COM51D, then SWiM communication errors will occur.

All signals should be verified with a DirecTV Advanced Installation Meter EIV+ test.

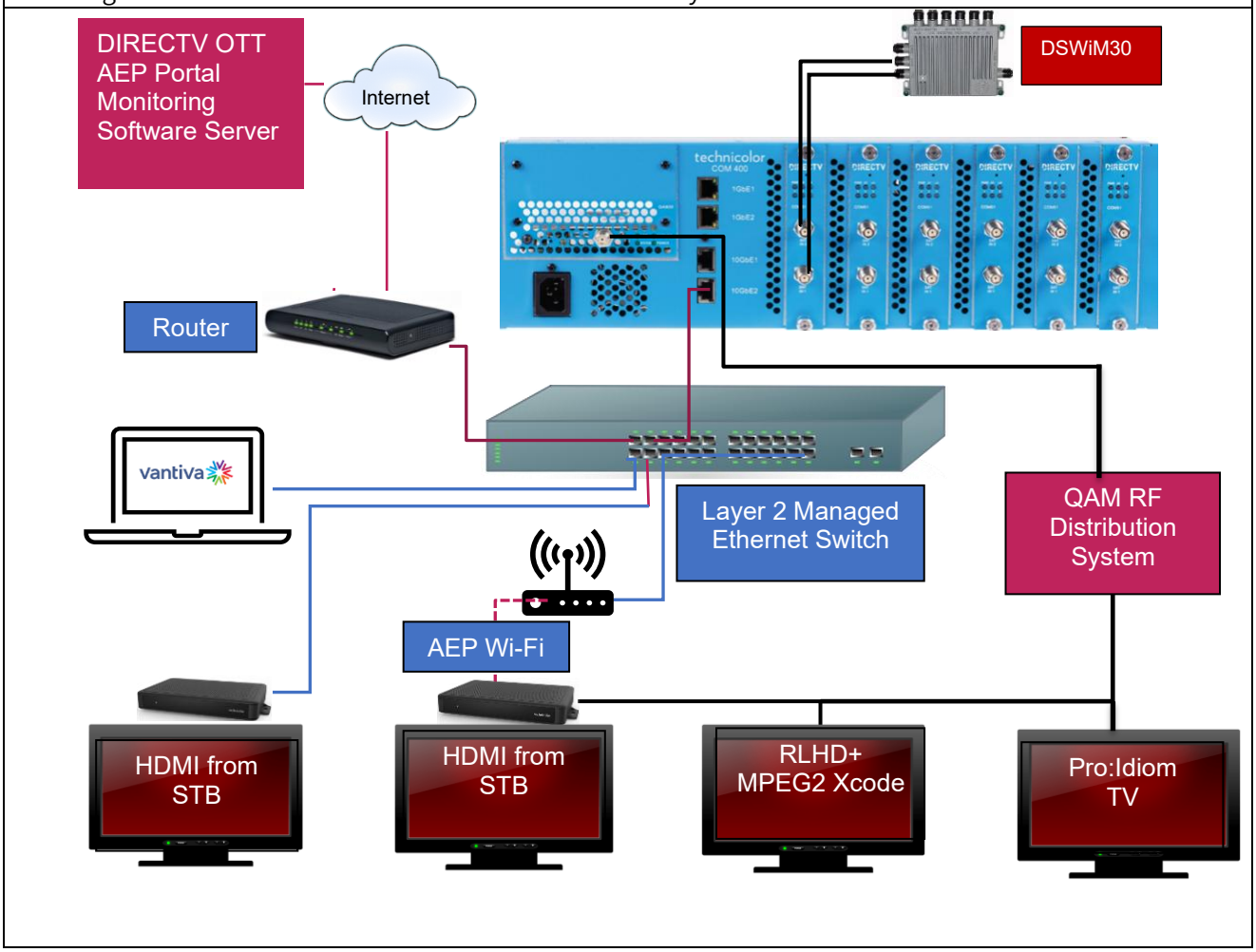
AIM Meter

Positive EIV+ Results



CONNECTIVITY OVERVIEW DIAGRAM

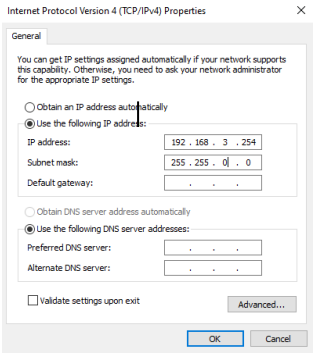
The diagram below illustrates connections to a COM3000 system.



PC CONFIGURATION FOR COM3000 INTERFACE

The COM system is configured via a laptop computer connected to the system via an ethernet cable. Configuration can be accessed via any of the ethernet ports on the front of the COM400 chassis.

Configure the laptop with a fixed network address:
IP 192.168.3.254 Below is an example of Windows 10 IPv4 configuration.
Sub Net Mask 255.255.0.0



SYSTEM POWER UP

Once assembled and connected to RF distribution power up the COM3000 by plugging in the power cord. There is no external power switch.
System startup LED Behavior

Definitions	
Laptop Computer	Required for COM configuration.
Router	Router provides LAN connectivity to all devices. Issues DHCP IP address all devices on the network.
MPEG2-4 Transcoder	Transcoders change signal from native DIRECTV MPEG4 to MPEG2 for use in RLHD+ systems.
NTSC transcoder	NTSC devices ingest HD digital streams and output 6MHz analog channels.
Encoders	Encoders are used for local channel insertion (LCI). They ingest A/V from a variety of sources and output ethernet to the QAM or RF to be combined with other video sources.
Pro:Idiom TVs	Pro:Idiom enabled TVs will decrypt Pro:Idiom encrypted HD signals from the COM3000
RLHD+	DIRECTV authorizes some institutions to use an unencrypted signal. The "Clear HD" signal is MPEG4. Not all consumer TVs will tune MPEG4 video in which case a transcoder, or set top box is required

The COM51D card has 6 LEDs on the front panel the top three are:

PWR – Displays solid green when the card is powered.

Activity – Flashes green when there is Ethernet activity between the chassis and card.

Link – Displays solid green indicating the card has Ethernet link to the chassis backplane.

Upon powering up the COM51D cards LEDs will go through a series of flashing indicating boot up.

LED 1	LED 2	LED 3	Stage	Note
OFF	OFF	OFF	Power Off	Normal Boot
ON	OFF	OFF	Power On	Normal Boot
OFF	ON	OFF	Checking imageA signature	Normal Boot
ON	ON	OFF	Checking imageB signature	Normal Boot
OFF	OFF	ON	Booting ImageA	Normal Boot
ON	OFF	ON	Booting ImageB	Normal Boot
OFF	ON	ON	Failsafe downloading image. Card will attempt TFTP download from 192.168.1.254. COM51D.bin. Using external TFTP software.	Fail Safe Mode
FLASH	OFF	OFF	Failsafe image download failed, reboot after 10 seconds	FATAL ERROR
OFF	FLASH	OFF	Failsafe image invalid, reboot after 10 seconds	FATAL ERROR
OFF	OFF	FLASH	Programming failsafe image into flash failed	FATAL ERROR
ON	ON	ON	Fail safe flash programming	Fail Safe Mode

Once the COM51D has successfully booted the LEDs will provide operational information as shown below.

LED1	LED 2	LED 3	Meaning
Off	Off	Off	No Power
ON	OFF	OFF	SWM error
ON	OFF	FLASH	SWM error while APG acquisition
ON	OFF	ON	SWM error
ON	ON	OFF	HW initialization (FPGA loading)
ON	ON	FLASH	APG acquisition
ON	ON	ON	Running
ON	FLASH	OFF	Software upgrading
ON	FLASH	ON	Software upgrading
ON	FLASH	FLASH	Software upgrading (flashing at same time)
ON	FLASH	FLASH	Software upgrade failure (alternate flash)

Under normal operations all three LEDs are solid green:
LED1: ON if all requested tuners are locked.
LED2: OFF=SWM error; ON=Running; FLASH=SW upgrading
LED3: OFF=FPGA loading; ON=FPGA loaded; FLASH=APG acquisition LED 1 indicating all requested tuners are locked.

COM400 CHASSIS

The COM400 Chassis houses power and connects the COM51D to QAM4 and provides ethernet connections. It has an internal layer two managed ethernet switch. The default settings are adequate for most installations.
If the system is a QAM based RF output, skip this section, and continue to COM51D configurations.

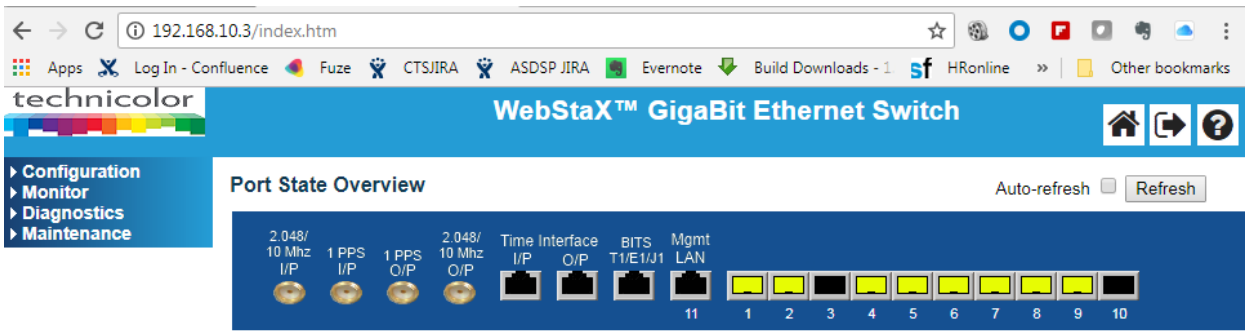
ACCESSING THE COM400 CHASSIS

To determine the IP address of the COM400 user interface use the following formula:
192.168.10. (chassis id +1)
For most single chassis configurations this would equate to 192.168.10.2
Login is admin, leave Password field blank.

PORT STATE OVERVIEW

The first page of the interface displays the Port State overview.
Ports 1-11 are utilized in the COM400 chassis and are displayed as lit when connection to each port is made.

In the example below all ports are connected except #7, the top QAM port.



Port #	COM400 Connection	Port #	COM400 Connection
1	COM51D slot 6	7	QAM Port 2 (TOP)
2	COM51D slot 5	8	QAM Port 1 (Bottom)
3	COM51D slot 4	9	Internal unmanaged Ethernet switch to both 1 GIG ports
4	COM51D slot 3	10	Top 10 GIG
5	COM51D slot 2	11	Bottom 10 GIG
6	COM51D slot 1		

Note: Both 1 gigabit ports are connected to the same port on the layer two switch via an unmanaged Ethernet switch. All multicast traffic requested by one port will be present on the other. For this reason, it is recommended that the one gigabit ports not be used for multicast traffic.

COM400 SOFTWARE UPDATE

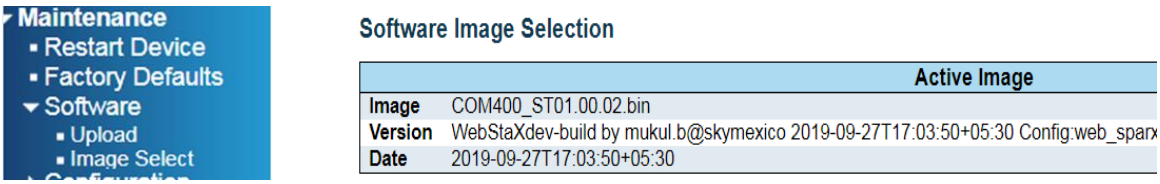
COM400 should always be running the latest software available. Software is available at the Vantiva website:

https://www.vantiva.com/video-multi-client-solutions-documentation-library/

To determine the current software running on the COM400 navigate to:

Maintenance > Software > Image Select

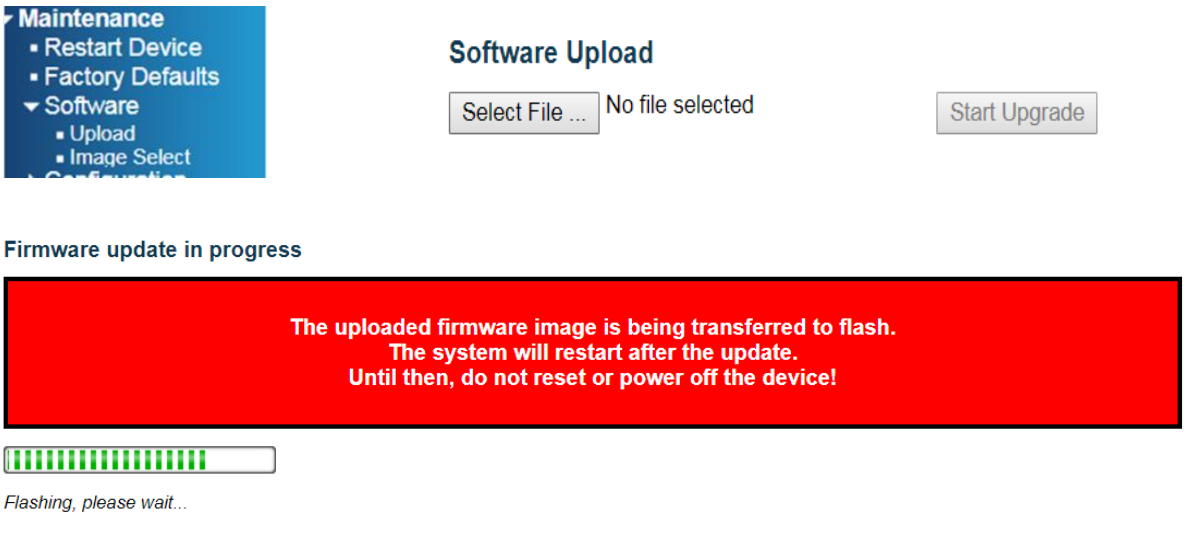
As shown below the software version is displayed on the top line labeled Image.



To update COM400 software navigate to Maintenance > Software > Upload.

Click Select File and navigate to the folder in which the software is saved. Upload to the COM400.

Then select Start Upgrade as shown below.



When software upgrade is completed reset the system to factory defaults:

Navigate to maintenance > Factory Defaults click Yes.

COM400 SETTINGS FOR MULTICAST VIDEO

By default, the COM400 is set to provide a stable environment, however, if you are using the system to output IP multicast video, a couple simple settings can be implemented for a more robust solution. These steps have been tested and proven using a variety of managed Ethernet switches from well-known manufacturers. No other advanced or further setup should be necessary for the COM400 and COM51D cards to work properly in a Multicast environment.

If the managed Ethernet switch provider requires other specific settings that you have selected, please continue with caution and test in a lab environment before installation on a live site.

The recommended setting / actions are:

Verify the COM400 is running current software

Verify IGMP Snooping is enabled

Connect your managed Ethernet switch to one of the 10GbE ports (they can negotiate to 1GbE)

Enable Router Port for the port connected to the managed Ethernet switch

Keep it simple. Don't depend on advanced settings or modes

Persistently save your settings

IGMP SETTINGS

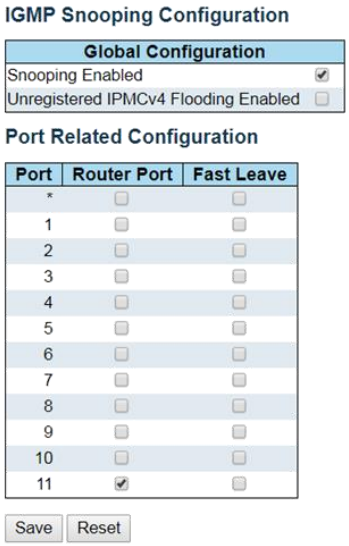
From the main menu navigate to:

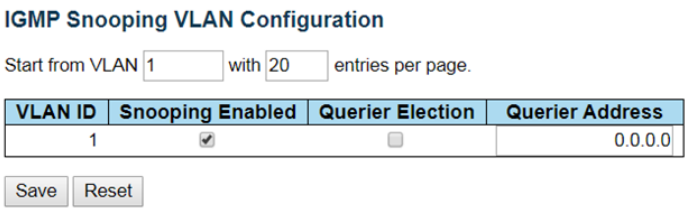
Configuration > IMPC > IGMP snooping > Basic Configuration

Verify **Snooping Enabled** is checked. If not, check the box and then click **Save.**

Fast Leave should be unchecked unless a STB is connected directly to the COM400.

Select **Router Port** for the port connected to your core switch. This will allow all Multicast traffic through the port. The external switch can then manage all IGMP functions.





From the IGMP snooping menu navigate to VLAN Configuration. Verify Snooping is enabled. If not, check the box and then click Save.

Querier Election should be off if you are using a managed external Ethernet switch.

PORT SETTINGS

From the main menu navigate to Configuration >Ports. : This screen provided information for the state and settings of each port on the switch.

Verify that the port connected displays a green link light as shown in the figure below.

Port Configuration

Port	Link	Speed		Adv Duplex		Adv speed						Flow Control			PFC		Maximum
		Current	Configured	Fdx	Hdx	10M	100M	1G	2.5G	5G	10G	Enable	Curr Rx	Curr Tx	Enable	Priority	Frame Size
*			<>	☑	☑	☑	☑	☑	☐	☐	☐	☑			☐	0-7	10240
1	●	1Gfdx	Auto	☑	☑	☑	☑	☑	☐	☐	☐	☑	✗	✗	☐	0-7	10240
2	●	1Gfdx	Auto	☑	☑	☑	☑	☑	☐	☐	☐	☑	✗	✗	☐	0-7	10240
3	●	1Gfdx	Auto	☑	☑	☑	☑	☑	☐	☐	☐	☑	✗	✗	☐	0-7	10240
4	●	1Gfdx	Auto	☑	☑	☑	☑	☑	☐	☐	☐	☑	✗	✗	☐	0-7	10240
5	●	1Gfdx	Auto	☑	☑	☑	☑	☑	☐	☐	☐	☑	✗	✗	☐	0-7	10240
6	●	1Gfdx	Auto	☑	☑	☑	☑	☑	☐	☐	☐	☑	✗	✗	☐	0-7	10240
7	●	Down	Auto	☑	☑	☐	☑	☑	☑	☐	☐	☑	✗	✗	☐	0-7	10240
8	●	2.5Gfdx	Auto	☑	☑	☐	☑	☑	☑	☐	☐	☑	✗	✗	☐	0-7	10240
9	●	2.5Gfdx	2.5Gbps FDX	☐	☐	☐	☐	☐	☐	☐	☐		?		☐	0-7	10240
10	●	Down	Auto	☑	☑	☐	☑	☑	☑	☑	☑	☑	✗	✗	☐	0-7	10240
11	●	100fdx	Auto	☑	☑	☐	☑	☑	☐	☐	☐	☑	✗	✗	☐	0-7	1518

This screen provides information for the state and settings of each port on the switch.

Verify that the port connected displays a green link light.

Flow Control

Some switches will use a flow control that allows the switch to request a slower data rate if the buffers start to fill. Checking the flow control box will allow the COM400 to respond to these requests. We recommend enabling flow control on all ports.

Advertised Port Speed

The 10G ports "advertise speeds between 100M and 10G. If your switch is having problems auto negotiating the connection, you can shut off advertised speeds above the rated bandwidth of your switch port.

MTU

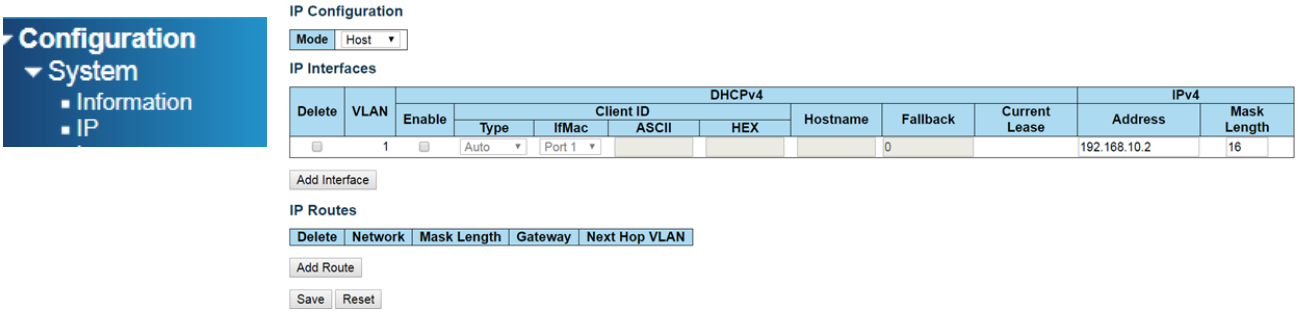
COM51D maximum transmission units (MTU) is 1500. Some external switches may prefer the COM400 switch settings to be set to a matching MTU (Frame Size) setting. The lowest MTU setting available in the COM400 switch is 1580 as shown below on port eleven.

CHANGING THE CHASSIS MANAGEMENT IP ADDRESS (OPTIONAL)

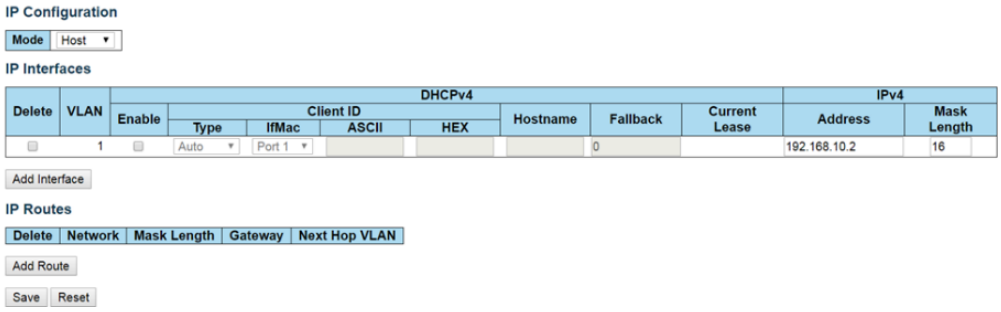
Making changes in this area can affect system communication. Proceed with caution.

Management IP address should only be changed when it is necessary to manage the entire system from a different subnet. The IP address of all COM51D cards will need to be changed to the same subnet as the chassis. Change the COM51D card IP address and add an alternate IP address for the QAM before proceeding.

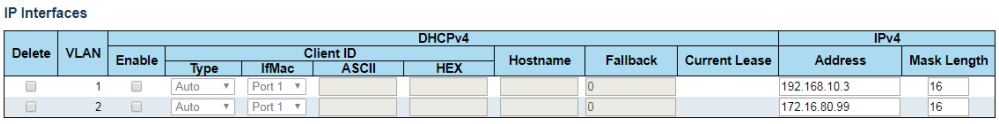
To change the IP address used to access the COM400 chassis navigate to Configuration->System->IP, as shown below:



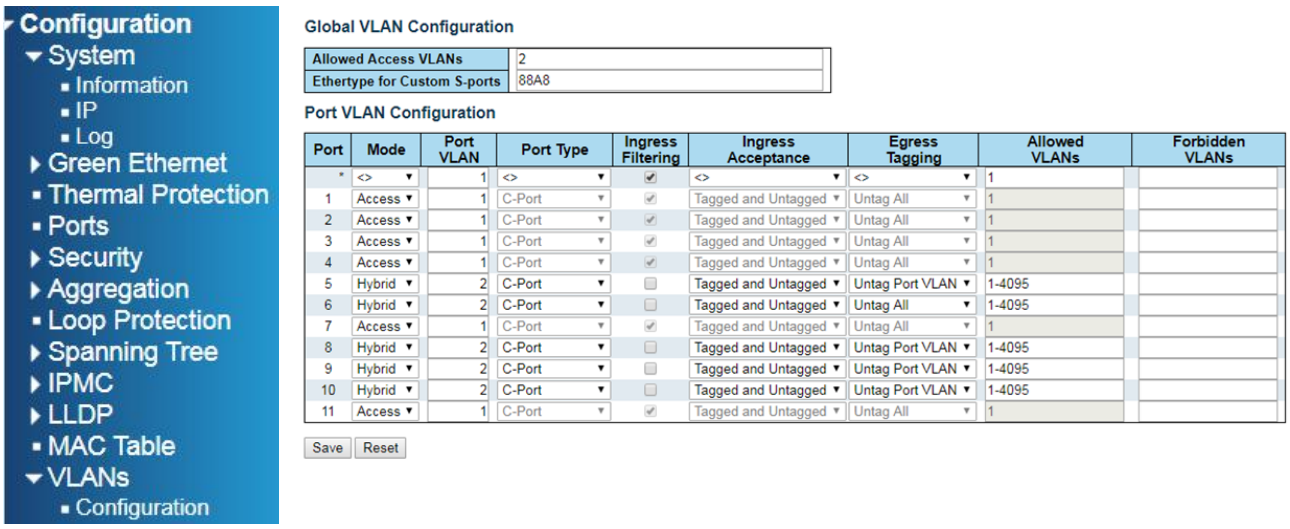
Click on **Add Interface**
Set the following:
VLAN = 2
Fallback =1
IP address = new management IP address (for this example we will use 10.0.0.251)
Mask Length = 16
Click on **Save**



Enable both interfaces



Next navigate to:
Configuration->VLANs->Configuration



To access the chassis and the associated COM cards and QAM from the same port all connected ports will need to be set to the same VLAN.

Set Allowed Access VLANs to two

Set each port to be used on VLAN2 to the following settings:

Mode = Hybrid

Port VLAN =2

Once the port is changed you will no longer be able to access the COM400 on the default IP address from that port. It is recommended to leave one port on VLAN1 so the chassis can be accessed with the default IP.

In the example shown, both one gigabit ports (port 9) and the top ten gigabit port (port 10) will use the new VLAN IP assignment.

Connecting directly to the bottom ten gigabit port (port 11) will allow connection with the default IP address.

Ports 5, 6, and 8 have been set to the new VLAN settings. This sets COM51D cards in slot one and two and the QAM to VLAN2

To verify the change has taken effect connect your PC to a VLAN two port.

Change the IP settings in your PC's ethernet connection to the correct subnet to access the new IP address. Enter the new IP address into the browser and verify you connect to the COM400 and the COM51D cards. (COM51D cards will need static IPs assigned to match the new subnet)

Change your IP setting back to match the default 192.168.3.XX subnet 255.255.0.0. Connect to a

VLAN one port and verify you can access the COM400 at the default 192.168.10.2 address.

If you encounter problems, reboot the COM400 chassis and all configurations will return to default. Once operations are verified, save the configuration to running config.

SAVE CHANGES TO RUNNING CONFIGURATION

Once you have verified all the setting changes are correct, save the settings to running configuration. Failure to complete this step will result in all new settings being lost upon power cycle.

Navigate to: Maintenance > Configuration > Save startup-config.

Click Save Configuration

COM421 CHASSIS

The COM421 chassis is designed for installations with lower channel counts.

The COM421 chassis supports two COM51D and a QAM4.

Unlike the COM400 chassis there are no dipswitches for chassis identification, COM51Ds and QAM4 will report as if they are in chassis one.

Note: As of September 2025 it is not recommended to use COM421 in IP Multicast systems

Installations requiring more than 2 COM51D should use the COM400.

There is no internal network switch. Internal IGMP is not necessary with only two COM51D cards.

The backplane and Ethernet ports are one gigabit.

The COM421 chassis supports both management of the COM51D, and QAM.

Power is supplied via the included external power supply

QAM4

QAM4 INTERFACE

The QAM tab of the COM51D user interface can be accessed in one of two ways:

From the Overview Page QAM summary click on the QAM IP address hyperlink

QAM Summary

Chassis	IP	Alt IP	Base Ch 1	Base Ch 2	Base Ch 3
1	192.168.6.2	225.100.0.0	23	27	31

From the QAM tab of the COM51D user interface enter the IP address of the QAM in the field and click Submit

DIRECTV COM3000 vantiva

Commands: Overview, Discover, PairingInfo, TuneAll, Help
Display, SysInfo, HealthInfo, EPG, Troute, Syslog, Lock, ATSC, NTSC, 401, Android, QAM

EdgeQAM Modulator

Which EdgeQam (192.168.6.1+chassis): 192.168.6.2
Submit | qamLog | qamHelp

The first step is setting up the COM3000 system is to assign channel outputs to the QAM Modulator. This may have been done in advance by the distributor; however, it is good practice to check and know how to change if necessary.

The QAM carriers can be assigned in one of two 128 RF channel groups.

Low group channels 1-128

High Group channels 26-158

If you need to utilize channels above 128 you must have all QAM carriers at or above 26

Channel outputs are set using the three boxes in the control section as shown below.

Control

chassisId = 1, hwVersion = 0.0, swVersion = 1.2.0, tempC = 39
MAC = 80:c6:ab:c0:02:0f, licenseCount = 48

frequencies: Index=-1 Freq=23 Count=48 //freq=0 to disable

The three boxes at the bottom of the control screen are used to reference the following:

Index — Sets the QAM index referenced in the first column of the QAM table. By default, the field is populated with -1. As a safety measure you must delete the -1 and enter the QAM Index.

Freq — Sets the QAM carrier index to be assigned to the QAM referenced in the first box.

Count — Sets the number of QAMs to be set in sequential order.

Index=1 Freq=23 Count=48 will set all the licensed QAM outputs sequentially, starting at Ch 23

Setting the Index to a specific QAM index and the count to one will change the output carrier to that channel.

Index=10 Freq=40 Count=1 will set the QAM index carrier ten to output Ch 40

Changing the count will set output carriers in sequential order starting with the Index specified.

Index=10 Freq=40 Count=5 will set all the QAM index carrier ten to output Ch 40, index 11 to 41, index 12 to 42, etc.

Note: Index one must be set to 23 for Advanced Entertainment Platform systems.

The QAM4 destination UDP port should be set to:

Port = QAM Channel * 16 + QAM Sub Channel

When completed the QAM will display the QAM Carrier Channel in the third column.

To review:

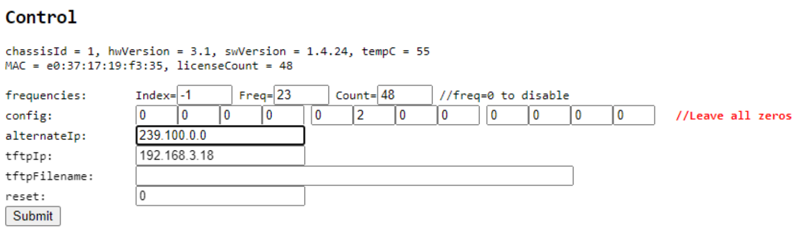
192.168.6.2:17 = 23-1

192.168.6.2:18 = 23-2

192.168.6.2:97 = 28-1

	PortBase	Chan	-1	-2	-3
Qam1	16	23	5.4	4.6	4.6
Qam2	32	24	6.4	5.9	5.3
Qam3	48	25	4.9	7.0	6.2
Qam4	64	26	12.4	12.0	12.2
Qam5	80	27	5.4	5.3	4.6
Qam6	96	28	6.7	8.1	8.1

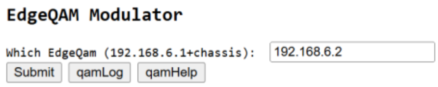
QAM4 ALTERNATE IP ADDRESS



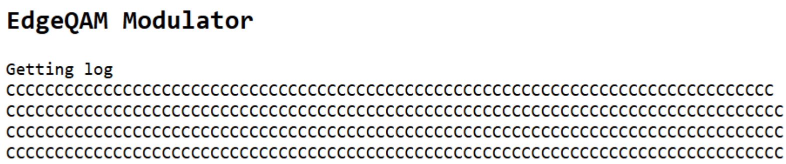
If an alternate IP address for the QAM4 is required, it can be entered in the alternateIp: field. In this example a multicast IP has been entered to facilitate a simultaneous output of both QAM and IP multicast.

QAM LOG

To access the QAM4 log click the QAMLog button on the QAM interface



It may be necessary to click the QAMLog button several times to get accurate information, especially on newly set up systems. A list of capital Cs indicates that all QAMs are running as expected.



Listed below are QAM log entries

LOG entry	Definition	Cause
A	ARP response	
c##	continuity counter error / Missing packets	A lower case 'c' followed by two numbers indicates a continuity counter error which indicates missing packets. Add one to the first number to determine the QAM carrier. Add one to the second number to determine the program number. For example, 'c12' indicates that the second QAM carrier, third program has missing packets.

P##	PCR time code discontinuity	PCRs are delayed 't##' where the first # reports the QAM carrier and the second # reports the number of eleven ms units that the PCR was late.

		Many errors often indicate that two different video sources are being sent to the same UDP port.
PMT##	Channel change detected	Common when using Mediatune
BAD#	Unexpected packets received	Disconnect networked devices
Overflow#	Indicates received data more than 38.8 Mbps	
P##	PCR time continuity	A 'P##' indicates a with the two numbers meaning the same as above. Many errors often indicate two different video sources are being sent to the same UDP port.

QAM4 SOFTWARE UPDATE

All Vantiva equipment should be running the latest software version. Software is available from your distributor or the Vantiva website:

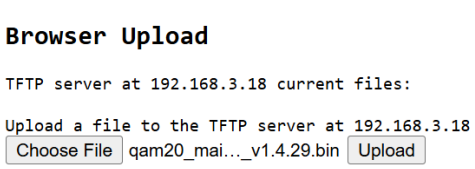
https://www.vantiva.com/connected-home/commercial-video-solutions/video-multi-client-solutions/

Software upgrade procedures for the QAM4 are below:

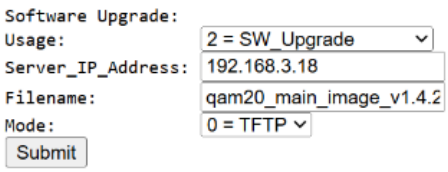
Upload

Download software file and in a folder on your PC.

Use the Pairing Info Browser Upload to locate the file and upload it to the COM51D.



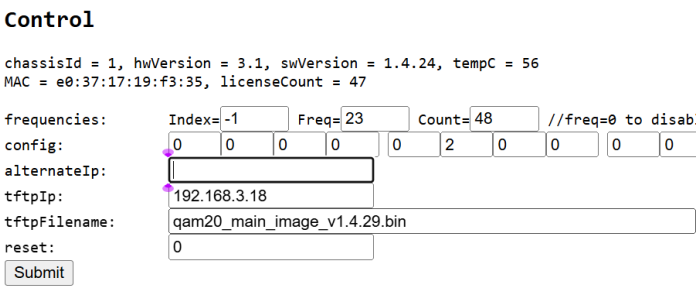
Software file will be displayed in the Filename field of the Software Upgrade section of the Pairing Info page. Copy the filename and note the server IP address.



Navigate to the QAM tab > Control section

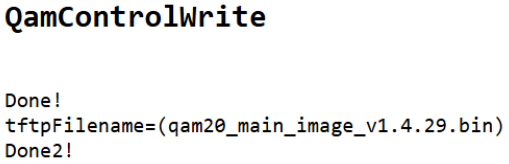
Paste the filename in the tftpFilename field.

Enter the IP address of the COM51D card being used.

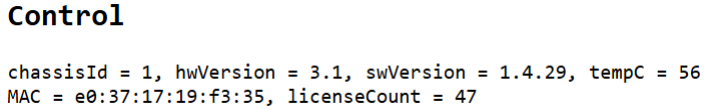


Click Submit

QAM4 reports software upgrade



New SW version is displayed in QAM>Control> swVersion field.



COM51D

COM51D WEBSERVER

Enter the IP address of the COM51D in an internet browser. IP address can be found in the table on page 6 of this manual. Typically, chassis one card one can be accessed at 192.168.3.18. Chrome is the recommended browser.

COM51D PASSWORD

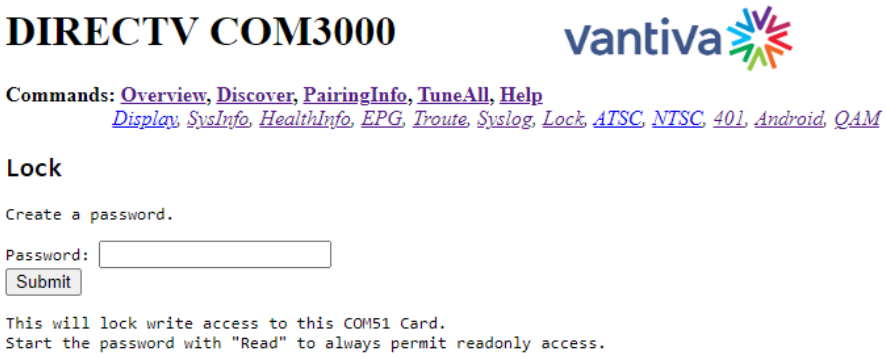
The default User Password is, "com3k".

CHANGING PASSWORD

Once the default password has been entered you can change the password via the Lock tab of the COM51D user.

To change the password, enter an alpha numeric text in the Password field and click submit. Note: no spaces in password.

Some circumstances require a blank COM51D password, such as Mediatune. To set a blank password leave the Password field blank and click on Submit.



COM51D LICENSING

TUNER LICENSING

The COM51D comes with all twenty-three video tuners enabled. Below material is reference for COM51s purchased prior to January 2024.

The COM51D card default setting enables eight tuners; additional tuners can be licensed in one tuner increments. This process should be completed during the order process. Tuner licensing is the responsibility of the Distributor providing the system. Additional tuners can be purchased post sale if a customer chooses to upgrade.

Tuner licensing count is displayed in the "Tuners" column of the COM51D SysInfo page.

The first number represents the number of licensed tuners, the second represents the number of SWiM frequency slots available.

DIRECTV COM3000

Commands: Overview, Discover, PairingInfo, TuneAll, Help
Display, SysInfo, HealthInfo, EPG, Troute, Syslog, Lo

Chassis	Slot	CardIP	EPG	MAC_Address	Tuners
1	1	192.168.3.18		b4:2a:0e:5a:40:44	23/23
1	2	192.168.4.21		60:3d:26:9f:3b:2a	23/23
1	3	192.168.3.20		ec:93:7d:42:30:62	18/15
1	4	192.168.3.21		10:c2:5a:4a:47:98	13/15
1	6	192.168.4.22		60:3d:26:9f:3b:0a	23/23

Slot	Tuner	Security	Channel	Mode	Major.Minor / IP:Port	Bitrate	SNR	Strength
	1	Pro:Idiom	100 CINE	QAM	62 . 1	1.9 Mbps	14	-18
	2	Pro:Idiom	100 CINE	QAM	62 . 2	2.0 Mbps	14	-18
	3	Pro:Idiom	100 CINE	QAM	62 . 3	1.9 Mbps	14	-19
	4	Pro:Idiom	100 CINE	QAM	63 . 1	1.9 Mbps	14	-19
	5	Pro:Idiom	100 CINE	QAM	63 . 2	2.0 Mbps	14	-20
	6	Pro:Idiom	100 CINE	QAM	63 . 3	1.9 Mbps	14	-19
	7	Pro:Idiom	100 CINE	QAM	64 . 1	1.9 Mbps	14	-19
	8	Pro:Idiom	100 CINE	QAM	64 . 2	1.9 Mbps	14	-19
	9	Pro:Idiom	100 CINE	QAM	64 . 3	0.0 Mbps	0	-125
	10	Pro:Idiom	100 CINE	QAM	65 . 1	0.0 Mbps	0	-125
	11	Pro:Idiom	100 CINE	QAM	65 . 2	0.0 Mbps	0	-125
1	12	Pro:Idiom	100 CINE	QAM	65 . 3	0.0 Mbps	0	-126
	13	Pro:Idiom	100 CINE	QAM	66 . 1	0.0 Mbps	0	-125
	14	Pro:Idiom	100 CINE	QAM	66 . 2	0.0 Mbps	0	-125
	15	Pro:Idiom	100 CINE	QAM	66 . 3	0.0 Mbps	0	-126
	16	Pro:Idiom	100 CINE	QAM	67 . 1	0.0 Mbps	0	-125
	17	Pro:Idiom	100 CINE	QAM	67 . 2	0.0 Mbps	0	-125

The COM51D Overview tab will highlight unlicensed tuner numbers in grey, and the bitrate, SNR, and Strength fields will be highlighted in red.

The final verification of licensing is in the COM51D Syslog. A COM51D exceeding the license count will display the following message in the Syslog:

```
user.err syslog: a: ***Need Tuner License File: tuners=8.
```

FEATURE LICENSES

The COM51D can be licensed for optional features. License files are created by your distributor and under normal circumstances will be installed on the COM51D prior to shipping.

Installed features are listed on the COM51D SYSINFO tab

Chassis	Slot	CardIP	EPG	MAC_Address	Tuners	Features
1	1	192.168.3.18	EPG	ec:93:7d:42:30:62	23/23	ClearHD MT HD StreamOut Clear_4k ClearGuide AEP Monitored mms=20
1	2	192.168.3.19		b4:2a:0e:5a:40:44	23/23	MT HD StreamOut ClearGuide Monitored

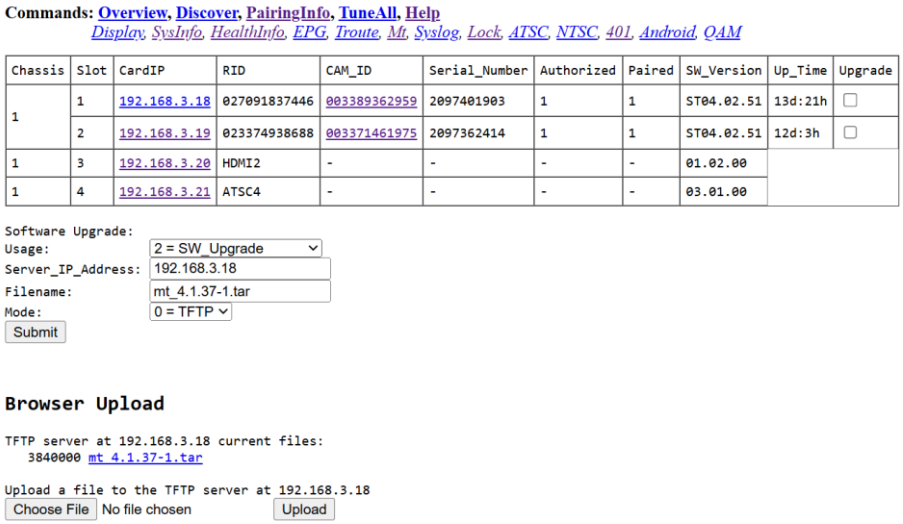
COM51D Feature Licenses

Feature	License Name	Function
IP	NoQAMCheck	If you are using a COM51D system in an IPTV system with no QAM or NTSC-8 the cards will need to be licensed for use by your distributor.
Clear HD	Clear_HD	Allows all channels to be in clear QAM (no Pro:Idiom)
Transcode	Transcode	Allows streaming to Transcoders using "Transcode" security setting
Manufacturer Index	keyIndex	Transcode manufacturer ID. 1= Video Propulsion; 2=Blonder-Tounge
Mediatune	MT	Licenses COM51D to run Mediatune software (includes 10 MMS)
Mediatune IP TVs	mms	Additional IPTVs for Mediatune MMS (Multicast Media Server)
Flextune	igmpTune	Licenses COM51D to run Flextune software (one COM51D card per system)
HD output	HD	Enables HD channels to be streamed. Enabled by default, except on COM46 FLEX
Stream out	StreamOut	Enables video to be streamed to any device. Enabled by default except COM46A and COM51A.

Loading a COM51D license file overwrites any existing license in the card. Any new license file must contain existing license features.

UPLOADING LICENSE FILES

License files are loaded onto the COM51D from the Pairing Info Screen



Commands: Overview, Discover, PairingInfo, TuneAll, Help
Display, SysInfo, HealthInfo, EPG, Troute, Mt, Syslog, Lock, ATSC, NTSC, 401, Android, QAM

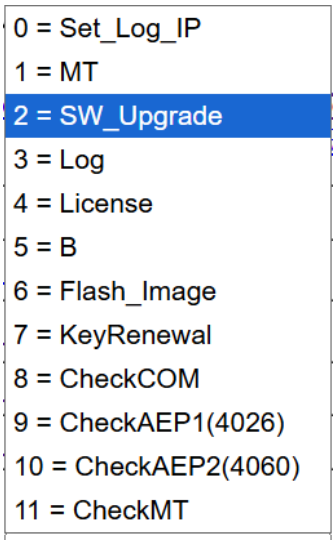
Chassis	Slot	CardIP	RID	CAM_ID	Serial_Number	Authorized	Paired	SW_Version	Up_Time	Upgrade
1	1	192.168.3.18	027091837446	003389362959	2097401903	1	1	ST04.02.51	13d:21h	☐
	2	192.168.3.19	023374938688	003371461975	2097362414	1	1	ST04.02.51	12d:3h	☐
1	3	192.168.3.20	HDMI2	-	-	-	-	01.02.00		
1	4	192.168.3.21	ATSC4	-	-	-	-	03.01.00		

Software Upgrade:
Usage: 2 = SW_Upgrade
Server_IP_Address: 192.168.3.18
Filename: mt_4.1.37-1.tar
Mode: 0 = TFTP
Submit

Browser Upload

TFTP server at 192.168.3.18 current files:
3840000 mt_4.1.37-1.tar

Upload a file to the TFTP server at 192.168.3.18
Choose File No file chosen Upload



Use the choose file button to navigate to the license file folder.

Click Upload

Check the upgrade box to specify which COM51D is being upgraded

Select usage from drop down box

Tuner and Feature license files will use 4=License

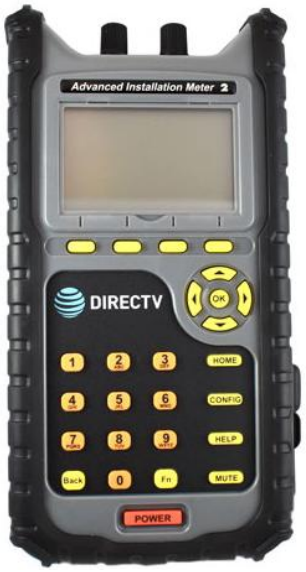
Click Submit

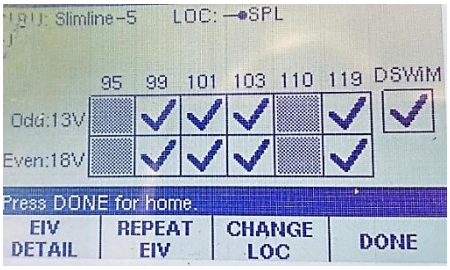
COM51D CONFIGURATION

SATELLITE INPUT

COM51D requires two SWiM connections from a digital SWIM30 set up to MFH2 specification.

Signal must be verified with a DIRECTV AIM meter.





SWiM input to COM51D should be attenuated by 9dB. Approved device is a DRE 9dB tap.

The COM51D Discover page will report SnR and Signal strength

Chassis	Slot	Tuner	QAM	Bitrate	Channel	SNR	Strength
		1	QAM 23-1	5.9 Mbps	206 ESPNHD	13	-35
		2	QAM 23-2	4.7 Mbps	209 ESPN2HD	13	-35

Signal levels should be 35dBm +/- 3dB

Minimum SnR should be greater than 10dB.

CONNECTION TO THE INTERNET

It is recommended best practice to always connect the COM chassis and thus the COM51D to the internet.

Internet connectivity in AEP systems is required per DIRECTV policy.

DIRECTV will access the system to push essential software updates to the AEP boxes.

COM51D DUAL NETWORK CAPABILITY

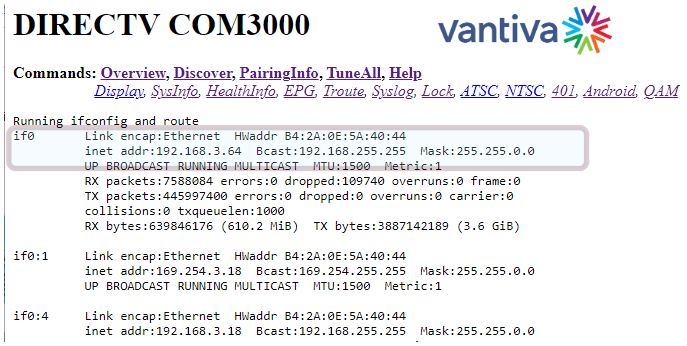
The COM51D has two network interfaces. The first interface is reserved for the default IP address assigned via chassis and slot position, or the IP address set as default in the COM51D settings.

Example, chassis one, slot one, will default to a 192.168.3.18 IP address.

The COM system will always be accessible at this address via a laptop configured for the correct subnet.

The second network interface is assigned and IP address via network DHCP.

The assigned DHCP address can be found in the COM51D IFCONFIG function. Navigate to the COM51D help icon then click on IFCONFIG.



When the COM51D comes online and connects to the DirecTV portal it will report MONITORED in the SYSINFO tab feature column

Features
ClearHD MT HD StreamOut Clear_4k ClearGuide AEP Monitored mms=20
MT HD StreamOut ClearGuide Monitored

PROGRAMMING ACTIVATION

Verify that the COM51D has been activated by DIRECTV.

Click on the CAMID hyperlink in the Pairing info tab to display activation status.

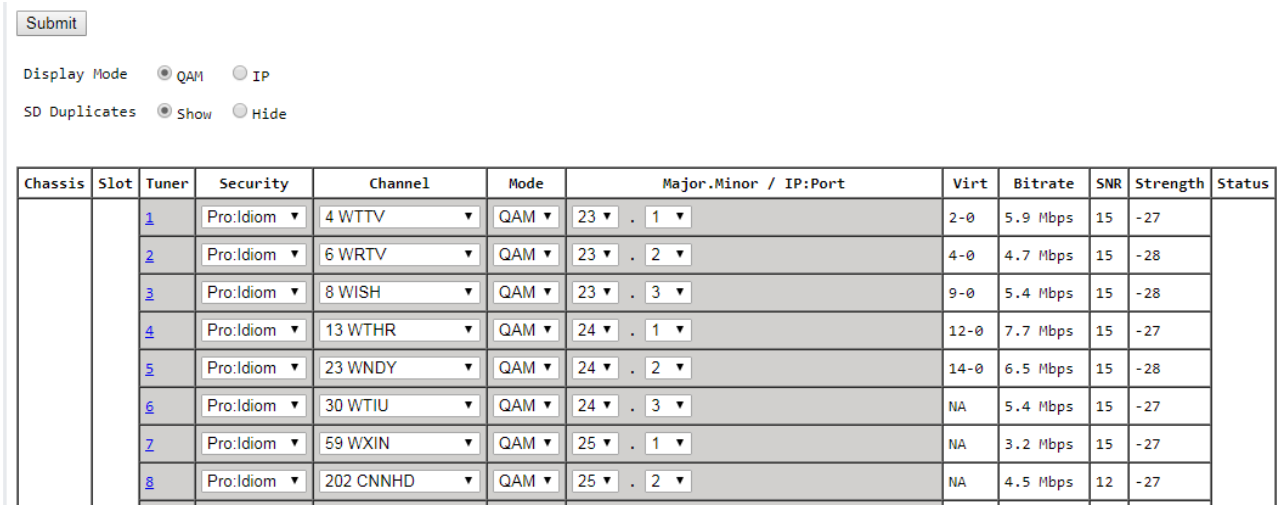
000 Card inserted = All tuned channels are activated

7XX errors are the result of activation problems

TUNER SETUP

Each active tuner in the COM51D must be assigned a DIRECTV program, Security mode, and a destination IP address / QAM output.

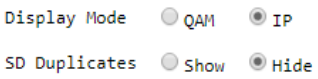
Channel programming is done from the COM51D Overview tab.



Chassis	Slot	Tuner	Security	Channel	Mode	Major.Minor / IP:Port	Virt	Bitrate	SNR	Strength	Status
		1	Pro:Idiom	4 WTTV	QAM	23 . 1	2-0	5.9 Mbps	15	-27	
		2	Pro:Idiom	6 WRTV	QAM	23 . 2	4-0	4.7 Mbps	15	-28	
		3	Pro:Idiom	8 WISH	QAM	23 . 3	9-0	5.4 Mbps	15	-28	
		4	Pro:Idiom	13 WTHR	QAM	24 . 1	12-0	7.7 Mbps	15	-27	
		5	Pro:Idiom	23 WNDY	QAM	24 . 2	14-0	6.5 Mbps	15	-28	
		6	Pro:Idiom	30 WTIU	QAM	24 . 3	NA	5.4 Mbps	15	-27	
		7	Pro:Idiom	59 WXIN	QAM	25 . 1	NA	3.2 Mbps	15	-27	
		8	Pro:Idiom	202 CNNHD	QAM	25 . 2	NA	4.5 Mbps	12	-27	

DISPLAY CONTROLS

Select preferred options for display of QAM or IP output configuration and Hide SD duplicate channels.



Clicking on the chassis of slot# will minimize the display for that chassis / slot

SLOT MINIMIZED

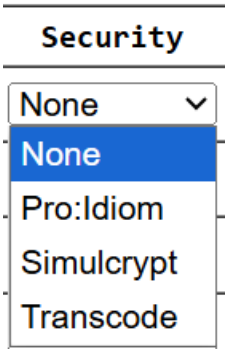
Chassis	Slot	Tuner	Security	Channel	Mode	Major.Minor / IP:Port	Virt	Bitrate	SNR	Strength	Status
	1	Click Slot number to expand data									

CHASSIS MINIMIZED

Chassis	Slot	Tuner	Security	Channel	Mode	Major.Minor / IP:Port	Virt	Bitrate	SNR	Strength	Status
1	Click Chassis number to expand data										

SECURITY MODE

Select the appropriate Security mode from the drop-down box.



None This setting removes all DRM and will only function on standard definition channels by default. Removal of Pro:Idiom Encryption from HD channels must be authorized by DIRECTV.

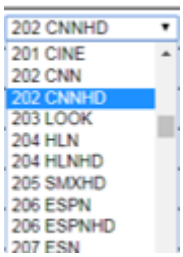
Pro:Idiom This is the standard setting for HD Pro:Idiom encrypted channels

Transcode Enables AES encryption to approved third-party devices. Required feature license

Simulcrypt Samsung Lynk (support provided by Samsung)

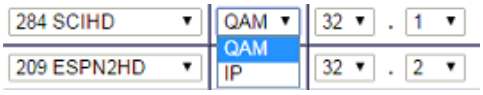
CHANNEL TUNE

Use the dropdown box in the Overview tab to select a DIRECTV program.



DISPLAY MODE

In QAM mode the interface will display the QAM major and minor numbers currently set in the QAM4 interface



IP mode displays a field to enter an IP address and port assignment.

Use IP mode to enter multicast IP addresses for IPTV systems. Recommended practice to use port number 5000 or greater.

Click Submit to save changes

OVERVIEW INFORMATION

Virt	The "virt" column will display the mapped PSIP channel assigned in the EPG.
Bitrate	Bitrate is reported from the QAM. If no QAM is installed, the display will show the bitrate of the COM51D tuner output.
SNR	SNR is a measurement of signal quality on the satellite input for the tuned channel. SNR will display a yellow warning if the signal to noise is between 7 and 10 and a red warning when less than 7.
Strength	Strength is a measurement of the satellite signal strength for the tuned channels in dBm. Strength read between -30 and -45dBm.

SIMULTAINOUS QAM AND MULTICAST OUTPUT

The COM3000 system is capable of outputting both IP and QAM signals simultaneously. This process requires a specific multicast address range, and an alternate IP address set in the QAM.

For unicast traffic, the QAM4 destination UDP port formula is "Port = QAM Channel * 16 + QAM Sub Channel". For multicast traffic, the destination UDP port should be 5000 or higher. Then the 3rd and 4th octets of the multicast address define the virtual destination port via the formula "3rd_octet * 256 + 4th_octet".

The COM3000 QAM4 has a much larger capacity, and the port designations extend beyond the limits of an IP address fourth octet.

To fully utilize the 48 QAM capacity of a QAM4 the port numbers for QAM Index 16 and above must be converted to use both the 3rd and 4th octet of the multicast IP address.

There is a formula to accomplish this: Port # / 256 rounded down to whole number = 3rd octet

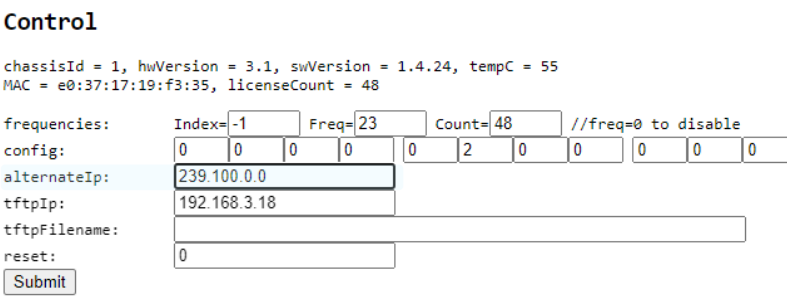
Port # - Third Octet value * 256

Assuming you were using 239.100.X.X as your Multicast IP address range, the address for port 257 would be: 239.100.1.1.

EXAMPLE:

Port #	/256 = 3rd octet	Port # -third octet*256
257	257/256= 1.003 (ROUND DOWN) =1	257 –(256*1) = 1
257	1	1

Set the Alternate IP field of the QAM4 to 239.100.0.0



The table below details the 3rd and 4th octets for all QAM ports assuming three channels per QAM.

QAM Port / Multicast IP Assignments

QAM Index	Port #	Third octet	Fourth octet
1	17	0	17
	18	0	18
	19	0	19
2	33	0	33
	34	0	34
	35	0	35
3	49	0	49
	50	0	50
	51	0	51
4	65	0	65
	66	0	66
	67	0	67
5	81	0	81
	82	0	82
	83	0	83
6	97	0	97
	98	0	98
	99	0	99
7	113	0	113
	114	0	114
	115	0	115
8	129	0	129
	130	0	130
	131	0	131
9	145	0	145
	146	0	146
	147	0	147
10	161	0	161
	162	0	162
	163	0	163
11	177	0	177
	178	0	178
	179	0	179
12	193	0	193
	194	0	194
	195	0	195
13	209	0	209
	210	0	210
	211	0	211
14	225	0	225
	226	0	226
	227	0	227
15	241	0	241
	242	0	242
	243	0	243
16	257	1	1
	258	1	2
	259	1	3

QAM Index	Port #	Third octet	Fourth octet
17	273	1	17
	274	1	18
	275	1	19
18	289	1	33
	290	1	34
	291	1	35
19	305	1	49
	306	1	50
	307	1	51
20	321	1	65
	322	1	66
	323	1	67
21	337	1	81
	338	1	82
	339	1	83
22	353	1	97
	354	1	98
	355	1	99
23	369	1	113
	370	1	114
	371	1	115
24	385	1	129
	386	1	130
	387	1	131
25	401	1	145
	402	1	146
	403	1	147
26	417	1	161
	418	1	162
	419	1	163
27	433	1	177
	434	1	178
	435	1	179
28	449	1	193
	450	1	194
	451	1	195
29	465	1	209
	466	1	210
	467	1	211
30	481	1	225
	482	1	226
	483	1	227
31	497	1	241
	498	1	242
	499	1	243
32	513	2	1
	514	2	2
	515	2	3

QAM Index	Port #	Third octet	Fourth octet
33	529	2	17
	530	2	18
	531	2	19
34	545	2	33
	546	2	34
	547	2	35
35	561	2	49
	562	2	50
	563	2	51
36	577	2	65
	578	2	66
	579	2	67
37	593	2	81
	594	2	82
	595	2	83
38	609	2	97
	610	2	98
	611	2	99
39	625	2	113
	626	2	114
	627	2	115
40	641	2	129
	642	2	130
	643	2	131
41	657	2	145
	658	2	146
	659	2	147
42	673	2	161
	674	2	162
	675	2	163
43	689	2	177
	690	2	178
	691	2	179
44	705	2	193
	706	2	194
	707	2	195
45	721	2	209
	722	2	210
	723	2	211
46	737	2	225
	738	2	226
	739	2	227
47	753	2	241
	754	2	242
	755	2	243
48	769	3	1
	770	3	2
	771	3	3

TUNE ALL

Once you have completed all the channel programming a text form of the tuning information will be available in the COM51D "Tune All" tab. This text field should be saved as a backup configuration.

Changes to the COM51D configuration can be done via the Tuneall file. Recommended practice is to copy and paste the file into a text editor, retaining the original information

The text in the tuning table requires the following format.

Chassis-Slot-Tuner	IP_Address:Port#	Major-Minor_Number	Security Mode 0=Clear 1=Pro:Idiom 3=Transcode
1-1-1	192.168.6.2:17	206-65535	-1

Tune Table	Current Tuning Table 1-1-1, 192.168.6.2:17, 3-65535-1; 1-1-2, 192.168.6.2:18, 10-65535-1; 1-1-3, 192.168.6.2:19, 29-65535-1; 1-1-4, 192.168.6.2:33, 6-65535-1; 1-1-5, 192.168.6.2:34, 17-65535-1; 1-1-6, 192.168.6.2:35, 259-65535-1; 1-1-7, 192.168.6.2:39, 209-65535-1; 1-1-8, 192.168.6.2:40, 276-65535-1;

DISCOVER

Most configurations on the COM3000 system can be done via the Overview page previously discussed. However, there is redundant information in the Discover page and links to advanced edit pages for feature configurations and troubleshooting.

The COM51D card issues a discovery call for all Vantiva cards (COM51D, COM46, ATSC4, HDMI2, QAM4) in the system and populates a table with basic information on current tuning parameters and RF signal levels.

Once this information is complete the Discover Web Page is displayed.

CHANNEL TUNE

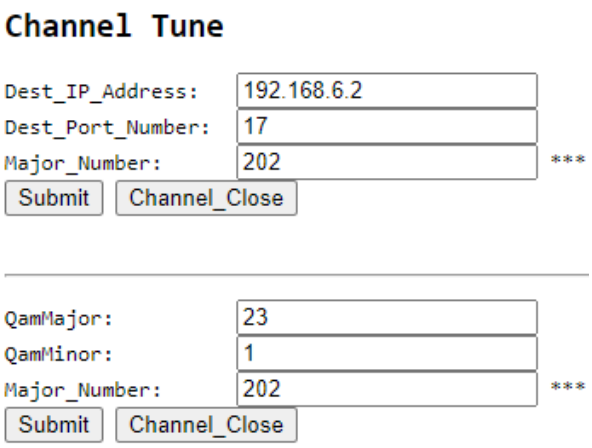
The channel tune is accessed either by clicking on the tuner number from the COM51D Overview page or by clicking on the DIRECTV channel number from the Discover screen.

This page permits two separate ways of tuning DIRECTV channels with Pro:Idiom encryption.

Specifies the destination IP address and port along with the DIRECTV channel number.

Allows entry of a QAM channel, sub-channel, and DIRECTV channel number. This is redundant to the channel tuning on the Overview screen.

Channels entered in this screen will tune to HD programming. This can be helpful when tuning local channels not easily identified as High Definition.



ADVANCED EDIT

To access the Advanced Edit section, click the advanced edit hyperlink at the bottom of the Channel tune screen.

There are multiple settings and information available in this section.

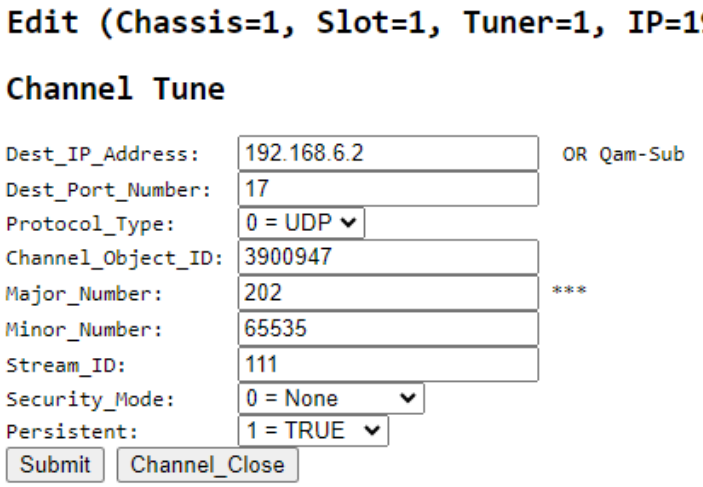
Many of the configurations in the advanced edit page are redundant to settings on the Overview page of the COM51D UI.

A detailed description of each advanced tuning field on the Advanced Edit page follows:

CHANNEL TUNE

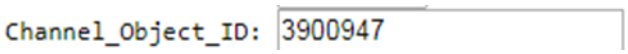
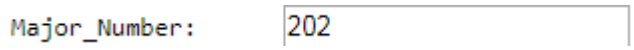
The Advanced Tune page can be used to change the main tuning parameters of a channel.

Additional parameters can be accessed by clicking the Advanced Edit hyperlink at the bottom of the Basic Tune screen, which navigates to the Advanced Tune screen.



Information identifying the chassis / slot / tuner and card IP address currently being addressed is displayed at the top of the page below the command links.

Chassis, Slot, Tuner	This value shows the Chassis number of the COM400, the COM400 slot and the COM51D tuner that holds the COM51D card you are currently tuning.
IP	This field shows the COM51D IP address.
Dest_IP_Address and Port #	This field allows manual entry of the IP address of the device you wish to stream video content to (e.g., an edge QAM). COM51D will stream to any valid unicast or multicast address.

Protocol_Type	This field is used to control whether the COM51D streams the data in UDP or RTP packet structures. The default value is UDP.
Channel_	This field is the data that COM51D uses for tuning purposes.
Object_ID	It will be automatically filled in when a valid DIRECTV channel number is entered into the "Major_Number" field.  Before the card has been successfully tuned, the default value is 0.
Major / Minor number	The major number is the DIRECTV channel number you tune to on a typical DIRECTV tuner. The default value is 0.  The Minor_Number field is automatically filled in by the COM51D card, with a default value of 65535. If the DIRECTV channel has a minor channel number, then the Minor_Number value must be entered. Many DIRECTV channels have both high-definition and standard-definition channels with the same Major and Minor numbers. COM51D will default to the high-definition channels when tuned from this field. To set the standard-definition channels instead, add 100000 to the Minor_Number. In most cases, this would cause the Minor_Number to be 165535 if the standard-definition channel is desired.
Stream_ID	This field is optional and allows a unique identifier to be applied to every video stream produced by the COM3000 system. The allowable values for this field are any whole number between 1 and 65535. This field is to be left as default for normal operation.

Stream_ID Values

There are special values a user can enter in the Stream_Id field which enable specific operations. If you are not sure of the functions, contact Vantiva Support.

3333	Don't block video if no ECM received
9001	Set the program number to the channel number
33002	Choose the 2nd audio track
33003	Choose the 3rd audio track
33004	Choose the 4th audio track
50009	Don't retune if missing Marker Object for 60 seconds
50055	Don't stop video if bad Marker Object
54001	Disable secondary audio programs

Security_Mode

Should be set from COM51D Overview tab

Info

Info

*Chassis_ID:	1
*Slot_ID:	1
*Tuner:	1
*Card_IP:	192.168.3.18
*Receiver_ID:	027091837446
*CAM_ID:	003389362959
*Network_ID:	11
*Frequency_Index:	118
*Authorized:	1
*Paired:	1
*Blackout:	0
*SW_Version:	ST04.02.51

Following is a brief explanation of each field shown above:

Chassis_ID

This field represents which COM400 chassis the card

Slot_ID

This field identifies the card's location within a chassis, numbered 1 through 6.

Tuner

This field identifies the tuner's location on the COM51D card (1 through 23).

Card_IP

Field shows the IP address of the COM51D card.

Receiver ID

Reports the Receiver ID, or RID. This value is the first of two parameters required to obtain authorization on the DIRECTV network.

CAM_ID

Reports the CAM ID. This value is the second of the two parameters required to obtain authorization on the DIRECTV network.

Network_ID

This field displays the DIRECTV network of the currently tuned channel. This number correlates to a specific satellite and can be used in conjunction with the Frequency Index field below to determine what satellite and transponder the tuner is using for the channel tuned.

Frequency Index

This field reports the frequency index as reported in the DIRECTV guide data.

Network ID numbers and corresponding satellite.

Network_ ID	Satellite	Control
0	101L	18V DC
0	101R	13V DC
2	110	22 kHz on
3	119	22 kHz on (same cable as 110)
10	99B(c)	DC (B-band) (s = spot beam; c = conus =
11	99A (s)	DC (A-band)
12	99	Reverse Band
13	103	Reverse Band
14	103A (s)	DiSEqc with 22 kHz
15	103B (c)	103B(c) DiSEqc with 22 kHz (enable B-

Authorized

This field provides feedback on whether the card has been authorized within the DIRECTV network. The card needs to be paired and authorized to receive DIRECTV programming. A value of '1' means that the card has been successfully authorized; '0' means that it has not yet been authorized or has lost its authorization.

Paired

This field provides feedback on whether the smart card has been successfully paired with the COM51D card. The card needs to be paired and authorized to receive DIRECTV programming. A value of '1' means that the card has been successfully paired; '0' means that it has not yet been paired or has lost its pairing.

Blackout

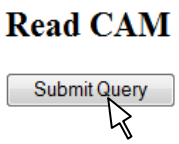
This field can be used to determine whether DIRECTV has issued a blackout of the content on a channel. This is a good thing to investigate if the video suddenly stops playing on any channel, but it is particularly likely to happen with nationally televised sporting events. A value of '0' means that the channel should be functioning properly; '1' means that the programming on the selected channel is not currently available to you. TVs will display a blackout message on screen in the event of a blackout.

LED Control Feature

This feature gives you the ability to assume control of the PWR LED temporarily. This can help you easily identify a specific card within a chassis if there is ever any doubt about which card you are accessing. The allowed values are:
0 = Off
1 = On
2 = Flashing

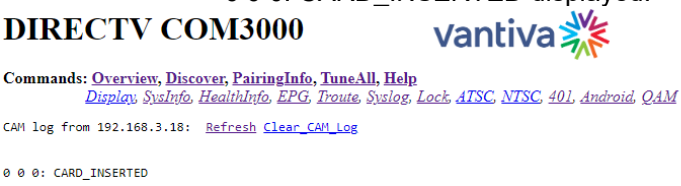
CAM Log

This section gives you the ability to read the log files generated by any COM51D card's Conditional Access Module (CAM), also known as its smart card. The messages reported here match the ones that may be seen on a normal set-top box and can be used to determine whether the card has been properly authorized and paired.



Under normal circumstances, an authorized card will produce a short CAM log file with

0 0 0: CARD_INSERTED displayed.



If, however, there are issues with the card's authorization, you will see messages that show error codes:

```
132 4 721: 721 - Service Isn't Authorized {tunerIndex=2} [GMT=Sun Feb 25 01:49:28 2018]
133 0 0: Can't view [GMT=Sun Feb 25 01:49:28 2018]
134 0 0: Service not authorized [GMT=Sun Feb 25 01:49:28 2018]
135 0 0: Can't view [GMT=Sun Feb 25 01:49:28 2018]
136 0 0: Service not authorized [GMT=Sun Feb 25 01:49:28 2018]
137 0 0: Can't view [GMT=Sun Feb 25 01:53:20 2018]
138 0 0: Service not authorized [GMT=Sun Feb 25 01:53:20 2018]
139 0 0: Can't view [GMT=Sun Feb 25 01:53:20 2018]
140 0 0: Service not authorized [GMT=Sun Feb 25 01:53:20 2018]
```

The 3-digit values starting with a "7" are the DIRECTV support extension numbers associated with the error condition.

Reset

This function allows you to initiate software reset on the COM51D card. Activating this feature is equivalent to pushing the recessed reset button on the face of the COM51D card.

File Transfer

N/A See Pairing info

User Configuration	This section gives you the ability to customize select features of the COM51D cards to better suit your application. Change IP settings the card Control and configure Syslog server Enter IP address of NTSC-8 and Tuner Count
IP Config	This field allows for one of three methods of IP address assignments to be chosen. 0 = Default - In this mode the IP address is assigned to the card based on the chassis ID and slot the card is currently in. The formula for this address is 192.168.3.[1 + (chassis ID X 16) + slot number]. 1 = DHCP_Persistent - In this mode all IP address information Base_IP, Subnet and Gateway are taken from the DHCP lease that the DHCP server issues to the card and is stored in non-volatile memory. 4 = Fixed - In this mode the user sets the Base_IP, Subnet and Gateway fields. All fields MUST be set. A Gateway MUST be defined regardless of whether it being there or not for this mode. Once you set the card IP you must reboot the card. 8 = No Change - This setting does not actually represent a separate mode but rather acts to tell the COM51D card to continue whatever mode it is currently using.
Time_to_Live	Time to Live field in IP protocol header.
Log_IP	This field allows you to direct the COM51D card to send its log files to an external destination IP address. Enter the IP address of a NTSC-8 to be fed from this COM51D card.
Log_Level	It is strongly advised that this field be left blank.
NTSC-8_IP	This field was originally used for Technicolor NTSC8 devices. However, it can now be used for streaming to Blonder Tounge NTSC16 devices
NTSC-8_tunercount	Blonder Tounge NTCS devices require a dash prefix (-XX) for tuner count. Recommend using up to sixteen tuners for an NTSC device.
UtilConfig	This field is for development purposes only and should be left blank.

MISC GET/SET

This function is used for multiple purposes. Entries are case sensitive.

Name	Value	Description
siteKey	64-bit hex	Pro:Idiom mobile key (write only value)
random		Displays a random 64-bit site key
factoryReset	1	Resets COM51D to factory settings. All feature and tuner licenses are lost
ping	Enter IP address	Result in syslog: COM51D user.warn syslog: a: 192.168.10.2 is alive!
tunerCount		Displays licensed tuner count
bitrate	0-22	Returns bitrate of specified tuner index
blackout	0-22	Reports blackout by tuner index
ccErrors	0-22	Reports CC errors by tuner index
keyIndex		Displays Transcoder Manufacturer index. VP transcode = 1 Blonder Tongue = 2
mms		Displays Mediatune MMS license count
updateBitrate		UCW4026MCS Software update Mbps
updateCount		UCW4026MCS software Update Iterations
videoTimeout		255 no video signal message (blue screen) set to 250 disables screen

<table>
<tr><td>ratingsAge</td><td>Enter required viewer age</td><td>This function will block all programming by rating. Display will be blank.</td></tr>
<tr><td></td><td colspan="2">
Enable ratingsAge from COM51D -> Discover -> Channel# -> AdvancedEdit -> Misc Get/Set

In the name field enter ratingsAge (case sensitive)

Example below will block the COM5D from streaming TV14 and R rated programming.

Misc Get/Set
Name: ratingsAge
Value: 13
Set: 1
Submit

Rating — Required Age of Viewer
TV-G 5
TV-PG 10
TV-14 14
TV-MA 18
G 5
PG 10
PG-13 13
R 14
NC-17 17
X 18
NR 13

To verify ratingsAge settings click on the Name hyperlink in the Misc Get/Set section.

Scroll down to ratingsAge, the age setting will be displayed as shown below.

<table>
<tr><td>rateLimit2</td><td>79900</td></tr>
<tr><td>ratingsAge</td><td>5</td></tr>
<tr><td>region_id</td><td></td></tr>
</table>

Blocked programming will be shown in the COM51D syslog

Oct 10 09:18:51 COM51 user.warn syslog: a: ratingsAge Limit(22) 14 > 5

Limit (tuner#) required programming age > programming age set)

Oct 10 09:19:02 COM51 user.err syslog: a: No packets(22, 361)

To cancel the settings set the age limit to 18.
</td></tr>
<tr><td>help</td><td></td><td>Shows all available commands</td></tr>
</table>

PAIRING INFO

Clicking on the PairingInfo tab on the COM3000 interface page, you can quickly evaluate the authorization status of all cards in the system.

In the example below all cards are activated and paired. Unauthorized / unpaired cards will display a 0 highlighted in red.

Discovered COM51D IP address is a hyperlink to the cards Syslog.

Discovered COM51D CAM_ID is a hyperlink to the Camlog

ATSC4 and HDMI2 cards will also be discovered and displayed. These can be accessed by clicking the hyperlinks in the IP address.

COM3000

Commands: Overview, Discover, PairingInfo, TuneAll, Help
Display, SysInfo, HealthInfo, EPG, Troute, Mt, Syslog, Lock, ATSC, NTSC, 401, Android, QAM

Chassis	Slot	CardIP	RID	CAM_ID	Serial_Number	Authorized	Paired	SW_Version	Up_Time	Upgrade
1	1	192.168.3.18	027091837446	003389362959	2097401903	1	1	ST04.02.51	15d:16h	☐
	2	192.168.3.19	023374938688	003371461975	2097362414	1	1	ST04.02.51	13d:23h	☐
1	3	192.168.3.20	HDMI2	-	-	-	-	01.02.00		
1	4	192.168.3.21	ATSC4	-	-	-	-	03.01.00		

Software Update and Browser Upload

Used to load files on the COM51D. (See COM51D Software upgrade)

Software Upgrade:
Usage: 2 = SW_Upgrade
Server_IP_Address: 192.168.3.18
Filename: mt_4.1.37-1.tar
Mode: 0 = TFTP
Submit

Browser Upload

TFTP server at 192.168.3.18 current files:
3840000 mt_4.1.37-1.tar

Upload a file to the TFTP server at 192.168.3.18
Choose File No file chosen Upload

RID and CAMID List

Text information for easy copy and pasted into other documents

RID and CAM_ID List

```
chassis-slot-tuners RID CAM_ID
1-1-23 027091837446 003389362959
1-2-23 023374938688 003371461975
```

Copy for CSL

Provided RID# and QAM4 MAC address for CSL licensing

Copy for CLS

```
027091837446
023374938688
e0:37:17:19:f3:35
```

COM51D SOFTWARE UPGRADE PROCEDURES

It is critical that the COM51Ds be configured for the latest software version. Cards connected to DIRECTV AEP systems may get occasional SW updates remotely, otherwise it is the user responsibility to keep the software up to date. Current software can be obtained through your distributor or on the Vantiva website:

https://www.vantiva.com/connected-home/commercial-video-solutions/video-multi-client-solutions/

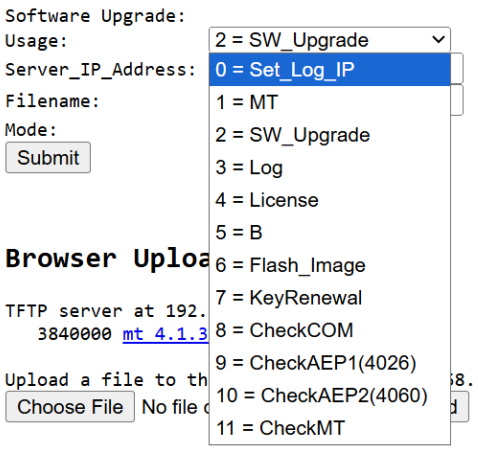
Software Upgrade

Click the Upgrade box in the Pairing info screen for the COM51Ds to be upgraded. One of all can be selected

Chassis	Slot	CardIP	RID	CAM_ID	Serial_Number	Authorized	Paired	SW_Version	Up_Time	Upgrade
1	1	192.168.3.18	027091837446	003389362959	2097401903	1	1	ST04.02.51	15d:16h	☑
	2	192.168.3.19	023374938688	003371461975	2097362414	1	1	ST04.02.51	13d:23h	☑

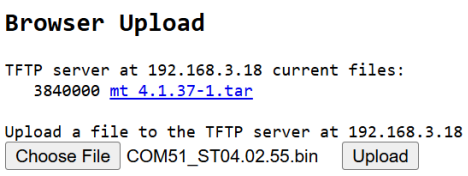
If the COM51D is connected to the internet software can be upgraded by navigating to the Software Upgrade > Usage dropdown box, then selecting 8=Check COM.

The COM51D will reach out to the DIRECTV software server, and if needed download and install the latest version



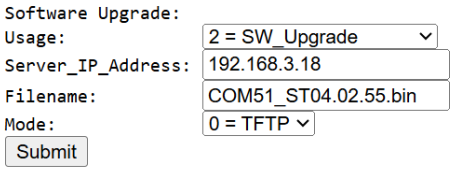
Download software file and in a folder on our PC.

Use the Pairing Info Browser Upload to locate the file and upload it to the COM51D.



Software file will be displayed in the Filename field of the Software Upgrade section of the Pairing Info page.

Select 2=SW Upgrade from the dropdown menu and click submit.



COM51D reports software upgrade.

```
Doing Software Upgrade
IP_Address=(192.168.3.18)
Usage=2
Filename=(COM51_ST04.02.55.bin)
1-1: http://192.168.3.18:8080
```

Card will reboot and will be inaccessible for several minutes

Video services will be interrupted for 2-3 minutes

New software version will be displayed in the Pairing Info tab

CardIP	RID	CAM_ID	Serial_Number	Authorized	Paired	SW_Version
192.168.3.18	027091837446	003389362959	2097401903	1	1	ST04.02.55

COM51D AEP SETTINGS

The COM51D requires several settings for use with DIRECTV Advanced Entertainment Platform set top boxes

Android Configuration

Navigate to Android>Config

At the bottom of the page are two examples of configurations.

RF (Coaxial) system requires connection to a Wi-Fi network.

IPTV system cannot use Wi-Fi

```
Example with WiFi:
<?xml version="1.0" encoding="UTF-8"?>
<configuration>
 <system>
  <wifiSsid>???</wifiSsid>
  <wifiPassword>???</wifiPassword>
  <wifiSecureType>WPA2</wifiSecureType>
 </system>
</configuration>

Example without WiFi:
<?xml version="1.0" encoding="UTF-8"?>
<configuration>
 <system>
 </system>
</configuration>
```

Enter the SSID and Password in the appropriate fields.

SSID must be visible

PW is required

No Captive portal

<wifiSsid>**MYWIFINetwork**</wifiSsid>

<wifiPassword>**0123456789**</wifiPassword>

Enter the configuration text into the Config.xml box

Config.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<configuration>
 <system>
  <wifiSsid>MYWIFINetwork</wifiSsid>
  <wifiPassword>0123456789</wifiPassword>
  <wifiSecureType>WPA2</wifiSecureType>
 </system>
</configuration>
```

IPTV No Wi-Fi

Config.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<configuration>
 <system>
  </system>
</configuration>
```

Click Submit

Submit

Pro:Idiom Mobile Key

AEP system requires a 64 bit Pro:Idiom Mobile Key be entered in each COM51D card.

Navigate to COM51D Advanced Edit>Misc GetSet

In the Name field enter siteKey

In value enter a 64-bit hexadecimal key

You can create a key, get one online or the COM51D will create a random Key.

To get a random key from the COM51D click on the **Name:** hyperlink in the Misc Get/Set location.

Scroll down to Random

random	6288914f399f26d61018417752eb640242d9c034d0a1d3d80bab6e52ef7db5ab

Copy this key and paste into the Value section of the Misc Get/Set and click submit.

All COM51D cards in the system must use the same key.

EPG

COM51D EPG requires specific settings for AEP. See EPG section below.

COM51D ELECTRONIC PROGRAM GUIDE

For this manual, the following instructions are based on COM51D software version ST.04.02.45. The EPG tap plays multiple roles in different system configurations.

PSIP

The EPG can also be used to convert the DIRECTV guide information into PSIP guide information that is supported by most televisions.

PSIP permits the channel number to be remapped, and the channel name to be displayed, the current time displayed, and the current and next program titles displayed.

To generate PSIP guide information, the last two numbers for each channel must list the QAM4 / QAM4 chassis number and QAM4 / QAM4 destination port number. This information is automatically filled in when EpgLoad is clicked. It is possible to add non-DIRECTV channels to the EPG. This is done by adding an entry where instead of a DIRECTV channel number, the capital letter 'N' appears followed by the channel name, and program information separated by underscore characters.

EPG Entry Examples

3-0 202-65535-hd 1 17	DIRECTV Ch 202 playing on QAM 1 port 17 will be mapped to channel 3-0
10-0 NLobby_The_Lobby_Channel 1 129	External source sent to QAM4 port 129. Mapped to play on channel 10
10-0 NHotel_Hotel_Information -10 1	External source is modulated outside of the COM system and combined into the RF network. External modulation is not recommended. Viewing programming not modulated by the COM system will result in loss of guide data from the COM system.
EPG QAM EpgLoad example.	202-0 202-65535-hd 1 17 206-0 206-65535-hd 1 18 209-0 209-65535-hd 1 19 212-0 212-65535-hd 1 33

EPG with Mapped QAM channels.

Channel guide on QAM1:20 mapped to channel 2.

202 mapped to ch3-0

206 mapped to ch 4-0

Externally modulated channel on 10-1 mapped to Ch 8.

2-0 NGuide_Channel Guide 1 20

3-0 202-65535-hd 1 17

4-0 206-65535-hd 1 18

5-0 209-65535-hd 1 19

6-0 212-65535-hd 1 33

7-0 218-65535-hd 1 34

8-0 NHotel_Hotel_Information -10 1

AEP boxes will receive EPG as an XML file and set up guide and channel designations. There is no way to "map" IPTV channels from EPG for non AEP devices. Programming information must be loaded onto these devices via proprietary methods. However, guide information can be displayed on a set IP stream.

EPG IP EpgLoad example. (guide.xml for AEP system)

Edited EPG with Mapped IPTV multicast address.

Channel guide on 239.100.10.50:5000 mapped to channel 2. (non AEP)

Hotel IP stream on 239.100.10.51:5000 mapped to Ch 8

AEP guide.xml

IPTV informational only

202-0 202-65535-hd 239.100.10.1 5000

206-0 206-65535-hd 239.100.10.2 5000

209-0 209-65535-hd 239.100.10.3 5000

212-0 212-65535-hd 239.100.10.4 5000

218-0 218-65535-hd 239.100.10.5 5000

2-0 NGuide_Channel_Guide 239.100.10.50 5000

3-0 202-65535-hd 239.100.10.1 5000

4-0 206-65535-hd 239.100.10.2 5000

5-0 209-65535-hd 239.100.10.3 5000

6-0 212-65535-hd 239.100.10.4 5000

7-0 218-65535-hd 239.100.10.5 5000

8-0 NHotel_HotelInfo 239.100.10.51 5000

Each channel in the EPG is comprised of a still image and it can take up to 10 seconds to produce the image for every channel being offered when the EPG is first loaded. For example, a location offering a list of 18 channels can expect to wait up to 3 minutes for a first-time EPG configuration.

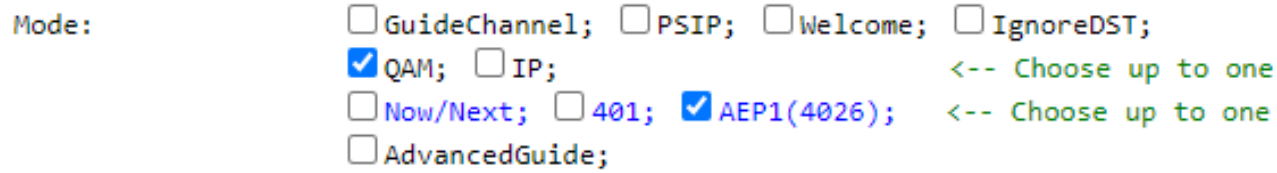
Due to the combination of the auto-scroll programming and the constant addition of new channels, you can expect the EPG to exhibit some odd behavior during the initial image creation. It may appear to skip around at random, but it can be expected to settle back into a normal operational state once it has finished generating all the necessary images.

EPG FOR ADVANCED ENTERTAINMENT PLATFORM (AEP)

AEP2 (UCW4060MCS) requires a different EPG configuration from AEP1 (UCW4026MCS).

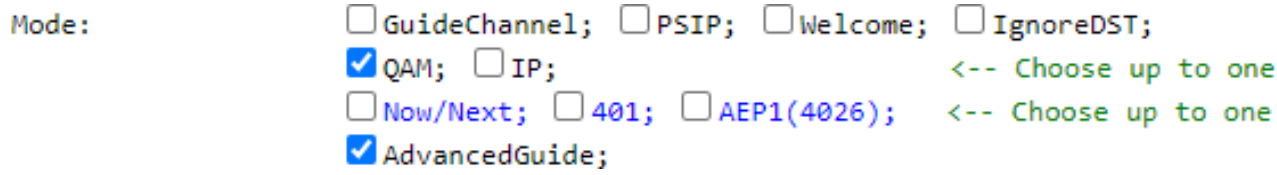
AEP1

On the COM5x EPG tab, checking the "AEP1 (4026);" box in the Mode field will create the required guide file for AEP1 (UCW4026MCS) set top boxes.

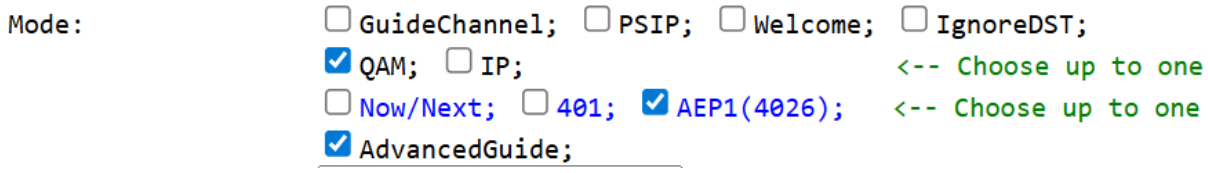


AEP2

Checking the "AdvancedGuide;" box in the Mode field will create the required guide file for AEP2 (UCW4060MCS) set top boxes.



Systems with both AEP1 and AEP2



Systems with both IP and QAM Distribution

AEP1

For AEP1 systems utilizing both IP and QAM distribution, use one COM51D card to set up AEP1 IP EPG and a separate COM51D card to set up AEP1 QAM EPG.

On one card:

```
Mode:   [ ] GuideChannel; [ ] PSIP; [ ] Welcome; [ ] IgnoreDST;
        [ ] QAM; [x] IP;                          <-- Choose up to one
        [ ] Now/Next; [ ] 401; [x] AEP1(4026);    <-- Choose up to one
        [ ] AdvancedGuide;
```

On another card:

```
Mode:   [ ] GuideChannel; [ ] PSIP; [ ] Welcome; [ ] IgnoreDST;
        [x] QAM; [ ] IP;                          <-- Choose up to one
        [ ] Now/Next; [ ] 401; [x] AEP1(4026);    <-- Choose up to one
        [ ] AdvancedGuide;
```

AEP2

For AEP2 systems utilizing both IP and QAM distribution, use one COM51D card to set up AdvancedGuide IP EPG and a separate COM5x card to set up AdvancedGuide QAM EPG.

One card:

```
Mode:   [ ] GuideChannel; [ ] PSIP; [ ] Welcome; [ ] IgnoreDST;
        [ ] QAM; [x] IP;                          <-- Choose up to one
        [ ] Now/Next; [ ] 401; [ ] AEP1(4026);    <-- Choose up to one
        [x] AdvancedGuide;
```

On another card:

```
Mode:   [ ] GuideChannel; [ ] PSIP; [ ] Welcome; [ ] IgnoreDST;
        [x] QAM; [ ] IP;                          <-- Choose up to one
        [ ] Now/Next; [ ] 401; [ ] AEP1(4026);    <-- Choose up to one
        [x] AdvancedGuide;
```

AUTOTUNE SCHEDULER

Overview

COM51D software version ST04.02.33 provides a more flexible Autotune Scheduler service which automatically tunes set programming channels to event channels based on specified search criteria.

The scheduler will search for event programming based on the following criteria:

Program Categories	Program Titles
Day of week	Time of day
DIRECTV program channel	

Scheduler Setup

Best practice is to run Autotune Scheduler on the first COM51D.

Do not run Autotune on multiple COM51D cards.

Once Autotune is set up, make programming changes while logged into the COM51D running Autotune.

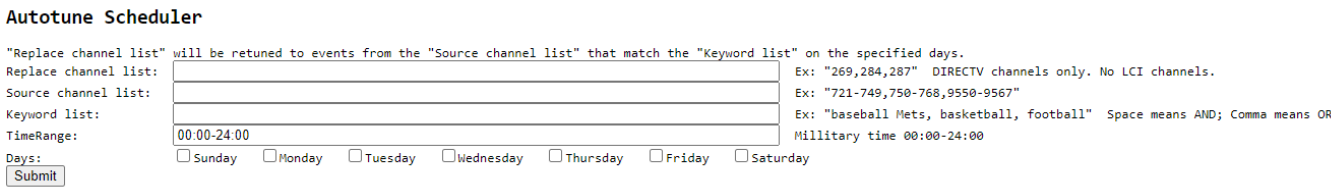
If channels in the replace channel list are changed, be sure to update the Autotune Scheduler.

Verify COM51D is running software version 04.02.33 or later.

Verify customer account is active for channels to be autotuned.

The DIRECTV document "**2023 Sports Offerings for DIRECTV for BUSINESS Customers**" provides the source channel list needed for different sports packages.

Navigate to the EPG tab, at the bottom of the page you will find the Autotune Scheduler section as shown below:



Scheduler Fields

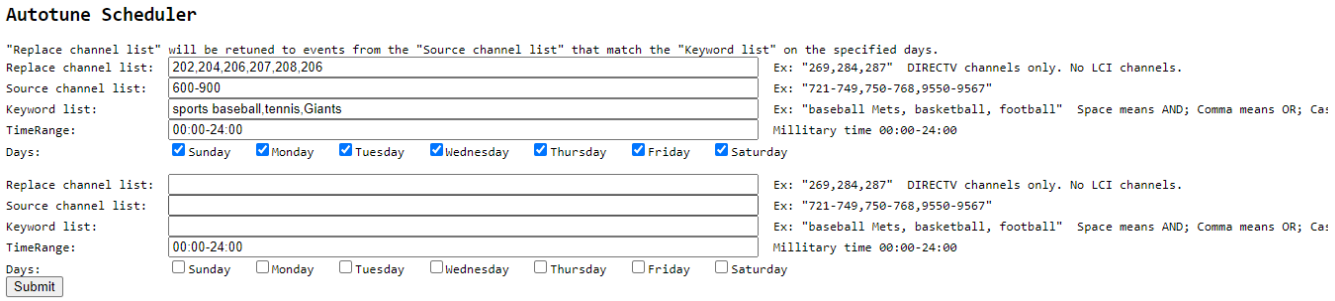
Replace channel List	Input DIRECTV channel numbers for the channels to be replaced by autotuned programing. Channel must be currently tuned on a COM51D tuner. Must be a DIRECTV channel, LCI channels will not work. The first matching program found will tune to the first available channel listed in the, "Replace channel list:". This may be set to a single channel or multiple channels (separated by commas) Each group will support up to 20 "replace channel" selections.
Source Channel list	These channels are searched once a minute for keyword matches. This may be set to a single channel or a channel range.
Keyword list	Search criteria is based on APG guide data programming titles and categories. Search criteria with multiple keywords can be set to "AND" or "OR" Keywords separated by a space request an "AND" search. "Baseball Cubs" searches for programming tagged as Baseball and Cubs Keywords separated by a comma requests an "OR" search. "Baseball, Cubs" searches for programming tagged as Baseball or Cubs Keyword search can be both "AND" and "OR." "Baseball Cubs, Baseball Mets, Football" searches for ("Baseball" AND "Cubs") OR ("Baseball" AND "Mets") OR ("Football") Categories are listed later in this document. The keywords are not case sensitive.

TimeRange	Select time to run search in local military time 00:00 – 24:00. Outside of the TimeRange, channels will be restored. Time range must extend through the end of the scheduled programming. Recommend not modifying this field unless necessary.
Days	Select days to conduct search.

Multiple Scheduling Instances

COM 51 can schedule up to 10 processing instances.

When one instance is submitted a second blank will open. If an additional instance is not needed, leave the last one blank.



Retune

Programming will be tuned back to the originally set channel if a low bitrate is seen for five minutes on the event channel, or 30 minutes after the event ends.

Auto-tuning to an unauthorized channel will be detected after five minutes of low bitrate.

EPG / Guide.XML channel and programming information will remain set to the original channel and will not display the scheduled programming information.

Recommended Practice

There are two different modes to use the Autotune Scheduler:

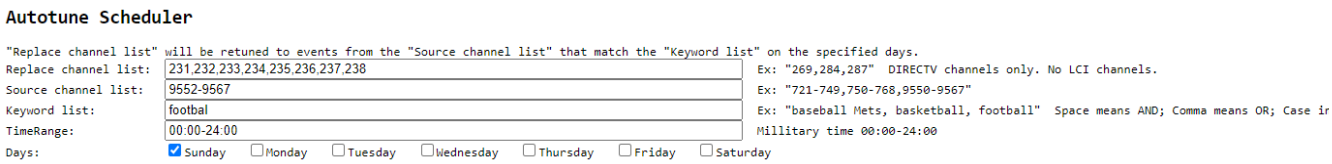
Set the list once at the beginning of the season. Use broad keywords like "baseball" or "football." Set a schedule to tighten filtering. This is an effective way to see all the sports programming from a special DIRECTV sports package.

Use tight filtering like "baseball Mets" or "baseball Reds." This may be needed if the source channel list includes "baseball programming" that you do not want.

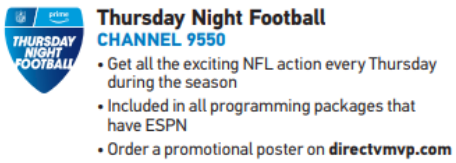
It is important to note the wide searches such a "baseball" may cause a channel to change and not change back if "baseball" programing is playing within the search criteria. Try to be as specific as possible. If a wide keyword is used a smaller Source channel should be used.

Programming Examples

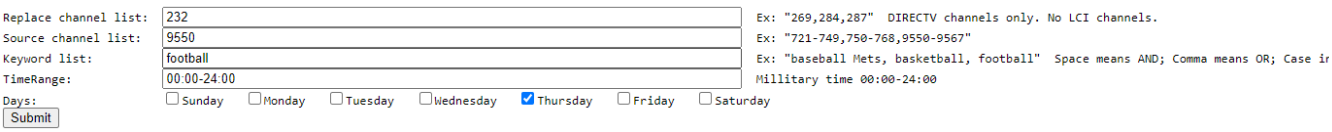
Replace channels 231,232,233,234,235,236,237,238 with NFL Sunday Ticket games on channels 9552-9567.



Note: No time frame is used. This allows games to be played until completed and a low bitrate logo appears.



Replace the Cooking Channel (232) with Thursday Night Football (9550).



Shortcuts

The table below contains settings for popular scheduled programming:

For "NFL SUNDAY TICKET": Source channel list: "9552-9567" Keyword list: "football" Days: "Sunday"	For "NFL REDZONE": Source channel list: "9551" OR "9551-9567" Keyword list: "football" Days: "Sunday"
For "Thursday Night Football": Source channel list: "9550" OR "9550-9567" OR "9550,9552-9567" Keyword list: "football" Days: "Thursday" OR "Thursday and Sunday"	For "NFL NETWORK": Source channel list: "212" OR "212, 9567" Keyword list: "football" Days: "All"
For "All Football" Source channel list: "212,9550-9567" Keyword list: "football" Days: "All"	For "NBA LEAGUE PASS": Source channel list: "750-768" Keyword list: "basketball" Days: "All"
For "MLB": Source list: "721-749" Keyword list: "baseball" Days: "All"	For "All Sports": Source list: "721-749,750-768,212,9 9567" Keyword list: "baseball, basketball, fo Days: "All"

FIXING AN UNRESPONSIVE COM51D

If, in the event of a catastrophic power fail or other "glitch" event during software updates, the COM5D card becomes unresponsive. It is possible to reprogram the card with a working copy of the flash image.

If a COM51 boots and finds it does not have a valid application image resident in flash, it will attempt to find an image using the BOOTP protocol. If it finds a BOOTP server on the network with a valid operating image it will download the image and reprogram the flash so that at the next reboot it will recover full operating capabilities.

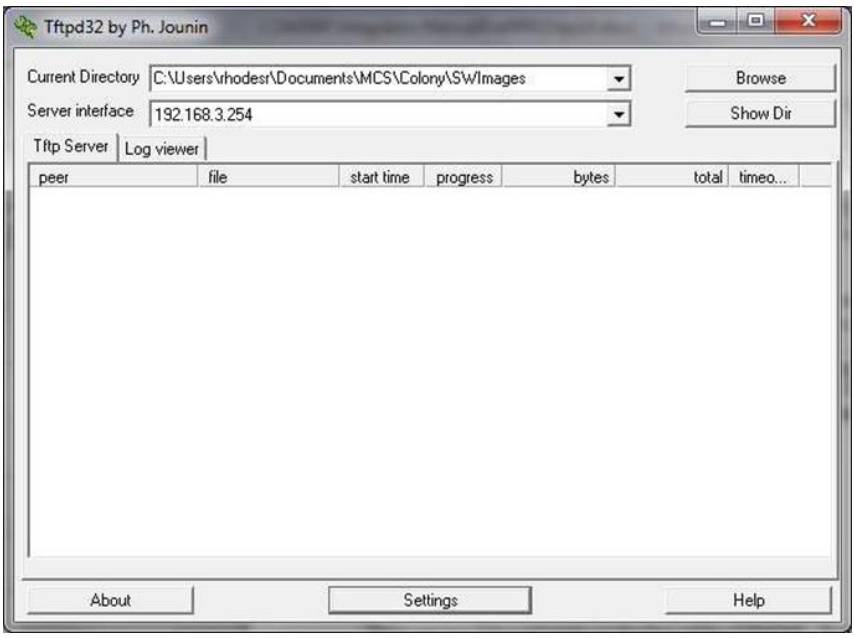
Note: This process will clear all license files and programming on the COM51D. Be sure you have access to the needed license files before proceeding.

The process requires a TFTP server, such as TFTP64 which contains a BOOTP server. be downloaded

To create a valid BOOTP image rename the most current COM51D Software <COM51.bin> and save to a directory on your PC.

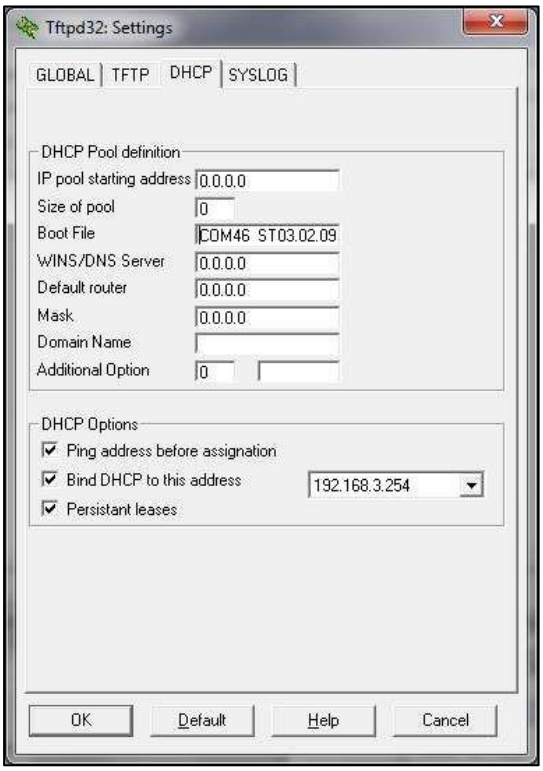
You PC must set a static IP of 192.168.3.254.

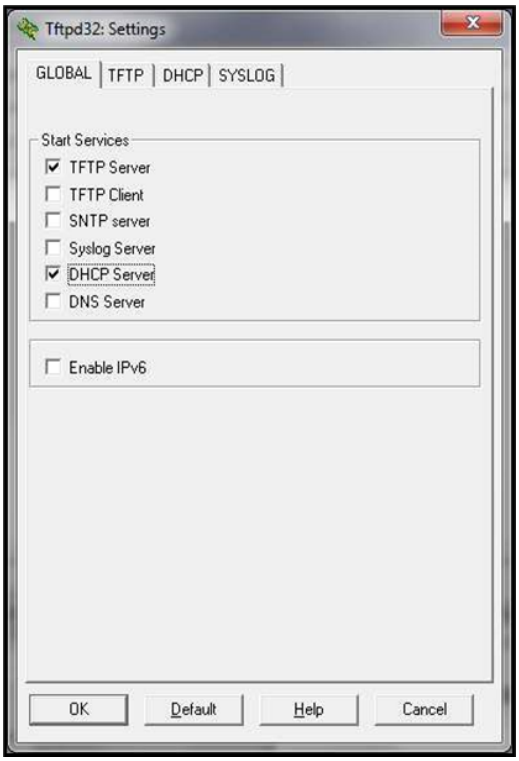
Set the TFTP the Current Directory field to the directory in which the application image is stored. The Server interface field should have the IP address of the host machine on which the image directory resides. When these fields are correct, press the 'Settings' button and select the 'DHCP' tab.



In the TFTP DHCP settings tab, enter the filename of the application image in the 'Boot File' field and click OK.

Next make sure that the DHCP option is checked in the 'GLOBAL' tab and hit OK. The Tftpd642 application will need to be restarted after making these changes.





Once the BOOTP option is enabled, factory reset the COM51D by holding down the reset button for 60 seconds. This should cause it to download a valid image, reprogram.

ADDITIONAL COM3000 EQUIPMENT

ATSC4

ATSC4 is designed to fit into a COM400 or 421 chassis slot. It will tune 4 off air carriers, up to 10 subchannels each, and output each as independent IP streams. These streams can be directed to QAM4 inputs, other UDP destinations or multicast IP addresses.

The basic features are shown below. Setup instructions are in a separate document, ATSC4 Integrator's Manual available from your distributor, or the Vantiva website.

4 ATSC off air or J.83b (QAM-B) input tuners

RF input, Multicast, or Unicast output

Four ATSC off-air or J.83b (QAM-B) input tuners

HDMI2

HDMI2 is designed to fit into a COM400 or 421 chassis slot. The HDMI2 card will accept two HDMI inputs and one USB device. It will output each as independent IP streams. These streams can be directed to QAM4 inputs, other UDP destinations or multicast IP addresses.

The basic features are shown below. Setup instructions are in a separate document, HDMI2 Integrator's Manual available from your distributor, or the Vantiva website.

Allows for local content insertion via HDMI to IP conversion

2 channels of locally sourced content via 2 HDMI inputs

Single USB

MPEG-2, H.264 (AVC), or H.265 (HEVC), and Dolby® Digital Audio (AC3), AAC, and MP3 support (PCM)

EXTERNAL VIDEO SOURCES

The COM3000 can modulate video sources from multiple sources.

Recommended device is the Vantiva HDMI2 card which is designed to be inserted into a COM400 or COM421 chassis slot. However, any device that converts content to an IP stream is acceptable.

Each source needs to be an MPEG2 single program transport IP stream and will require a QAM output carrier assignment.

Care should be taken in combining multiple digital video sources. In some cases, placing non-Pro:Idiom programing adjacent to Pro:Idiom programming in the channel ring could cause Pro:Idiom key loss due to Packet Identifier (PID) overlap.

AEP systems should always send external sources via an IP stream to the QAM4. If externally modulated encoders are used, the AEP boxes will lose guide information if tuned to the external source for an extended period.

MPEG4 TO MPEG2 TRANSCODER

The Vantiva COM3000 system outputs MPEG4 content on an MPEG2 transport stream containing the original encoded video stream as available from DIRECTV.

High-definition programming is MPEG4 (H.264) with AC3 audio.

High-definition programming includes Pro:Idiom encryption unless otherwise authorized by DIRECTV and properly licensed for operation.

All end points on the property must be capable of receiving and decrypting MPEG4, Pro:Idiom encrypted signal.

DIRECTV approved transcoders are available to transcode native MPEG4 signal to MPEG2.

Use of transcoders requires DIRECTV approval and COM51D licensing.

DIRECTV has approved the use Blonder-Tongue MPEG2 transcoders. These devices receive encrypted HD MPEG4 programming from the COM system via IP, transcodes it to MPEG2 and streams it back to the QAM4.

Blonder-Tongue

The transcoders may output standard definition digital signal or MPEG2 HD streams.

A license key for transcoding will be required. This feature license file is available from your Vantiva distributor at no charge but requires DIRECTV approval.

NOTE: For accurate bit rates to display Blonder Tongue Transcoders should use port assignments starting at 20070.

RECEIVERLESS HD+

Under certain environments DIRECTV will allow HD programming to be broadcast without Pro:Idiom encryption. If approved by DIRECTV the distributor will work with Vantiva to license the COM51D cards to provide clear, unencrypted signals.

LEGACY EQUIPMENT

COM51A

COM51DA is a specially configured COM51D card which works only with the Vantiva NTSC-8 analog modulator.

It will not stream IP video to a QAM or ethernet port.

Only the NTSC-8 will receive video data from a COM51DA.

A COM51DA is software upgradable to a standard COM51D.

Note: When a COM51DA is upgraded to COM51D, any COM51DA tuner licenses will be converted to COM51D tuner licenses (which requires tokens)

DCI401MCS

DCI401MCS is a setback box designed to accept Pro:Idiom encrypted QAM channels and output to a TV via HDMI. Documentation for this product is available on the Vantiva website.

DEFINITIONS

Term	Definition
Admin PC	A PC is required for initial setup and configuration. It is highly recommended to set up remote access to the COM3000 system for monitoring and maintenance post installation. This can be accomplished via several methods: A PC on site, connected to the internet running TeamViewer or a similar remote desktop program. PC will need to be on the same IP subnet as the COM3000 system. VPN router set up for remote access via a Virtual Private Network
ATSC	Advanced Television Systems Committee. An international organization developing voluntary standards for digital television. Typically used to describe terrestrial off-air broadcast TV standards. ATSC Tuner describes a TV capable of receiving digital off-air broadcasts. http://atsc.org/
ATSC-8	This is a device previously provided by Vantiva to provide ATSC off air television signals to the COM3000. It is configured and controlled through the COM3000 web interface. Depending on configuration it can deliver 8 program channels or 8 complete ATSC8 broadcasts including all sub channels in the carrier.
COM3000	This describes the Vantiva system consisting of a COM400 / 421 chassis, COM51D or cards and QAM4 / QAM4 modulators. Replaced previous product COM2000.
COM51D Receiver Card	Receiver cards for the COM3000 system. Replaced previous product version COM46 / Com46A. The COM51D has all 23 video tuners enabled by default.
COM400 Chassis	This device houses the COM51D and QAM4 / QAM4 components in a COM3000 system. All video traffic is routed through the two 10 Gigabit and two 1 Gigabit Ethernet (GbE) ports on the front of the chassis and to the QAM4 / QAM4 slots. System management and control can be done by connecting a computer to any of the ethernet ports on the front panel. Replaced previous product version COM360.

COM421 Chassis	This device houses 2 COM51Ds and a QAM. It is intended for smaller installations
QAM4 / QAM4	A circuit board that is installed in the COM400 / 421 Chassis. It converts the COM51D's IP-packetized streams to QAM-modulated RF for distribution throughout a property. The board provides up to 16 QAM carriers and is software upgradeable in groups of two QAMS for a maximum of 48 QAM carriers.
SWQAM2	The SWQAM2 is a software key that will enable 2 QAM channels per key on a QAM4 / QAM4 card. By purchasing 3 SWQAM2 keys a QAM4 / QAM4 can be expanded to 12 QAM channels.
DSWiM 30	DIRECTV SWM. One DSWiM 30 will provide a signal to a COM51D card when tuning more than 8 channels.
EAS	Emergency Alert Systems can be interfaced with the COM3000 to stream emergency notifications to all QAM channels. A local message can be created and played via a PC and VLC or a ZyCast Media Server. https://www.fcc.gov/encyclopedia/emergency-alert-system-eas
Edge QAM	In a typical installation, the COM51D cards will be configured to stream to a QAM4 / QAM4 modulator.
GIGe	Gigabit Ethernet High speed Ethernet standard for transmitting data at one gigabit per second. All switches in the GIGe (video) network must be rated to pass this level of traffic.
IGMP	Internet Group Management Protocol. Used by Ethernet Switches and end devices to manage multicast video on IP networks.
HD	High Definition
Hot-swappable	The unit or device this term describes may be added to, removed from, or replaced within the system it is a part of without powering anything down.
MPEG	Moving Pictures Experts Group - A working group of ISO/IEC with the mission to develop standards for coded representation of digital audio and video and related data. Most commercial and some residential TVs support MPEG4 standards. All DIRECTV HD signals are MPEG4 contained in an MPEG2 transport stream. Many residential and some older commercial TVs will only support MPEG2 signals. http://mpeg.chiariglione.org/

PC/VLC	The COM3000 can accept streaming video from a networked PC running VLC, an open-source video software. http://www.videolan.org/vlc/index.html
PID	Packet Identification A 13-bit field in the header of every 188-byte MPEG2 transport packet.
Pro:Idiom	Pro:Idiom is an industry accepted digital rights management encryption technology for video signals broadcast in commercial establishments such as hotels, dormitories, and hospitals. All major programmers have accepted Pro:Idiom as an encryption method to secure programming. Only televisions or set-back boxes with built in Pro:Idiom encryption system decoders will be able to decrypt the signal. http://www.zenith.com/wp-content/uploads/2013/05/ProIdiom_Overview_2010-10-08.pdf
Pro:Idiom Mobile	A version of Pro:Idiom which is software based and can be decrypted using an approved and licenses software player.
Property Distribution Network	This network, set up and maintained by the system operator or property owner, distributes television signals via RF or IP technology. Traditional analog RF plants often need repairs and upgrades before they pass digital HD programming. RF levels and signal to noise ratios (Modulation Error Rate) should be tested to industry standards. IP systems require technicians proficient in IP switch configurations, specifically multicast networks utilizing Internet Group Management Protocols (IGMP).
PSIP	Program and System Information Protocol. Signals included in a digital TV signal define the display channel. For example, an off-air channel may be broadcast on UHF Ch 38, but the station call letters are Ch 7. PSIP data instructs the TV to display a virtual channel 7 on the TV rather than the physical channel 38. PSIP data also includes current and future programming information. http://www.atscforum.org/
Satellite Distribution Network	This network consists of the dish, LNB and associated equipment necessary to provide KA/KU band satellite signals to the COM3000. The COM3000 requires a SWiM signal to each card proportional to the number of tuners desired. It is assumed that installation technicians have adequate expertise and proper test equipment required to install the distribution system to DIRECTV specifications.
SD	Standard Definition
SWiM Switch	Single Wire Multi-Switch – An DIRECTV module used for the distribution of satellite signals.

SWQAM2	The SWQAM2 is a software key that will add 2 QAM channels per key on a QAM4 / QAM4.
System Integrator	The person or company that performs the onsite installation.
System Operator	The company or organization that typically holds the "right of entry" and is responsible for installation and all onsite support on a daily basis.
Transcryption	The process by which the COM3000 system converts content streaming from DirecTV 's conditional access system to Pro:Idiom encrypted video.