Understanding Diagnostic Screens in an Axiom tru2way Environment

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

Providing customer support for any product or technology can be stressful. Customers want answers NOW! We understand the need for providing quick and accurate responses to network users, and we strive to provide tools to make this task easier. The diagnostic screens for the Separable Security CableCARD™ (SSC) Host Digital Home Communications Terminals (DHCTs) are a quick way that you can monitor and diagnose performance relative to the system, as well as the Multi-Stream CableCARD (M-Card™) module.

This guide describes the diagnostics screens included with the software for these DHCTs when they are operating in a tru2way™ environment. CableCARD-related diagnostic screens are displayed when the M-Card module is properly housed in the appropriate slot on the rear panel of the DHCT and when the card is successfully bound to the system.

This guide describes the diagnostic screens included when using the following software:

- PowerTV® OS
- Axiom 1.4 middleware

Important: The diagnostic screens associated with the M-Card module that are described in this document assume that you are using one of our M-Card modules. If you are using a different M-Card module, please consult the documentation associated with that card for further information.

Purpose

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

- Determine the tru2way software version that is currently installed and running
- Confirm the tuning mode
- Verify encrypted and unencrypted modes
- View the Bootloader diagnostic screen to help determine the status of the Bootloader upgrade
- Examine the software components installed on your DHCT
- Verify the host ID number

- Verify the ECM and EMM counts
- Determine if there has been a decryption failure, and if so, when it occurred
- Determine the customer service number you need to start service
- Verify the current copy protection authorization

Audience

This guide is written for network operators and personnel who have experience with accessing the diagnostic screens for Explorer DHCTs and who have experience working with M-Card modules.

Note: The diagnostic screens and other information described in this document are based on the PowerTV OS and Axiom version 1.4 (tru2way middleware).

Document Version

This is the fourth formal release of this document. In addition to minor text and graphic changes, the following table provides the technical changes to this document.

Description	See Topic
Updated several screen names, screen shots, and screen information tables due to updated version of Axiom (version 1.4)	■ ***DOCSIS Information Diagnostic Screen*** (on page 16) ■ ***DOCSIS Events Diagnostic Screen*** (on page 23) ■ ***Application Information Diagnostic Screen*** (on page 37) ■ ***Conditional Access Diagnostic Screen*** (on page 39) ■ ***Host Component Information Diagnostic Screen*** (on page 47) ■ ***Linux Memory Information Diagnostic Screen*** (on page 56)
Added several diagnostic screens	■ ***DSG Filters Diagnostic Screen*** (on page 25) ■ ***Energy Management Diagnostic Screen*** (on page 49) ■ ***Common Download Diagnostic Screen*** (on page 53)
Added tru2way® diagnostic screens	■ ***tru2way Diagnostic Screens*** (on page 59)

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Understanding Diagnostic Screens in a tru2way Environment

Introduction

Cisco set-tops include diagnostic screens based on the Axiom middleware.

To 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

View Diagnostic Screens

Accessing Diagnostic Screens

To access the diagnostic screens, complete the following steps:

1. Press the **POWER** button until the Power LED flashes, then release the **POWER** button.
2. While the Power LED is blinking, press the **POWER** button a second time (do not hold the button the second time). The set-top displays the first page in the series of diagnostic screens.
3. To navigate to the next or previous diagnostic screen, press the **PAGE +/PAGE UP/NEXT +** or the **PAGE -/PAGE DOWN/NEXT -** button, depending on the type of remote control you are using.
4. To view diagnostic screens that are accessed via a hypertext link on a diagnostic page, press the **SELECT** button on your remote control.
5. To exit the diagnostic screens, press the **EXIT** button on your remote control.

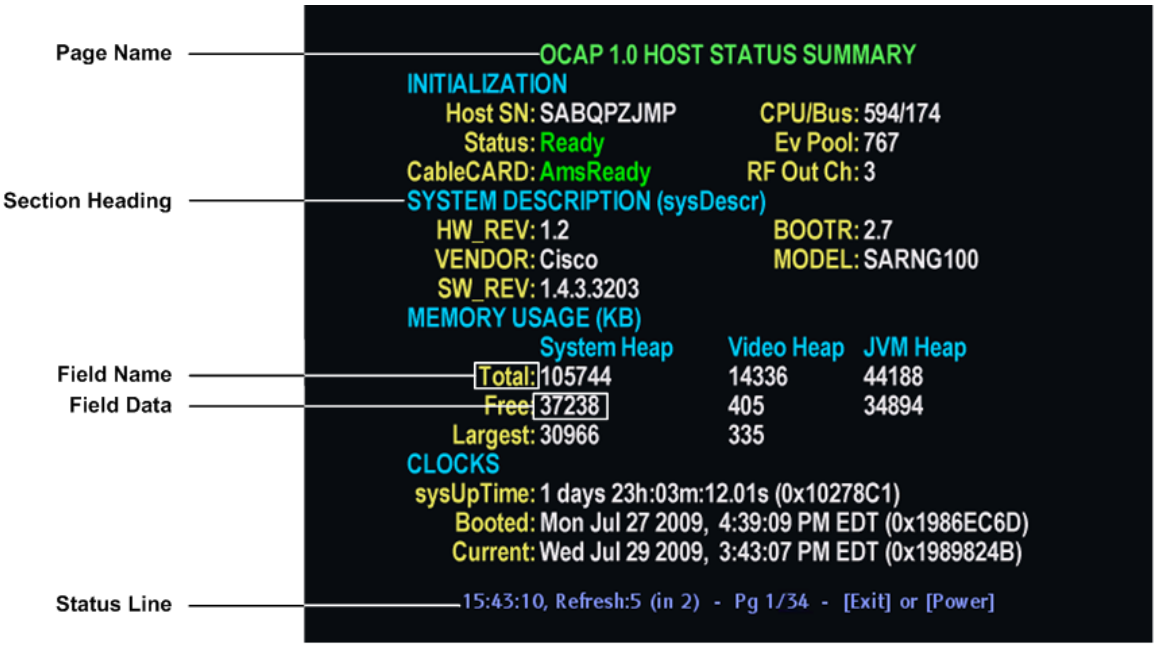
Identifying Information Within Diagnostic Screens

This section helps you to locate information within diagnostic screens and provides the following information:

- An example of a diagnostic screen with its key elements
- Descriptions of the color-coded text
- Descriptions of the status line content

The following example shows the components of a diagnostic screen.

Note: This screen is for illustrative purposes only.



Axiom Diagnostic Page Transparency

You can set the transparency level of the Axiom diagnostic pages so that you can still see the video behind the diagnostic page displayed. This can be helpful when you troubleshoot.

You can change the transparency level of the video using either the set-top front panel or the remote control.

Changing the Transparency Level Using the Remote Control

- Press the **B** button to toggle between the different transparency levels (0%, 25%, 50%, 75%, 100%).

Changing the Transparency Level Using the Front Panel

- Press the **Select** button to toggle between the different transparency levels (0%, 25%, 50%, 75%, 100%).

Exit Diagnostic Screens

To exit the diagnostic screens, press the **Exit** button on the front panel of the set-top.

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System-Specific Diagnostic Screens

Introduction

This chapter provides diagnostic screens related to the current state of the set-top box and to the overall system. The data that is presented in these screens includes the software version, serial numbers, boot status, and object carousels.

In This Chapter

Status Summary Diagnostic Screen

Information

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

Performing Tasks

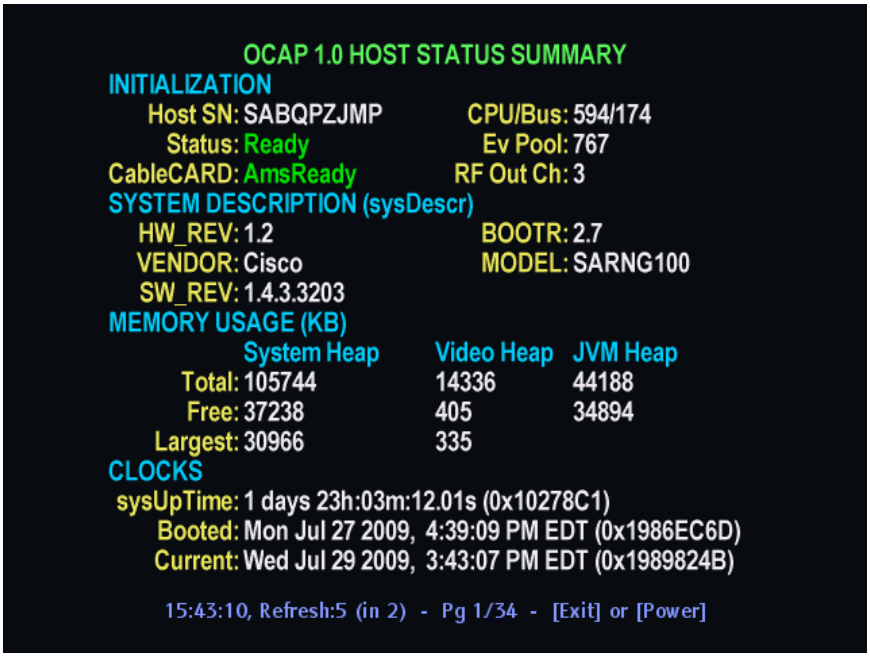
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the current status of the boot process
- Verify the system information
- Check the amount of available memory
- Check when the DHCT was last booted and if it is receiving the correct time

Screen Components

- Initialization
- System Description
- Memory Usage
- Clocks

Example:



Screen Fields and Values

The following tables describe the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Initialization

Field Name	Description	Possible Values
HOST SN	The serial number of the host	■ **Hardware-dependent value**
Boot Status	The status of the overall boot process	■ **In Progress—**The DHCT is still booting and has not launched its monitor application. ■ **Host Ready—**The DHCT has completed the boot process and is in two-way mode.

Field Name	Description	Possible Values
CableCARD	The status of the CableCARD module	■ **AmsReady—**The CableCARD module has completed the boot process. ■ **AmsNotReady—**The CableCARD module has not completed the boot process. ■ **AmsReset—**The CableCARD module has been reset. ■ **AmsRemoved—**The CableCARD module has been removed from the host. ■ **AmsFailed—**The CableCARD host has failed. ■ **UnknownHoming—**If you see this indicator, contact Cisco Services.
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]**
RF Out Ch	The channel number that the set-top uses to display on the TV	■ **3** ■ **4**

ROM Software Versions Parameters

Field Name	Description	Possible Values
HW_REV	The version of hardware for the host	■ **Hardware-dependent value**
VENDOR	The manufacturer for the host	■ **Hardware-dependent value**
SW_REV	The version for the resident application	■ **[Software-dependent]** **Example:** 1.5.1.302
BOOTR	The version for the host bootloader	■ **[Software-dependent]** **Example:** 2.5
MODEL	The model number for the host	■ **Hardware-dependent value**

Memory Usage

This table describes the values for the following system memory values:

- **System Heap:** Overall memory available to the porting layer.
- **Video Heap:** Memory that is initialized when video begins streaming.
- **JVM Heap:** Total memory available to Java (for Axiom and for Java applications and applets). This value is subtracted from the System Heap total, up to a preconfigured limit.

Field Name	Description	Possible Values
Total	The total amount of memory assigned	■ **[Integer ≥ 0]**
Free	The amount of free memory available	■ **[Integer ≥ 0]**
Largest	The largest contiguous, free block of memory available	■ **[Integer ≥ 0]**

Clocks

Field Name	Description	Possible Values
sysUpTime	The amount of time time elapsed since the tru2way system last booted **Note:** The hexadecimal format for the time is shown in parenthesis.	■ **[Days, Hours, Minutes, Seconds]**
Booted	The date and time that the Explorer DHCT 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]**

Host Boot Status Results Diagnostic Screen

Information

This section provides an overview diagram and field descriptions for the Host Boot Status Results diagnostic screen. You can view this screen to review the results of the boot process performed by the DHCT.

Performing Tasks

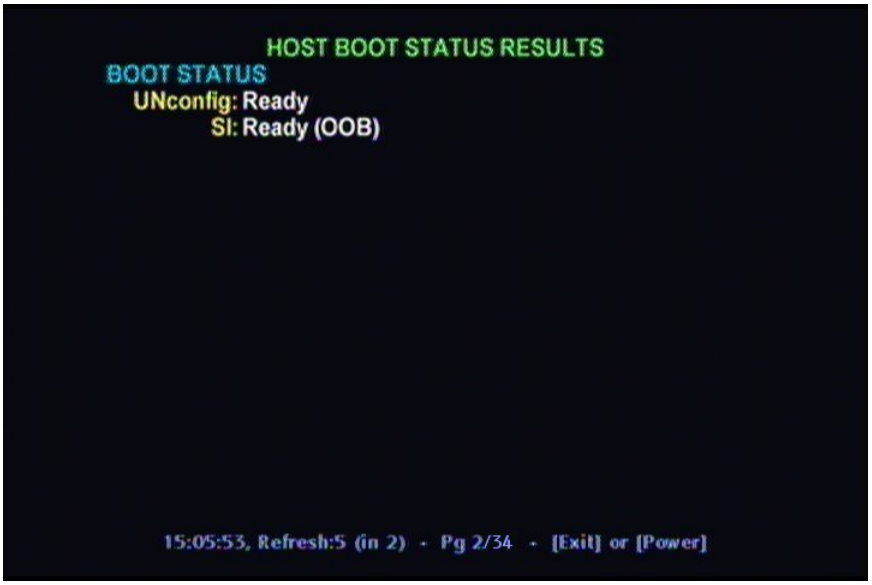
By accessing this diagnostic screen, you can perform the following tasks:

- Check the boot status of the DHCT
- Determine if the DHCT is ready to receive data

Screen Components

- Boot Status

Example:



Screen Fields and Values

The following table describes the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Data Acquisition

Field Name	Description	Possible Values
UNconfig	Describes the boot process for the User-to-Network (UNcfg) configuration	■ **Ready—**two-way UNcfg message received ■ **Broadcast—**broadcast UNcfg message received ■ **Searching—**no UNcfg message received ■ **n/a—**Host is using a third-party CableCARD module
SI	Describes the boot process for the System Information (SI)	■ **Ready—**SI tables are loaded ■ **Searching—**SI tables are not loaded

Host DAVIC Status Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the Host DAVIC Status diagnostic screen. You can view this screen to obtain statistical information about the radio frequency (RF) channels and network on your system in real-time.

Performing Tasks

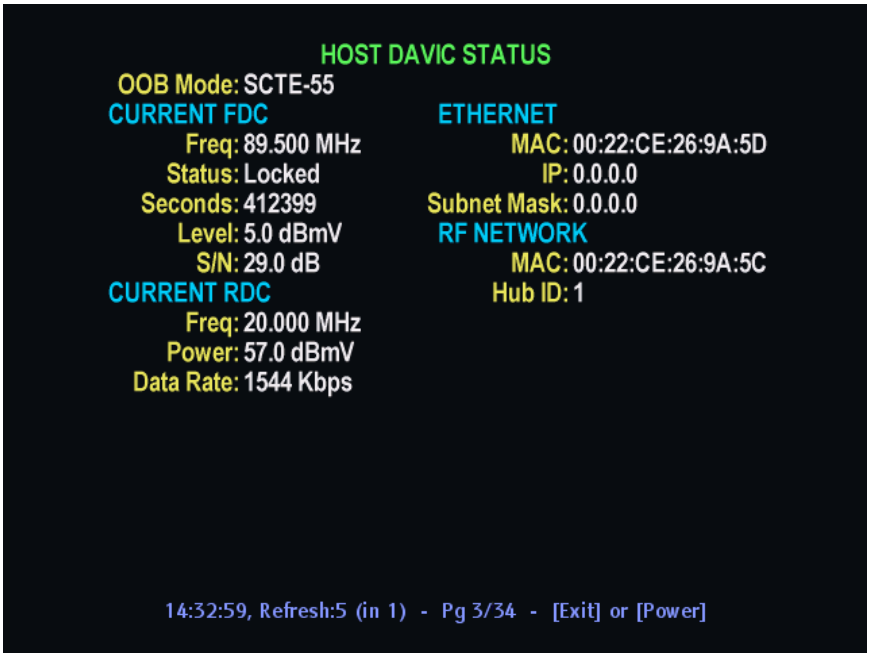
By accessing this diagnostic screen, you can perform the following tasks:

- Confirm the power levels and frequencies of the FDC and the RDC
- Confirm the network parameters for the Ethernet
- Confirm the network parameters for the RF network

Screen Components

- Current FDC
- Current RDC
- Ethernet
- RF Network

Example:



Screen Fields and Values

The following tables describe the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Current FDC

Field Name	Description	Possible Values
OOB Mode	The out-of-band path used by the host	■ **SCTE-55**—DAVIC in use ■ **DSG**—Cisco CableCARD module in use ■ **Other**—Third-party CableCARD module (not using DOCSIS) in use
Freq	The frequency (Freq) of the tuned QPSK receiver	■ **[Network-dependent]** **Range:** 70–130 MHz
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
Seconds	The number of seconds that the frequency has been locked	■ **[Integer ≥ 0]**

Field Name	Description	Possible Values
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
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) of the tuned QPSK transmitter	■ **[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
Data Rate	Current data rate of the RDC	■ **[Integer ≥ 0]**

Ethernet

Field Name	Description	Possible Values
MAC	The MAC address assigned to the Ethernet adapter	■ **[Hardware-dependent, unique for each Ethernet network interface]** **Example:** 00:40:7B:C0:EE:C1
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

Field Name	Description	Possible Values
MAC	The MAC address assigned to the RF network adapter	■ **[Hardware-dependent, unique for each Ethernet network interface]** **Example:** 00:40:7B:C0:EE:C1
Hub ID	The hub to which this host is assigned	■ **[Hub-dependent]** ■ **N/A**

DOCSIS Information Diagnostic Screen

Information

This section provides an overview of the DOCSIS Information diagnostic screen for DHCTs in Basic or Advanced DSG mode, including the fields and parameters that are included in the screen.

Information

This section provides an overview of the DOCSIS® Status diagnostic screen for DHCTs in Basic or Advanced DSG mode, including the fields and parameters that are included in the screen.

Performing Tasks

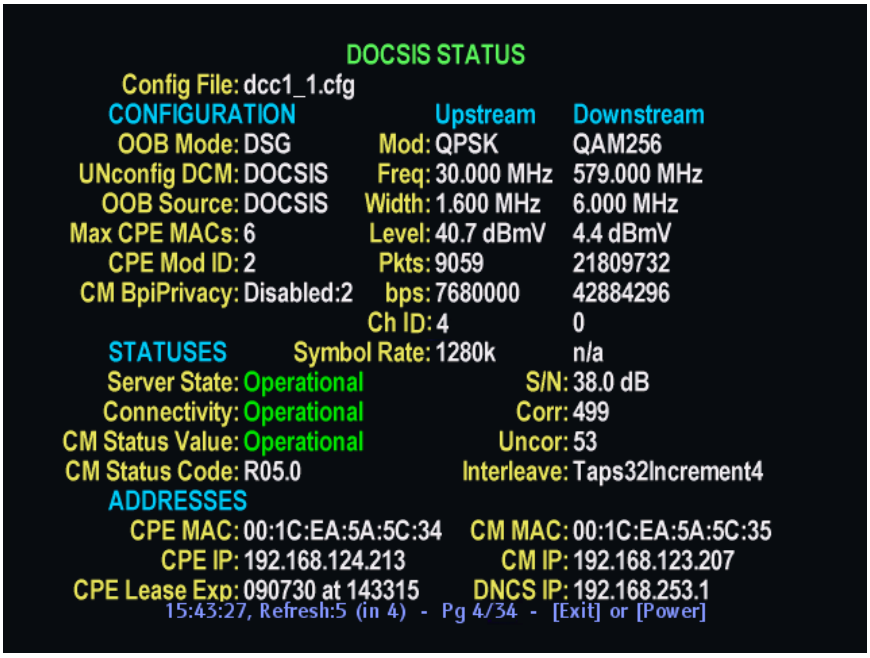
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the status of the DOCSIS network operations on your system
- Verify if the DHCT is running in DSG mode
- Verify the DNCS MAC and IP addresses

Screen Components

- Statuses
- Addresses
- Upstream Downstream

Example:



Screen Fields and Values

The following tables describe the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Notes:

- Fields that are only included in the diagnostic screen for *DHCTs without DSG* will include an *.
- Fields that are only included in the diagnostic screen for *DHCTs with DSG* will include an **.

Configuration

Field Name	Description	Possible Values
Config File*	The file name that represents the configuration file	■ **[Network-dependent]**
OOB Mode	The location where the out-of-band data is coming from	■ **SCTE-55**—DAVIC in use ■ **DSG**—Cisco CableCARD module in use ■ **Other**—Third-party CableCARD module (not using DOCSIS) in use

Field Name	Description	Possible Values
Unconfig DCM	The status of the DHCT cable modem (DCM)	■ **DODA** ■ **DAVIC** ■ **TelcoReturn** ■ **DOCSIS** ■ **Ethernet** ■ **Unknown** ■ **DOCSISONLY** ■ **DAVICONLY** ■ **DODAONLY** ■ **EthernetOnly** ■ **DavicExpress** ■ **TelcoReturnOnly** ■ **DavicExpressOnly**
OOB Source	The out-of-band source information	■ **DODA** ■ **DAVIC** ■ **TELCO** ■ **DOCSIS** ■ **DOCSISONLY** ■ **DAVICONLY** ■ **DODAONLY** ■ **Unknown**
Max CPE MACs	The maximum number of external Ethernet MAC addresses the cable modem can support plus one	■ **[Integer > 1]**
CPE Mod ID	The identification number for the QPSK modulator	■ **[Integer > 1]**
CM BpiPrivacy	Cable Modem Baseline Privacy Interface. Determines the status of privacy between the cable modem and the CMTS	■ **Enabled: 1** ■ **Enabled: 2** ■ **Enabled: 1,2** ■ **Disabled: 1** ■ **Disabled: 2** ■ **Disabled: 1,2**

Field Name	Description	Possible Values
Mod	A downstream and upstream mode for the inband tuner	■ **Downstream** • **QAM-64** • **QAM-256** • **Other** • **Unknown** ■ **Upstream** • **QAM16** • **QPSK** • **Other**
Freq	The downstream and upstream frequency (MHz)	■ **[Dependent on frequency]**
Width	The upstream and downstream signal bandwidth	■ **6 MHz**: downstream for DOCSIS ■ **8 MHz**: downstream for Euro-DOCSIS ■ **Variable**: bandwidth for upstream signal
Level	The downstream and upstream power levels relative to 1 millivolt (dBmV)	■ **[Integer]**
Pkts	The cumulative number of packets received downstream and transmitted upstream	■ **[Integer ≥ 0]**
bps**	The downstream and upstream transmission rates in bits per second (bps)	■ **[Integer ≥ 0]**
Ch ID**	The upstream channel ID (UCID) identification value that is associated with a DSG rule	■ **[Integer ≥ 0]**
CH ID*s	Channel ID of the current channel in use	■ **[Network-dependent]**
Symbol Rate**	The upstream baud rate in kilosymbols per second (ksps)	■ **[Network-dependent]**

Statuses

Field Name	Description	Possible Values
Server State	The operational state of DOCSIS	■ **EstablishTOD** ■ **ImageDwnload** ■ **Inactive** ■ **ObtainingIP** ■ **Operational** ■ **Ranging** ■ **ReadingUCD** ■ **Registering** ■ **Scanning** ■ **SendingaParams** ■ **Unauthorized** ■ **Unavailable**: displays in red
Connectivity	The status of the network connectivity	■ **Inactive** ■ **Scanning** ■ **Reading UCD** ■ **Ranging** ■ **Obtaining IP** ■ **EstablishToD** ■ **SendingParams** ■ **Registering** ■ **Operational** ■ **ImageDwnLoad** ■ **Unauthorized** ■ **Other** ■ **1WayOperational** ■ **2WayUpDisabled** ■ **Unknown—**Contact Cisco Services

Field Name	Description	Possible Values
CM Status Value	The status of the embedded cable modem	■ **Other** ■ **NotReady** ■ **NotSynchronized** ■ **PhySynchronized** ■ **UsParametersAcquired** ■ **RangingComplete** ■ **IpComplete** ■ **TodEstablished** ■ **SecurityEstablished** ■ **ParamTransferComplete** ■ **RegistrationComplete** ■ **Operational** ■ **Access Denied** ■ **Unknown—**Contact Cisco Services
CM Status Code	These values are defined by the DOCSIS standard	■ Refer to Annex D of the DOCSIS 2.0 OSSI specification for details
S/N	The approximate downstream signal-to-noise S/N ratio (dB)	■ **[Integer ≥ 0]**
Corr	The number of correctable errors	■ **[Integer ≥ 0]**
Uncor	The number of uncorrectable errors	■ **[Integer ≥ 0]**
Interleave	Displays the level of interleave	■ **Unknown** ■ **Other** ■ **Taps8Increment16** ■ **Taps16Increment8** ■ **Taps32Increment4** ■ **Taps64Increment2** ■ **Taps128Increment1** ■ **Unknown Value #—**Contact Cisco Services

Addresses

Field Name	Description	Possible Values
CPE MAC	The MAC address for the cable modem host	■ **[Hardware-dependent]**
CPE IP	The IP address for the PowerTV CPE	■ **[Network-dependent]**
CPE Lease Exp	The expiration date for the lease on the PowerTV CPE (YYMMDD.hhmmss)	■ **[Time]**
CM MAC	The MAC address for the PowerTV customer premises equipment (CPE)	■ **[Hardware-dependent]**
CM IP	The IP address for the cable modem host	■ **[Network-dependent]**
DNCS IP	The IP address for the DNCS	■ **[Network-dependent]**
CMTS MAC*	The MAC address for the cable modem termination system (CMTS)	■ **[Hardware-dependent]**

DOCSIS Events Diagnostic Screen

Information

This section provides an overview of the DOCSIS Events diagnostic screens, including the fields and parameters that are included in the screen. The information within the screens provides information about DOCSIS events, including the level of event, when they last occurred, and how often they have occurred.

Note: Several separate DOCSIS Events diagnostic screens exist; one for events 1-5, one for events 6-10, etc. Each screen contains the same fields which are described in this section.

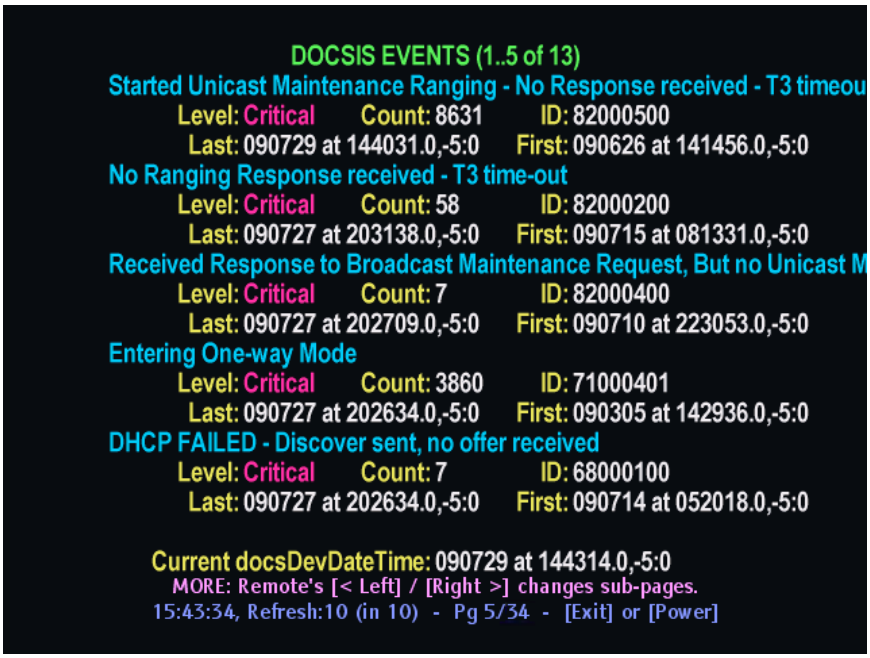
Performing Tasks

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

- Determine the level of the events listed
- Determine the most recent occurrence of DOCSIS events
- Determine how often the events occur

Screen Components

Example:



Screen Fields and Values

The following table describes the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Field Name	Description	Possible Values
Level	The DOCSIS level of the event	■ **Debug** ■ **Information** ■ **Notice** ■ **Warning** ■ **Error** ■ **Critical** ■ **Alert** ■ **Emergency**
Last	The most recent occurence of the event	■ **YYMMDD at hhmmss.d** (where d is tenths of seconds)**, -/+ UTC time differential** **Example:** **091012 at 120105.2, -5.0** translates to October 12, 2009 at 12:01:05:02, UTC - 5 hours (west of UTC)
Count	The number of times the event has occurred	■ **Integer ≥ 1**
ID	The event ID	■ **Integer > 0**
First	The first occurrence of the event	■ **YYMMDD at hhmmss.d** (where d is tenths of seconds)**, -/+ UTC time differential** **Example:** **091012 at 120105.2, -5.0** translates to October 12, 2009 at 12:01:05:02, UTC - 5 hours (west of UTC)
Current docsDevDateTime	The current date and time	■ **YYMMDD at hhmmss.d** (where d is tenths of seconds)**, -/+ UTC time differential** **Example:** **091012 at 120105.2, -5.0** translates to October 12, 2009 at 12:01:05:02, UTC - 5 hours (west of UTC)

DSG Filters Diagnostic Screen

Information

This section provides an overview of the DSG Filters diagnostic screens, including the fields and parameters that are included in the screen. The information within the screens provides forwarding and filtering statistics for each DSG tunnel filter.

Note: Several separate DSG Filters diagnostic screens exist; one for filters 1 and 2, one for filters 3 and 4, etc. Each screen contains the same fields which are described in this section.

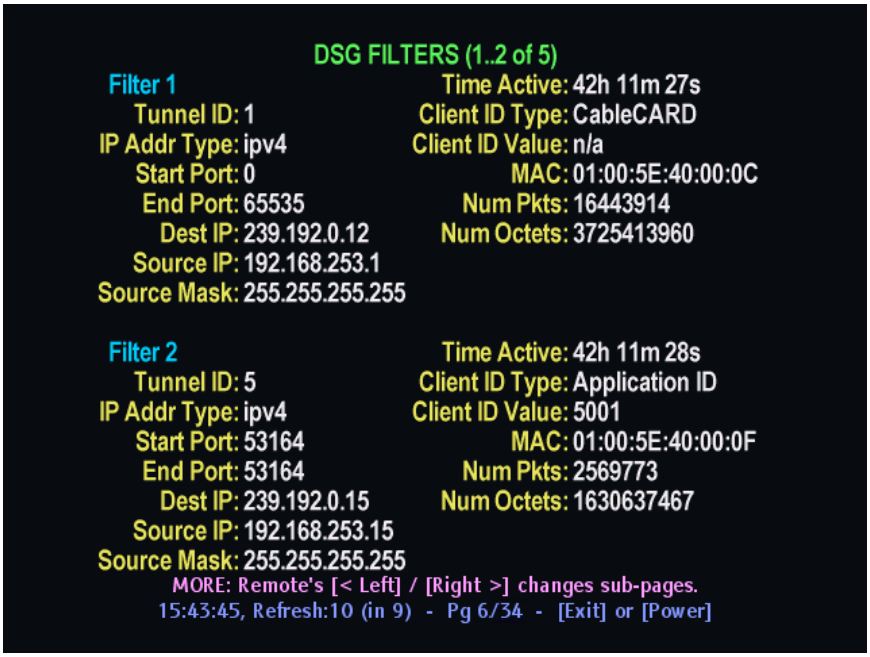
Performing Tasks

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

- Determine the destination MAC and IP address for a DSG tunnel
- Determine the number of packets that have been filtered through a tunnel

Screen Components

Example:



Screen Fields and Values

The following table describes the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Field Name	Description	Possible Values
Tunnel ID	The ID associated with this tunnel	■ **[Integer ≥ 1**
IP Addr Type	The type of IP configuration in use	■ **IPv4** ■ **IPv6**
Start Port	The start UDP port value that is associated with the DSG tunnel	■ **[Integer ≥ 0 and ≤ 65535]**
End Port	The end UDP port values that is associated with the DSG tunnel	■ **[Integer ≥ 0 and ≤ 65535]**
Dest IP	The destination IP address that is associated with the DSG tunnel and used with the DSG eCM filtering and forwarding process	■ **[Network-dependent]** ■ **0**—indicates that the destination IP address does not apply
Source IP	The source IP address that is associated with the DSG tunnel and is used with the DSG eCM filtering and forwarding process.	■ **[Network-dependent]** ■ **0**—indicates that the source IP filtering does not apply
Source Mask	The source IP subnet mask for the DSG stream that is used to filter and forward DSG traffic	■ **[Network-dependent]**
Time Active	The amount of time the tunnel has been active	■ **[Hours, Minutes, Seconds]**
Client ID Type	The client type as defined by the DSG specification	■ **CableCARD** ■ **Broadcast ID** ■ **MAC Address** ■ **CA System ID** ■ **Application ID**
Client ID Value	The value or address associated with the Client ID Type	■ **[Client ID Type field-dependent]**
MAC	The destination MAC address associated with the DSG tunnel entry	■ **[Hardware-dependent]**
Num Pkts	The total number of packets that are being classified and filtered for the DSG tunnel entry since the entry was created	■ **[Integer ≥ 0**
Num Octets	The total number of octets that are being classified and filtered for the DSG tunnel entry since the entry was created	■ **[Integer ≥ 0**

Host QAM Status Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the Host QAM Status diagnostic screen. You can view this screen to obtain diagnostic information for each QAM tuner.

Performing Tasks

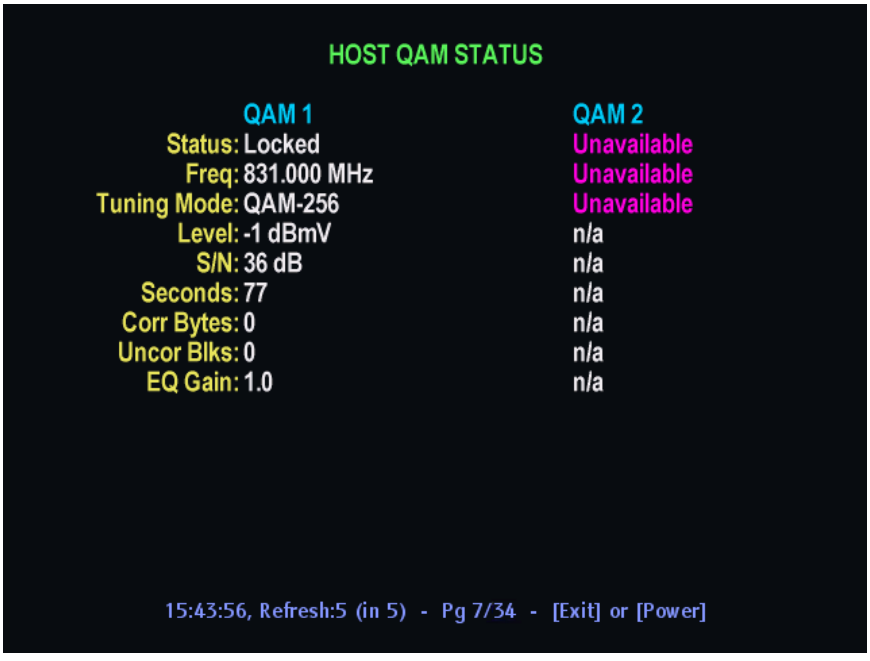
By accessing this diagnostic screen, you can perform the following tasks:

- Check the integrity of the QAM signal
- Determine the current capacity of QAM buffer
- Verify the total number of packets received since the QAM channel became active
- Determine the status of a QAM channel

Screen Components

- QAM 1
- QAM 2

Example:



Screen Fields and Values

The following table describes the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Note: The following table includes the status parameters for both QAM 1 and QAM 2 because the fields, descriptions, and values are similar in definition.

QAM 1 and QAM 2 Parameters

Field Name	Description	Possible Values
Status	The status that indicates whether a QAM is locked or unlocked on a valid analog or QAM channel	■ **Locked**—tuner is locked ■ **Unlocked**—tuner is not locked
Freq	The frequency (freq) in which the inband tuner is tuned (MHz)	■ **[Dependent upon setting]**
Tuning Mode	The current mode of the inband tuner	■ **QAM-64** ■ **QAM-128** ■ **QAM-256** ■ **Analog** **N/A**
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 ■ **n/a**—not applicable on this DHCT
S/N	The signal to noise ratio **Note:** This parameter is only applicable on QAM data channels.	■ **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 on this DHCT
Seconds	The number of seconds that the tuner has been locked on the current frequency	■ **[Integer ≥ 0]**

Field Name	Description	Possible Values
Corr Bytes	The number of bytes received in error that have been successfully corrected by the FEC code	■ **[Integer ≥ 0]** **Important:** If incrementing rapidly, macroblocking or picture freezing may be present. **n/a**—not applicable on this DHCT
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, macroblocking or picture freezing may be present. **n/a**—not applicable on this DHCT
EQ Gain	The QAM equalizer gain (EQ Gain) on QAM data channel **Note:** This 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 requires you to correct the signal problem ■ **<0.8 or >1.1** (value displayed in red)—serious signal problem that needs immediate attention ■ **n/a**—not applicable on this DHCT

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.

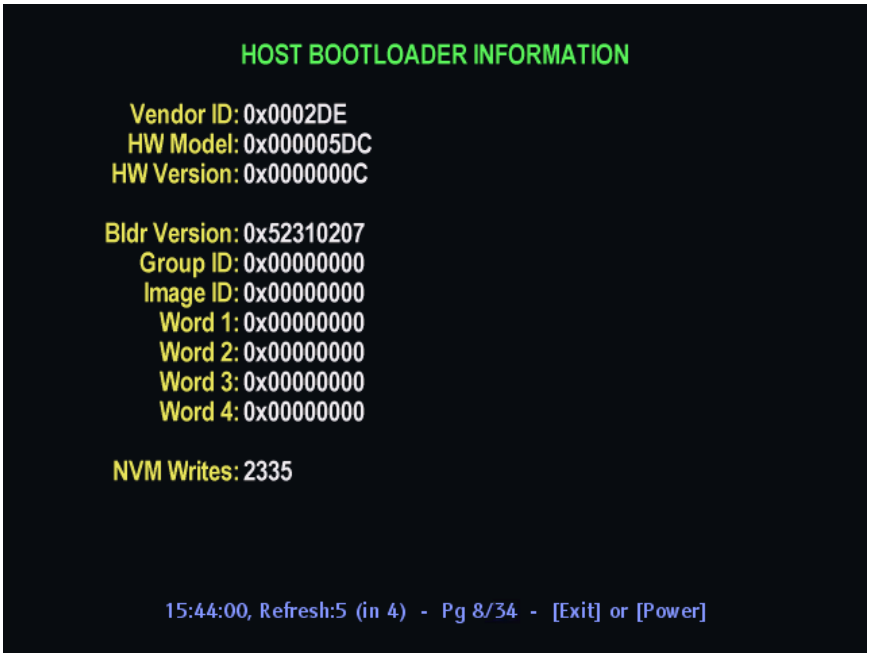
Performing Tasks

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

The following table describes the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

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 CVT group to which the DHCT belongs	■ **0x00000000—**default group ID ■ **0x000000xx—**"xx" are two numeric values ■ **na—**DHCT does not support CVT download
Image ID	The bootloader image ID	■ **[Hexadecimal Image ID]** ■ **0x000000xx—**"xx" are two numeric values ■ **na—**Bootloader image 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 non-volatile memory (NVM) since the DHCT last booted	■ **[Integer > 0]** ■ **n/a—**Bootloader not loaded

Object Carousel Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the Object Carousel Information diagnostic screen. You can view this screen to verify the object carousels that have successfully mounted.

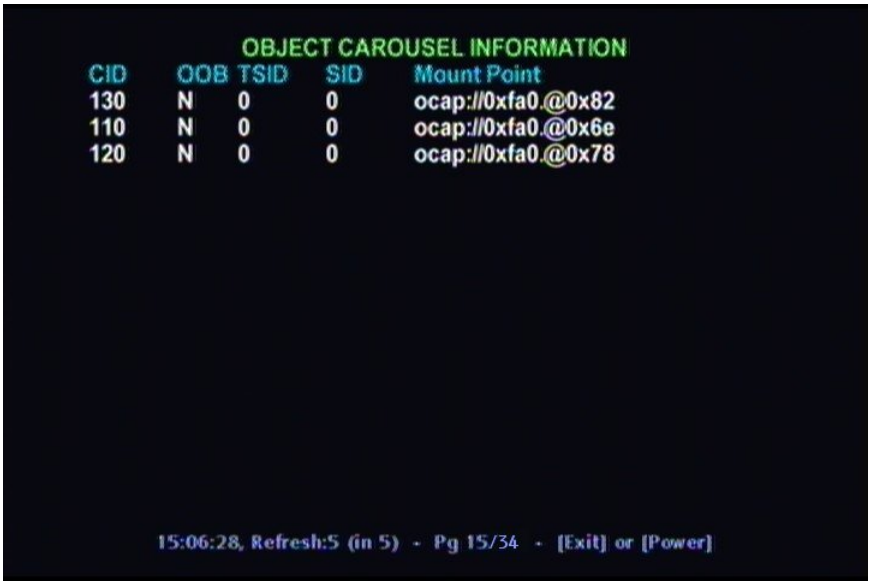
Performing Tasks

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

- Verify the object carousels that are mounted
- Determine the ID number for the object carousel
- Determine where in the object carousel the content is to be included

Screen Components

Example:



Screen Fields and Values

The following table describes the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Field Name	Description	Possible Values
CID	The ID number for the object carousel	■ **[Integer > 1]**
OOB	Indicates whether or not the content is out-of-band	■ **Y** (Yes) ■ **N** (No)
TSID	A unique number that identifies the transport stream	■ **Up to 5 numeric characters** **Example:** 1052
SID	A unique number that identifies the service ID (program number) for out-of-band carousels and the source ID for inband carousels	■ **[Integer ≥ 1]**
Mount Point	The specific location (directory path) within the object carousel that the content is to be included	■ **[Platform-dependent]**

XAIT Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the XAIT (Extended Application Information Table) Information diagnostic screen. You can view this screen for launching and managing unbound applications.

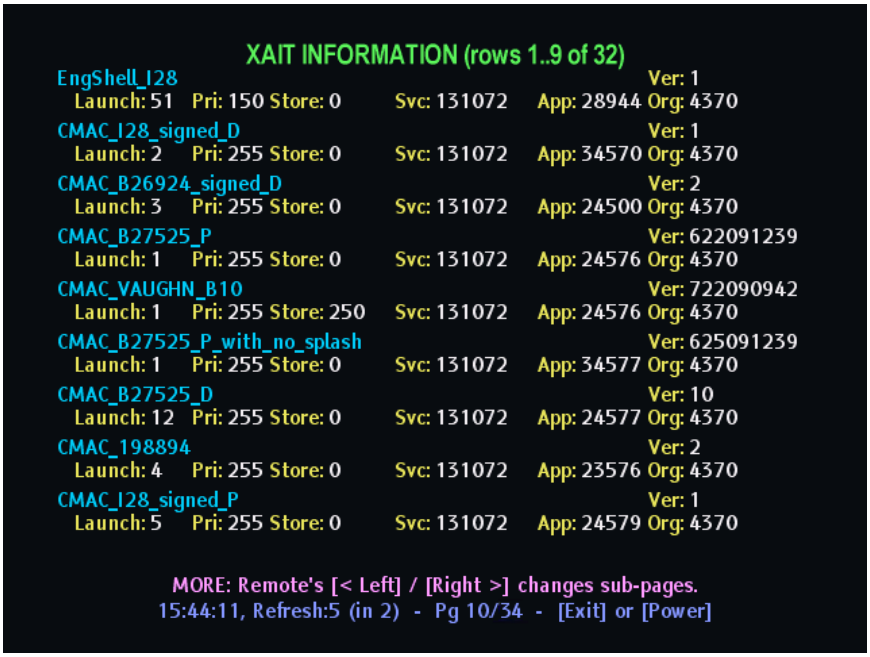
Performing Tasks

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

- Determine the list of applications that are available
- Determine the service associated with each application

Screen Components

Example:



Screen Fields and Values

The following table describes the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Field Name	Description	Possible Values
Application Name	The name of the application	■ **[Application-dependent]**
Ver	The version of the application	■ **[Application-dependent]**
Launch	Launch order of this application **Note:** The higher the launch number, the lower the launch priority of the application	■ **[Integer ≥ 0]**
Pri	The application priority **Note:** The higher the Pri number, the lower the application priority	■ **[Integer ≥ 0]**
Store	The application storage priority **Note:** The higher the Store number, the lower the application priority	■ **[Integer ≥ 0]**
Svc	The service ID of the abstract service in which this application belongs	■ **[Integer ≥ 0]**
App	The ID number associated with the application	■ **[Application-dependent]**
Org	The organization of the application owner	■ **[Application-dependent]**

Application Information Diagnostic Screen

Information

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

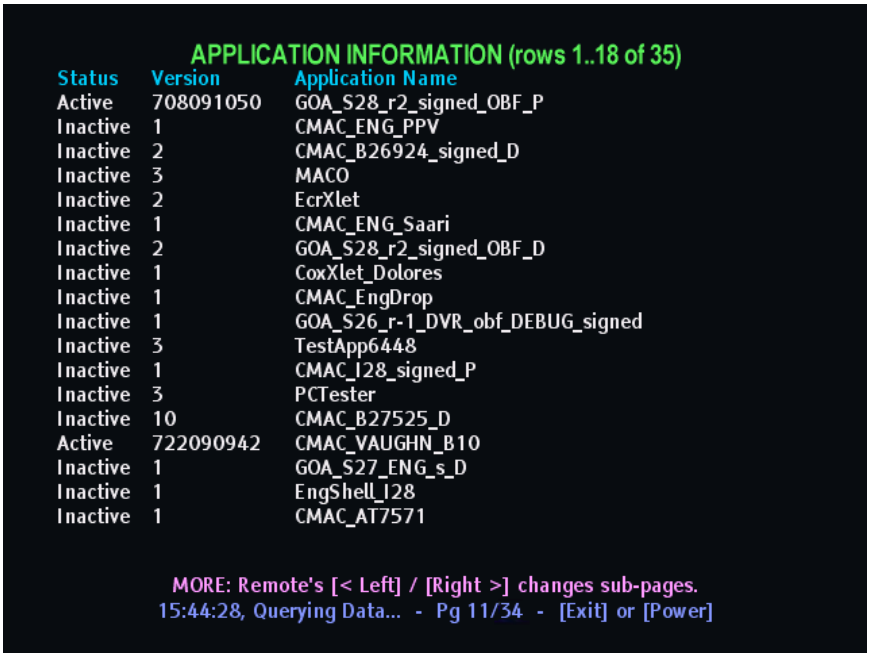
Performing Tasks

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

- Verify the software and software version for each component available to the DHCT
- Verify release status for software and driver components available to the DHCT
- Determine when a component was created

Screen Components

Example:



Screen Fields and Values

The following table describes the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Field Name	Description	Possible Values
Status	The status of each software component installed on the set-top	■ **Active** ■ **Inactive**
Version	The version of each software component installed on the set-top	■ **[Software-dependent]**
Application Name	The name of each component in the XAIT **Note:** For Axiom versions that support targeted XAIT, this field lists the applications targeted to the specific set-top type	■ **[Component-dependent]** **Example:** HostSettings

Conditional Access Diagnostic Screen

Introduction

This section provides an overview of the diagram and field descriptions for the CableCARD Conditional Access Details Screen.

Important:

- All other CableCARD module diagnostic screens are dependent on the manufacturer of the CableCARD module. The host pulls these screens from the CableCARD module and displays them for your information.
- If you are using Cisco M-Cards for your CableCARD modules, you can get detailed information on these screens from *M-Card and S-Card Diagnostic Screens on a TV Host: A Reference Guide* (part number 4015203).

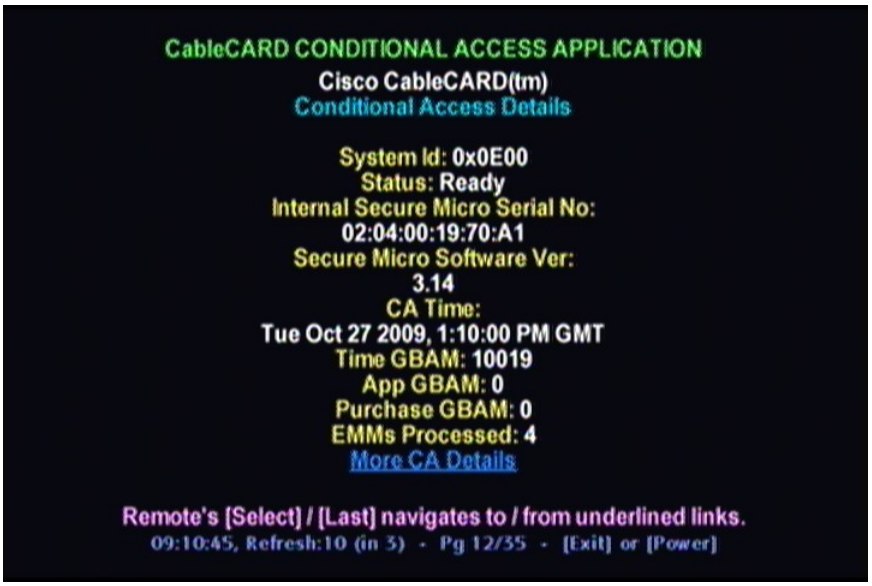
Performing Tasks

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

- Determine the current CableCARD module operating status
- Verify the number of EMM messages received and validated by the M-Card module
- Determine the number of successful IPPV event purchases (based on the Purchase GBAM field)

Screen Components

Example:



Screen Fields and Values

The following table describes the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Field and Link Names	Description	Possible Values
System Id	An ID that describes the type of CA system that is supported by the M-Card module **Note:** This field is a PowerKEY parameter.	■ **[0x0E00]**—required value
Status	The current operating status for the PowerKEY CA supported by the M-Card module	■ **Ready**—desired value; PowerKEY CA launched successfully ■ **Not Ready-No CA Strm**—CA stream is not available ■ **Not Ready-No Time GBAM**—CA stream is available but waiting for Time GBAMs ■ **Not Staged**—M-Card module is not provisioned in the DNCS ■ **N/A**—initialization or an internal problem while attempting to receive the status

Field and Link Names	Description	Possible Values
Internal Secure Micro Serial No	The 6-byte MAC address for the Internal Secure Micro Element (for PowerKEY)	■ **Unique per M-Card** **Example:** 00:14:F8:F1:0A:5D ■ **N/A**
Secure Micro Software Ver	The version of the Secure Micro Element (for PowerKEY)	■ **Unique per M-Card** **Example:** 3.14 ■ **Not Detected**—external Secure Micro is not present
CA Time	Conditional access (CA) time received through the global broadcast authenticated message (GBAM)	■ **[Time]** **Example:** Tue Jun 12, 2007, 10:08:00 PM GMT **Note:** This value matches the current time to the nearest minute. ■ **Waiting For Update**—time not yet received
Time GBAM	Indicates the number of Time GBAM messages processed	■ **[Integer ≥ 1]** ■ **0**—time GBAMs not yet processed
App GBAM	Indicates the number of Application GBAM messages received	■ **[Integer ≥ 1]** ■ **0**—application GBAMs not yet processed
Purchase GBAM	Indicates the number of purchase GBAMs processed	■ **[Integer ≥ 1]**
EMMs Processed	Indicates the number of entitlement management messages successfully processed since the last power-up	■ **[Integer ≥ 1]** ■ **0**—EMMs not yet processed

DVR HDD Information Diagnostic Screen

Information

This section provides a diagram and field descriptions of the DVR HDD Info diagnostic screen, including the fields and parameters that are included in the screen. This screen contains information regarding the hard disk drive on the DHCT that is used to store digitally recorded video programs.

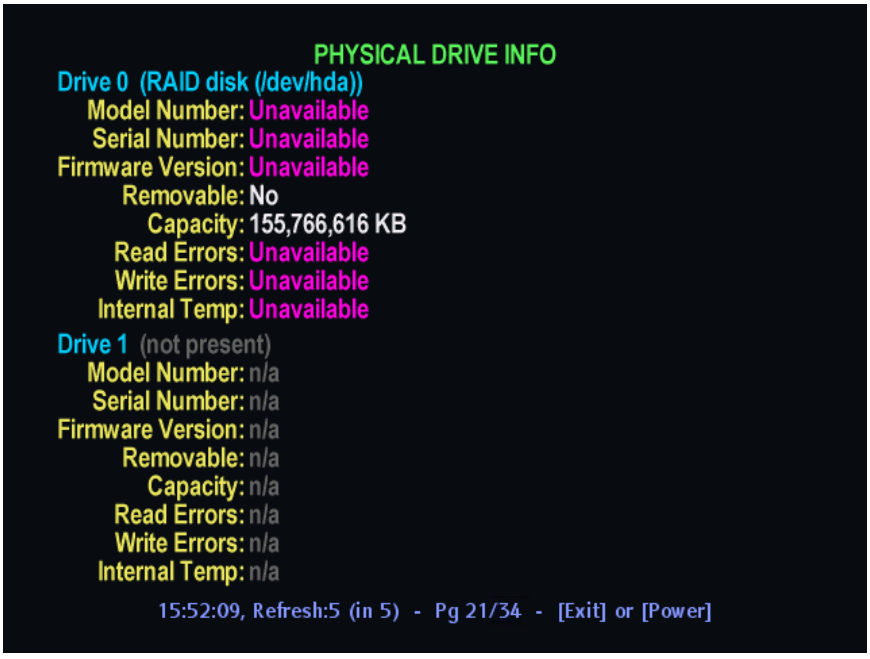
Performing Tasks

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

- Determine the model and serial number of the hard drive
- Verify the amount of available free space
- Determine the size and capacity of the ITFS (Information Technology File System) and the AVFS (Audio/Video File System) file systems
- Verify statistical information about the DVR hard disk in the DHCT

Screen Components

Example:



Screen Fields and Values

The following table describes the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Physical Drive Info

Field Name	Description	Possible Values
Model Number	The model type for the DVR HDD	■ **[Model-dependent]**
Serial Number	The serial number for the DVR HDD	■ **[Model-dependent]**
Firmware Version	The firmware identification number	■ **[Software-dependent]**
Removable	Displays whether the hard drive is removable	■ **Yes**—the hard drive is removable ■ **No**—the hard drive is not removable
Capacity	The size of the sectors for the HDD	■ **[Hard drive-dependent]**
Read Errors	The number of read errors	■ **0**—desired value **Note**: An integer > 0 could indicate an issue.
Write Errors	The number of write errors	■ **0**—desired value **Note**: An integer > 0 could indicate an issue.
Internal Temp	The internal operating temperature of the hard drive	■ **[Integer > 0]**

Partition Info Diagnostic Screen

Information

This section provides a diagram and field descriptions of the Partition Info diagnostic screen, including the fields and parameters that are included in the screen. This screen contains information about the partition that exists on the hard drive.

Important: The Explorer 8000 and 8000HD Home Entertainment Servers do not support the use of a SATA device; therefore, "Unavailable" will appear for all fields in this diagnostic screen.

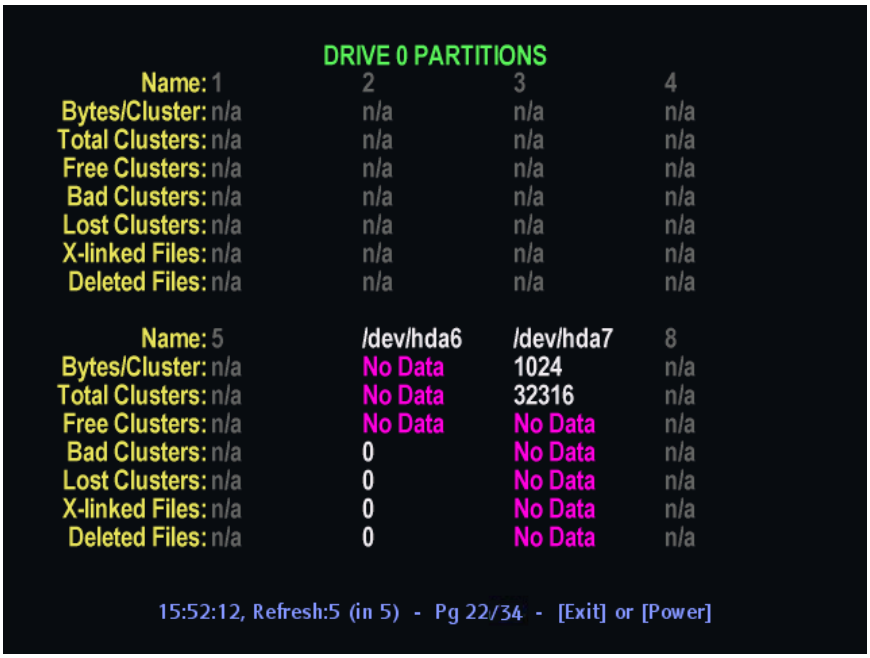
Performing Tasks

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

- Verify the capacity for the partition
- Verify the amount of available space that remains in the partition
- Determine if any lost or bad clusters exist in the partition

Screen Components

Example:



Important: A second Partition Info diagnostic screen exists in the diagnostic screen sequence. Both Partition Info screens contain the same parameters; however, the data reflects a different partition.

Screen Fields and Values

The following table describes the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Field Name	Description	Possible Values
Name	The ID of the partition	■ **[Model-dependent]**
Bytes/Cluster	The number of bytes per cluster	■ **[Integer > 0]**
Total Clusters	The total number of clusters in the partition	■ **[Integer > 0]**
Free Clusters	The total number of free clusters (not written to) in the partition	■ **[Integer > 0]**
Bad Clusters	The number of bad clusters (clusters having a physical flaw) on the hard disk.	■ **0**—desired value **Note:** If this is a large value, call Cisco Services.

Field Name	Description	Possible Values
Lost Clusters	The number of lost clusters (data fragment that does not associate with any files) within the partition	■ **0**—desired value **Note:** If this is a large value, call Cisco Services.
X-Linked Files	The number of crosslinked files that exist within the partition.	■ **0**—desired value **Note:** If this is a large value, call Cisco Services.
Deleted Files	The number of files deleted from this partition	■ **[Integer > 0]**

Host Component Information Diagnostic Screen

Information

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

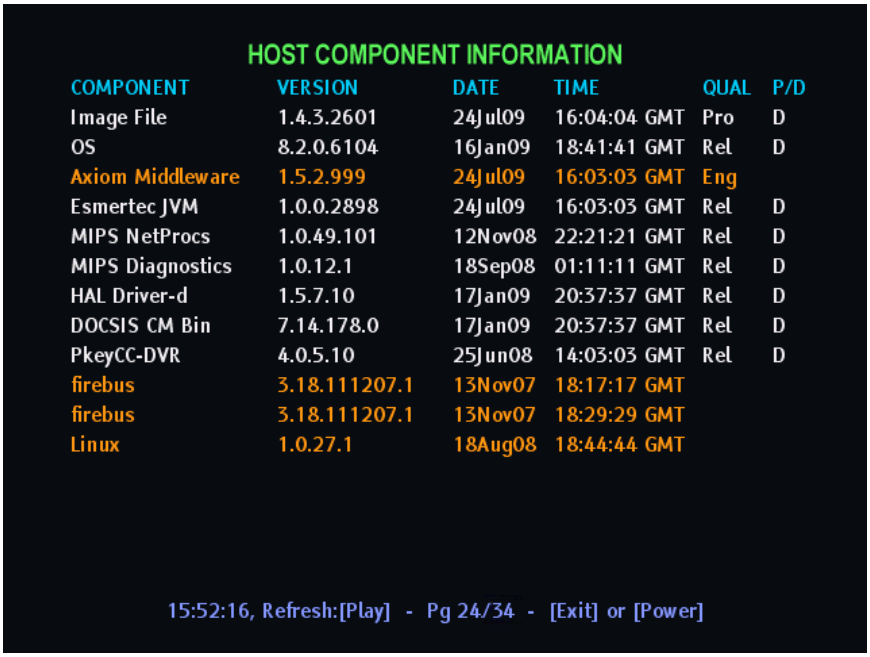
Performing Tasks

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

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

Screen Components

Example:



Screen Fields and Values

The following table describes the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Field Name	Description	Possible Values
Component	The name of each component installed on the set-top	■ **[Component-dependent]** **Example:** Axiom Middleware
Version	The version of each software component installed on the set-top	■ **[Software-dependent]** **Example:** 1.0.15.01
Date	The date each component was created	■ **[Date]** **Example:** 07Sept09
Time	The time that each component was created (GMT)	■ **[Software-dependent]** **Example:** 20:37:03 GMT
Qual	The development or release status of each component installed on the set-top	■ **Pro—**Released code ■ **Rel—**Released code ■ **Dev—**Development code ■ **Eng—**Engineering code
P/D	Defines the status of the software code	■ **P—**Production code ■ **D—**Debug code

Energy Management Diagnostic Screen

Introduction

This section provides details of the Energy Management diagnostic screen, including the fields and parameters that are included in the screen.

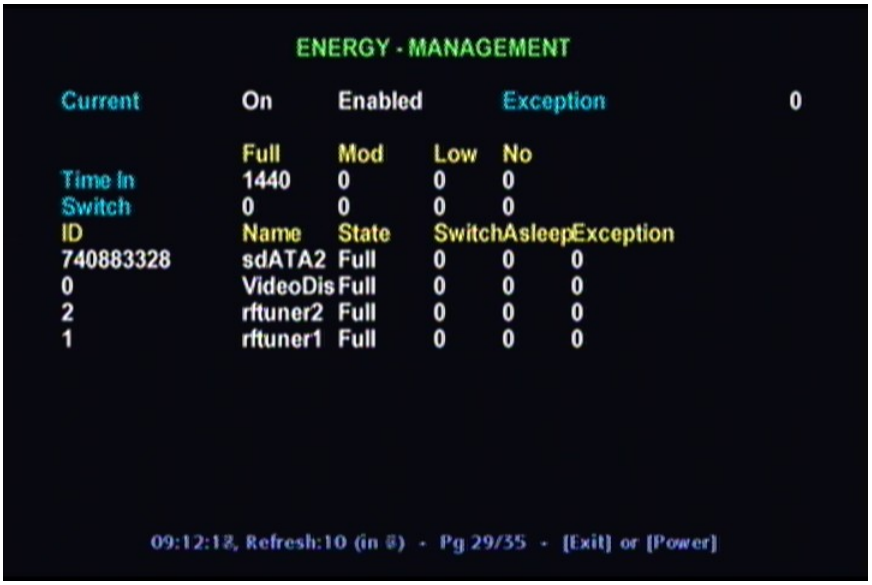
Performing Tasks

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

- Review the DHCT Energy Management-specified power level
- Review the DHCT current power level
- Review the total number of minutes (over the last 24 hours) that the DHCT was in each of the Energy Management power levels
- Review the total number of minutes (over the last 24 hours) that the ENERGY STAR-capable components within the DHCT were in specific power modes

Screen Components

Example:



Screen Fields and Values

The following table describes the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Notes:

- ENERGY STAR-capable hardware components can be any of the following components within the DHCT:
  - Hard disk drive
  - In-band tuner(s)
  - Video output port(s)
- The top part of this screen (Current, Exception, Time In, and Switch fields) contains information about the DHCT and cumulative information about the ENERGY STAR-capable hardware components within the DHCT.
- The lower part of the screen (ID, Name, State, Switch, Asleep, and Exception fields) contains specific information about the individual ENERGY STAR-capable hardware components within the DHCT.

DHCT Fields

Field Name	Description	Possible Values
Current	**On**	Current software-controlled DHCT power state. ■ **On** ■ **Off**
	Enabled	Current DHCT Energy Management state. ■ **Enabled** ■ **Disabled**
Exception	The number of minutes (over the past 24 hours) that the ENERGY STAR-capable hardware components have been powered on, and the DHCT is in a power state other than Full power	■ **0 ≤ Integer ≤ 1440** **Note:** This number is the total for all components within the DHCT. Though individual component times might add up to a larger number, this total will never be larger than 1440 (the number of minutes in 24 hours).
Time In	**Full**	The number of minutes (over the past 24 hours) that the DHCT has been in Full power mode.
	Mod	The number of minutes (over the past 24 hours) that the DHCT has been in Moderate power mode.
	Low	The number of minutes (over the past 24 hours) that the DHCT has been in Low power mode.
	No	The number of minutes (over the past 24 hours) that the DHCT has been in No power mode.
Switch	**Full**	The number of times (over the past 24 hours) that the DHCT has been switched to Full power mode.
	Mod	The number of times (over the past 24 hours) that the DHCT has been switched to Moderate power mode.
	Low	The number of times (over the past 24 hours) that the DHCT has been switched to Low power mode.
	No	The number of times (over the past 24 hours) that the DHCT has been switched to No power mode.

Component Fields

The following hardware component names are used for the component fields:

- **sdATA2**—Internal hard disk drive
- **VideoDis**—Video output port(s)
- **rftuner1**—In-band tuner #1
- **rftuner2**—In-band tuner #2

Field Name	Description	Possible Values
ID	The unit number of the ENERGY STAR-capable hardware component	■ **[Component-dependent]**
Name	The name of the ENERGY STAR-capable hardware component	■ **[Component-dependent]**
State	The current power state of the ENERGY STAR-capable hardware component	■ **Full**—Full power ■ **Mod**—Moderate power ■ **Low**—Low power ■ **No**—No power
Switch	The number of times (over the past 24 hours) that the hardware component has changed power modes	■ **[Number]** The following hardware component names are used in this field: ■ **sdATA2—**Internal hard disk drive ■ **VideoDis**—Video output port(s) ■ **rftuner1**—In-band tuner #1 ■ **rftuner2**—In-band tuner #2
Asleep	The number of minutes (over the past 24 hours) that the hardware component was in a power state other than Full power	■ **0 ≤ Integer ≤ 1440**
Exception	The number of minutes (over the past 24 hours) that the specific Energy Star-capable hardware component has been powered on, and the DHCT is in a power state other than Full power	■ **0 ≤ Integer ≤ 1440**

Common Download Diagnostic Screen

Introduction

This section describes the Common Download diagnostic screen, including the fields and parameters that are included in the screen.

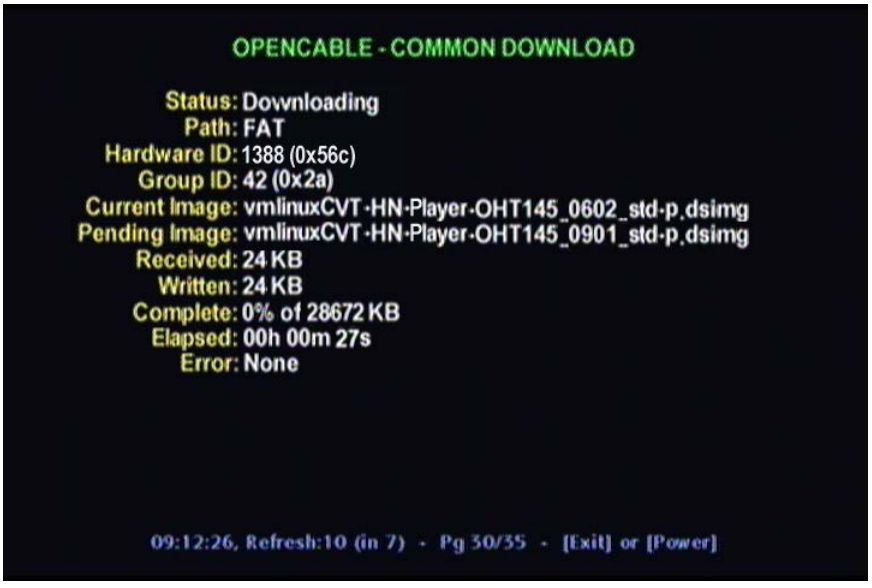
Performing Tasks

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

- Verify the status of the current download
- Verify the path that the current download is using
- Verify the percentage of download completion

Screen Components

Example:



Screen Fields and Values

The following table describes the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Field Name	Description	Possible Values
Status	Status of the download	■ **No Trigger**—No valid trigger received ■ **Current**—CVT received, image on set-top is current ■ **Required**—CVT received, download required ■ **Downloading**—Download in progress ■ **Complete**—Download complete, reboot imminent
Path	Path of the download	■ **None**—No download in progress ■ **FAT**—In-Band FAT channel DSM-CC data carousel ■ **OOB**—DSG application tunnel DSM-CC data carousel ■ **TFTP**—DOCSIS TFTP
Hardware ID	Hardware ID of the platform	■ **[Platform-dependent]**
Group ID	Common download group ID stored in the bootloader	■ **[Integer ≥ 0]**
Current Image	Current image name stored in bootloader	■ **[File-dependent]**
Pending Image	Pending image name, from CVT	■ **[File-dependent]**
Received	Displays size of file received (in kB)	■ **[File-dependent]**
Written	Displays size of file (in kB) written to persistent memory (HDD or flash)	■ **[File-dependent]**
Complete	Percentage of download completed	■ **[0 ≤ Integer ≤ 100]**
Elapsed	Time elapsed during download	■ **[Time]**

Field Name	Description	Possible Values
Error	Last error detected	**Important:** The errors displayed can include some or all of the following errors: ■ **None**—Desired result ■ **Trigger Status Invalid_CVT** ■ **Trigger Status Damaged_CVT** ■ **Trigger Status Invalid_CVT_CVC** ■ **Trigger Status CVT_No_CVC** ■ **Trigger Status CVT_Mismatch_VendorID** ■ **Trigger Status CVT_Mismatch_HardwareVersionID** ■ **Trigger Status CVT_Mismatch_HostMACAddress** ■ **Trigger Status CVT_Mismatch_HostID** ■ **Trigger Status CVT_Mismatch_GroupID** ■ **Image Status Invalid_CodeImage** ■ **Image Status Invalid_CodeImage_CVC** ■ **Image Status Mismatch_MessageDigest** ■ **Image Status Mismatch_CodeImageCRC** ■ **Download Status Download_Failed** ■ **Download Status Download_MaxRetry_Reached** ■ **Download Status Download_Cancelled** ■ **Download Status Download_Aborted** ■ **Upgrade Status Upgrade_Failed** ■ **Upgrade Status Damaged_CodeImage** ■ **Upgrade Status Reboot_MaxRetry_Reached** ■ **Upgrade Status Certificate_Failure**

Linux Memory Information Diagnostic Screen

Introduction

This section provides an overview of the Linux Memory Information diagnostic screen, and includes details on the various kinds of RAM in use and available for use.

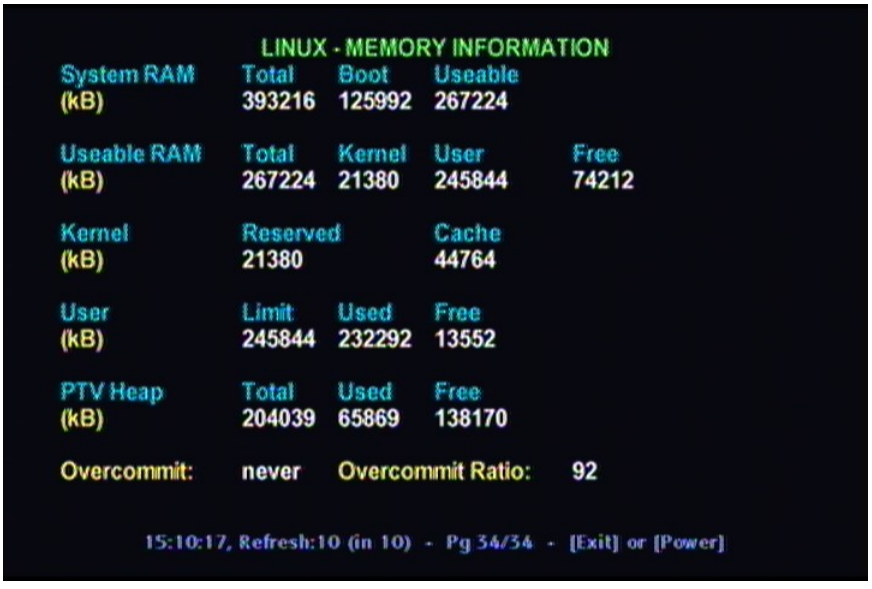
Performing Tasks

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

- Verify the total RAM capability for the system
- Determine the total RAM available for use
- Determine the kernel reserve memory size
- Determine whether there is a memory leak in your system

Screen Components

Example:



Screen Fields and Values

The following table describes the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Note: All memory values are given in kilobytes.

Field Name	Description	Possible Values
System RAM Total	The total physical system RAM visible to Linux (in KB). This will be the actual RAM size minus a small amount reserved for use by the bootloader (around 1Mb).	■ **[Integer ≥ 0]**
System RAM Boot	The amount of RAM required to boot the Linux kernel. This includes all static device allocations in kernel space.	■ **[Integer ≥ 0]**
System RAM Useable	The total free useable RAM available after booting the kernel. This is reported by Linux as "memTotal".	■ **[Integer ≥ 0]**
Useable RAM Total	The total free useable RAM available after booting the kernel. This is reported by Linux as "memTotal".	■ **[Integer ≥ 0]**
Useable RAM Kernel	The amount of RAM reserved for use by the Linux kernel.	■ **[Integer ≥ 0]**
Useable RAM User	The maximum amount of RAM available to user processes. Reported by Linux as CommitLimit.	■ **[Integer ≥ 0]**
Useable RAM Free	The total amount of free RAM currently available to the system. This is reported by Linux as "MemFree".	■ **[Integer ≥ 0]**
Kernel Reserved	The amount of RAM reserved for use by the Linux kernel.	■ **[Integer ≥ 0]**
Kernel Cache	The amount of RAM used in Linux cache. Reported by Linux as "Cached". This disposable cache may cause kernel memory usage to exceed the specified limit reserved for the kernel.	■ **[Integer ≥ 0]**

Field Name	Description	Possible Values
User Limit	The maximum amount of RAM available to user processes. Reported by Linux as CommitLimit.	■ **[Integer ≥ 0]**
User Used	The total address space currently committed to user space (including the PTV heap). Reported by Linux as CommittedAS.	■ **[Integer ≥ 0]**
User Free	The total free address space currently available to user space processes.	■ **[Integer ≥ 0]**
PTV Heap Total	The total size of the PTV heap.	■ **[Integer ≥ 0]**
PTV Heap Used	The amount of used memory currently in the PTV heap.	■ **[Integer ≥ 0]**
PTV Heap Free	The amount of free memory currently in the PTV heap.	■ **[Integer ≥ 0]**
Overcommit	Indicates whether Linux is configured to allow the memory manager to commit more virtual address space than the total available physical memory.	■ **never** ■ **allowed**
Overcommit Ratio	When memory overcommit is disabled, this parameter indicates the percentage of total available RAM that can be used for user space allocations. For instance, if the system is configured with an overcommit ratio of 81, then user space allocations can use up to 81% of the total available RAM (leaving 19% reserved for the kernel).	■ **[Integer ≥ 0]**

3

tru2way Diagnostic Screens

Introduction

This chapter includes information on the diagnostic screens based on an early draft of the CableLabs® tru2way Diagnostic Screen specification. Some information in these screens is the same as other diagnostic screens, but is included here to provide you with a common look and feel across multiple set-top models and vendors.

In This Chapter

View Diagnostic Screens

Accessing tru2way Diagnostic Screens

You can access the tru2way diagnostic screens using either the front-panel buttons or the remote control.

Accessing tru2way Diagnostic Screens

Complete these steps to access the tru2way diagnostic screens using the front-panel buttons.

1. Press the **VOL+** and **INFO** buttons (on the set-top) simultaneously until the first page in the series of diagnostic screens appears.
2. To navigate to the next diagnostic screen, press the **RIGHT ARROW** button on the remote control. To navigate to the precious screen, press the **LEFT ARROW** button on the remote control.
3. To change menu categories, press the **DOWN ARROW** button (next) or the **UP ARROW** button (previous) on the remote control.
4. To return to the previous menu, press the **LAST** button on the remote control.

Accessing tru2way Diagnostic Screens

Complete these steps to access the tru2way diagnostic screens using the remote control.

1. Press and hold the **EXIT** key for two seconds. The POWER LED blinks.
2. In a rapid succession, press the **DOWN** button twice, then press the number **2**. The tru2way diagnostic screens appear on the screen.
3. To navigate to the next diagnostic screen, press the **RIGHT ARROW** button on the remote control. To navigate to the precious screen, press the **LEFT ARROW** button on the remote control.
4. To change menu categories, press the **DOWN ARROW** button (next) or the **UP ARROW** button (previous) on the remote control.
5. To return to the previous menu, press the **LAST** button on the remote control.

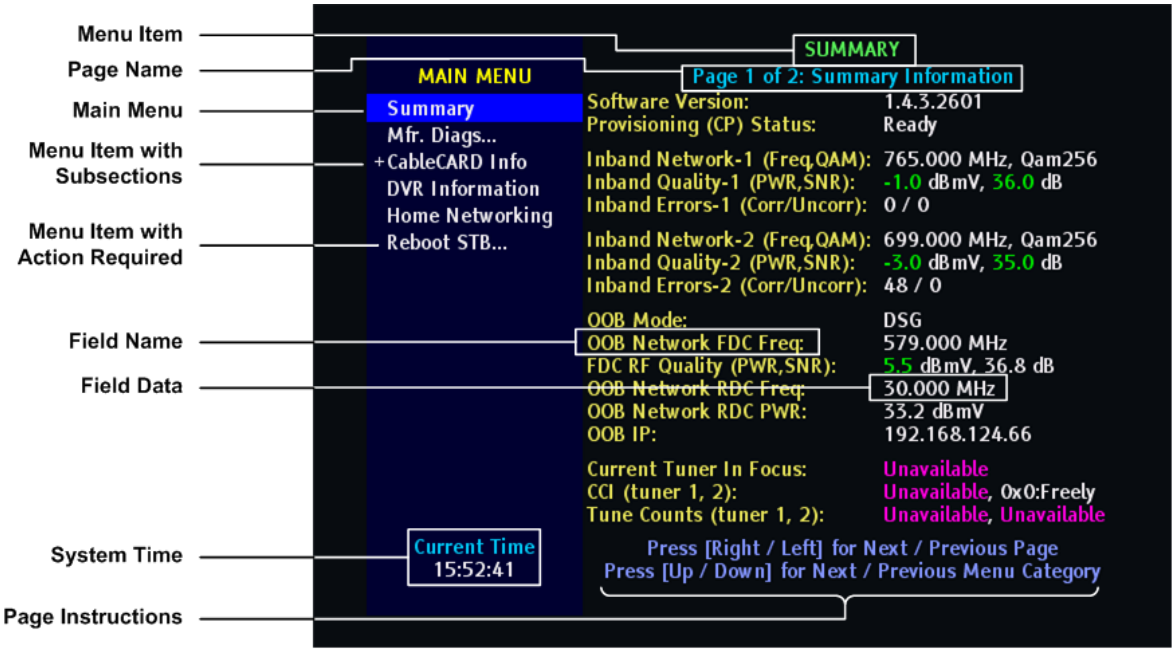
Identifying Information Within CableLabs Diagnostic Screens

This section helps you to locate information within diagnostic screens and provides the following information:

- An example of a diagnostic screen with its key elements
- Descriptions of the color-coded text
- Descriptions of the status line content

The following example shows the components of a tru2way diagnostic screen.

Note: This screen is for illustrative purposes only.



tru2way Diagnostic Page Transparency

You can set the transparency level of the tru2way diagnostic pages so that you can still see the video behind the diagnostic page displayed. This can be helpful when you troubleshoot.

You can change the transparency level of the video using either the set-top front panel or the remote control.

Press the **Guide** button to toggle between the different transparency levels (0%, 25%, 50%, 75%, 100%).

tru2way Summary Screens

Introduction

This section provides an overview of the Summary diagnostic screens.

Performing Tasks

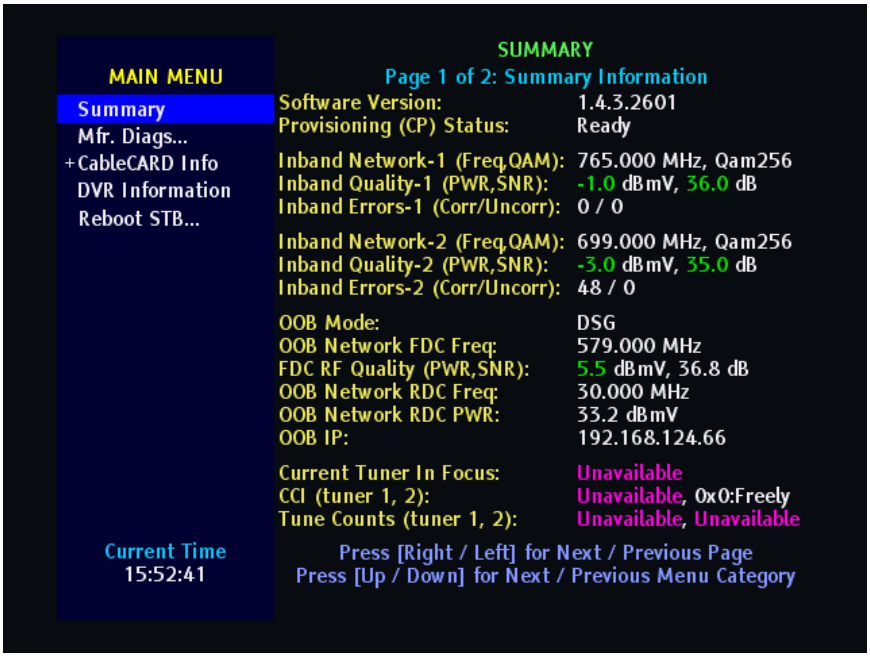
By accessing this diagnostic screen, you can perform the following tasks:

- Determine the current middleware software version and provisioning status
- Verify the inband and out-of-band (OOB) network parameters
- Determine the current tuner in focus
- Determine whether the inband PAT, PMT, and OC are experiencing timeouts
- Determine whether the OOB OC is experiencing timeouts
- Determine whether inband tuner failures exist

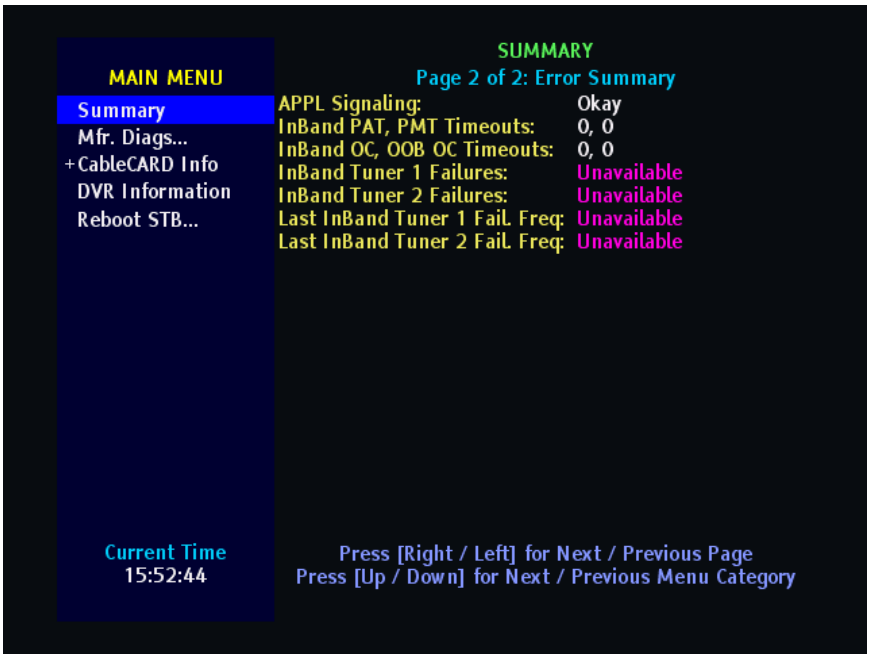
Screen Components

Examples:

Summary Information



Error Summary



Screen Fields and Values

The following tables describe the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Summary Information Screen

Field Names	Description	Possible Values
Software Version	The version for the resident application (middleware)	■ **[Software-dependent]** **Example:** 1.5.1.302
Provisioning (CP) Status	The current status of the M-Card/host authentication (binding)	■ **Ready**—authorization has been received from the headend by the card/Host pair and the authentication and binding are complete ■ **Not Ready**—waiting for authorization or authorization failed
Inband Network-1 (Freq,QAM)	The frequency (freq) in which the inband tuner is tuned (MHz) and the current mode of the inband tuner for network 1	**Freq (Frequency)** ■ **[Dependent upon setting]** **QAM** ■ **QAM-64** ■ **QAM-256** ■ **Analog** ■ **Other**

Field Names	Description	Possible Values
Inband Quality-1 (PWR, SNR)	The approximate received signal level (PWR, in dBmV) and the signal to noise ratio (SNR, in dB) for the applicable QAM data channels for tuner 1	**PWR (Power)** ■ **Refer to specific hardware specifications** • **value displayed in white**—signal level is nominal • **value displayed in amber**—signal level is between –12 and –15dBmV or between +12 and +15dBmV • **value displayed in red**—signal level is either lower than –15dBmV or higher than +15dBmV ■ **n/a**—not applicable on this DHCT **SNR (Signal to Noise Ratio)** ■ **Refer to specific hardware specifications** • **value displayed in white**—signal level is nominal • **value displayed in red**—signal level is unacceptably too high or too low: – **64 QAM**—signal level is lower than 25dB – **256 QAM**—power level is either between –10 and –15dBmV and SNR is less than 36dB or power level is between –10 and +15dBmV and SNR is less than 33dB ■ **n/a**—not applicable on this DHCT
Inband Errors-1 (Corr, Uncorr)	The number of bytes received in error that have been successfully corrected by the FEC code (Corr) and the number of blocks that have not been successfully corrected (Uncorr) by the FEC code for tuner 1	**Corr (Corrected bytes)** ■ **[Integer ≥ 0]** **Important:** If incrementing rapidly, macroblocking or picture freezing may be present. **n/a**—not applicable on this DHCT **Uncorr (Uncorrected blocks)** ■ **[Integer ≥ 0]** **Important:** If incrementing rapidly, macroblocking or picture freezing may be present. **n/a**—not applicable on this DHCT

Field Names	Description	Possible Values
Inband Network-2 (Freq,QAM)	The frequency (freq) in which the inband tuner is tuned (MHz) and the current mode of the inband tuner for tuner 1	**Frequency** ■ **[Dependent upon setting]** **Range:** 70 to 130 MHz ■ **value displayed in red**—frequency is either lower than 70 MHz or higher than 130 MHz **QAM** ■ **QAM-64** ■ **QAM-256** ■ **Analog** ■ **Other**
Inband Quality-2 (PWR,SNR)	The approximate received signal level (PWR, in dBmV) and the signal to noise ratio (SNR, in dB) for the applicable QAM data channels for tuner 2 (if applicable)	**PWR (Power)** ■ **Refer to specific hardware specifications** • **value displayed in white**—signal level is nominal • **value displayed in amber**—signal level is between –12 and –15dBmV or between +12 and +15dBmV • **value displayed in red**—signal level is either lower than –15dBmV or higher than +15dBmV ■ **n/a**—not applicable on this DHCT **SNR (Signal to Noise Ratio)** ■ **Refer to specific hardware specifications** • **value displayed in white**—signal level is nominal • **value displayed in red**—signal level is unacceptably too high or too low: – **64 QAM**—signal level is lower than 25dB – **256 QAM**—power level is either between –10 and –15dBmV and SNR is less than 36dB or power level is between –10 and +15dBmV and SNR is less than 33dB ■ **n/a**—not applicable on this DHCT

Field Names	Description	Possible Values
Inband Errors-2 (Corr/Uncorr)	The number of bytes received in error that have been successfully corrected by the FEC code (Corr) and the number of blocks that have not been successfully corrected (Uncorr) by the FEC code for tuner 2 (if applicable)	**Corr (Corrected bytes)** ■ **[Integer ≥ 0]** **Important:** If incrementing rapidly, macroblocking or picture freezing may be present. ■ **n/a**—not applicable on this DHCT **Uncorr (Uncorrected blocks)** ■ **[Integer ≥ 0]** **Important:** If incrementing rapidly, macroblocking or picture freezing may be present. ■ **n/a**—not applicable on this DHCT
OOB Mode	The out-of-band path used by the host	■ **OOB**—SCTE55 mode ■ **DSG**—DOCSIS modem mode
OOB Network FDC Freq	The frequency (Freq, in MHz) of the tuned QPSK receiver	■ **[Network-dependent]** **Range:** 70–130 MHz

Field Names	Description	Possible Values
FDC RF Quality (PWR, SNR)	Power (in dBmV) and Signal to Noise Ratio (SNR, in dB) of the out-of-band forward data channel	**PWR (Power)** ■ **Refer to specific hardware specifications** • **value displayed in white**—signal level is nominal • **value displayed in amber**—signal level is between –12 and –15dBmV or between +12 and +15dBmV • **value displayed in red**—signal level is either lower than –15dBmV or higher than +15dBmV ■ **n/a**—not applicable on this DHCT **SNR (Signal to Noise Ratio)** ■ **Refer to specific hardware specifications** • **value displayed in white**—signal level is nominal • **value displayed in red**—signal level is unacceptably too high or too low: – **64 QAM**—signal level is lower than 25dB – **256 QAM**—power level is either between –10 and –15dBmV and SNR is less than 36dB or power level is between –10 and +15dBmV and SNR is less than 33dB ■ **n/a**—not applicable on this DHCT
OOB Network RDC Freq	The frequency (in MHz) of the tuned QPSK transmitter	■ **[Dependent upon setting] Range:** 5 to 42 MHz ■ **value displayed in red**—frequency is either lower than 5 MHz or higher than 42 MHz

Field Names	Description	Possible Values
OOB Network RDC PWR	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
OOB IP	The IP address assigned to the out-of-band Ethernet adapter	■ **[Network-dependent]** **Example:** 10.1.0.1
Current Tuner in Focus	Type of tuner currently in focus	■ **Unavailable**
CCI (tuner 1, 2)	Displays the copy control information (CCI) for each tuner in the host	**CCI** Possible values: ■ **0x0**—Copy Freely ■ **0x1**—No More ■ **0x2**—Copy Once ■ **0x3**—Copy Never ■ **0x4**—Copy status undefined
Tune Counts (tuner 1, 2)	Displays the number of tuning incidents on the host	■ **[Integer ≥ 0], [Integer ≥ 0]**

Error Summary Screen

Field Names	Description	Possible Values
APPL Signaling	Displays results of reading the Extended Application Information Table (XAIT)	Possible values: ■ **Okay**—XAIT was read without error ■ **Error**—an error occurred while reading the XAIT
InBand PAT, PMT Timeouts	Displays errors resulting from reading the Program Association Table (PAT) and the Program Map Table (PMT)	■ **Integer ≥ 0, Integer ≥ 0** **Example: 0,0**
InBand OC, OOB OC Timeouts	Displays the number of inband object carousel (InBand OC) and out-of-band object carousel (OOB OC) timeouts	■ **Integer ≥ 0, Integer ≥ 0** **Example: 0,0**
InBand Tuner 1 Failures	Displays the number of tuning errors that have occurred since the last host boot cycle for tuner 1	■ **Integer ≥ 0**
InBand Tuner 2 Failures	Displays the number of tuning errors that have occurred since the last host boot cycle for tuner 2	■ **Integer ≥ 0**
Last InBand Tuner 1 Fail. Freq	The last frequency (in MHz) that the InBand tuner 1 failed to tune	Possible values: ■ **[Integer > 0] MHz**—the last frequency that failed to tune since the last host boot cycle ■ **N/A**—a tuning error has not occurred since the last host boot cycle
Last InBand Tuner 2 Fail. Freq	The last frequency (in MHz) that the InBand tuner 2 failed to tune	Possible values: ■ **[Integer > 0] MHz**—the last frequency that failed to tune since the last host boot cycle ■ **N/A**—a tuning error has not occurred since the last host boot cycle

Mfr. Diags Diagnostic Screen

Introduction

This section provides an overview of the Mfr. Diags diagnostic screen.

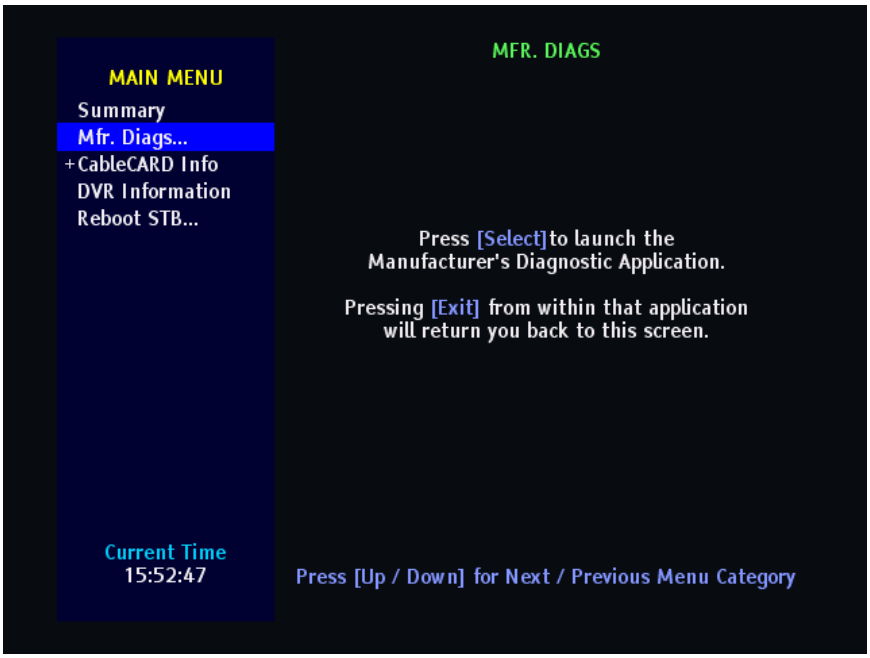
Performing Tasks

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

- Launch the manufacturer-specific diagnostic application

Screen Components

Example:



CableCARD Info Diagnostic Screens

Introduction

The CableCARD diagnostic screens, other than the first summary screen, are entirely dependent on the manufacturer of the CableCARD module.

The host displays its own CableCARD summary information on the first summary screen.

The host then pulls any subsequent CableCARD diagnostic screens from the CableCARD module and displays them for your information. These screens are dependent on the CableCARD manufacturer and are not included in this document.

If you are using Cisco M-Cards for your CableCARD modules, you can get detailed information on these screens from *M-Card and S-Card Diagnostic Screens on a TV Host: A Reference Guide* (part number 4015203).

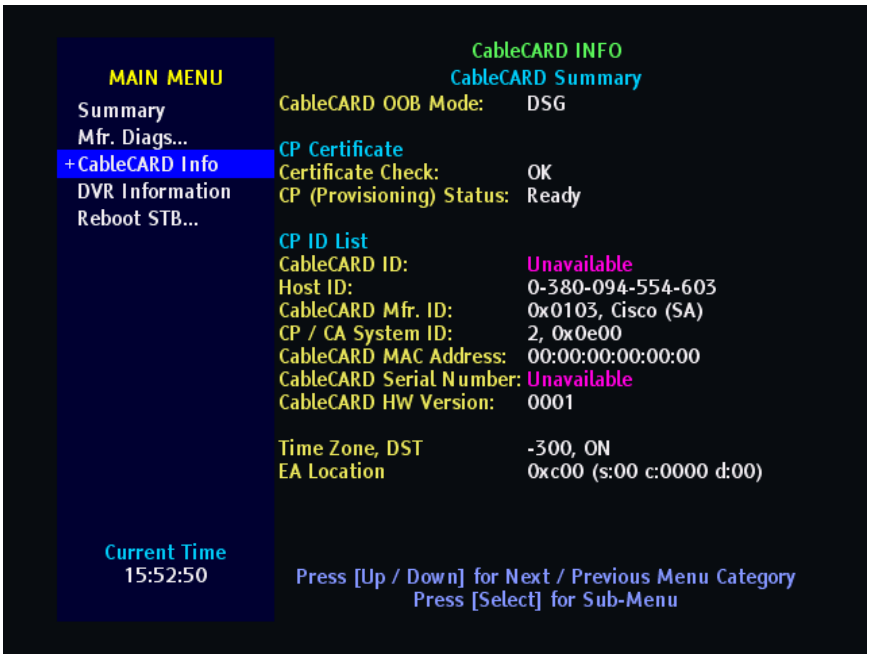
Performing Tasks

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

- Determine the CableCARD OOB mode
- Determine the copy protection provisioning status
- View the CableCARD, host, and manufacturer IDs
- View the CableCARD MAC address, serial number, and software and hardware versions

Screen Components

Example:



Screen Fields and Values

The following table describes the fields and possible values that can appear on the TV screen when you are reviewing the tru2way diagnostic screens. They can be useful for troubleshooting.

Important:

- The host displays its own CableCARD summary information on the first summary screen.
- The host then pulls any subsequent CableCARD diagnostic screens from the CableCARD module and displays them for your information. These screens are dependent on the CableCARD manufacturer and are not included in this document. Refer to the CableCARD manufacturer's documentation for descriptions of these diagnostic screens.

Field and Link Names	Description	Possible Values
CableCARD OOB Mode	Displays the communication mode of the CableCARD module	Possible values: ■ **OOB**—the CableCARD module is communicating with the headend using the out-of-band channel ■ **DOCSIS**—the CableCARD module is communicating with the headend using a DOCSIS channel

Field and Link Names	Description	Possible Values
Certificate Check	Displays the results of the copy protection authentication between the CableCARD module and the host	Possible values: ■ **OK**—the copy protection certificates have been successfully authenticated ■ **Failed**—one of the certificates failed authentication
CP (Provisioning) Status	Displays whether the CableCARD module has requested the host authentication key for binding	Possible values: ■ **Ready**—the host authentication key has been requested ■ **Not Ready**—the host authentication key has not been requested
CableCARD ID	Displays the ID of the CableCARD module inserted into the host	■ **[Hardware-dependent]**
Host ID	Displays the ID of the host	■ **[Hardware-dependent]**
CableCARD Mfr. ID	Displays the manufacturer of the CableCARD module	■ **[Hardware-dependent]**
CP/CA System ID	Displays the system ID of the copy protection system (CP) and of the conditional access system (CA)	**CP System ID** Possible values: ■ **0**—invalid value ■ **1**—invalid value ■ **2**—CableCARD CP system; valid value ■ **3**—invalid value ■ **4**—invalid value **CA System ID** ■ **[Hardware-dependent]** **Example: 0xE00**
CableCARD MAC Address	The MAC address of the CableCARD module inserted into the host	■ **[Hardware-dependent]**
CableCARD HW Version	The hardware version of the CableCARD module inserted into the host	■ **[Hardware-dependent]**

Field and Link Names	Description	Possible Values
Time Zone, DST	Displays the time shift (in seconds) relative to standard time and the Daylight Saving Time (DST) status	**Time Zone Offset** **Example:** If the time shift is one hour earlier, the Time Zone field should display –**300** **DST (Daylight Saving Time)** Possible values: ■ **ON**—DST is observed ■ **OFF**—DST is not observed
EA Location	Location of the host	■ **Hexadecimal code based on location** Other values displayed: ■ **s**—state code ■ **c**—county code ■ **d**—county subdivision code

DVR Information Diagnostic Screens

Information

This section provides a summary of the DVR Information diagnostic screen.

Performing Tasks

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

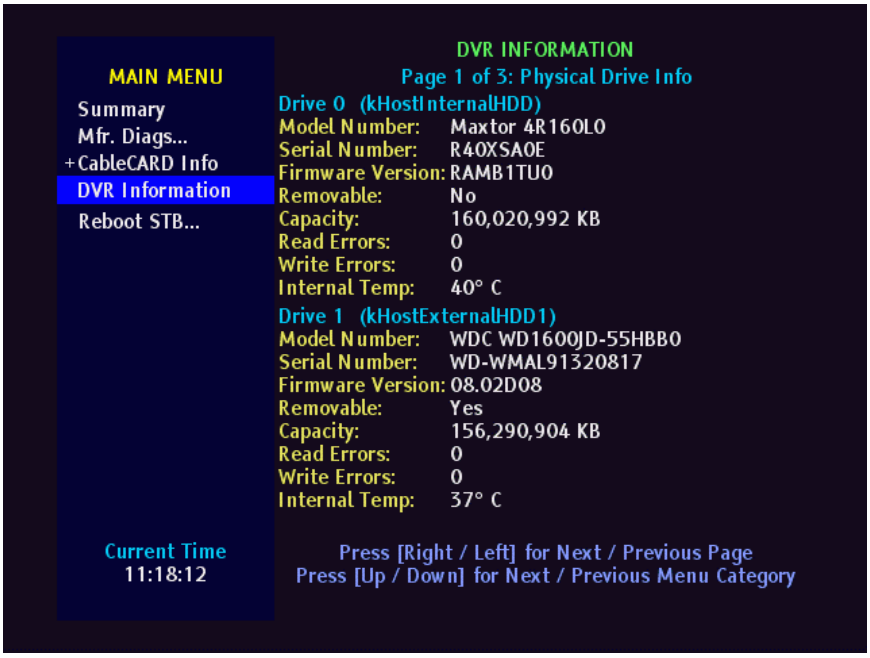
- View vendor-specific diagnostics for the DVR hard disk drive

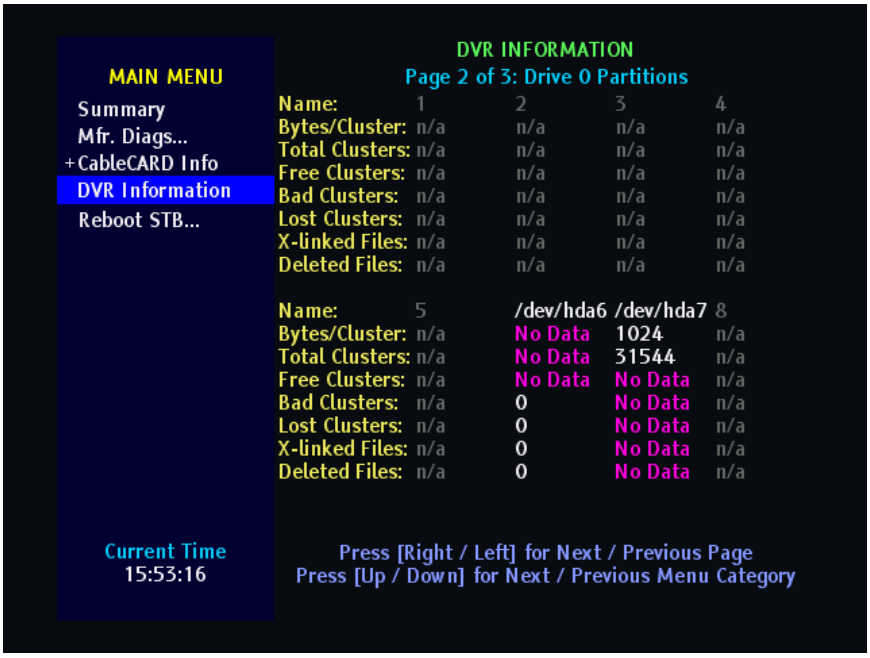
Note: If the set-top does not contain a DVR, a message similar to the following will appear on this diagnostic screen:

DVR features are not supported in this device.

Screen Components

Examples:





Screen Fields and Values

The following tables describe the fields and possible values that can appear on the TV screen when you are reviewing the diagnostic screens. They can be useful for troubleshooting.

Note: There might be multiple hard drives in the host, or multiple partitions on the hard drive itself. Multiple pages of data might appear (one for each drive and/or partition); however, the data displayed is the same for each drive and/or partition.

Physical Drive Info

Field Name	Description	Possible Values
Model Number	The model type for the DVR HDD	■ **[Model-dependent]**
Serial Number	The serial number for the DVR HDD	■ **[Model-dependent]**
Firmware Version	The firmware identification number	■ **[Software-dependent]**
Removable	Displays whether the hard drive is removable	■ **Yes**—the hard drive is removable ■ **No**—the hard drive is not removable
Capacity	The size of the sectors for the HDD	■ **[Hard drive-dependent]**
Read Errors	The number of read errors	■ **0**—desired value **Note**: An integer > 0 could indicate an issue.

Field Name	Description	Possible Values
Write Errors	The number of write errors	■ **0**—desired value **Note**: An integer > 0 could indicate an issue.
Internal Temp	The internal operating temperature of the hard drive	■ **[Integer > 0]**

Partition Information

Field Name	Description	Possible Values
Name	The ID of the partition	■ **[Model-dependent]**
Bytes/Cluster	The number of bytes per cluster	■ **[Integer > 0]**
Total Clusters	The total number of clusters in the partition	■ **[Integer > 0]**
Free Clusters	The total number of free clusters (not written to) in the partition	■ **[Integer > 0]**
Bad Clusters	The number of bad clusters (clusters having a physical flaw) on the hard disk.	■ **0**—desired value **Note:** If this is a large value, call Cisco Services.
Lost Clusters	The number of lost clusters (data fragment that does not associate with any files) within the partition	■ **0**—desired value **Note:** If this is a large value, call Cisco Services.
X-Linked Files	The number of crosslinked files that exist within the partition.	■ **0**—desired value **Note:** If this is a large value, call Cisco Services.
Deleted Files	The number of files deleted from this partition	■ **[Integer > 0]**

Reboot STB Diagnostic Screen

Information

This section provides a summary of the Reboot STB diagnostic screen.

Performing Tasks

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

- Reboot the set-top from the diagnostic screen

Screen Components

Example:

Rebooting the Set-Top from the Reboot STB Diagnostic Screen

To reboot the set-top from this diagnostic screen:

Press and hold the **SELECT** button on the set-top or on the remote control for 5 seconds. The set-top will reboot.

4

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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September 2012 Printed in USA Part Number 78-4011047-01 Rev D