Understanding the Cisco STA1520 Tuning Adapter Diagnostic Screens

Application Guide

Please Read

Important

Please read this entire guide. If this guide provides installation or operation instructions, give particular attention to all safety statements included in this guide.

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About This Guide

Introduction

The Cisco® STA1520 tuning adapter (tuning adapter), like other Digital Home Communications Terminals (DHCTs) in a Cisco Digital Broadband Delivery System (DBDS) provides human-readable diagnostic output as a user-friendly means of monitoring the overall health and performance of the device and of the system. However, unlike other traditional DHCTs, the tuning adapter has no graphical or audio-visual interface for presenting on-screen diagnostics directly to the user. Instead, the tuning adapter provides diagnostic output for display in a web browser on the Digital Network Control System (DNCS).

Note: The Unidirectional Digital Cable Product (UDCP) host device that the tuning adapter is connected to provides on-screen display of the diagnostic screens. Please refer to the documentation that came with your UDCP device for instructions on accessing this information.

Purpose

After reading this guide, you will be able to use the diagnostic screens to help identify and evaluate system and status information for the tuning adapter in your cable system. The following list includes some of the tasks you can perform using the diagnostic screens:

- Verify the operational status of the tuning adapter
- Determine the version of the currently loaded configuration file for the tuning adapter, if applicable
- Verify the operating status for the UDCP session
- Determine whether or not the physical USB connection between the tuning adapter and UDCP has been established
- Obtain SDV and UDCP session status information
- Determine the authentication status for the UDCP
- Verify tuning adapter authorization status (brick mode)
- View available memory and usage information
- Verify that the correct channel map is loaded
- Determine the status of the RF network interface
- Obtain tuning adapter protocol statistics and anomalies
- Verify the current status for the USB 2.0 device

- Verify the current software versions for SARA and the PowerTV® Operating System (OS)
- Verify RF levels
- Confirm the tuning mode
- Verify PowerKEY® entitlement agent status
- Determine the status of the Bootloader upgrade

Scope

The contents of this document only describe the procedures for viewing the tuning adapter diagnostics screens in a web browser on the DNCS. It does not discuss procedures for accessing these diagnostic screens via cmd2000 or the UDCP on-screen display.

Audience

This guide is written for cable system operators, service providers, and Cisco personnel who have experience with the tuning adapter and with understanding diagnostic information related to SARA.

Related Publications

You may find the following publications useful as resources when you implement the procedures in this document.

- *Download and Define Parameters in the Tuning Adapter Configuration File* (part number 4025013)
- *Downloading New Client Application Platform Installation Instructions* (part number 4003052)
- *Explorer Digital Home Communications Terminal Staging Guide* (part number 734375)
- *Explorer® Digital Home Communications Terminal Troubleshooting Guide* (part number 717867)
- *Provisioning the DNCS to Support SDV Services User Guide* (part number 4012948)
- *Recommendations for Data Carousel Rate Management* (part number 716377)
- *Staging Area Quick Reference Sheet* (part number 740230)
- *Staging the Tuning Adapter, Addendum to 734375* (part number 4025012)

Document Version

This is the second release of this document.

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Understanding the Diagnostic Screens

Introduction

SARA captures diagnostic information on the tuning adapter at run-time and provides this information for display in a web browser on the DNCS via HTTP as a series of HTML diagnostic screens.

The diagnostic screens allow you to quickly confirm the operational status and software version of the tuning adapter, view the current state of the UDCP, verify session information, and view statistics for various packets that have been transmitted and received over the USB interface. In addition, you can also quickly review overall system data such as checking upgrade status by reviewing Bootloader information and viewing extensive details about switched digital video (SDV).

To successfully view the information within the diagnostic screens, you must know how to access them. This section provides instructions to help you access and navigate the diagnostic screens.

In This Chapter

Access the Diagnostic Screens

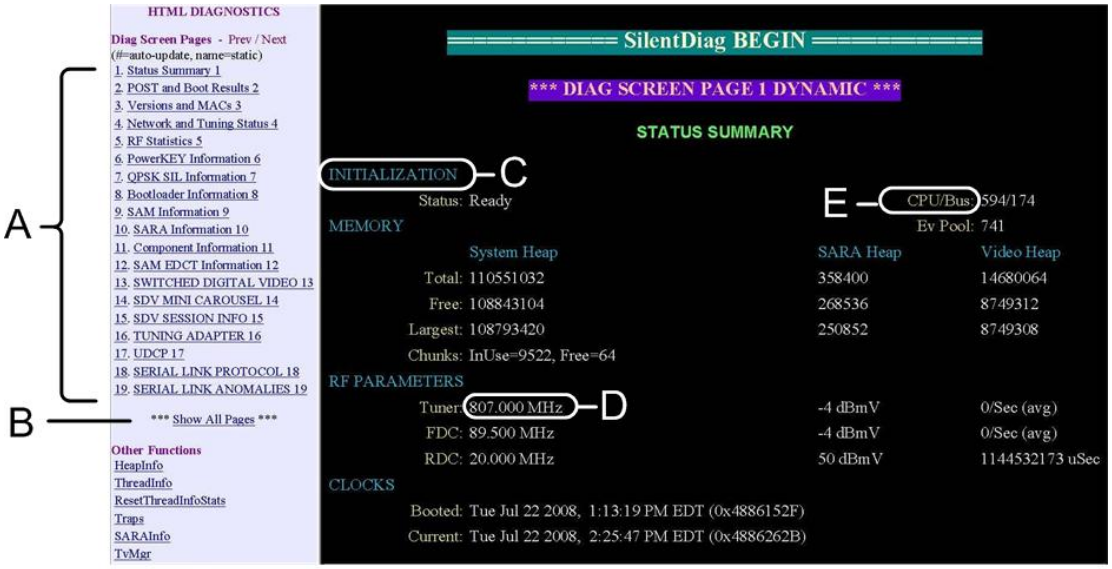
Follow these steps to access the diagnostic screens from a web browser on the DNCS via HTTP.

1. Launch a web browser that is installed on the DNCS.
2. From the **Address** field located at the top of your web browser, type **http://<tuning_adapter.ip.address>:5030/1.html** and then press **Enter**. Your web browser displays the first diagnostic screen (Status Summary) of the tuning adapter you are using.

   Note: In this command, <tuning_adapter.ip.address> represents the actual IP address of the tuning adapter that you are using.
3. Follow the on-screen instructions and click the links to view other diagnostic screens.

Identify Information Within Diagnostic Screens

The following example of a diagnostic screen shows the HTML diagnostics table of contents (click a link to see a specific diagnostic screen or click **Show All Pages** to view a scrollable list of diagnostic screens in one window), along with the Status Summary diagnostic screen. The diagnostic screen that is shown is used to identify components of each screen.



A **Link to each diagnostic screen**
B **Link to scrollable display of all diagnostics screens on one page**
C **Section Heading**
D **Field Text**
E **Field Name**

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Tuning Adapter Diagnostic Screens

Introduction

This chapter describes the diagnostic screens supported by the tuning adapter. These screens accumulate data that relate specifically to the tuning adapter, as well as the overall system.

In This Chapter

Status Summary Diagnostic Screen

Information

This section provides a sample of the Status Summary diagnostic screen along with field descriptions. You can view this screen to obtain information concerning the status of the system initialization, memory, boot status, and clocks.

Performing Tasks

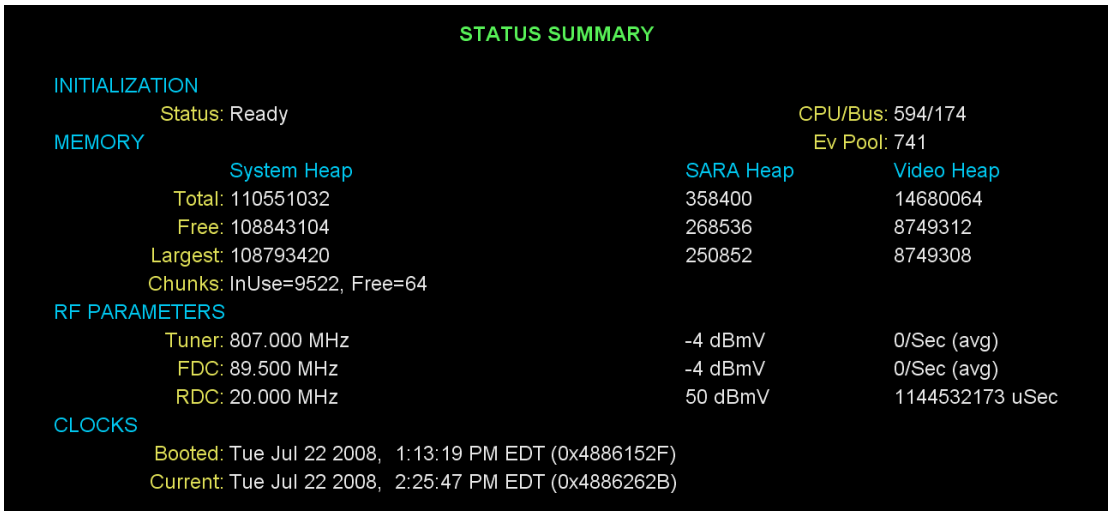
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the current status of the boot process
- Check the amount of available memory
- View the power levels and frequencies of the tuner
- Check when the tuning adapter was last booted and if it is receiving the correct time of day

Screen Components

- Initialization
- Memory
- RF Parameters
- Clocks

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Initialization

Field Name	Description	Possible Values
Status	The status of the overall boot process	■ **Host Ready**: The tuning adapter has completed the boot process and is in two-way mode.
CPU/Bus	The speed, in megahertz (MHz), at which the microprocessor and data bus are running	■ **Hardware-dependent value**
Ev Pool (Event Pool)	The number events available in the event pool of the OS	■ **[Integer > 0]**

Memory

Field Name	Description	Possible Values
Total	The total amount of memory assigned to the tuning adapter, SARA, and the video	■ **[Integer ≥ 0]**
Free	The amount of free memory available for the tuning adapter, SARA, and the video	■ **[Integer ≥ 0]**
Largest	The largest contiguous, free block of memory for the tuning adapter, SARA, and the video	■ **[Integer ≥ 0]**
Chunks	The number of in use and free chunks of available memory	■ **[Integer ≥ 0], [Integer ≥ 0]**

RF Parameters

Field Name	Description	Possible Values
Tuner or Tuner 1	Describes the following frequency data at the center of the channel of the inband tuner ■ If tuned to a *digital* channel, this field displays the frequency, the current *approximate* signal level, and the average errors per second ■ If tuned to an *analog* channel, this field displays the frequency and the analog channel	■ **Frequency**: Dependent upon setting (MHz) ■ **Signal Level** • **Acceptable Range**[1]: –16 to +15 dBmV • **Recommended Range**: –8 to +8 dBmV ■ **Average Errors per Second**: Integer close to 0 that is not changing
FDC	Provides information about the forward data channel (FDC)	■ **Frequency**: Dependent upon the setting in which out-of-band receiver is tuned (MHz) ■ **Signal Level** (approximate) • **Acceptable Range**[1]: –16 to +15 dBmV • **Recommended Range**: –10 to +10 dBmV ■ **Average Errors per Second**: Integer close to 0 that is not changing

[1] If the dBmV falls outside of the specified ranges, the system and DHCTs may continue to operate, but plant or system maintenance may be required. Perform an analysis using a spectrum analyzer on the incoming signal.

Field Name	Description	Possible Values
RDC	The information about the reverse data channel (RDC)	■ **Frequency**: Dependent upon the setting to which RDC transmitter is broadcasting (MHz) ■ **Signal Level of Transmitter** • **Acceptable Range**[2]: +25 to +55 dBmV • **Recommended Range**: +27 to +53 dBmV ■ **Round Trip Delay**: delay between the tuning adapter and quadrature phase shift keying (QPSK) modem at the headend or hub (µsec)

Clocks

Field Name	Description	Possible Values
Booted	The date and time that the tuning adapter last booted **Note:** The hexadecimal format for the date and time is shown in parenthesis.	■ **[Date, Time]**
Current	The current date and time **Note:** The hexadecimal format for the date and time is shown in parenthesis.	■ **[Date, Time]**

[2] A setting greater than +55 dBmV may indicate a problem. If the dBmV falls outside of the specified ranges, perform an analysis using a spectrum analyzer on the incoming signal.

Post and Boot Results Diagnostic Screen

Information

This section provides an overview of the Power On Self Test (POST) and Boot Status diagnostic screen.

The Boot Status section includes the results of the boot process performed by the tuning adapter. You can view the Boot Status section to confirm whether or not the tuning adapter is ready to receive data.

Note: The POST results section is not applicable to the tuning adapter.

Performing Tasks

By accessing this diagnostic screen, you can perform the following tasks:

- Ensure that all hardware is present on the system
- Ensure that all hardware components are functioning properly
- Check the boot status of the tuning adapter
- Determine if the tuning adapter is ready to receive data

Screen Components

- Post Results**:** Not Applicable
- Boot Status

Example:

Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Boot Status

The tuning adapter must access information from various sources in order to boot. The Boot Status section includes the results of the adapter's attempt to access the sources that the adapter must receive in order to boot. These results are updated in the order shown as the adapter boots up. The indicators within this screen are updated as the adapter moves through the possible states; however, they are never updated in reverse because this information only indicates the status during boot up.

Field Name	Description	Possible Values
UNcfg	The boot process for the User-to-Network configuration (UNcfg)	■ **Broadcast**: Global broadcast message received ■ **Ready**: An individually addressed configuration message received ■ **Searching**: No UNCfg message received
BFS	The boot process for the Broadcast File System (BFS)	■ **Ready**: BFS directory has been found and loaded ■ **Searching**: Looking for the BFS directory
SI	The boot process for the System Information (SI)	■ **Ready**: SI tables are loaded ■ **Searching**: SI tables are not loaded
SAM	The boot process for the Service Application Manager (SAM) **Important**: If the tuning adapter config file is present and contains channel lineup information, then the SAM boot status reports the TA config file load status rather than the SAM load status.	■ **Ready QAM**: SAM has completed loading inband data ■ **Ready QPSK**: SAM has completed loading out-of-band data ■ **Trying QAM**: SAM is attempting to load data inband ■ **Trying QPSK**: SAM is attempting to load data out-of-band ■ **Waiting**: SAM is waiting for other required boot operations to finish before attempting to load its tables
IPG	**Important:** This field can be ignored.	

Field Name	Description	Possible Values
PowerKEY	The boot process for a PowerKEY CableCARD	■ **Ready**: PowerKEY components are ready ■ **Waiting EMM**: Waiting for Entitlement Management Messages (EMMs) to load ■ **Waiting EUT**: Waiting for the Entitlement Unit Table (EUT) to load ■ **Waiting Time**: Waiting for the Time global broadcast authentication message (GBAM) (message sending the time of day to the PowerKEY components)
Analog Capable	**Important:** This field can be ignored.	

Versions and MACs Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the Software Versions and Serial Numbers diagnostic screen. You can view this screen to verify the version numbers and serial numbers for all applicable hardware and software modules.

Performing Tasks

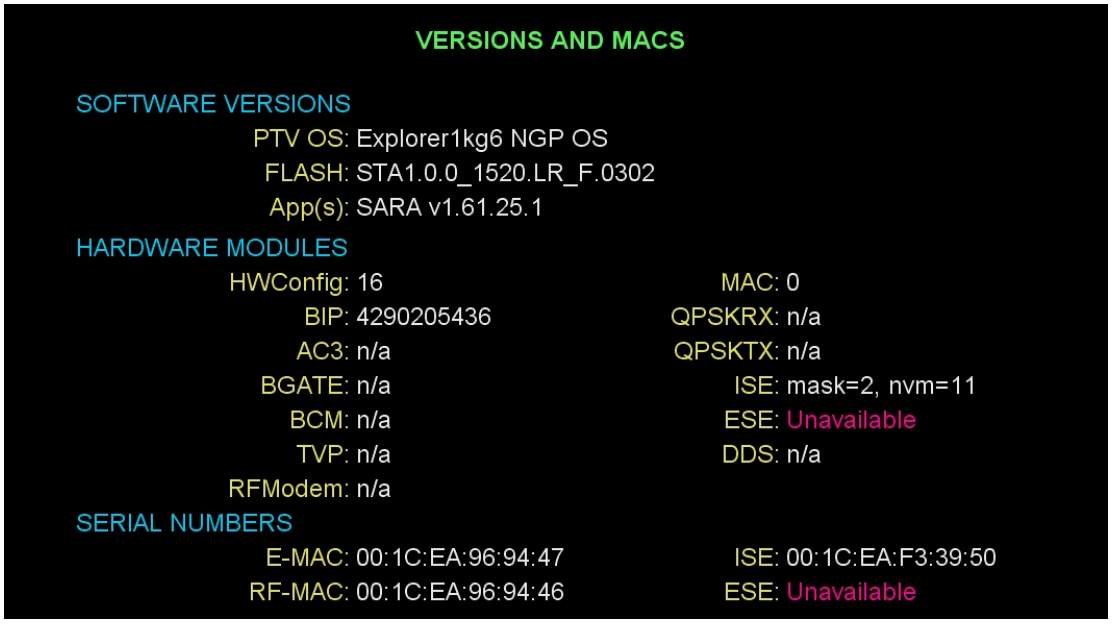
By accessing this diagnostic screen, you can perform the following tasks:

- Confirm the software version
- Confirm the hardware modules
- Verify that the RF-MAC matches the MAC address on the DNCS

Screen Components

- Software Versions
- Hardware Modules
- Serial Numbers

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Software Versions

The Software Versions section includes the current firmware versions of the software in Read Only Memory (ROM).

Field Name	Description	Possible Values
PTV OS	The version for the PowerTV OS	■ **[Software-dependent]**
FLASH	The version for the resident application	■ **[Software-dependent]**
App(s)	The names and version numbers of the applications available for execution	■ **[Software-dependent]**

Hardware Modules

The Hardware Modules section includes the version numbers of all applicable hardware modules.

Field Name	Description	Possible Values
HWConfig	The version of the hardware configuration (HWConfig) module	■ **[Hardware module-dependent]** **Note**: This value should match the revision number (without decimals, for example 5.9 will appear as 59) printed on the bottom of the tuning adapter
BIP	The version of the broadband interface processor (BIP) modules	■ **[BIP module-dependent]** ■ **n/a**: not a standalone part
AC3	The version of the digital AC-3 module	■ **[AC3 module-dependent]** ■ **n/a**: not a standalone part
BGATE	The version of the QPSK transceiver (encoding and decoding) module	■ **[QPSK transceiver module-dependent]** ■ **n/a**: not a standalone part
BCM	The version of the ASIC for demodulating the QAM signal module	■ **[ASIC-dependent]** ■ **n/a**: not a standalone part

Field Name	Description	Possible Values
TVP	The state of the TV tuner resource in the resident application according to the TV Program Manager (TVP) component of the PowerTV OS	■ **[TVP component-dependent]** ■ **n/a:** not a standalone part
RFModem	The version of the transmitter and receiver for QPSK	■ **[Hardware-dependent]** ■ **n/a:** not a standalone part
MAC	The ASIC version that includes: ■ MPEG decoding ■ Graphics ■ AC-3 decoding ■ NTSC encoding	■ **[Hardware-dependent]** ■ **n/a:** not a standalone part
QPSKRX	The QPSK Receiver (QPSKRX) version	■ **[Hardware-dependent]** ■ **n/a:** not a standalone part
QPSKTX	The QPSK Transmitter (QPSKTX) version	■ **[Hardware-dependent]** ■ **n/a:** not a standalone part
ISE	The Internal Secure Element (ISE) and PowerKEY component serial number	■ **[Hardware-dependent]**
ESE	The External Security Element (ESE) smart card (optional component) serial number	■ **[Hardware-dependent]** ■ **Unavailable:** smart card is not currently in use
DDS	The analog descrambling ASIC module version	■ **[Hardware-dependent]** ■ **n/a:** ASIC module is not available

Serial Numbers

The Serial Numbers section includes the MAC addresses for specific hardware modules.

Note: If the MAC address is not available, the field displays **Unavailable**.

Field Name	Description	Possible Values
E-MAC	The Ethernet media access control (E-MAC) adapter MAC address, if installed	■ **[Unique per DHCT]** **Example**: 00:18:68:BF:46:32
RF-MAC	The RF network adapter MAC address that is used by the DNCS	■ **[Hardware-dependent]** **Example**: 00:26:A4:BF:64:2F
ISE	The ISE and PowerKEY component serial number	■ **[Unique per tuning adapter]** **Example:** 00:40:7B:BF:46:3D
ESE	The serial number of the ESE smart card (optional component)	■ **[Unique per tuning adapter]** **Example:** smart card is not currently in use

Network and Tuning Status Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the Statuses and Network Parameters diagnostic screen. You can view this screen to identify real-time status information and network parameters.

Note: The MPEG Stats section is not applicable to the tuning adapter.

Performing Tasks

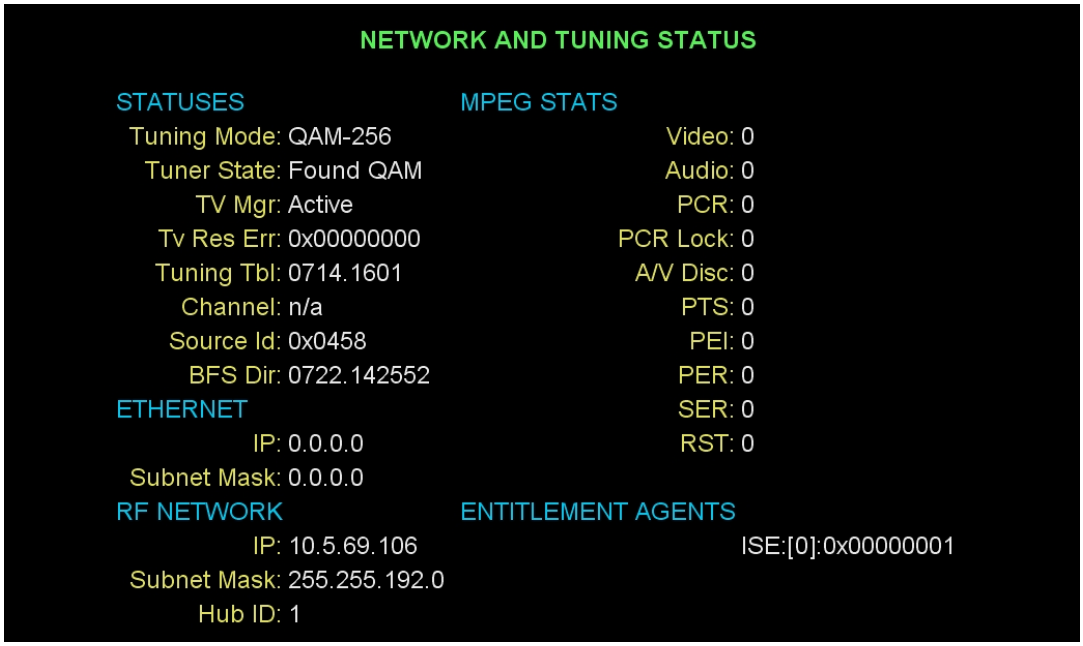
By accessing this diagnostic screen, you can perform the following tasks:

- Confirm the tuning mode
- Verify MPEG information for the current stream
- Confirm that the tuning adapter displays an RF network Internet protocol (IP) address, a subnet mask, and a hub ID

Screen Components

- Statuses
- Ethernet
- RF Network
- MPEG Stats: (Not Applicable)
- Entitlement Agents

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Statuses

The Statuses section includes the status information related to the channel that the subscriber is viewing.

Field Name	Description	Possible Values
Tuning Mode	The current mode of the inband tuner	■ **Analog**: if sap or stereo are detected on the current analog channel, one of the following modes appear: • **Analog (sap)** • **Analog (sap, stereo)** • **Analog (stereo)** ■ **QAM-64** ■ **QAM-128** ■ **QAM-256**

Field Name	Description	Possible Values
Tuner State or Tuner 1 State	The state of the tuner according to the TV manager component of the PowerTV OS	■ **Found QAM**: Tuner successfully tuned to a digital channel ■ **Found Sync**: Tuner successfully tuned to an analog channel ■ **Idle/Available**: Tuner is not in use by an application; tuner is available for use ■ **Waiting QAM**: TV Manager is waiting for the tuner to tune to the desired QAM frequency and lock onto valid data ■ **Waiting Sync**: TV Manager is waiting for the tuner to find the signal on an analog channel
TV Mgr	The state of the TV tuner resource in the resident application according to the TV Manager component of the PowerTV OS **Note:** If the resident application is not using the tuner, the TV Manager displays the state of the active resource using the tuner (if any).	■ **Active**: the resource of the resident application is currently active (in use/tuned) ■ **Denied**: the tuning request for the resource was denied ■ **Inactive**: TV Manager is not in use and is available to process requests ■ **Notified**: TV Manager has instructed the resident application to release the resource not the tuner so the TV Manager can use the tuner for a different request ■ **Suspended**: The tuner resource for the resident application is suspended ■ **Suspending**: TV Manager has notified the owner of the currently active resource to suspend so that it can use the tuner for another request ■ **Unknown**: TV Manager received an unknown state ■ **Waiting PAT**: TV Manager is waiting for the Program Association Table (PAT) to arrive on a QAM channel before the tuning request can complete ■ **Waiting PMT**: TV Manager is waiting for the program Map Table (PMT) to arrive on a QAM channel before the tuning request can complete

Field Name	Description	Possible Values
TV Res Err	The last resource denied error code received by the ResApp from the TV manager when trying to tune (if any)	■ **0x00000000**: no resource errors ■ **0x[non-zero hexagonal number]**: indicates an error was received
Tuning Tbl	The most recent tuning table activation date and time (MMDD.hhmm) received by the tuning adapter	■ **[Time]** **Example**: 0507.1500
Channel	The channel number and the status for the tuned channel	■ **Clear to Air** (unencrypted) ■ **Free Preview** ■ **Purchased** (for pay-per-view) ■ **Subscription** ■ **Unauthorized** **Note:** An unauthorized channel may display **unauthorized** for a few seconds and then it changes to n/a when the unauthorized barker appears.
Source ID	The source identification number for the tuned channel	■ **[Channel-dependent]** (hexadecimal format)
BFS Dir	The date and time (MMDD.hhmmss) that the BFS directory was last read	■ **[Time]** **Example**: 0507.150027

Ethernet

Note: The values are only valid if the DHCT has an Ethernet adapter installed.

Field Name	Description	Possible Values
IP	The IP address assigned to the Ethernet adapter	■ **[Network-dependent]** **Example:** 10.1.0.1
Subnet Mask	The IP subnet mask assigned to the Ethernet adapter	■ **[Network-dependent]** **Example:** 255.255.255.0

RF Network

The RF Network section includes a description of the RF network adapter.

Field Name	Description	Possible Values
IP	The IP address that the DNCS assigned to the RF network	■ **[Network/DHCT configuration-dependent]** ■ **Unavailable**: DHCT is not authorized for two-way communications or is unable to establish a two-way connection with the DBDS
Subnet Mask	The IP subnet mask that is assigned to the RF network adapter by the DNCS	■ **[Network-dependent]**
Hub ID	The hub number to which the tuning adapter is connected when booted	■ **[Network-dependent]**

Entitlement Agents

Field Name	Description	Possible Values
ISE or ESE	The entitlement agent ID (EAID) that was installed on the ISE or ESE (also known as a smart card) and inserted in to the DHCT	■ **0x00000001** **Note:** The number within the brackets is an index number. The hexadecimal number that follows the index number displays the EAID. ■ **ESE[1]** ■ **ISE[1]**

RF Statistics Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the RF Statistics diagnostic screen. You can view this screen to obtain statistical information about the three RF channels on your system in real-time.

Performing Tasks

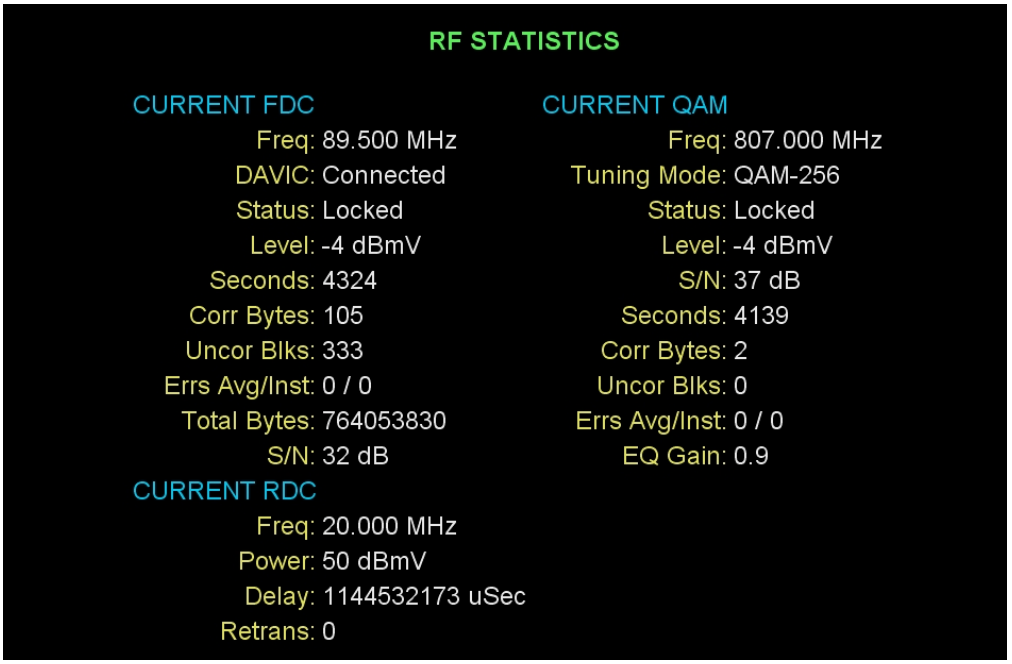
By accessing this diagnostic screen, you can perform the following tasks:

- Confirm the power levels and frequencies of the FDC and the RDC
- Confirm the power levels and frequencies of the QAM modulator
- Monitor the average and instantaneous errors of the FDC and the QAM

Screen Components

- Current FDC
- Current RDC
- Current QAM

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Current FDC

Field Name	Description	Possible Values
Freq	The frequency (Freq) of the tuned QPSK receiver	■ **[Network-dependent]** **Range:** 70–130 MHz
DAVIC	The status of the current Digital Audio Visual Council (DAVIC) connection	■ **Boot**: DHCT is booting ■ **Calib Power**: DHCT is calibrating the power level of the QPSK transmitter for optimal performance ■ **Completion**: DHCT received sign on request; waiting for DAVIC initialization to complete or for DAVIC ranging/ power calibration message ■ **Conn Conf**: DHCT received a DAVIC connect message for a connection set up by an active session, sent a DAVIC connect response message, and is waiting for a DAVIC connect confirm message to acknowledge the session connection is ready to use ■ **Connected**: connection exists; typically two-way ■ **Data Lock Lost**: DHCT stopped receiving valid data; must re-establish a DAVIC connection when it finds valid data ■ **Dflt Cfg**: DHCT is waiting for DAVIC default configuration message ■ **DNCS Conn**: DHCT adjusted its power, received initialization completion message, and is waiting for DNCS to send a DAVIC connect message to establish default DNCS connection

Field Name	Description	Possible Values
DAVIC, continued		■ **DNCS Conf**: DHCT received DAVIC connect message from DNCS, responded with a DAVIC connect response message, and is waiting for a connect confirm message ■ **Provisioning**: DHCT is waiting for a DAVIC provision message ■ **Host Ready**: DAVIC connection is fully functional ■ **Resp**: DHCT received sign-on request and is waiting for randomized timeout before sending the DAVIC sign-on response to the DNCS ■ **Searching Chnls**: DHCT is searching for QPSK frequency for valid DAVIC data ■ **Sign-On**: DHCT is waiting for the DAVIC sign on message from DNCS ■ **Slow-Boot Wait**: DHCT is waiting for the slow boot timeout period ■ **Unauthorized**: DHCT is not authorized to sign on with DNCS ■ **Waiting**: DHCT is attempting to initiate a DAVIC connection
Status	The status of the receiver in regards to receiving valid data	■ **Locked**: Receiver is locked onto a frequency with valid QPSK data ■ **Unlocked**: Receiver is not locked onto a frequency with valid QPSK data
Level	The approximate received signal level	■ **Refer to specific hardware specifications** • **value displayed in white**: signal level is nominal • **value displayed in amber**: signal level is marginally too high or too low • **value displayed in red**: signal level is unacceptably too high or too low

Field Name	Description	Possible Values
Seconds	The number of seconds that the frequency has been locked	■ **[Integer ≥ 0]**
Corr Bytes	The number of bytes received in error that have been successfully corrected by the forward error correction (FEC) code	■ **[Integer ≥ 0]** **Important:** If incrementing rapidly, picture freezing or macroblocking may be present.
Uncor Blks	The number of data blocks received in error that were not successfully corrected by the FEC code	■ **[Integer ≥ 0]** **Important:** If incrementing rapidly, picture freezing or macroblocking may be present
Errs Avg/Inst	Two unique numbers that describe data errors ■ **First Number**: the average number of errors during the time the frequency was locked ■ **Second Number**: the number of errors since the last time the screen was refreshed	■ **[Integer ≥ 0 / Integer ≥ 0]**
Total Bytes	The total number of data bytes successfully read since the frequency was locked	■ **[Integer ≥ 0]**
S/N	The signal-to-noise ratio	■ **Refer to specific hardware specifications** • **value displayed in white**: signal level is nominal • **value displayed in amber**: signal level is marginally too high or too low • **value displayed in red**: signal level is unacceptably too high or too low ■ **n/a**: not applicable for this DHCT

Current RDC

Field Name	Description	Possible Values
Freq	The frequency, in MHz, to which the QPSK transmitter is tuned	■ **[Dependent upon setting] Range:** 8 to 26.5 MHz
Power	The output level of the QPSK transmitter	■ **Refer to specific hardware specifications** • **value displayed in white**: signal level is nominal • **value displayed in amber**: signal level is marginally too high or too low • **value displayed in red**: signal level is unacceptably too high or too low
Delay	The round-trip delay, in microseconds, between the DHCT and the modem at the headend or hub that is used to determine when to transmit the slotted-aloha packets **Note:** Slotted-aloha packets are used to assign periods of time or slots when the DHCT can transmit without interfering with other DHCTs on the same hub	■ **[Integer ≥ 0]**
Retrans	The number of retransmissions (likely due to noise or collisions) of the same data since the DHCT was last booted	■ **0**: desired value ■ **non-0**: indicates a potential issue with a reserve plant

Current QAM

Important: On the tuning adapter, the descriptions in the Current QAM section of the RF Status diagnostic screen always refer to the first tuner. The information displayed in the Current QAM descriptions is not necessarily related to what the UDCP is displaying on the main TV screen or the PIP.

Field Name	Description	Possible Values
Freq	The frequency (Freq) of the tuned QPSK receiver (MHz)	■ **[Dependent upon setting]**
Tuning Mode	The current mode of the inband tuner	■ **QAM-64** ■ **QAM-128** ■ **QAM-256** ■ **Analog** The following is a list of conditions for the possible modes that are placed after the specific tuner mode: • **A**: inband tuner is in the A mode • **B**: inband tuner is in the B mode • **s**: inband tuner is scrambled **Example: QAM-256Bs**
Status	The status of the receiver in regards to receiving valid data	■ **Locked**: tuner is locked ■ **Unlocked**: tuner is not locked
Level[3]	The approximate received signal level	■ **–8 to +8 dBmV (value displayed in white)**: signal level is nominal ■ **>+8 or <–8 dBmV (value displayed in amber)**: signal level is marginally too high or too low ■ **<Range or >Range (value displayed in red)**: signal level is unacceptably too high or too low
S/N[4]	The approximate signal noise ratio (dB) **Note:** The S/N ratio only applies for QAM data channels.	■ **QAM-64**: 28 dB – 34 dB (minimum: 25 dB) ■ **QAM-256**: 32 dB – 34 dB (minimum: 30 dB) ■ **n/a**-not applicable on this DHCT

[3] The level and signal-to-noise data is provided for your convenience. These measurement results are not a substitute for measurements taken with signal level meters or spectrum analyzers.

Field Name	Description	Possible Values
Seconds[5]	The number of seconds that the frequency has been locked	■ **[Integer ≥ 0]**
Corr Bytes[5]	The number of bytes received in error that have been successfully corrected by the forward error correction (FEC) code	■ **[Integer ≥ 0]** **Important:** If incrementing rapidly, picture freezing or Macroblocking may be present.
Uncor Blks[5]	The number of data blocks received in error that were not successfully corrected by the FEC code	■ **[Integer ≥ 0]** **Important:** If incrementing rapidly, picture freezing or Macroblocking may be present
Errs Avg/Inst[5]	Two unique numbers that describe data errors **First Number**: the average number of errors during the time the frequency was locked **Second Number**: the number of errors since the last time the screen was refreshed	■ **[Integer ≥ 0 / Integer ≥ 0]**
EQ Gain	The QAM equalizer gain (EQ Gain) on QAM data channel **Note:** The EQ Gain parameter is only applicable on QAM data channels.	■ **0.9 to 1.0 (value displayed in white)**: signal level is nominal ■ **0.8 and 1.1 (value displayed in amber)**: signal level is marginally too high or too low and required you to correct the signal problem ■ **<0.8 or >1.1 (value displayed in red)**: serious signal problem that needs immediate attention

[4] The level and signal-to-noise data is provided for your convenience. These measurement results are not a substitute for measurements taken with signal level meters or spectrum analyzers.
[5] This field applies to QAM Data Channels only. It does not apply to analog channels.

PowerKEY Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the PowerKEY Information diagnostic screen. You can view this screen to obtain information about the PowerKEY encryption.

Performing Tasks

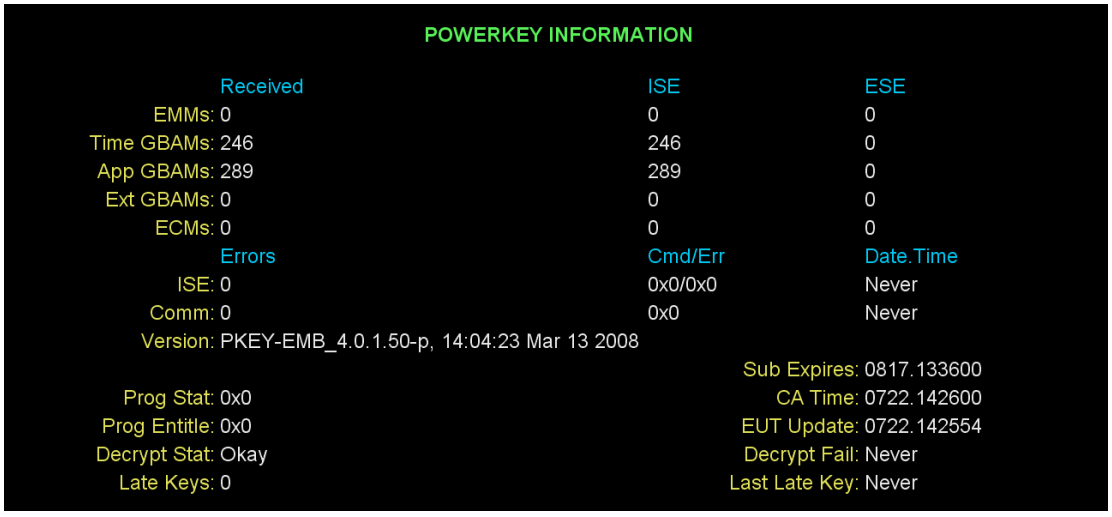
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the total number of messages and type of messages received by the DHCT
- View the number of messages validated by the ISE and the ESE components
- Verify if the Sub Expires date is at least 30 days ahead of the current date
- Determine the encryption status for a program

Screen Components

- Received, ISE, and ESE
- Errors, Cmd/Err, and Date.Time
- Miscellaneous Fields

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Received, ISE, and ESE Parameters

This section contains statistics for the various message types that can be received. Messages are accumulated and displayed for the following categories:

- **Received**: the total number of messages for each message type received by the DHCT
- **ISE:** the number of messages for each message type that is validated by the ISE
- **ESE**: the number of messages for each message type that is validated by the ESE (smart card)

Field Name	Description	Possible Values
EMMs	Counters for EMMs	■ **[Integer ≥ 0]** **Note:** Increments when authorization is sent to DHCT.
Time GBAMs	Counters for time GBAMs	■ **[Integer ≥ 0]** **Note:** Increments over a period of time as provisioned on the DNCS.
App GBAMs	Counters for application GBAM messages	■ **[Integer ≥ 0]** **Note:** Increments over a period of time as provisioned on the DNCS.
Ext GBAMs	Counters for extend event GBAM messages	■ **[Integer ≥ 0]** **Note:** Changes when an event (PPV/IPPV [interactive PPV]) is extended.
ECMs	Counters for entitlement control messages (ECMs) (smart cards)	■ **[Integer ≥ 0]** **Note:** Increments when ECMs are received.

Errors, CMD/Err, and Date.Time

This section contains error statistics for the secure microprocessor. Error statistics are accumulated and displayed for the following categories:

- **Errors**: the number of errors that have occurred with the ISE (secure micro), Comm (Communication with the secure microprocessor), or the version
- **CMD/Err**: the last error that occurred with the ISE, Communication with the secure microprocessor, or the version. If no errors have occurred, then these values are zero
- **Date.Time**: the date and time when the last error occurred for the ISE, Comm, or the version. Never appears if there are no errors

Field Name	Description	Possible Values
ISE	Statistics for the ISE	■ **0**: no errors present ■ **[non-0]**: indicates EMMs have expired
Comm	Statistics for the communications with the secure microprocessor	■ **0**: no errors present ■ **[non-0]**: indicates secure element detected on error

Miscellaneous Fields

Field Name	Description	Possible Values
Version	PowerKEY software version	■ **[Software-dependent]** **Example:** PKEY_3.9.9.2-p +dvrs3, 09:29:29 Nov 20 2007
Prog Stat	Digital PID on which ECMs associated with the current program are received (hexadecimal number)	■ **0**: program is not encrypted or scrambled (in the clear) ■ **[non-0]**: encryption issue has occurred
Prog Entitle	Current entitlement ID for which the current program is authorized (hexadecimal number)	■ **0**: program is not encrypted or scrambled (in the clear) ■ **[non-0]**: encryption issue has occurred

Field Name	Description	Possible Values
Decrypt Stat	Status of the decryption	■ **Blacked Out**: DHCT is authorized to receive program, but program is blacked out in geographical area ■ **ECM Strm Err**: Internal error condition occurred within the QAM broadcasting the current program ■ **No Longer Auth**: DHCT is no longer authorized for program ■ **Okay**: current decryption status is okay (decrypting) or program is in the clear (see Prog Stat above)
Late Keys	Number of times that a program key decryption operation occurred after the DHCT received the program data **Note:** MPEG decoding artifacts (macroblocks) seen concurrent with these errors may be attributed to this condition.	■ **0**: encryption is OK ■ **[non-0]**: encryption issue has occurred
Sub Expires	Date and time that the subscription authorizations expire (MMDD.hhmmss)	■ **[Time]** **Notes:** • Subscription authorizations generally expire 20 to 30 days from the previous renewal date. • A date less than 20 days into the future indicates a problem. ■ **Expired**: subscription is expired
CA Time	Current authenticated time received through the GBAM (MMDD.hhmmss)	■ **[Time]** **Note:** This value matches the current time to the nearest minute.
EUT Update	Last time the DHCT received an update to the entitlement unit table (EUT Update) from the (MMDD.hhmmss)	■ **[Time]** **Notes:** • Time is updated according to system activity (typically a few times a day). • All DHCTs should reflect the same time.
Decrypt Fail	Time of the last program decryption failure (MMDD.hhmmss)	■ **[Time]** ■ **Never**: no decryption failures

Field Name	Description	Possible Values
Last Late Key	Time that the last late key occurred (MMDD.hhmmss)	■ **[Time]** ■ **Never**: no late keys

QPSK SIL Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the QPSK SIL (Signaling Interface Layer) Information diagnostic screen. You can view this screen to verify various forward and reverse path statistics for the QPSK receiver of the DHCT.

Performing Tasks

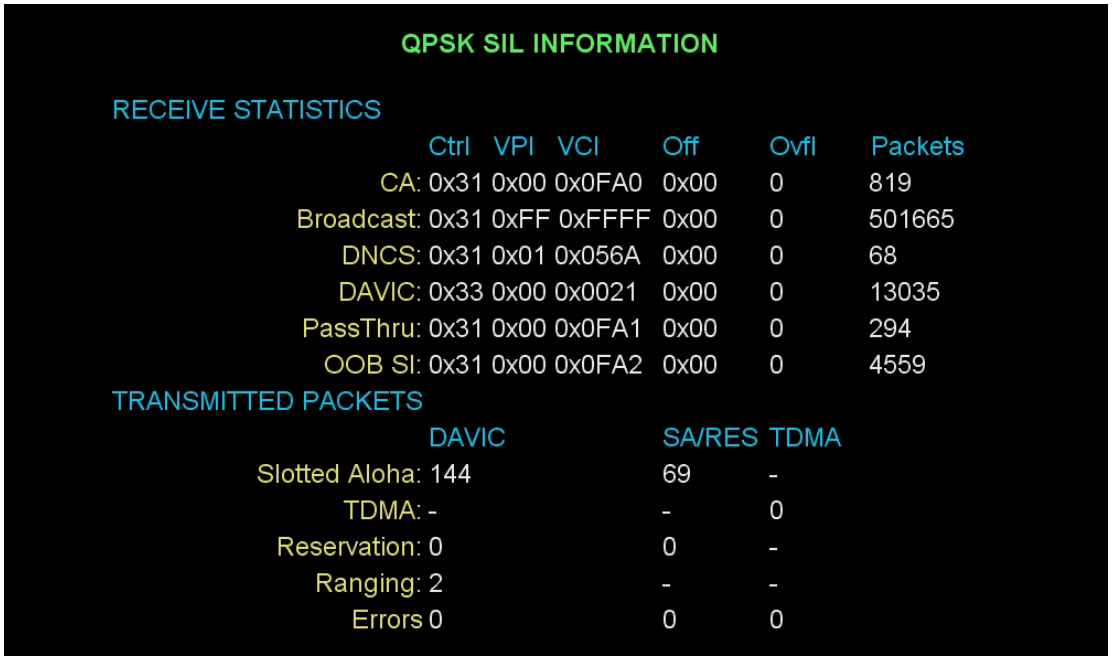
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the number of individual data packets received
- Determine if transport packets were aborted
- Verify if there is a packet present in the receive buffer
- Determine if a channel is enabled

Screen Components

- Receive Statistics
- Transmitted Packets

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Receive Statistics

The Receive Statistics section displays the QPSK forward path data statistics for the following data channels that are included within the screen.

- **CA**: the channel containing conditional access data
- **Broadcast**: he channel containing data that is broadcast to multiple DHCTs
- **DNCS**: the channel that the DNCS uses to communicate with the DHCT
- **DAVIC**: the channel used for the DAVIC connection
- **Pass Thru**: the channel on which the DHCT receives one-way pass-through messages
- **OOB SI**: the channel containing out-of-band (OOB) SI

Field Name	Description	Possible Values
Ctrl	The value of the "channel" control register	■ **[Bit 0 set]**: indicates channel is enabled (hexadecimal value)
VPI	The value of the "channel" asynchronous transfer mode (ATM) hardware filter	■ **[Hexadecimal number]**
VCI	The value of the "channel" ATM hardware filter	■ **[Hexadecimal number]**

Field Name	Description	Possible Values
Off	The channel "hardware filter" offset into the data stream	■ **[Hexadecimal number]**
Ovfl	The number of DMA overflows that occurred on the channel	■ **0** ■ **[Very low number]** **Note:** A higher number indicates a problem.
Packets	The number of individual data packets received; typically represents a single Ethernet frame	■ **[Integer ≥ 0]**

Transmitted Packets

The Transmitted Packets section displays the QPSK reverse path data statistics for the following transmission types that are included in the diagnostic screen:

- **Slotted Aloha**: slotted-aloha style transmission values and are typically DAVIC command and control messages or small reservations App messages
- **TDMA** (Time Division Multiple Access): TDMA values that are used by a constant bandwidth connection
- **Reservation**: reserved slot transmissions; most applications and some DAVIC messages are sent this way
- **Ranging**: number of calibration transmissions between the QPSK modem and the DHCT performed during DAVIC sign-on that achieves the RDC power level
- **Errors**: number of transmit packets for each of the three channel types that have been aborted with a hardware error or time out error

The following table describes the field names and values within the Transmitted Packets section.

Note: When the status of the transmitted packets field is not available, a dash (-) appears.

Field Name	Description	Possible Values
DAVIC	The number of transmit packets across a DAVIC connection	■ **[Integer ≥ 0]** ■ **(dash)**: status is unavailable
SA/RES	The number of transmit packets for slotted-aloha style transmissions	■ **[Integer ≥ 0]** ■ **(dash)**: status is unavailable
TDMA	The number of transmit packets for TDMA transmissions	■ **[Integer ≥ 0]** ■ **(dash)**: status is unavailable

Bootloader Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the Host Bootloader Information diagnostic screen. Bootloader is a factory program loaded into the DHCTs to ensure reliable upgrades. You can view this screen to confirm the status of the Bootloader.

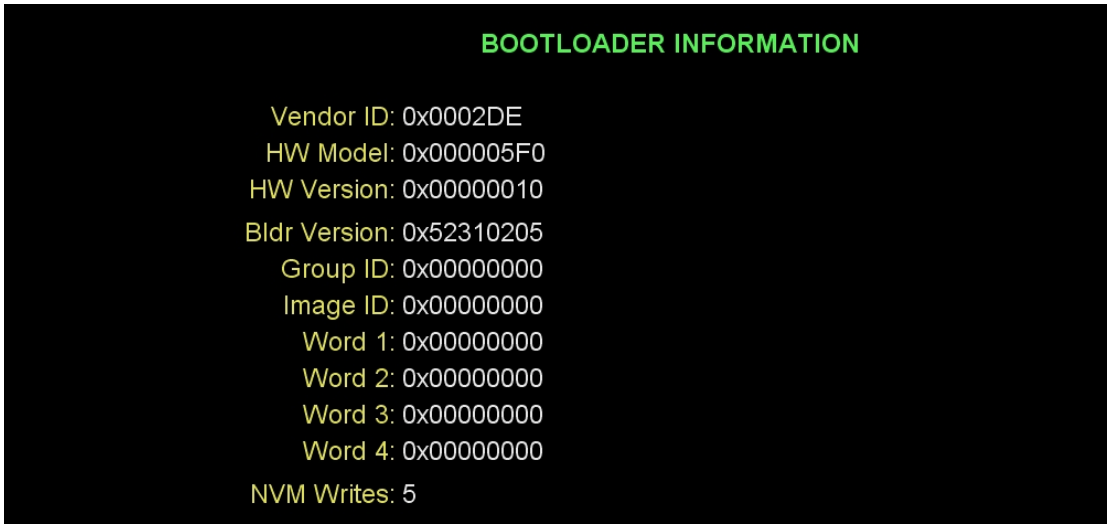
Performing Tasks

By accessing this diagnostic screen, you can perform the following tasks:

- Determine the version number of the PowerTV Bootloader
- Verify the vendor ID for the manufacturer of the DHCT
- Determine the identification number of the FLASH ROM image
- Determine the code version table (CVT) download group for the DHCT

Screen Components

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Notes:

- If **na** appears in all of the fields, then the Bootloader application has not been loaded on that DHCT.
- The Bldr Version Group ID, Image ID, Word, and NVM Writes fields are CVT-only fields.
- In the Word fields, resource descriptors are used to validate that new software can be used by the DHCT and, therefore, help prevent bad code from being loaded onto the DHCT.

Field Name	Description	Possible Values
Vendor ID	The vendor number defined by the manufacturer for the DHCT (hexadecimal format)	■ **[Manufacturer-dependent]:** last 6 digits are first 6 digits of MAC address for DHCT ■ **na:** Bootloader not loaded
HW Model	The hardware model for the DHCT (hexadecimal format)	■ **[Hardware model-dependent]** ■ **na:** Bootloader not loaded
HW Version	The version number of the hardware model	■ **[Hardware model-dependent]:** in hexadecimal format ■ **na:** Bootloader not loaded
Bldr Version	The software version for the PowerTV Bootloader (hexadecimal format)	■ **[Software-dependent]** ■ **na:** Bootloader not loaded
Group ID	The logical group that the DHCT has been assigned to	■ **0x00000000:** default group ID ■ **0x000000xx:** "xx" are two numeric values ■ **na:** DHCT does not support CVT download
Image ID	The image number currently loaded in FLASH ROM **Note:** The Image ID is determined by the DNCS. The same ROM image may display differently on different system hardware.	■ **[Hexadecimal Image ID]:** ID is created by the DNCS ■ **0x000000xx:** "xx" are two numeric values ■ **na:** Bootloader not loaded
Word 1	The first word of the resource descriptor	■ **[Text]:** hexadecimal format
Word 2	The second word of the resource descriptor	■ **[Text]:** hexadecimal format

Field Name	Description	Possible Values
Word 3	The third word of the resource descriptor	■ **[Text]:** hexadecimal format
Word 4	The fourth word of the resource descriptor	■ **[Text]:** hexadecimal format
NVM Writes	The number of writes to the NVM since the DHCT last booted	■ **[Integer > 0]** ■ **n/a:** Bootloader not loaded

SAM Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the SAM Information diagnostic screen. You can view this screen to determine which downloaded applications are present in memory and currently active.

Important: Data will only appear in this screen when third-party applications are implemented.

Performing Tasks

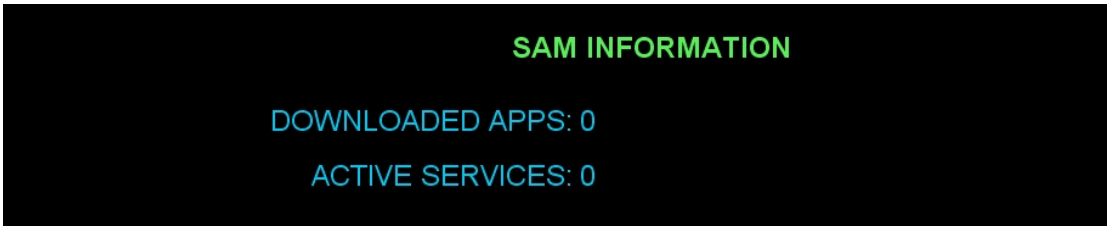
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the name of downloaded applications
- Determine what services are currently running
- Verify the EID required to run an application

Screen Components

- Downloaded Apps
- Active Services

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Downloaded Apps

This section provides information about applications that have been downloaded from the network and are currently present in memory.

Note: This section will not include data if a third-party application is not present.

Field Name	Description	Possible Values
Name	The name of the application	■ **[Application-dependent]**
Ver	The version of the application	■ **[Application-dependent]**
AppId	The ID number for the application	■ **[Assigned by OS]**
EID	The entitlement ID number required to run the application	■ **[Hexadecimal value]**
ActCount	The number of times the application has been activated since it was downloaded	■ **0**: application has not run ■ **> 0**: application has been run
Ev	An indication of whether or not an application uses SAM events	■ **F (false)**: does not use SAM events ■ **T (true)**: uses SAM events
Size	The file size of the application (K)	■ **[Application-dependent]**

Active Services

This section provides information about services that are currently running.

Field Name	Description	Possible Values
ShortDesc	A short description of the service	■ **[Alphanumeric text string]**: alphabetical text saved on the system
ServiceId	The ID associated with the service used by the SAM	■ **[Numeric ID]**: ID of service saved on the system
AppName	The full URL of the application	■ **[HTML address]**

SARA Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the SARA Information diagnostic screen. You can view this screen to obtain information about SARA. If SARA detects any unusual or failure conditions, the screen displays these conditions on the bottom half of the screen under the heading of **Software Anomalies**.

Performing Tasks

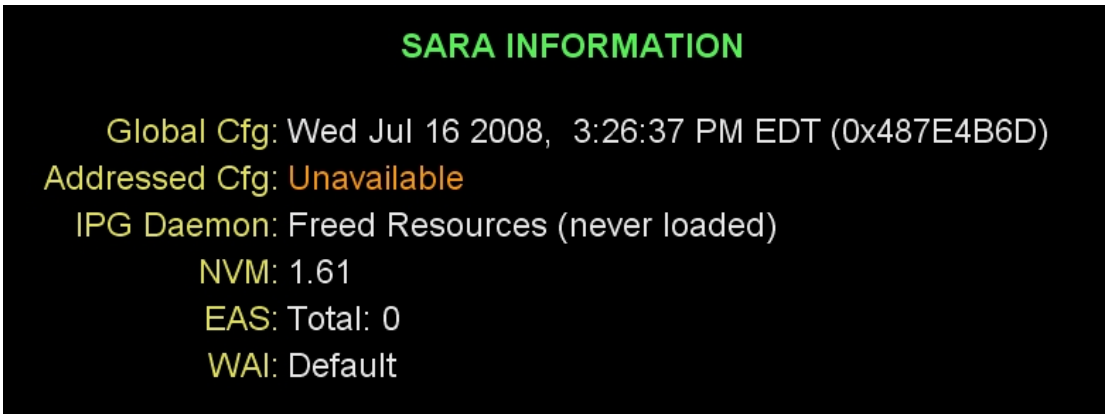
By accessing this diagnostic screen, you can perform the following tasks:

- Determine when the global configuration data was sent to the DHCT
- Determine when the DHCT-specific configuration data was created and sent to the DHCT
- Verify when the most recent IPG data was received by the DHCT

Screen Components

- SARA Information
- Software Anomalies

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Software Information

Field Name	Description	Possible Values
Global Cfg	The date and time that the global configuration data was created **Important:** If you are not operating in a SARA environment, please ignore the details for this field.	■ **[Date, Time]**: ASCII and hexadecimal format ■ **Unavailable**: DHCT has not received any individually addressed configuration data
Addressed Cfg	**Important:** Please ignore this field.	
IPG Daemon	**Important:** Please ignore this field.	
EAS	**Important:** Please ignore this field as the EAS handling is performed by the UDCP.	
WAI	**Important:** Please ignore this field.	

Software Anomalies

This section *only* includes messages when SARA detects unusual or failure conditions. These messages may appear when SARA detects software anomalies.

Important: The presence of an anomaly does not necessarily indicate a problem with the DHCT. The DHCT may have detected an anomaly within the network or at the headend. If any anomalies appear, record the entire message, and then contact your system administrator or Cisco Services for further assistance.

Component Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the Component Information diagnostic screen. You can view this screen to verify the software and driver versions installed on the DHCT.

Performing Tasks

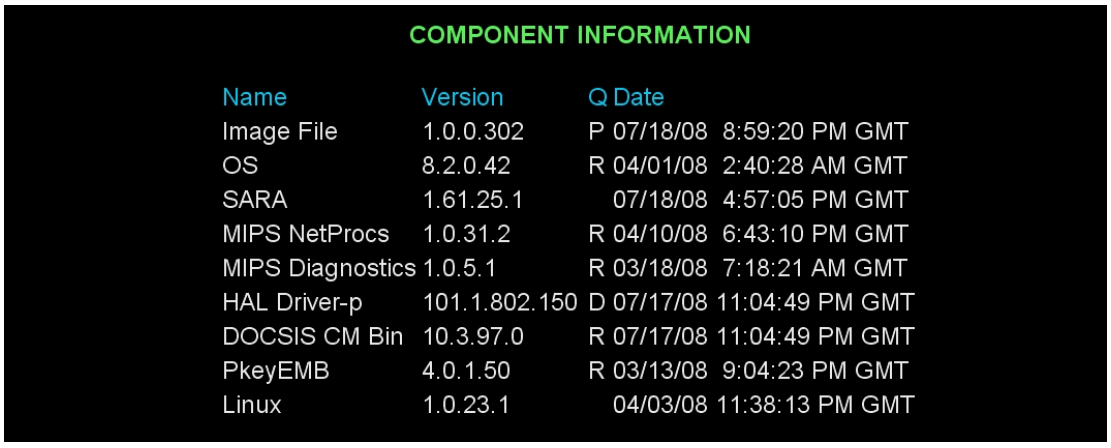
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the software and software version for components installed on the DHCT
- Verify release status for software and driver components installed on the DHCT
- Determine when a component was created

Screen Components

- Name
- Version
- Q (Quality)
- Date

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Name

Lists the name of the component installed on the DHCT.

Version

The Version section includes information about the versions of the various software components that are installed on the DHCT.

Quality

The Q (Quality) section includes information about the development or release status of the various software and driver components that are installed on the DHCT.

Field Name	Description	Possible Values
Q	The release status of the various software and driver components	**a (alpha)**: Indicates the software is in an alpha version
		b (beta): Indicates the software is in a beta version
		d, D: Indicates the software is in a development version
		R: Indicates the software is in an officially released version

Date

The Date section includes the date that the component was created.

SAM EDCT Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions for the SAM EDCT Information diagnostic screen. When the EDCT feature is installed, the channel lineup can be customized for individual DHCTs. The SAM EDCT Information diagnostic screen provides information about the EDCT feature.

Performing Tasks

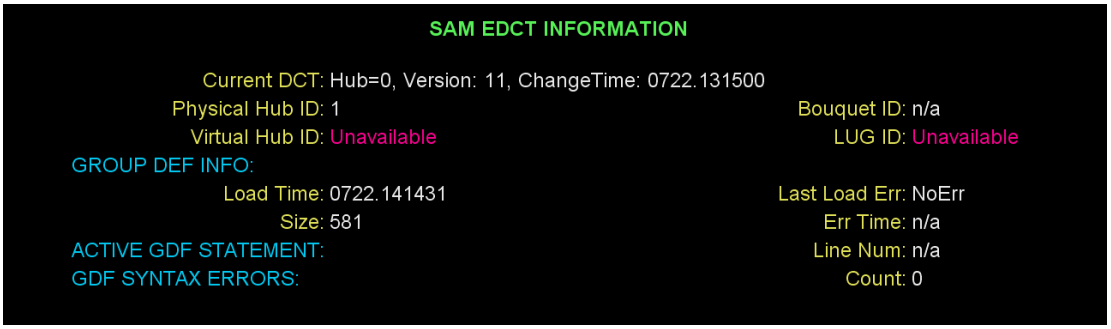
By accessing this diagnostic screen, you can perform the following tasks:

- Identify information about the currently loaded and currently assigned display channel table (DCT)
- Determine the physical hub or bouquet ID assignment for the DHCT
- Evaluate possible errors that the DHCT experienced while attempting to load the Group Definitions File (GDF) from BFS.

Screen Components

- General Fields
- Group Def Info
- Active GDF Statement
- GDF Syntax Errors

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

General Fields

The first section of the SAM EDCT Information diagnostic screen includes general information about the DCT, as well as various identification data associated with the DHCT.

Field Name	Description	Possible Values
Current DCT	The display channel table information including the channel table selection mode and identifier (hub, virtual hub, bouquet, or lineup group) **Format:** <selection mode>=<id>, Version: <DCT version>, Change Time: <MMDD.hhmmss>	■ **[Selection mode=Integer > 0], [Version: Integer > 0], [Time]** ■ **Unavailable**: DCT is not loaded
Physical Hub ID	The unique ID of the physical hub that the DHCT belongs to	■ **[Integer ≥ 0]** ■ **Unavailable**: DHCT is in a DVB-SI system environment using NDS conditional access
Virtual Hub ID	The unique identifier for the virtual hub that the DHCT belongs to	■ **[Integer ≥ 0]** ■ **Unavailable**: DHCT is in a DVB-SI system environment using NDS conditional access
Bouquet ID	The unique identifier assigned to the DHCT that is used when applying the default channel table selection strategy	■ **[Integer ≥ 0]** ■ **Unavailable**: DHCT is not in a DVB-SI system environment. The physical hub ID should be used for the default channel table selection
LUG ID	The unique identifier of the lineup group (LUG) that is assigned to the DHCT **Notes:** ■ The LUG ID will override the Hub ID if it is defined. ■ The LUG is a group of hubs that use the same DCT.	■ **[Integer ≥ 0]** ■ **Unavailable**: no lineup ID is assigned

Group Def Info

The Group Def Info section includes information related to the loading of the group definition file (GDF). The GDF is loaded out-of-band via the BFS.

Field Name	Description	Possible Values
Load Time	The date and time that the GDF was loaded on the DHCT (MMDD.hhmmss)	■ **[Time]** ■ **Not Loaded**: no GDF is currently loaded
Size	The size of the currently loaded, uncompressed GDF (bytes)	■ **[Integer > 1]** ■ **0**: no GDF file is currently loaded
Last Load Err	The last error experienced by the DHCT when the DHCT attempted to load the GDF from BFS	■ **NoErr**: no load errors occurred ■ **PathNotFound**: the GDF does not exist on BFS ■ **OutOfMemory**: not enough memory to load the GDF ■ **ReadErr**: failed to read the file from BFS ■ **ExceededMaxLength**: the GDF exceeded the maximum allowable length ■ **FileChanged**: the GDF was modified on BFS while attempting to load on the DHCT ■ **UnknownErr**: unknown error
Err Time	The date and time when the last error occurred when the DHCT attempted to load GDF from BFS (MMDD.hhmmss)	■ **[Time]**
Line Num	The line number of the active GDF statement in the currently loaded GDF	■ **[Integer > 1]** ■ **n/a**: no active GDF statement exists

Active GDF Statement

The Active GDF Statement section includes status information about the active GDF statement.

Field Name	Description	Possible Values
Active GDF Statement	The actual statement from the currently loaded GDF in which the current DCT assignment is based on	■ **[Correlates with Assigned DCT value]** **Note:** If there is no active GDF statement, then the line below the Line Num field is blank and the Assigned DCT field will reflect the default channel table selection mode and identifier.

GDF Syntax Errors

The Active GDF Statement section includes status information about the active GDF statement.

Field Name	Description	Possible Values
Count	The total number of lines with syntax errors in the currently loaded GDF	■ **[Integer ≥ 0]** **Note:** A count of zero indicates that there are no syntax errors.
<Warning Statements>	The error type, line number, and offset for each syntax error **Note:** The offset is the number of characters from the beginning of the GDF statement minus any non-delimiting white space where the syntax error was detected.	Type of syntax errors include: ■ **ParseErr**: token, delimiter, or keyword is out of sequence ■ **IllegalTokenChar**: illegal character was found while reading the token ■ **UnrecognizedCondition**: condition did not match one of the valid condition ■ **UnrecognizedActionType**: action type did not match the valid actions ■ **InvalidConditionValue**: the condition value is invalid ■ **InvalidActionValue**: the action value is invalid ■ **IncompleteStatement**: the end of line was encountered prematurely

Switched Digital Video Diagnostic Screen

Introduction

This section provides an overview of the Switched Digital Video diagnostic screen, and includes information that describes the SDV client and server, including the number of SDV channels that have been authorized for this service. Detailed statistics about the SDV protocol are also included in this diagnostic screen.

Performing Tasks

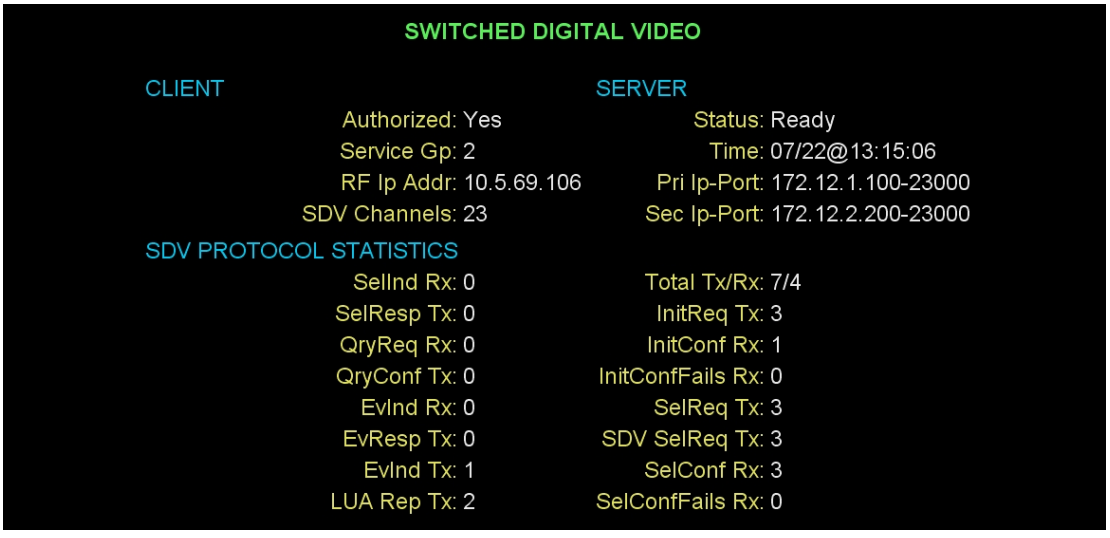
By accessing this diagnostic screen, you can perform the following tasks:

- Determine if the client (DHCT) is authorized for SDV services
- Identify the status of the SDV server
- Verify details about the transmission of data for the SDV service

Screen Components

- Client
- Server
- SDV Protocol Statistics

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Client

Field Name	Description	Possible Values
Authorized	Indicates whether or not the client is authorized for SDV service (_SASD service) or the_SASD service does not exist	■ **Yes**: service is authorized ■ **No**: service is not authorized ■ **n/a**: service does not exist
Service Gp	The ID of the service group to which this client belongs	■ **[Integer ≥ 1]** ■ **n/a**: service does not exist
RF Ip Address	The IP address for the RF network	■ **[Network-dependent]**
SDV Channels	The number of SDV channels (WatchSDV services) in the channel lineup	■ **[Integer ≥ 0]**

Server

Field Name	Description	Possible Values
Status	The current status of the client communications with the SDV server (init request and receiving a response)	■ **Ready**: (desired value) init request is successfully confirmed and accepted by the SDV server ■ **Pending**: the set-top is in the process of establishing communications with the SDV server ■ **Unavailable**: init request failed ■ **Unknown**: init request not yet initiated
Time	The time of the last successful initial request confirmed by the server	■ **[month/day@hh:mm:sec]**
Pri Ip-Port	The IP address and port number (IP address-Port number) for the primary SDV server	■ **[Network-dependent]** **Example**: 192.168.99.5-2300 ■ **0.0.0.0-n/a**: primary SDV server is not available
Sec Ip-Port	The IP address and port number (IP address-Port number) for the secondary SDV server	■ **[Network-dependent]** **Example**: 192.168.99.5-23000 ■ **0.0.0.0-n/a**: secondary SDV server is not available

SDV Protocol Statistics

The SDV Protocol section displays statistics for the external protocol messages used for SDV. These statistics are combined for all sessions and protocols.

Field Name	Description	Possible Values
SelInd Rx	The number of Select Indications received	■ **[Integer ≥ 0]**
SelResp Tx	The number of Select Responses sent	■ **[Integer ≥ 0]**
QryReq Rx	The number of Query Requests received	■ **[Integer ≥ 0]**
QryConf Tx	The number of confirmed Query Responses sent	■ **[Integer ≥ 0]**
EvInd Rx	The number of Event Indications received	■ **[Integer ≥ 0]**
EvResp Tx	The number of Event Responses sent	■ **[Integer ≥ 0]**
EvInd Tx	The number of Event Indications sent	■ **[Integer ≥ 0]**
LUA Rep Tx	The number of LUA (Last User Activity) reports sent	■ **[Integer ≥ 0]**
Total Tx/Rx	The total number of requests sent and received	■ **[Integer ≥ 0]/[Integer ≥ 0]**
InitReq Tx	The total number of init requests sent, excluding retransmissions	■ **[Integer ≥ 0]**
InitConf Rx	Total number of initial confirm messages received from SDV server that indicate success or failure	■ **[Integer ≥ 0]**
InitConfFails Rx	Total number of initial confirms received from the SDV server that indicate failure	■ **[Integer ≥ 0]**
SelReq Tx	The total number of select requests sent for SDV and non-SDV services, excluding retransmissions	■ **[Integer ≥ 0]**
SDV SelReq Tx	The total number of select requests sent for SDV, excluding retransmissions	■ **[Integer ≥ 0]**
SelConf Rx	The total number of select confirm messages received from SDV server that indicate success or failure	■ **[Integer ≥ 0]**
SelConfFails Rx	The total number of select confirms received from the SDV server that indicate failure	■ **[Integer ≥ 0]**

SDV Mini Carousel Diagnostic Screen

Introduction

This section provides an overview of the SDV Mini Carousel diagnostic screen, and includes information that describes the Mini Carousel (MC) Discovery Files, as well as details about the MC data. The MC Discovery Files are generated by the DNCS and placed on BFS to support the inband MC discovery process for an SDV client. Only one SDV MC Discovery file exists per service group. It is located in the bfs:///sgm/sdv/ib directory. MC data is generated by the SDV server for each service group and placed in the transport stream as Private MPEG packets.

Important: The DNCS-generated mini carousel discovery files are ignored by the tuning adapter if your system includes a fixed scan list of SDV frequencies in the tuning adapter config file or in the _SASD SAM Service URL. In this case, the mini carousel discovery file information data is populated based on the fixed scan list that you have included on your system. For details about using a fixed scan list, refer to *Provisioning the DNCS to Support SDV Services User's Guide* (part number 4012948).

Performing Tasks

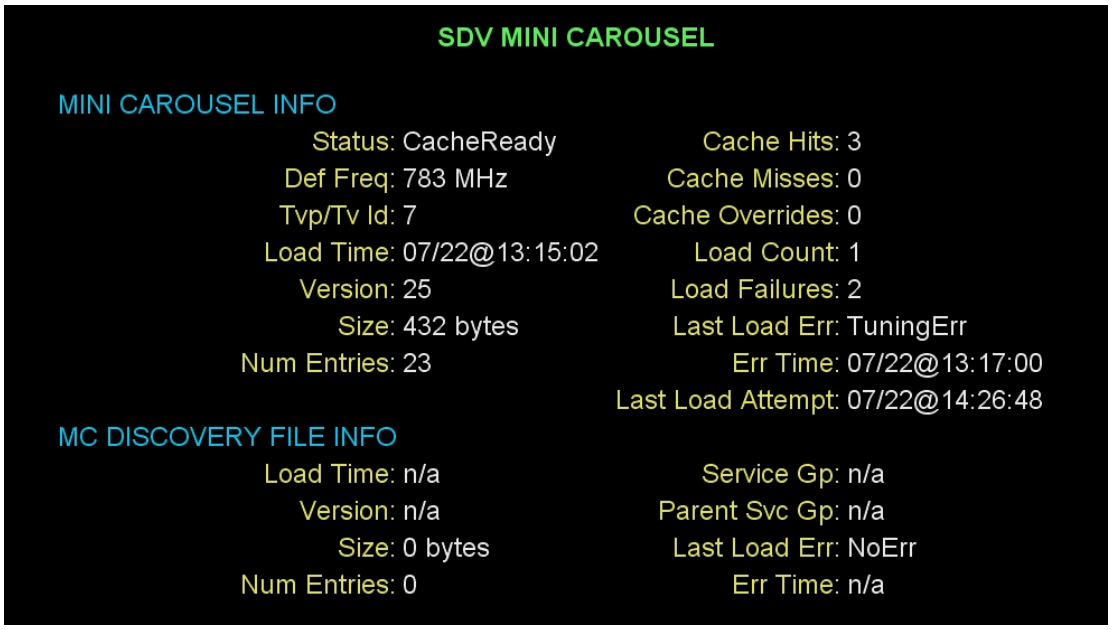
By accessing this diagnostic screen, you can perform the following tasks:

- Determine the date and time that the mini carousel was last loaded in cache
- Determine the current status for the mini carousel
- Identify the version for the mini carousel

Screen Components

- Mini Carousel Info
- MC Discovery File Info

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Mini Carousel Info

Field Name	Description	Possible Values
Status	The current status of the information from the mini carousel	■ **Init**: initial state at boot time prior to loading mini carousel data. Also the state reported when the set-top is not authorized for SDV ■ **SgDiscovery**: client is performing or waiting to perform the service group discovery process ■ **McpDiscFileRead**: client is reading or waiting to read the BFS file to obtain a list of SDV QAM frequencies to scan for mini carousel data ■ **McpDiscovery**: client is scanning or waiting to scan SDV QAM frequencies in search of mini carousel data ■ **CacheReady**: (desired value) mini carousel loaded and data acquired to allow viewing of SDV channels

Field Name	Description	Possible Values
Def Freq	The default or home SDV frequency in MHz. The client will tune to this frequency to read the mini carousel data if not already tuned to another SDV frequency	■ **[Integer ≥ 0]**
Tvp/Tv Id	The internal identifier of the logical hardware resource assigned or allocated for loading inband mini carousel data	■ **[Integer ≥ 1]** ■ **n/a**: no logical tuner resource is currently assigned or allocated for loading the inband mini carousel
Load Time	The time when the mini carousel information was loaded into cache	■ **[month/day@hh:mm:sec]**
Version	The version number for the mini carousel cached file	■ **[0 to 31]**
Size	The size of the mini carousel data (bytes)	■ **[Integer ≥ 0]**
Num Entries	The number of programs (channels) in the mini carousel data	■ **[Integer ≥ 0]**
Cache Hits	The number of times requested tuning parameters were successfully received from the mini carousel cache **Notes:** ■ This includes cache hits after forcing a reload of the mini carousel. ■ This value is only reset to zero when it rolls over or the agent is reset.	■ **[Integer ≥ 0]**
Cache Misses	The number of times requested tuning parameters were not found in the mini carousel cache even after reloading mini carousel data **Note:** This value is only reset to zero when it rolls over or the agent is reset.	■ **[Integer ≥ 0]**

Field Name	Description	Possible Values
Cache Overrides	The number of times the cached tuning parameters from the mini carousel have been overridden by fresh tuning parameters received from the SDV server via CCP (Channel Change Protocol) **Note:** This value is only reset to zero when it rolls over or the agent is reset.	■ **[Integer ≥ 0]**
Load Count	The number of times the mini carousel data has successfully been read (or loaded) by the client **Note:** This value is only reset to zero when it rolls over or the agent is reset.	■ **[Integer ≥ 0]**
Load Failures	The number of times the client has failed to read the mini carousel data **Note:** This value is only reset to zero when it rolls over or the agent is reset.	■ **[Integer ≥ 0]**
Last Load Err	The type of error for the last load (read) of the mini carousel	■ **NoErr**: last load was successful ■ **ReadErr**: read of last load failed ■ **MemFull**: not enough memory for last load ■ **Aborted**: last load attempt was aborted ■ **TuningErr**: tuning failure during last load ■ **SGMismatch**: service group identified in the mini carousel data does not match the set-top's service group found during service group discovery ■ **UnknownErr**: an unknown error occurred during load
Err Time	The time when the last error occurred in loading	■ **[month/day@hh:mm:sec]** ■ **n/a**: no load errors have occurred since reset
Last Load Attempt	The time when the last load was attempted on the DHCT	■ **[month/day@hh:mm:sec]** ■ **00/00@00:00:00**: no load errors have occurred since reset

MC Discovery File Info

Field Name	Description	Possible Values
Load Time	The time when the MC Discovery file was loaded on the DHCT during discovery	■ **[month/day@hh:mm:sec]** ■ **n/a**: file is not loaded
Version	The current version of the MC Discovery File, expressed as a timestamp of when the file contents were generated by the DNCS	■ **[month/day@hh:mm:sec]**
Size	The size of the MC Discovery File in bytes	■ **[Integer ≥ 0]**
Num Entries	The total number of tuning parameter entries in the MC Discovery File	■ **[Integer ≥ 1]** ■ **0**: no entries
Service Gp	The service group of the currently loaded MC Discovery File **Note:** In systems with no parent/child service groups, this should match the service group identified on the VOD Information and the Switched Digital Video diagnostic pages	■ **[Integer ≥ 1]** ■ **n/a**: MC Discovery file not loaded
Parent Svc Gp	The next higher level parent service group in the hierarchy above the child service group	■ **[Integer ≥ 1]** ■ **n/a**: MC Discovery File not loaded or there is no parent service group above the child service group

Field Name	Description	Possible Values
Last Load Err	The error status from the last load of the mini-carousel data (MCD) in discovery. The status reflects the last error type after a successful load of the MCD	■ **NoErr**: successful load ■ **BadParamErr**: bad parameters specified ■ **OutOfStateErr**: load request denied due to inappropriate state ■ **FileNotFoundErr**: MCD file does not exist on BFS for this service group ■ **OutOfMemoryErr**: insufficient memory to process request ■ **ReadErr**: failed to read MCD file from BFS ■ **TunerConflictErr**: could not load MCD file due to higher priority tuner request ■ **FileChangedErr**: MCD file changed on BFS during read ■ **TimeoutErr**: request timed out ■ **AbortedErr**: request was intentionally aborted ■ **BadDataErr**: the data was loaded successfully but is invalid ■ **UnknownErr**: unknown error occurred during load attempt
Err Time	The time at which the last discovery file load error was reported	■ **[month/day@hh:mm:sec]** ■ **n/a**: no file load has occurred

SDV Session Info Diagnostic Screen

Introduction

This section provides an overview of the SDV Session Info diagnostic screen, and includes information that describe the details of SDV-related sessions, including the current SDV and tuner status.

Performing Tasks

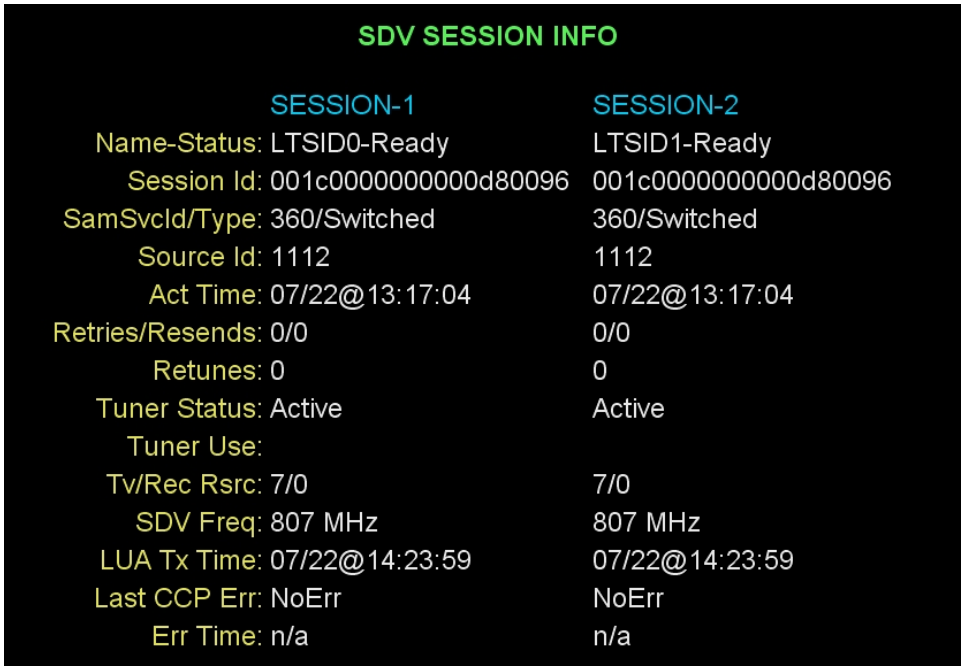
By accessing this diagnostic screen, you can perform the following tasks:

- Determine the current status of an SDV session
- Determine the current status of the tuner
- Verify the name of the current SDV session

Screen Components

- Session-1
- Session-2

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Field Name	Description	Possible Values
Name – Status	The name and current status of the session	■ **[Name of Session]** and one of the following: • **Ready**: tuning parameters have been acquired • **Idle**: no service is selected for this session • **Pending**: Session Manager is waiting for tuning parameters from either the cache manager or the SDV server • **Unavailable**: failed to acquire tuning parameters for the selected SDV service
Session Id	The 10-byte session ID for the that uniquely identifies the SDV client/server session within the system	■ **[Session-dependent]**
SamSvcId/Type	The SAM service ID identifying the program and type of service defined for that session	■ **[Integer ≥ 0]** and one of the following: • **Switched**: switched digital service • **Broadcast**: broadcast service • **n/a**
Source Id	The ATSC source ID	■ **[Integer ≥ 0]**
Act Time	The time of activation for the session	■ **[month/day@hh:mm:sec]**
Retries/Resends	The number of times a select request has been resent due to timeout or user initiated retry, or due to a resend request for the currently selected service	■ **[Integer ≥ 0]/[Integer ≥ 0]**
Retunes	The number of times the client has received updated tuning parameters for currently selected service requiring a retune	■ **[Integer ≥ 0]**
Tuner Status	The tuner status from an SDV perspective	■ **Active**: successfully tuned ■ **Inactive**: not using a tuner ■ **n/a**: session has not yet requested a tuner

Field Name	Description	Possible Values
Tuner Use	An indication of how the tuner is being used	■ **Main**: tuner is being used for main TV display ■ **Rec**: tuner is being used for a scheduled recording ■ **PPV**: tuner is being used for pay-per-view (PPV) content ■ **PIP**: tuner is being used for picture-in-picture (PIP) ■ **n/a**: no tuner is in use for this session
Tv/Rec Rsrc	The internal identifiers for the logical hardware resources allocated for presenting and recording the SDV service	■ **[Integer ≥ 0]**: current service to viewer is either on main TV, PIP, or AUX OUT ■ **0**: current service to viewer is not on main TV, PIP, or AUX OUT
SDV Freq	The frequency (MHz) used by the agent to tune to the currently selected SDV service	■ **[Integer ≥ 0]**
LUA Tx Time	The time when the last user action was reported to the SDV server	■ **[month/day@hh:mm:sec]** ■ **n/a**

Field Name	Description	Possible Values
Last CCP Err	The last error from the CCP (Channel Change Protocol) for this session	■ **NoErr**: no error was reported ■ **Timeout**: timeout waiting on response from server ■ **OutOfService**: program is no longer available ■ **FormatErr**: invalid format in CCP sent to server ■ **Redirect**: force tune indication from server ■ **InvalidSG**: server cannot identify service group from its topology ■ **UnknownClient**: agent has not registered with server ■ **NoResource**: session resource is unavailable ■ **BWNotAvail**: bandwidth bind on edge device failed ■ **ExceedsCapacity**: server capacity of agents has exceeded ■ **VerNotSupported**: agent version is not supported ■ **unknownErr**: unknown error ■ **n/a**: CCP was not initiated
Err Time	The time that the last error was reported from the CCP for this session	■ **[month/day@hh:mm:sec]** ■ **n/a**: no errors reported

Tuning Adapter Status Diagnostic Screen

Introduction

This section provides an overview of the Tuning Adapter Status diagnostic screen, and includes details about the tuning adapter, including operational status, config file information, and authorization status.

Performing Tasks

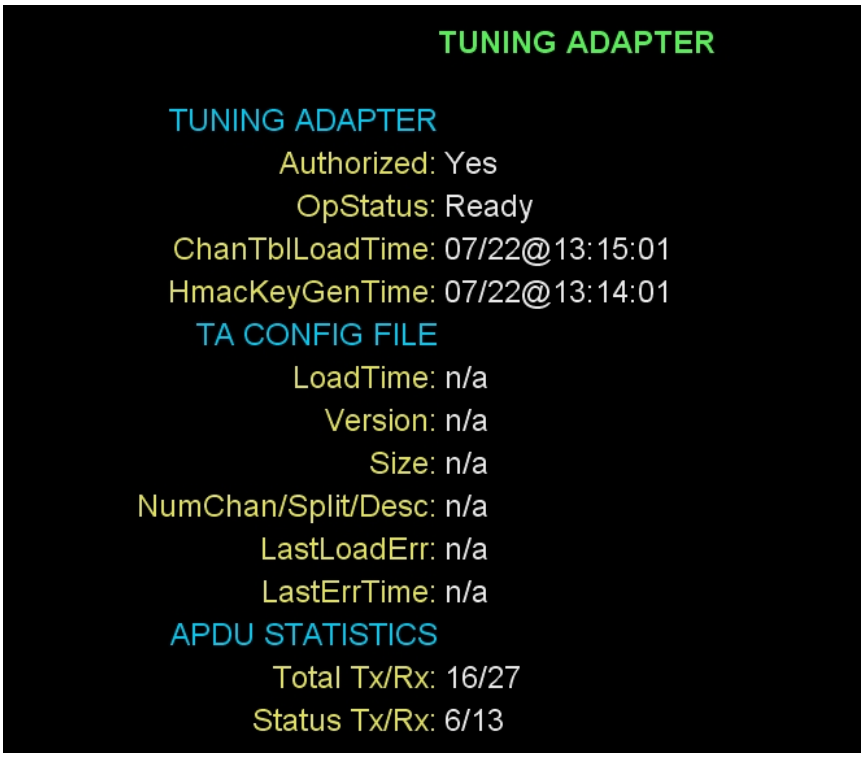
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the current operating status for the tuning adapter
- Determine the version of the currently loaded tuning adapter configuration file and when it was loaded, if applicable
- Determine the authorization status for the tuning adapter

Screen Components

- Tuning Adapter
- TA Config File
- APDU Statistics

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Tuning Adapter

Field Name	Description	Possible Values
Authorized	The current brick mode status of the tuning adapter	■ **Yes** ■ **No** ■ **Pending**

Field Name	Description	Possible Values
OpStatus	The operational status of the tuning adapter that is communicated to the UDCP over USB **Note:** The tuning adapter remains in the "Initializing" state until it receives a tr_init_req() APDU from the UDCP and has completed UDCP authentication and other necessary initialization steps (for example, loading the channel table). The tuning adapter then transitions to the "Ready" state to resolve tuning requests from the UDCP or it transitions to the "Disabled" state if it is in brick or standby mode.	■ **Initializing** ■ **Ready** ■ **Disabled** ■ **Unavailable** ■ **Upgrade**
ChanTblLoadTime	The time when the currently loaded version of the channel table was loaded	■ **[month/day@hh:mm:sec]** ■ **n/a**
HmacKeyGenTime	The time of the current HMAC key used to verify requests from the UDCP	■ **[month/day@hh:mm:sec]** ■ **n/a**

TA Config File

Field Name	Description	Possible Values
LoadTime	The time when the currently loaded version of the tuning adapter configuration file was loaded	■ **[month/day@hh:mm:sec]** ■ **n/a**
Version	The version of the currently loaded tuning adapter configuration file that is represented as a human readable timestamp	■ **[month/day@hh:mm:sec]** ■ **n/a**
Size	The size of the configuration file (KB)	■ **[Integer ≥ 0]**
NumChan/Split/Desc	The number of channels, split channels, and additional descriptors in the currently loaded version of the tuning adapter configuration file	■ **[Integer ≥ 0]/[Integer ≥ 0]/[Integer ≥ 0]**
LastLoadErr	The most recent tuning adapter load error	■ **NoErr** ■ **BadParam** ■ **OutOfState** ■ **NotFound** ■ **OutOfMem** ■ **ReadErr** ■ **BadData** ■ **UnknownErr**
LastLoadTime	The time in which the most recent tuning adapter configuration file load error occurred **Note:** If this time is greater than the LoadTime, the error has occurred since the last successful load. If this time is less than LoadTime, the error occurred prior to the most recent successful load.	■ **[month/day@hh:mm:sec]** ■ **n/a**

APDU Statistics

Field Name	Description	Possible Values
Total Tx/Rx	The total number of tuning adapter interface APDUs transmitted and received over USB	■ **[Integer ≥ 0]/[Integer ≥ 0]**
Status Tx/Rx	The total number of udcp_status_req() and udcp_status_rsp() APDUs transmitted and received over USB	■ **[Integer ≥ 0]/[Integer ≥ 0]**

UDCP Status Diagnostic Screen

Introduction

This section provides an overview of the UDCP Status diagnostic screen, and includes information about the current session, as well as the authentication status of the UDCP.

Performing Tasks

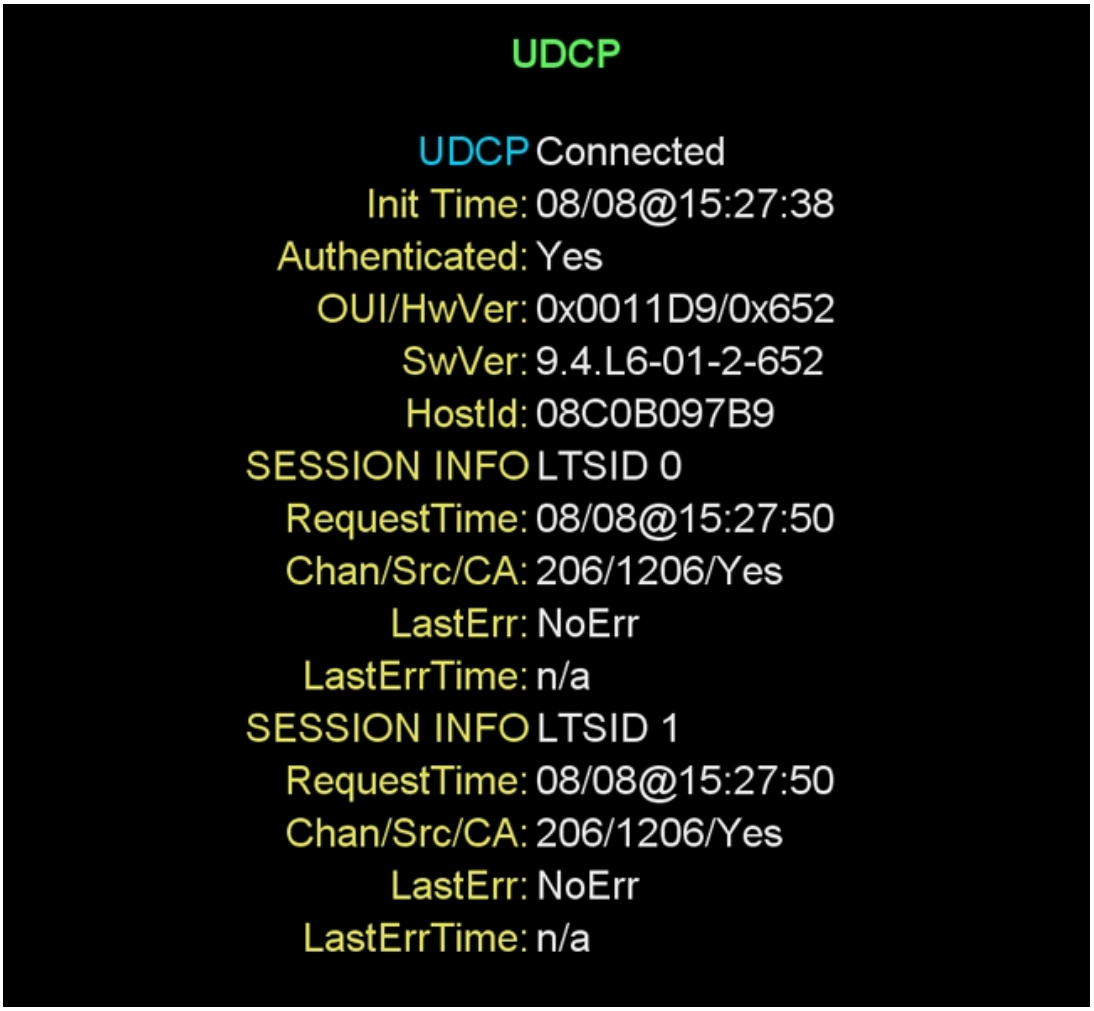
By accessing this diagnostic screen, you can perform the following tasks:

- Determine if the physical USB connection between the tuning adapter and the UDCP has been established
- Verify the authentication status for the UDCP
- Verify when the most recent tuning adapter request occurred on the local transport stream ID (LTSID)

Screen Components

- UDCP
- Session Info

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

UDCP

Field Name	Description	Possible Values
UDCP	The current status of the physical USB connection between the tuning adapter and the UDCP	■ **Connected** ■ **Not Connected**
Init Time	The time when most recent tr_init_req() APDU was received from the UDCP	■ **[month/day@hh:mm:sec]** ■ **n/a**

Field Name	Description	Possible Values
Authenticated	The authentication status of the UDCP	■ **Yes** ■ **No** ■ **In Progress** ■ **Undetermined**
OUI/HwVer	The Organizationally Unique Identifer (OUI) of the UDCP manufacturer assigned by IEEE, and the UDCP hardware version expressed as a single integer	■ **0xXXXXXX/0xXXXX** ■ **n/a**
SwVer	Identifies the UDCP software version	■ **Version string** ■ **n/a**
HostId	The common name of the manufacturer certificate for the UDCP	■ **[Certificate-dependent]** ■ **n/a**

Session Info LTSID 0

Field Name	Description	Possible Values
RequestTime	The time of most recent resolve tuning request on LTSID 0	■ **[month/day@hh:mm:sec]** ■ **n/a**
Chan/Src/CA	The channel number, source ID, and conditional access allowed status for the request on LTSID 0	■ **[Integer ≥ 0]/[Integer ≥ 0]/Yes** or **No**
LastErr	The most recent resolve tuning response error for LTSID 0	■ **NoErr** ■ **ChanNotAvail** ■ **NetworkNotAvail** ■ **TuneInfoNotAvail** ■ **IllegalChan** ■ **InvalidLTSID** ■ **BadSignature** ■ **SrcParamsUnknown** ■ **InvalidTunerUse**

Field Name	Description	Possible Values
LastErrTime	The time of the most recent resolve tuning response error on LTSID 0 **Note:** If this time is equal to or greater than the RequestTime, then the error applies to the current request. If this time is less than the RequestTime, it is an old error from a previous request.	■ **[month/day@hh:mm:sec]** ■ **n/a**

Session Info LTSID 1

Field Name	Description	Possible Values
RequestTime	The time of most recent resolve tuning request on LTSID 1	■ **[month/day@hh:mm:sec]** ■ **n/a**
Chan/Src/CA	The channel number, source ID, and conditional access allowed status for the request on LTSID 1	■ **[Integer ≥ 0]/[Integer ≥ 0]/Yes** or **No**
LastErr	The most recent resolve tuning response error for LTSID 1	■ **NoErr** ■ **ChanNotAvail** ■ **NetworkNotAvail** ■ **TuneInfoNotAvail** ■ **IllegalChan** ■ **InvalidLTSID** ■ **BadSignature** ■ **SrcParamsUnknown** ■ **InvalidTunerUse**
LastErrTime	The time of the most recent resolve tuning response error on LTSID 1 **Note:** If this time is equal to or greater than the RequestTime, then the error applies to the current request. If this time is less than the RequestTime, it is an old error from a previous request.	■ **[month/day@hh:mm:sec]** ■ **n/a**

Serial Link Protocol Diagnostic Screen

Introduction

This section provides an overview of the Serial Link Protocol diagnostic screen, and includes information specific to the serial link protocol, including the current state of the USB device.

Performing Tasks

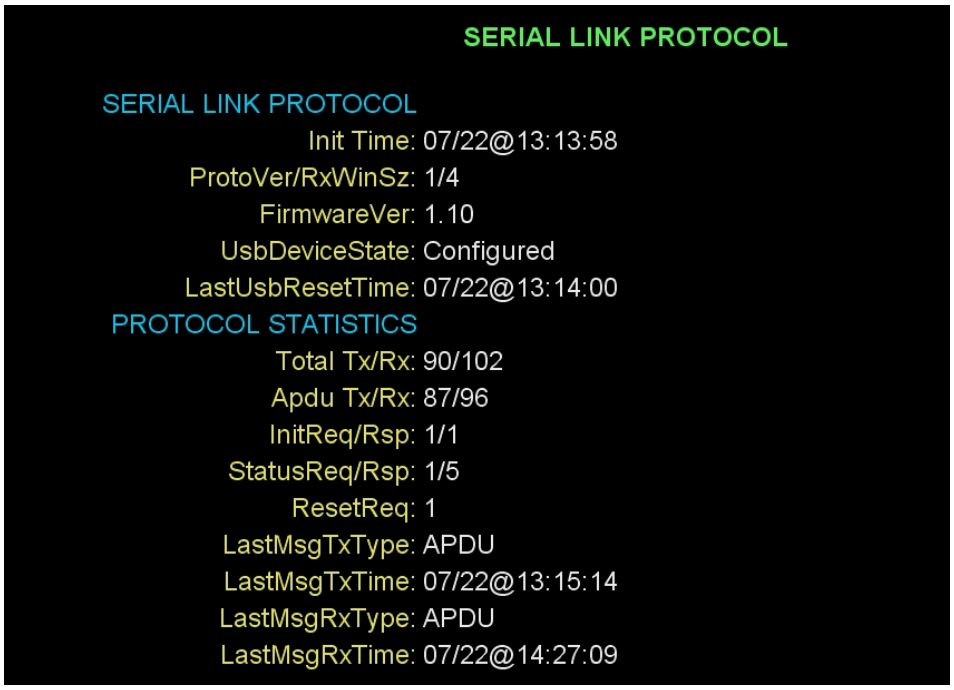
By accessing this diagnostic screen, you can perform the following tasks:

- Determine the date and time when the serial link protocol initial response message was received
- Verify the version for the STA1520 USB controller firmware
- View statistics for various packets that have been transmitted and received over the serial link

Screen Components

- Serial Link Protocol
- Protocol Statistics

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Serial Link Protocol

Field Name	Description	Possible Values
InitTime	The time when the serial link protocol Init Response message was received after initializing the serial link	■ **[month/day@hh:mm:sec]** ■ **n/a**
ProtoVer/RxWinSz	The version number for the serial link protocol and the receive window size used by this tuning adapter	■ **[Version-dependent]**
FirmwareVer	The major and minor version number for STA1520 USB controller firmware	■ **[Firmware-dependent]**

Field Name	Description	Possible Values
UsbDeviceState	The current state of the USB device state per USB 2.0 specifications. **Note**: "Configured" also implies "Powered" and "Attached". When the physical USB connection is successfully established, it should say "Configured".	■ **Configured:** the physical USB connection is successfully established ■ **Attached** ■ **Powered** ■ **Default** ■ **Address** ■ **Suspended** ■ **n/a**
LastUsbResetTime	The time of last reset condition detected by the USB bus	■ **[month/day@hh:mm:sec]** ■ **n/a**

Protocol Statistics

Field Name	Description	Possible Values
Total Tx/Rx	The total number of packets transmitted and received over the serial link. **Note**: Packets can include serial link protocol control messages or APDU segments. Large APDUs are segmented into 64 byte packets.	■ **[Integer ≥ 0]/[Integer ≥ 0]**
Apdu Tx/Rx	The total number of APDU segments sent and received over the serial link	■ **[Integer ≥ 0]/[Integer ≥ 0]**
InitReq/Rsp	The total number of serial link protocol init request and response messages transmitted and received over the serial link **Note:** These messages are not forwarded to UDCP.	■ **[Integer ≥ 0]/[Integer ≥ 0]**
StatusReq/Rsp	The total number of serial link protocol status request and response messages transmitted and received over the serial link **Note:** These messages are not forwarded to UDCP.	■ **[Integer ≥ 0]/[Integer ≥ 0]**
ResetReq	The total number of serial link protocol USB reset requests initiated by the tuning adapter	■ **[Integer ≥ 0]**
LastMsgTxType	The type of serial link protocol packet that was last sent	■ **APDU** ■ **InitReq** ■ **StatusReq** ■ **ResetReq** ■ **n/a**
LastMsgTxTime	The time that the last serial link protocol packet was sent	■ **[month/day@hh:mm:sec]** ■ **n/a**
LastMsgRxType	The type of serial link protocol packet that was last received	■ **APDU** ■ **InitRsp** ■ **StatusRsp** ■ **n/a**

Field Name	Description	Possible Values
LastMsgRxTime	The time that the last serial link protocol packet was received	■ **[month/day@hh:mm:sec]** ■ **n/a**

Serial Link Anomalies Diagnostic Screen

Introduction

This section provides an overview of the Serial Link Anomalies diagnostic screen, and includes information about anomalies or errors affecting the serial link.

Performing Tasks

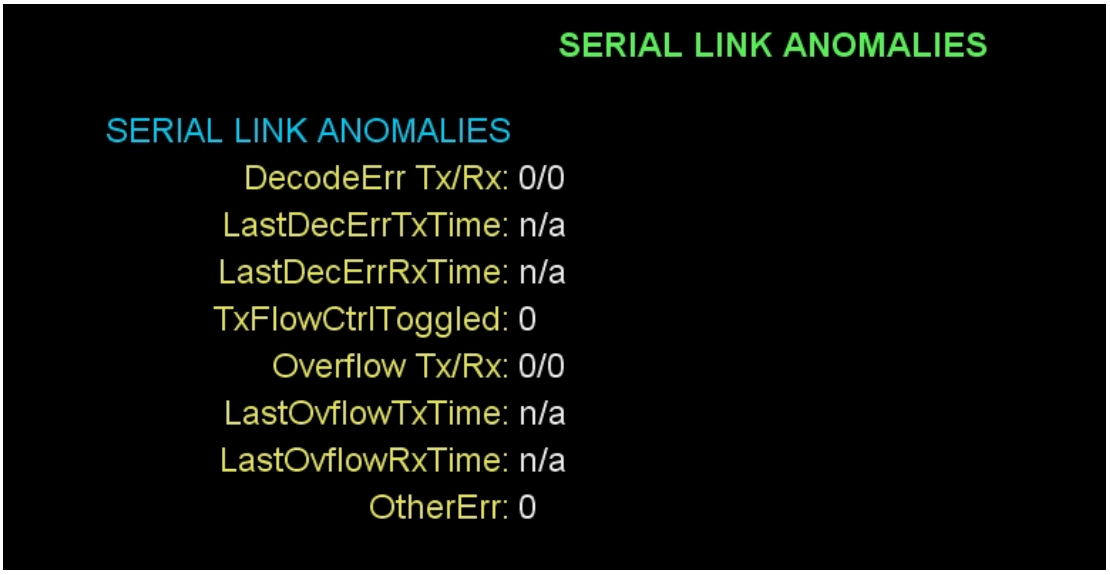
By accessing this diagnostic screen, you can perform the following tasks:

- Verify when the last decode error affecting a transmitted and a received serial link anomalies message occurred
- Determine the number of times the XOFF/XON software flow control status has been toggled
- Verify the number of overflow errors that have occurred during packet transmission over the serial link

Screen Components

Serial Link Anomalies

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Serial Link Anomalies

Field Name	Description	Possible Values
DecodeErr Tx/Rx	The number of decode and checksum errors for serial link protocol messages that have been sent and received	■ **[Integer > 0]**
LastDecErrTxTime	The time of the last decode error that affected a transmitted serial link protocol message (MM/DD@HH:MM:SS)	■ **[month/day@hh:mm:sec]** ■ **n/a**
LastDecErrRxTime	The SAM service ID identifying the program and type of service defined for that session (MM/DD@HH:MM:SS)	■ **[month/day@hh:mm:sec]** ■ **n/a**
TxFlowCtrlToggled	The number of times that the XOFF/XON software flow control status has been toggled. **Note:** The initial state is XON. When the status is toggled to XOFF, the count increments by 1. When the status is toggled back to XON, it increments by 1 again. An odd-numbered value means the status is XOFF and an even numbered value means the status is XON. A non-zero value does not indicate an error, but it is an error for an odd numbered value to persist longer than a few seconds.	■ **[Integer > 0]**
Overflow Tx/Rx	The number of overflow errors for serial link protocol messages that have been sent and received	■ **[Integer > 0]/[Integer > 0]**
LastOvflowTxTime	The time of last overflow error affecting a transmitted serial link protocol message	■ **[month/day@hh:mm:sec]** ■ **n/a**

Field Name	Description	Possible Values
LastOvflowRxTime	The time of last overflow error affecting a received serial link protocol message	■ **[month/day@hh:mm:sec]** ■ **n/a**
OtherErr	The number of unspecified errors affecting the serial link	■ **[Integer > 0]**

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Customer Information

If You Have Questions

If you have technical questions, call Cisco Services for assistance. Follow the menu options to speak with a service engineer.

Access your company's extranet site to view or order additional technical publications. For accessing instructions, contact the representative who handles your account. Check your extranet site often as the information is updated frequently.

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