Cisco Unified Screen and Clean Application

User 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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Contents

About This Guide

Introduction

As part of regular business operations, subscribers may return a Cisco® set-top box (STB) to you; for example, when they move to a new city or if the STB is not functioning properly. Upon receiving the STB and before returning it to a subscriber, you will want to ensure that the STB is in optimal working condition and that it is returned to its original factory condition.

To make certain that a returned STB is ready for another subscriber, Cisco has developed the Screen and Clean application. This application ensures that the components of the STB are functioning properly and restores all factory default settings.

The Screen and Clean application runs various tests, selected by the operating technician, and delivers results in real-time right to your desktop. This tool is a diagnostic tool; therefore, if any test fails, you can rerun the test or refer to your normal troubleshooting procedures.

Purpose

This guide teaches you how to use the Screen and Clean application on returned STBs so that they can be distributed with factory default settings to new subscribers. You will learn how to set up your test system to use the Screen and Clean application, as well as how to install the application on your PC.

Scope

This guide provides the following information and instructions:

- System requirements
- System setup
- Screen and Clean installation and testing procedures
- Test descriptions

Audience

This guide is written for system operators and technicians who are responsible for restoring an STB to its original factory condition, as well as verifying that the STB functions properly.

Document Version

This is the second 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 images for improved user interface	Throughout document
Clarified several test parameters and updated the results example	***Running the Screen and Clean Application*** (on page 26)

1

Welcome to the Screen and Clean Application

Introduction

This overview of the Screen and Clean application introduces you to the purpose and key features of this application. This section also introduces the components of the Screen and Clean main screen. The components include menu options and toolbar buttons.

The Screen and Clean application is a Windows-based application that runs on a personal computer (PC) and communicates with a Cisco STB that has been returned by a subscriber.

The purpose for using the Screen and Clean application includes the following functions:

- Verifying the operation of an STB
- Resetting the non-volatile memory (NVM) to clear out the previous subscriber's settings
- Reformatting the hard drive to remove any user content (applicable models only)
- Providing minimal tracking of any failed tests

In This Chapter

Introducing Screen and Clean

Features

The Screen and Clean application includes the following features:

- No testing of software is necessary; all tests are designed to find hardware faults
- The test process requires minimal interaction by the operator
- The Screen and Clean application does not interfere with normal subscriber operation
- Immediate test results are displayed in the user interface

Benefits

The Screen and Clean application provides you with the following benefits:

- Verifies the operation of the STB
- Tests major sub-systems of the STB, such as digital and analog video, audio connections, and front panel buttons
- Provides minimal tracking of any failed tests
- Restores the STB to the factory default state

Application Overview

This section describes the components of the Screen and Clean user interface, including the main menu and the toolbar.

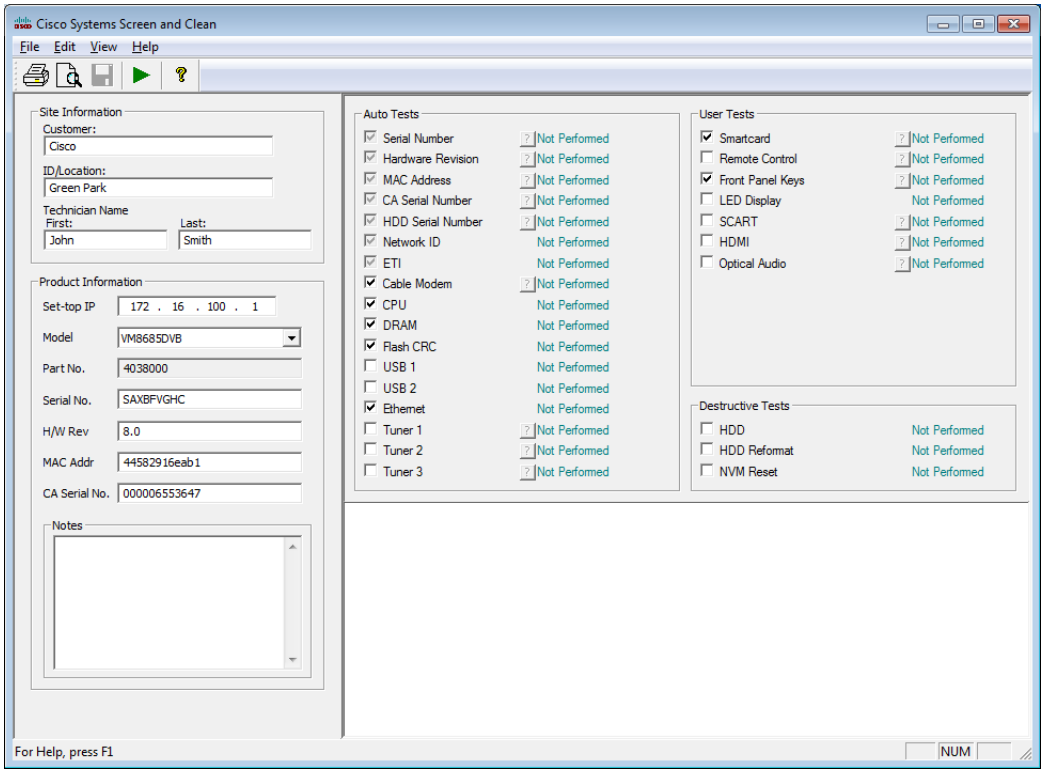
Note: For information about how to set up your system to run the Screen and Clean application, go to System Setup. For information on how to run the Screen and Clean application, go to Running the Screen and Clean Application.

Screen and Clean Window

The Cisco Screen and Clean window opens immediately after you launch the application. The main Screen and Clean window consists of the following components:

- **Main Menu**—Contains various menus that allow you to access commands
- **Toolbar**—Contains icons that provide quick access to commonly used features
- **Technician Information**—Includes text boxes that allow you to input information about the test site, technician, STB product, and any special situation, or circumstances (Notes)
- **Test Control Panel**—Includes a list of automated, user, and destructive tests
- **Test Results**—Provides an area where results are reported for each completed test

The following example shows the Cisco Systems Screen and Clean main window.



Main Menu

This section provides descriptions of the Main Menu options. The Main Menu options include the following menus:

- File
- Edit
- View
- Help

File Menu Command Functions

File Menu Command	Function
Run Tests	Runs the tests that you selected in the main control panel
Stop Tests	Stops the tests **Note:** If a test is in progress, it will complete before the remaining tests are stopped.

File Menu Command	Function
Save to DB	Saves the test results to the database (DB) **Notes:** ■ This option is only valid after a test session has been completed. ■ This option is not enabled if Auto Save to DB is enabled.
Print	Prints a copy of the test results to your default printer
Print Preview	Allows you to view how the test results will appear when they are printed
Print Setup	Allows you to specify the printer and printer connection
Exit	Closes the Screen and Clean application

Edit Menu Command Functions

Edit Menu Command	Function
Copy All Output to Clipboard	Copies all output from the test results window to the clipboard **Notes:** ■ You do not need to select any text prior to executing this command. ■ You can also right-click your mouse button in the test results area and select **Copy All to Clipboard** to place a copy of the output on the clipboard.
Settings	Allows you to customize testing parameters for the test site

View Menu Command Functions

View Menu Command	Function
Toolbar	Allows you to view or hide the toolbar
Status Bar	Allows you to view or hide the status bar
Clear Output on Run	Allows you to enable an auto-clear feature that clears the output from the test results area each time a new test is run **Note:** If you do not wish to enable this feature, you can manually clear the output from the test results area, when desired. To do so, select **Clear Output** from the View menu or right-click your mouse button in the test results section and select **Clear Output**.
Clear Output	Allows you to clear the output from the test results area **Note:** You can also right-click your mouse button in the test results area and select **Clear Output** to delete output from this area.
Auto Save to DB	If selected, all output from the test results window is automatically saved to the database when the test session is complete **Notes:** ■ When enabled, the manual **Save to DB** option is disabled. ■ If this feature is not checked, you must manually save output to the database using the **Save to DB** command or the **Save Results** button. ■ Once the test results have been saved, you cannot save them again.
DB Records	Allows you to display all records saved to the database with the option of deleting them as well

Help Menu Command Functions

Help Menu Command	Function
Help Topics	Allows you to view an index of help topics for Screen and Clean
About Screen and Clean	Provides copyright and version information

Toolbar Functions

The toolbar within the Screen and Clean application allows you to quickly access commonly used features as shown in the following diagram:

Icon	Command	Function
	Print	Prints a copy of the test results
	Print Preview	Allows you to view how the test results will appear when they are printed
	Save Results	Saves the test results to the database **Note:** You can only save test results once after each test session.
	Run Tests	Runs the tests selected in the main control panel
	Stop Tests	Stops the tests **Notes:** ■ This icon is only visible when the tests are running. ■ If a test is in progress, it will complete, but no other tests will begin.
	Help	Displays a list of help topics

Technician Information

When you first open the Screen and Clean application, you will enter the appropriate information in the **Site Information** section. The fields in these sections are text-only fields.

You will also enter the appropriate information (for example, MAC address) from the labels on the STB into the **Product Information** area of the window, typically using a barcode scanner.

Important: You must include an entry for each field, except the **Notes** field, to successfully run a test session.

Notes:

- If you enter a serial number, hardware revision, MAC address, or CA serial number incorrectly in the Product Information area, the tests for those values (Automated Tests area of the control panel) will fail. When a test fails, the correct value is displayed in the test results area and the incorrect value is highlighted in yellow. You should check the values marked on the set-top in case there is a labeling error.
- The MAC address can either be the set-top MAC address or the set-top's cable modem MAC address, depending on the set-top model. However, it must match the label on the set-top. If both MAC labels are present, use the set-top MAC address.
- Once you enter information into any of these fields, it is saved for future tests.

Test Control Panel

The main test control panel includes the following test types:

- **Auto Tests—**Tests that do not require you to perform any functions. These tests are automatically run by the application
- **User Tests—**Tests that require you to perform a function (for example, pressing front-panel keys for the Front Panel Keys test)
- **Destructive Tests—**Tests that remove any owner-configured data (for example, the NVM Reset Test returns the STB to factory defaults)

Note: You can select any number of tests to run simultaneously.

Test Results

The test results section includes information regarding the outcome of each test, including the date and time that the tests were started and finished.

- The starting date and time is shown at the beginning of the test results.
- The ending date and time is shown at the end of the test results.
- The duration of the entire test session is also included at the end of the test results.

Most tests display a **Passed** (text is green) or **Failed** result (text is red), while others also list actual values; for example, Network ID (value is blue). All test results can be printed to your printer or saved to the database.

If a test yields a pass result, the STB successfully passed the requirements for the individual test. If all of the tests in a test run pass, an overall "Passed" test result is shown in the test results window.

Example:

```
Overall Test Results
Passed
```

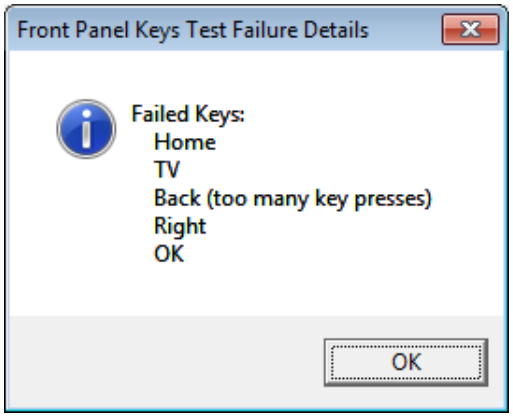
If a test fails, the STB did not pass the requirements of the individual test. If any number of tests fail during a test run, an overall Failed test result is shown in the test results window.

Example:

```
Overall Test Results
Failed: 2 Tests
```

If a failure is reported and details are available, a question mark icon () activates next to the Failed result in the main control panel. Click this icon to view why an individual test failed.

Example: If the Front Panel Keys test did not pass, the following dialog may appear when you click the question mark icon.



Important: If a test fails, you can run the test again. If the test continues to fail, follow your normal procedures for further troubleshooting.

2

System Setup

Introduction

This section describes and illustrates the typical setup for connecting PCs to a mini-headend environment. This section also describes the procedures for operating and installing the Screen and Clean software application on your PC.

In This Chapter

System Requirements

This section outlines the software and hardware requirements that are needed to use the Screen and Clean application.

Software

The following software is required on the PC that is running the Screen and Clean application:

- Cisco Screen and Clean Application
- Microsoft Windows XP or Windows 7
- Open Database Connectivity (ODBC) Data Source

Hardware

To successfully test STBs with the Screen and Clean application, the system or test operator is required to have the following equipment for their system environment:

- An STB
- Rc5 remote control
- Universal Broadband Router Cable Modem Termination System (UBR CMTS)
- Mini-headend
- Television
  - SCART connector (serial input)
  - Standard-definition TV (SDTV)
  - High-definition TV (HDTV) with HDMI™
  - IEC 60958 optical input (digital audio)
- Cable TV signal
- MPEG2 stream generator/player, preferably having three transport stream outputs that contain different content
- Three QAM modulators
- One CMTS for DOCSIS® communication (256-QAM is recommended)
- RF combining network for the three QAMs and CMTS
- Two-way distribution network for multiple test bench requirements
- RF attenuator for each test bench to change drop levels

- PC connected to the CMTS network with the Screen and Clean application installed
- Printer
- CA test cards[1]
- Peripheral device
- Burn-in racks
- Assorted cable leads (including an SCART cable, RCA cable, RF cable, power cable, IR cable, RJ-45 cabling, and USB connector cable)

[1] The Smartcard test requires a valid, functioning, non-blacklisted card.

Test Configuration

Overview

This section describes how to connect an STB to your PC and your headend system. The connections described within this section will ensure that each Screen and Clean test operates properly.

Connecting the STB

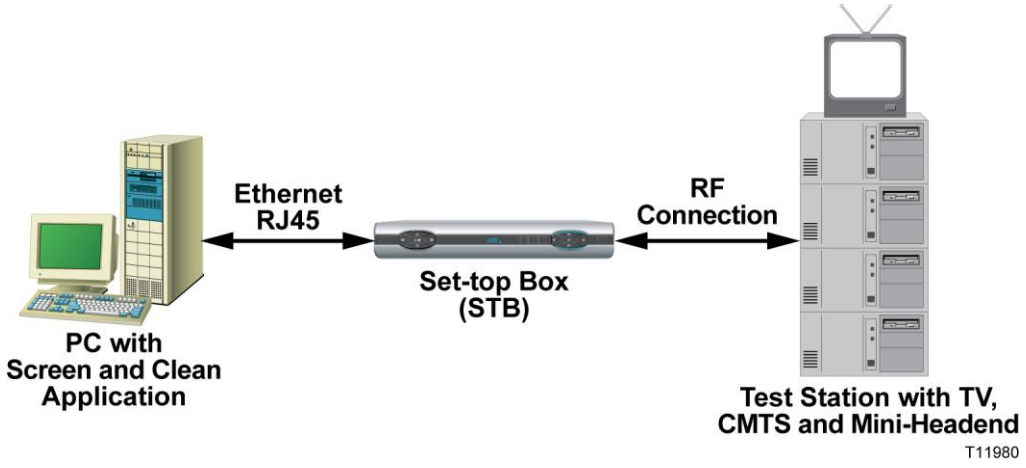
Depending on the STB type and test station setup, there are two configuration options:

1. Direct Ethernet connection.
2. Connection via CMTS.

These two options are illustrated next in the section.

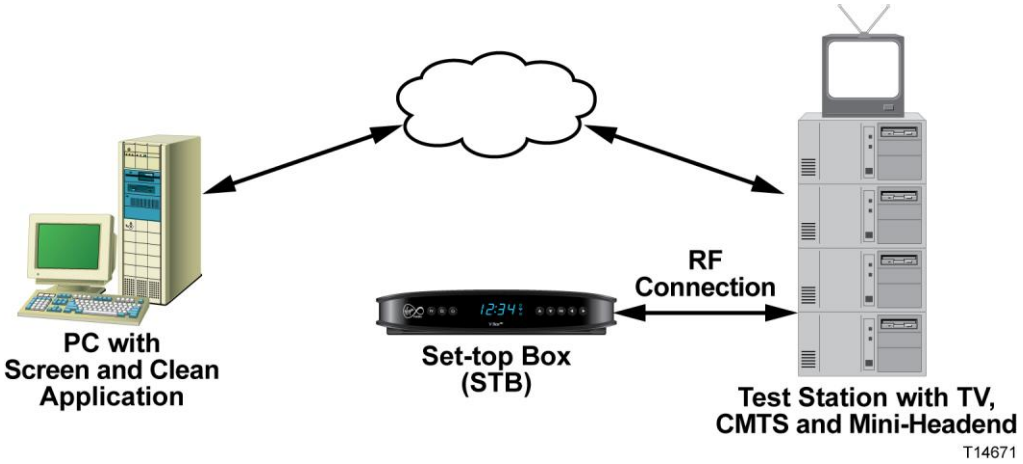
Direct Ethernet Connection

To communicate with the STB, the PC needs to be connected using Ethernet directly to the STB as illustrated in the following example.



Connection via CMTS

To communicate with the STB, the PC needs to be connected using Ethernet to the same network as the UBR CMTS as illustrated in the following example.



Complete the following steps to connect the STB to a PC and a test station.

1. Using an RF cable, connect the STB to the RF connection located on your mini-headend system.
2. Using a SCART cable, HDMI cable, power cable, or IR cable, connect the STB to the SDTV or HDTV, as needed.

   Note: These cables are needed for specific tests. Refer to ***Screen and Clean Test Descriptions*** (on page 35), to determine where the cables are connected and which cable is needed for each test.

Installing the Screen and Clean Application

This section describes the procedures for installing the Screen and Clean application onto your PC.

This section also includes instructions for setting up a data source. A data source provides the connection information that enables you to communicate with the Screen and Clean database.

Complete the following steps to install the Screen and Clean application on your PC.

1. Insert the Screen and Clean CD into the CD-ROM drive on your PC. The Screen and Clean Welcome window opens. Alternatively, double-click the **setup.exe** file from the installation folder.
2. Click **Next.** The Select Installation Folder window opens.
3. Select one of the following:
   - **Everyone**
   - **Just Me**
4. Complete one of the following options:
   a. Click **Next** to install the application into the default folder destination.
   b. Click **Browse** to install the application into a different folder.

   Result: The Confirm Installation window opens.
5. Review your installation settings.
6. Are your settings correct?
   - If **yes**, click **Next**.
   - If **no**, click **Back** and correct your settings by repeating steps 3 through 5, as needed.
7. When the Installation Complete window opens, click **Close** to exit.

   Results:
   - The Screen and Clean application is successfully installed on your PC.
   - The Screen and Clean program group is added to the Start menu (**Start > Programs > Cisco SPVTG >Screen & Clean > Screen & Clean**) and contains shortcuts to the application and this guide.
   - A Screen & Clean icon is placed on your desktop for quick access to the application.

Configuring the Data Source

Open DataBase Connectivity (ODBC) is a programming interface that provides a common language for Windows-based applications to access databases on a network.

The Screen and Clean application requires you to manually set up an ODBC data source so that you can save test results to the database.

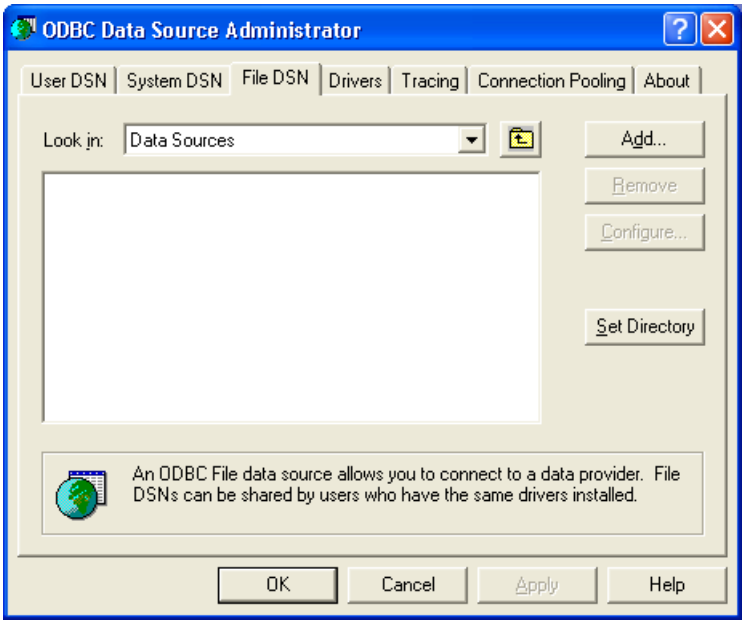
Note: If you have already set up the ODBC data source for an earlier version of Screen and Clean, you do not have to set it up again.

Configuring the Data Source for Windows XP

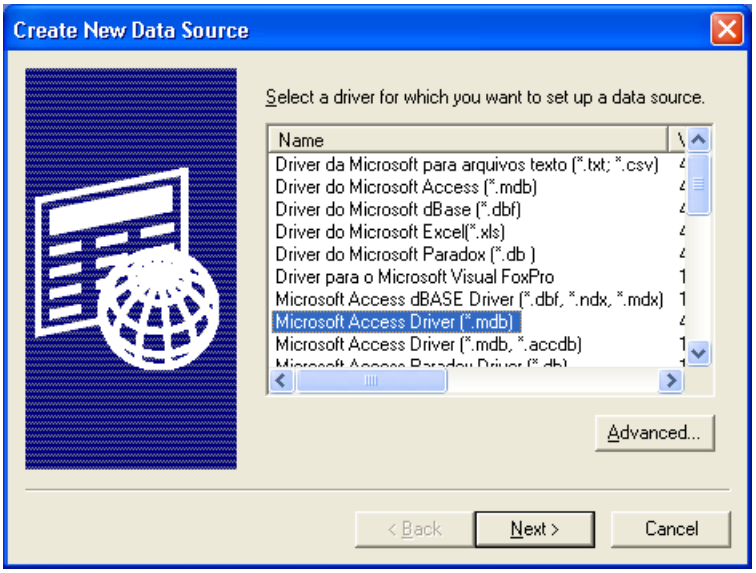
The following instructions will guide you through setting up an ODBC data source name that points to the Screen and Clean database if you are running Windows XP.

1 From your desktop, click the **Start** menu and then select the following sub commands:

Settings > Control Panel > Administrative Tools > Data Sources (ODBC). The ODBC Data Source Administrator window opens.



2 Click the **File DSN** tab, and then click **Add**. The Create New Data Source window opens.



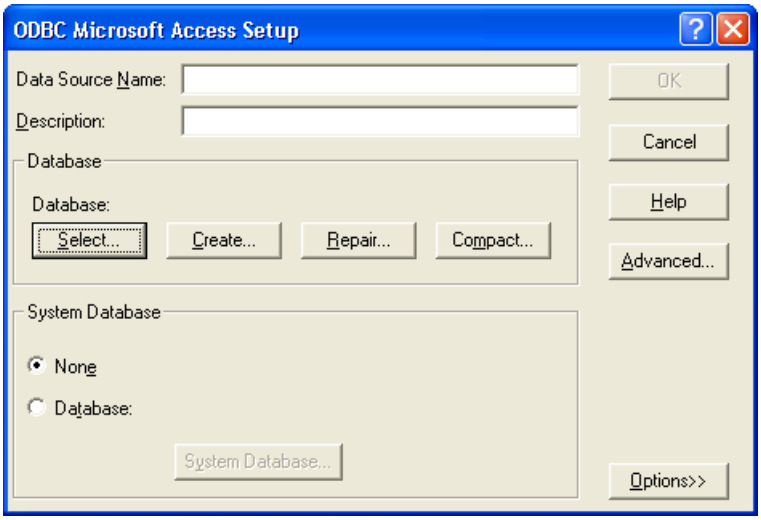
3 Select **Microsoft Access Driver** (*mdb) and click **Next**. A second Create New Data Source window opens.

4 In the Data Source Name box, type **ScreenClean.dsn** for the data source, and click **Next**.

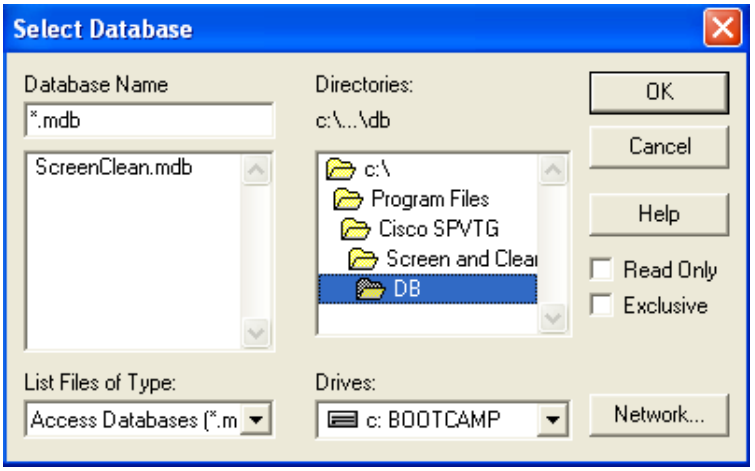
Important: You *must* use **ScreenClean.dsn** for the data source name. If you use a different name, test results will *not* be saved to the database.

Result: An overview of the Screen and Clean data source is shown in the next window.

5 Click **Finish**. The ODBC Microsoft Access Setup window opens.

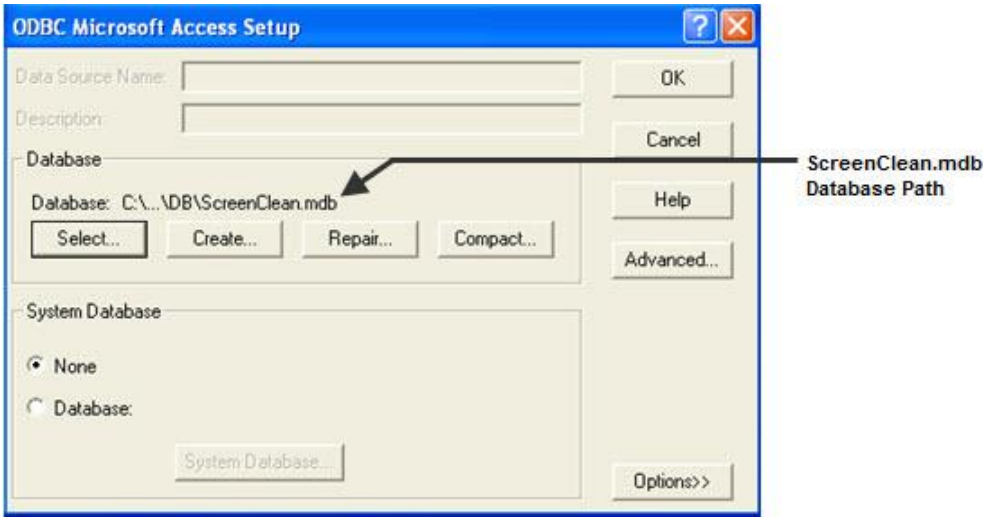


6 Click **Select**. The Select Database window opens.



7 Navigate to the **C:\Program Files\Cisco SPVTG\Screen and Clean\DB** directory and select **ScreenClean.mdb**.

8 Click **OK**. The ODBC Microsoft Access Setup window opens and displays the database path where the ScreenClean.mdb data source is located.



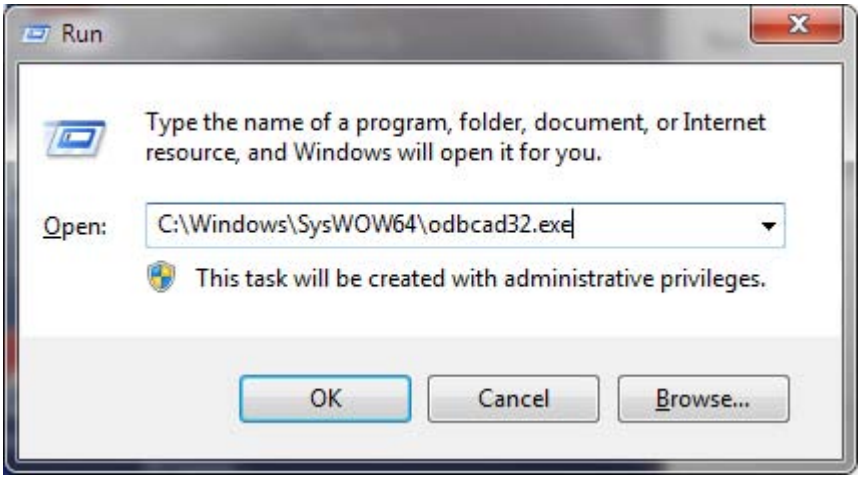
9 Click **OK**. The Select Database window closes and the ScreenClean.mdb data source is inserted into the ODBC Data Source Administrator window.

10 Click **OK**.

Configuring the Data Source for Windows 7

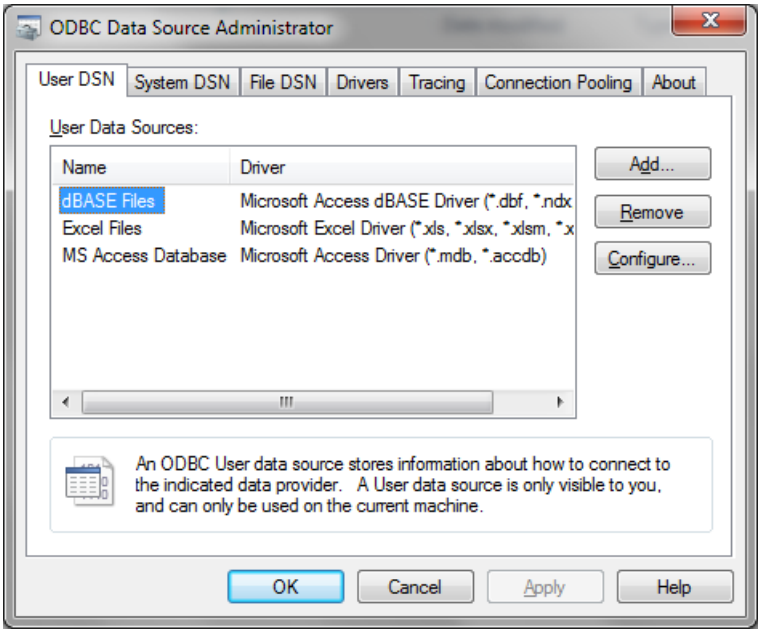
The following instructions will guide you through setting up an ODBC data source name that points to the Screen and Clean database if you are running Windows 7.

1 From your desktop, click the **Start** menu, type the command shown below into the Run menu.



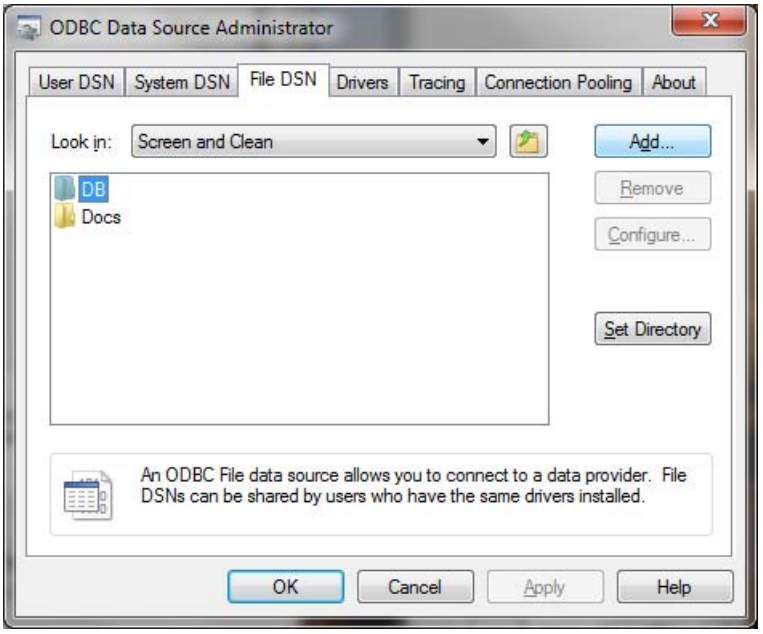
2 Click **OK**.

Result: The ODBC Data Source Administrator window opens with the User DSN tab in the forefront.



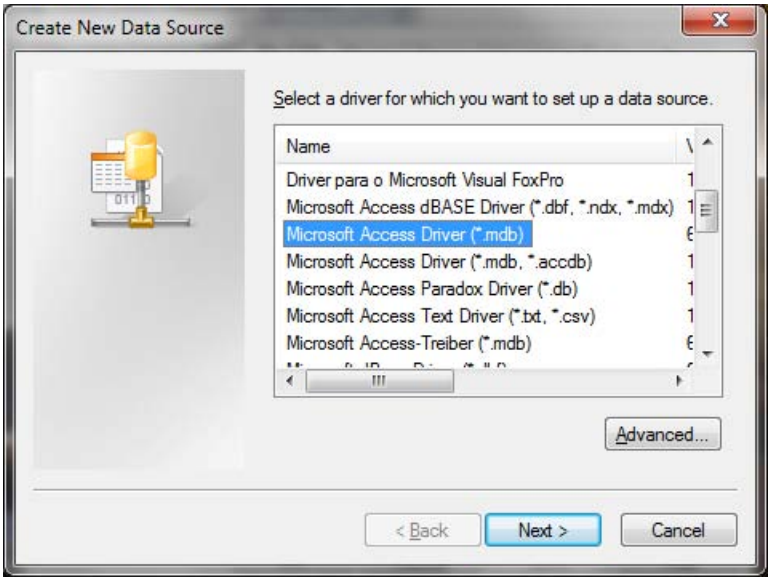
3 Click the **File DSN** tab

4 Click **Add**. The ODBC Data Source Administrator window refreshes.



5 Select **DB** and click **Add**. A Create New Data Source window opens.

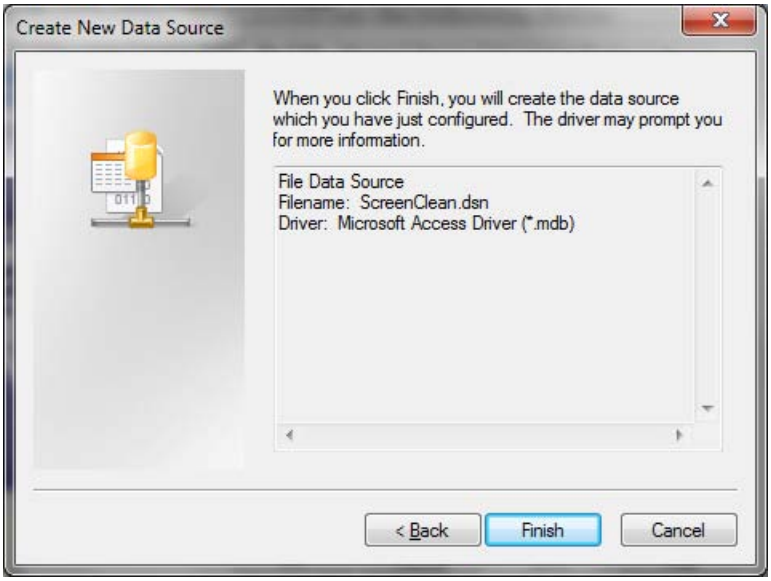
6 Select **Microsoft Access Driver** (*mdb) and click **Next**. A second Create New Data Source window opens.



7 In the Data Source Name box, type **ScreenClean.dsn** for the data source, and then click **Next**.

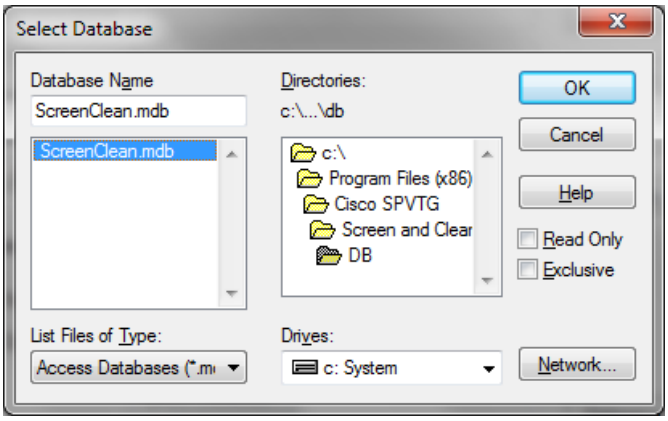
Important: You *must* use **ScreenClean.dsn** for the data source name. If you use a different name, test results will *not* be saved to the database.

Result: An overview of the Screen and Clean data source is shown in the next window.



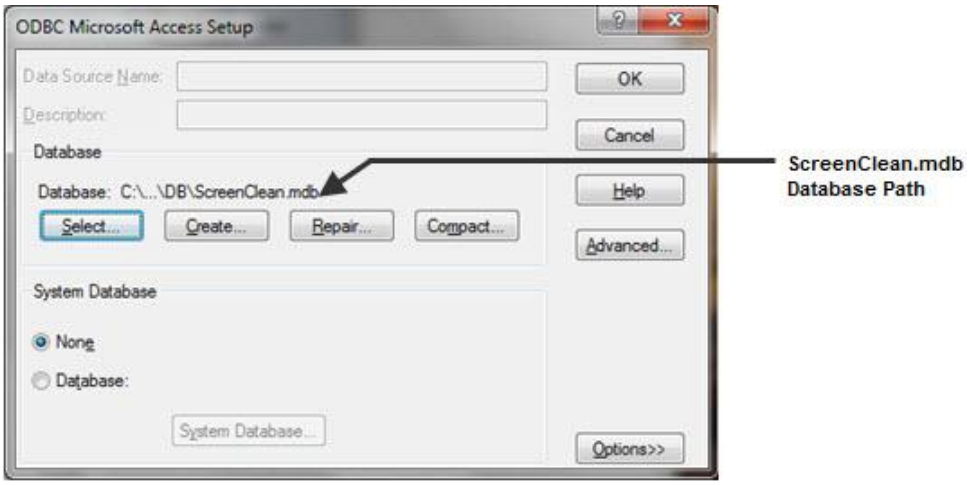
8 Click **Finish**. The ODBC Microsoft Access Setup window opens.

9 Click **Select**. The Select Database window opens.



10 Navigate to the **C:\Program Files (x86)\Cisco SPVTG\Screen and Clean\DB** directory and select **ScreenClean.mdb**.

11 Click **OK.** The ODBC Microsoft Access Setup window opens and displays the database path where the ScreenClean.mdb data source is located.



12 Click **OK**. The Select Database window closes and the ScreenClean.mdb data source is inserted into the ODBC Data Source Administrator window.

13 Click **OK**.

3

Testing an STB Using Screen and Clean

Introduction

This section describes how to run automated, user, and destructive tests on an STB using the Screen and Clean application. This section also includes the procedures for starting up an STB.

Note: The STBs can only be tested one at a time.

For a complete description of each type of test, go to ***Screen and Clean Test Descriptions*** (on page 35).

In This Chapter

Running the Screen and Clean Application

This section describes how to run the Screen and Clean application and how to start up the STB.

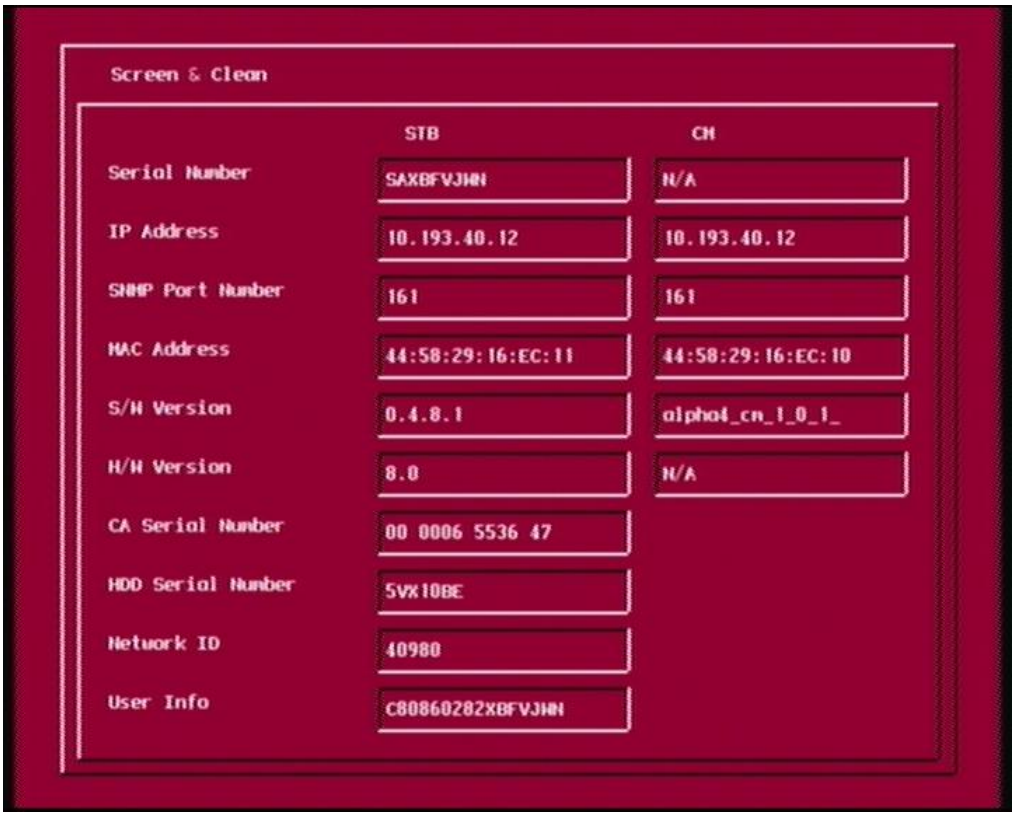
These procedures assume that you have successfully connected the STB to the host computer and a TV. If you have not yet connected your system, refer to System Setup.

Important: These procedures outline the basic steps to run the Screen and Clean application; they do not describe each test. Please refer to ***Screen and Clean Test Descriptions*** (on page 35) for information about each test.

1 Insert the power input to the STB.

2 Press and hold the **right arrow** ( ) and the **up arrow** ( ) buttons at the same time for at least 10 seconds.

3 Release the buttons. After a few seconds, the TV startup screen appears.



4 Did the Screen and Clean graphic appear?.

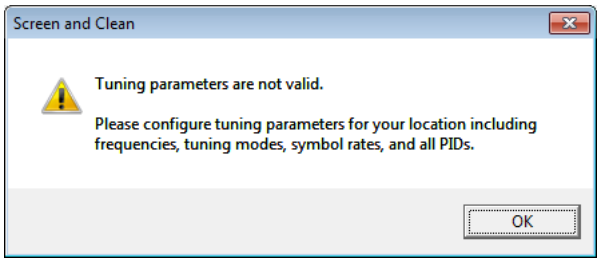
- If **yes**, the STB has successfully booted into Screen and Clean mode.
- If **no**, repeat steps 1 through 3.

5 Wait for the STB IP address to appear in the IP Address field. This address indicates that the STB is ready to communicate with the PC.

6 Double-click the **Screen & Clean** icon on your desktop.

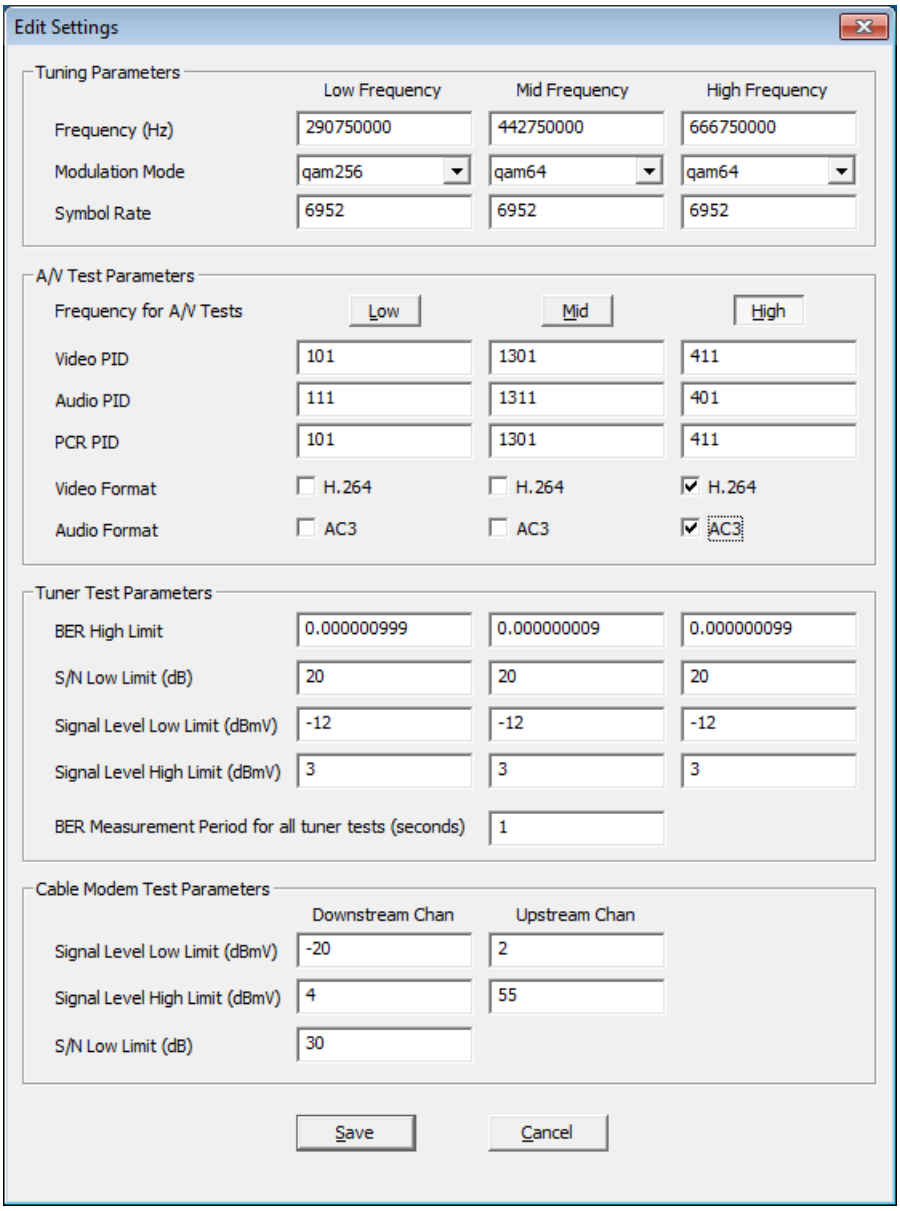
7 Is this the first time you are accessing the Screen and Clean application?

- If **yes**, a "Tuning parameters are not valid." dialog similar to the following opens.



- If **no**, the Screen and Clean window opens. Go to step 14.

8 Click **OK**. The Edit Settings window opens.



9 In **Tuning Parameters**, enter the following information:

- The low, mid, and high frequency parameters for your test site, as needed.
- The frequency, modulation mode, and symbol rate that match your test streams.

Note: The frequency value must be between 100,000,000 Hz and 860,000,000 Hz.

10 In **A/V Test Parameters**, enter or select the following information:

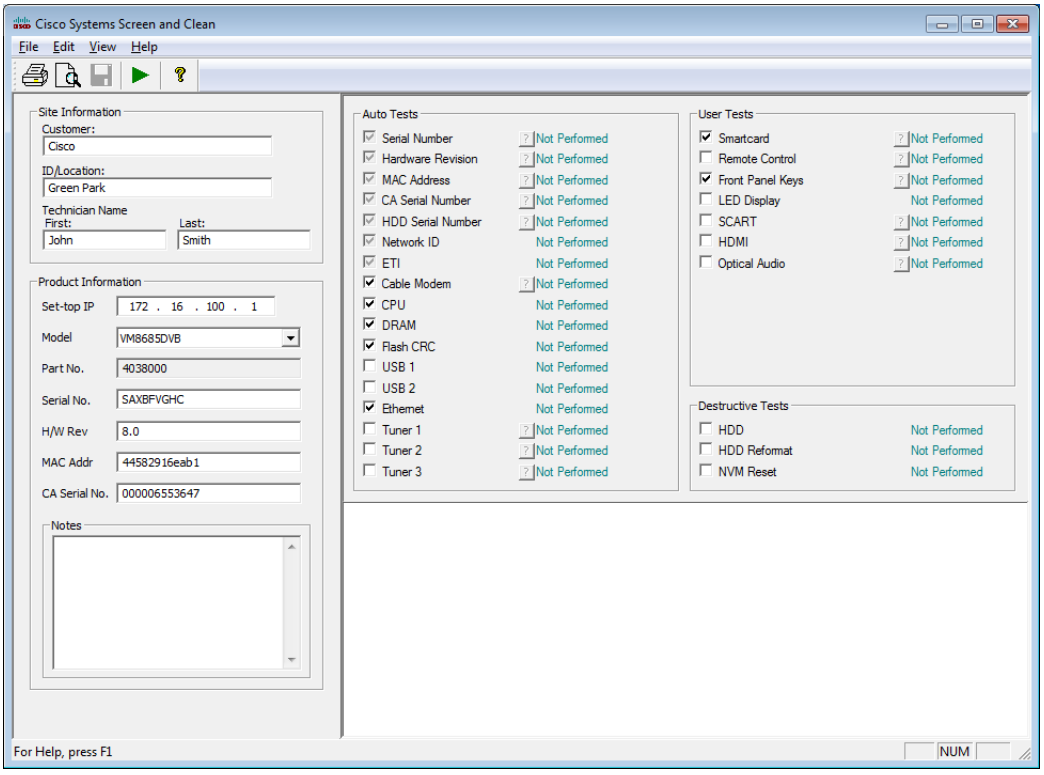
- Enter the video, audio, and PCR PID values for each of the low, mid, and high frequencies.
- Select the video and audio formats, H.264 and AC3, if applicable to your chosen PIDs.
- Adjust the **Frequency for A/V Tests** selection, as needed.

Note: The PID values must be between 1 and 8191.

11 In **Tuner Test Parameters**, adjust the values as needed.

12 Click **Save**. A dialog opens and asks you to confirm the changes that you made.

13 Click **OK**. The Screen and Clean window opens.



14 In **Site Information**, enter the appropriate information in the following fields:

- Customer
- ID/Location
- Technician Name (first and last name)

Important: Each of these fields *must* include an entry before you attempt to run a test.

Note: All data that you provide in this section is automatically saved in these fields until you change them.

15 In **Product Information**, enter the values for the following fields:

- Set-top IP—*Must* be manually entered to run the Screen and Clean application
- Model—Select the STB model from the drop-down menu
- Part No.—Automatically inserted by the system after you select the model
- Serial No.—Located on the bottom label of the STB being tested
- H/W Rev—Located on the bottom label of the STB being tested
- MAC Addr—Located on the bottom label of the STB being tested
- CA Serial No.—Located on the bottom label of the STB being tested

  Important: Each of these fields must include an entry before you attempt to run a test.

  Notes:

  – The serial number, hardware revision, MAC address, and CA serial number values should be on labels attached to the STB. If one of these entries is entered incorrectly, the tests for those values (Automated Tests area of the main control panel) will fail. When this test fails, the correct value is displayed in the test results area in red and the incorrect value you entered is highlighted in yellow.

  – All data that you provide in this section is automatically saved in these fields until you change them.

16 From the **Notes** section, enter any text that is necessary to describe the testing situation (for example, user complaint or issue).

Notes:

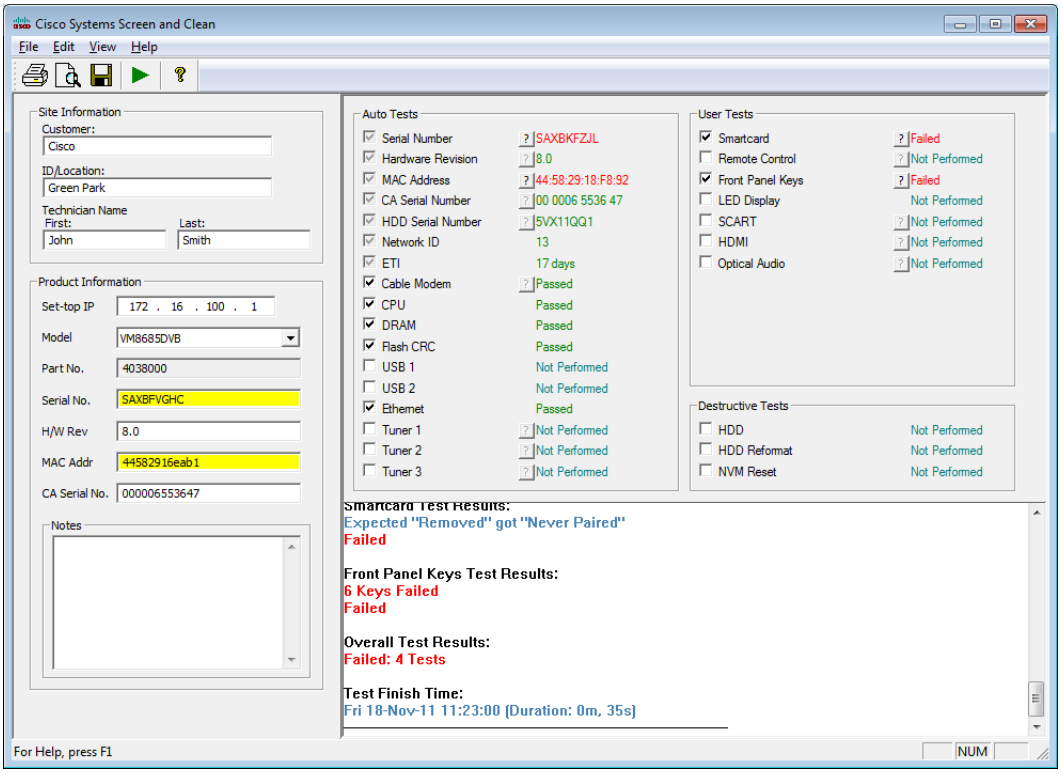
- An entry in this field is not required.
- This text field is limited to 255 characters and is not specific to any parameter.

17 Select the tests that you want to run by selecting the check box located to the left of each test in the **Automated Tests**, **User Tests**, and **Destructive Tests** areas of the main control panel.

Notes:

- The tests in the Automated Tests area do not require any user interaction.
- The tests in the User Tests area require user interaction (for example, pressing front-panel keys for the Front Panel Keys test).
- The Destructive Tests will result in all original owner data/configuration being erased from the STB. These are usually run as the last step in the Screen and Clean process.

18 Click **File > Run tests**, or click **Run Tests** from the toolbar to begin testing the STB. The results of each test are shown in the lower right portion of the application window.



19 Click **File > Save to DB** or click **Save Results** to save the results to the database.

Notes:

- Each set of test results can only be saved to the database one time.
- If you have enabled the Auto Save to DB feature located in the View menu, you do not need to manually save the test results. The test results are automatically saved to the database after the test run completes.

20 Click **File > Print** or click **Print** to print the results.

Note: To see a preview of the printed copy, click **File > Print Preview** or click **Print Preview**  .

Screen and Clean Test Results

```
Customer.............: Cisco
Name.................: John Smith
Location.............: Green Park
Test Date/Time.......: Fri 18-Nov-11 11:37:51
Model Number.........: VM8685DVB
Part Number..........: 4038000
Serial Number........: SAXBKFZJL
Hardware Revision....: 8.0
MAC Address..........: 44:58:29:18:F8:92
CA Serial Number...: 00 0006 5536 47
```

Overall Test Results....: Failed: 4 Tests

```
Serial Number.........................Failed
     Set-top value "SAXBKFZJL" does not match user-entered value of "SAXBFVGHC"
Hardware Revision.....................Passed (8.0)
MAC Address...........................Failed
     Set-top value "44:58:29:18:F8:92" does not match user-entered value of "44582916eab1
CA Serial Number......................Passed (00 0006 5536 47)
HDD Serial Number.....................Passed (5VX11QQ1)
Network ID............................Passed (13)
ETI...................................Passed (17 days)
Cable Modem...........................Passed
CPU...................................Passed
DRAM..................................Passed
Flash CRC.............................Passed
USB 1.................................Not Performed
USB 2.................................Not Performed
Ethernet..............................Passed
Tuner 1...............................Not Performed
Tuner 2...............................Not Performed
Tuner 3...............................Not Performed
Smartcard.............................Failed
     Expected "Removed" got "Never Paired"
Remote Control........................Not Performed
Front Panel Keys......................Failed
     Failed Keys:
         Home
         TV
         Back (too many key presses)
         Right
         OK
LED Display...........................Not Performed
SCART.................................Not Performed
HDMI..................................Not Performed
Optical Audio.........................Not Performed
HDD...................................Not Performed
HDD Reformat..........................Not Performed
NVM Reset.............................Not Performed
```

```
Notes:
          < No Additional Notes >
```

Page 1

21 Do you want to run another test?

- If **yes**, initiate a new test on the same STB or a different STB, and then repeat steps 15 through 20, as needed
- If **no**, click **File > Exit**. The Screen and Clean application closes.

4

Screen and Clean Test Descriptions

Introduction

This section provides a brief description of each test in the Screen and Clean application that can be run on the STB. The test descriptions include the purpose of the test, as well as the possible test results.

In This Chapter

Auto Tests

This section describes each automated test type. Automated tests do not require operator involvement; therefore, the output will indicate when these tests have completed.

Automated tests include the following test types:

Serial Number

A unique number assigned to an STB and used for identification purposes.

This test is always run by default.

Purpose: The Serial Number test verifies the serial number for a specific STB.

Results: The correct serial number appears in the test results area.

Example:

```
Serial Number Test Results
SABKNRGWQ
Passed
```

Hardware Revision

The hardware (H/W) revision number is the hardware version number for the STB.

This test is always run by default.

Purpose: The Hardware Revision test verifies the hardware version number for the STB.

Results: The correct hardware revision number appears in the test results area.

Example:

```
Hardware Revision Test Results
8.2
Passed
```

MAC Address

The MAC address is the unique physical address for the STB.

This test is always run by default.

Purpose: The MAC address test verifies the MAC address for the STB.

Results: The correct MAC address appears in the test results area.

Example:

```
MAC Address Test Results
00:01:E6:68:9B:E5
Passed
```

CA Serial Number

CA provides the encryption and conditional access services in the system.

The CA serial number is the serial number for the CA software that is currently loaded on the STB.

Purpose: The CA serial number test verifies the serial number for the headend software.

Results: The CA serial number appears in the test results area.

Example:

```
CA Serial Number Test Results:
00 0006 5536 47
Passed
```

HDD Serial Number

The HDD Serial Number is the hard disk drive unique number for the STB.

This test is always run by default.

Purpose: The HDD Serial Number test verifies the hard drive serial number for the STB.

Results: The correct hard drive serial number appears in the test results area.

Example:

```
HDD Serial Number Test Results:
Serial: 5VX10EN
Model: ST31000322CS
Firmware Rev: CA13
Passed
```

Network ID

The Network ID is a unique identifier that the STB uses to obtain its network data (for example, channel line-up).

This test is always run by default.

Note: If this value is cleared after running the NVM Reset test, the new Network ID value will not be read or displayed until the STB has been rebooted.

Purpose: The Network ID test verifies the value that the STB uses to obtain its network data.

Results: The Network ID is a numeric number that appears in the test results area.

Example:

```
Network ID Test Results:
41053
Passed
```

ETI

The elapsed time indicator (ETI) is the total amount of time that an STB has been in use since it left the factory.

The ETI is not reset and is updated every 24 hours. If the STB reboots prior to running for a continuous 24 hours, the ETI value will not increment.

This test is always run by default.

Purpose: The ETI test reports the amount of time (in days) that the STB has been in use since it left the factory.

Example:

```
ETI Test Results:
70 days
Passed
```

Cable Modem

The Cable Modem test checks various DOCSIS parameters: CMTS MAC address, upstream and downstream power levels, downstream signal-to-noise ratio, downstream frequency, and operational state for the STB.

With the exception of the downstream frequency, if any of the parameters are outside the specified limits the test fails. The downstream frequency is provided for information only.

Purpose: Provides verification that the Cable Modem is operating correctly. The CM parameters appear in the test results area.

Results:

- **Passed**—The CM is functioning properly.
- **Failed**—The CM is not functioning properly.

Example:

```
Cable Modem Test Results:
CMTS: 00:d0:ba:77:03:54  Pass
US Level: 36.3 dBmV  Pass
DS Level: -10.0 dBmV  Pass
DS S/N: 34.3 dB  Pass
DS Freq: 586750000Hz
State: operational(12)  Pass
Passed
```

CPU

The CPU is the main processing device within the STB. Currently, only one processor is available in the STB; therefore, the CPU must be functional for testing to occur.

Purpose: The CPU test verifies whether or not the CPU is functioning properly.

Results:

- **Passed**—The CPU is functioning properly.
- **Failed**—The CPU is not functioning properly.

Example:

```
CPU Test Results:
Passed
```

DRAM

The dynamic random access memory (DRAM) is checked by writing a test pattern to the usable DRAM, and then reading the DRAM to confirm that the expected pattern exists.

Purpose: The DRAM test verifies whether or not the DRAM is functioning properly.

Results:

- **Passed**—The DRAM is functioning properly.
- **Failed**—The DRAM is not functioning properly.

Example:

```
DRAM Test Results:
Passed
```

Flash CRC

After you start up the STB, the bootloader calculates the cyclic redundancy check (CRC) of the flash image and compares this value to the one stored in the flash memory. These values must match for the STB to function properly.

Purpose: The Flash CRC test verifies the CRC that is calculated for the flash image matches the value stored in flash memory.

Results:

- **Passed**—The CRC for the flash image is valid.
- **Failed**—The CRC for the flash image is not valid.

Example:

```
Flash CRC Test Results
Passed
```

USB

The USB test is used to test a USB port.

Important: Depending on the features of the STB, the Screen and Clean application can test multiple USB ports.

Purpose: The USB test verifies whether or not the USB port is functioning properly.

Results:

- **Passed**—The USB port is functioning properly.
- **Failed**—The USB port is not functioning properly.

Example:

```
USB Test Results:
Mass Storage Device
Passed
```

Ethernet

The Ethernet test is used to test the Ethernet port.

Purpose: The Ethernet test verifies whether or not the Ethernet port is functioning properly.

Results:

- **Passed**—The Ethernet port is functioning properly.
- **Failed**—The Ethernet port is not functioning properly.

Example:

```
Ethernet Test Results
Passed
```

Tuner

Each Tuner test tests a single tuner within the STB and reports frequency-related information for that tuner module.

Important: Depending on the features of the STB, the Screen and Clean application can test up to three tuners.

Purpose: The tuner tests verify that the frequency-related parameters on the STB are within an acceptable operating range.

Results: The results section includes the values for a low-, mid-, and high-frequency test. The results of these frequency tests yield one of the following results:

- **Passed**—The parameters for the tuner are within an acceptable range.
- **Failed**—The parameters for the tuner are not within an acceptable range.

Example:

```
Tuner 1 Test Results
Low Frequency Test…
Tuner Locked Status: Locked
Frequency: 419000000 Hz
Signal Level: 5 dB Pass
S/N: 32 dB Pass
BER: 0.000e+000 (000000000000) Pass

Mid Frequency Test…
Tuner Locked Status: Locked
Frequency: 519000000 Hz
Signal Level: 5 dB Pass
S/N: 32 dB Pass
BER: 0.000e+000 (000000000000) Pass

High Frequency Test…
Tuner Locked Status: Locked
Frequency: 619000000 Hz
Signal Level: 5dB Pass
S/N: 32 dB Pass
BER: 0.000e+000 (0.000000000000) Pass
Passed
```

User Tests

User tests require your involvement (for example, to press the front-panel keys). You then respond to questions prompted by the Screen and Clean application. The response to these questions determines the outcome of each test.

User tests include the following test types:

- ***Smart Card*** (on page 45)
- ***Remote Control*** (on page 45)
- ***Front Panel Keys*** (on page 46)
- ***LED Display*** (on page 47)
- ***SCART*** (on page 48)
- ***HDMI*** (on page 48)
- ***Optical Audio*** (on page 49)

Smart Card

The Smart Card slot is usually located on the back panel of the STB and is labeled **SMARTCARD**.

To perform this test, you must insert a Smart Card if one is not inserted in the SMARTCARD slot or remove a Smart Card that is already inserted in the SMARTCARD slot.

Purpose: The Smart Card test verifies that the SMARTCARD slot on the STB is functioning properly.

Results:

- **Passed**—The Smart Card connection port is working properly.
- **Failed**—The Smart Card connection port is not working properly.

Example:

```
Smart Card Test Results:
Passed
```

Remote Control

The IR receiver is located on the front panel of the STB and receives signals from the remote control.

When the test begins, point the remote control towards the STB IR receiver, and then press keys **1** and **2** on the remote control when prompted by the Screen and Clean application.

Purpose: The Remote Control test verifies that the IR receiver on the STB is receiving a signal from the remote control.

Results:

- **Passed**—The STB received the signal from the remote control; therefore, the IR receiver is working properly.
- **Failed**—The STB did not receive the signal from the remote control; therefore, the IR receiver is not working properly.

Example:

```
Remote Control Test Results
Key 1: Passed
Key 2: Passed
Passed
```

Front Panel Keys

The STB includes front-panel keys that allow you to access functions and features on the STB.

When the Front Panel Keys test begins, a test window opens and continues to display until one of the following conditions is met:

- All keys have been pressed and successfully recognized by the STB.
- One or more key presses were not recognized by the STB; and therefore, you click **OK** in response to the following statement:

  Press all indicated Front panel buttons ONCE, then Click OK.

When the test begins, each front-panel key is shown as a red question mark button in the test window. Press each key on the front panel of the STB one time to verify that the key is working properly.

- If the key is functioning properly, the key indicator in the Front Panel Buttons window changes to a green OK button.
- If you press a key twice or if the key "bounces" and causes the application to detect multiple presses to be detected, the key indicator changes to a yellow X button.
- If you do not press a key, or if there is a hardware failure, the key indicator for that key continues to display the red question mark button. In this case, you can try to repeat the key press; otherwise, you will need to click **OK** in response to the dialog box.

Purpose: The Front Panel Keys test verifies that each front-panel key on the STB is functioning properly.

Results:

- **Passed**—All of the front panel keys are working properly.
- **Failed**—One or more front panel keys are not working properly. A list of keys that are not functioning properly are provided in the test results area.

Example:

```
Front Panel Keys Test Results

All Keys Passed

Passed
```

LED Display

The display panel on the front of the STB provides general status information.

For example, if the ONLINE LED is illuminated, then the STB is successfully connected to the CMTS on the headend.

When the LED Display test begins, a test window opens and continues to display until you click **Yes** or **No** in response to the following question:

Are the front panel LEDs displaying the same pattern as the above display?

Purpose: The LED Display test verifies that LEDs on the front panel of the STB are operating correctly.

Results:

- **Passed**—The LEDs on the STB match those on the Front Panel LEDs test window and are operating correctly.
- **Failed**—The LEDs on the STB do not match those on the Front Panel LEDs test window and do not operate correctly.

Example:

```
LED Display Test Results:
Passed
```

SCART

The SCART connector is located on the back panel of the STB and is labeled **SCART**.

To perform this test, you must connect a SCART cable from the TV to the STB.

When the SCART test begins, video and audio is played using the SCART output. A dialog window opens and continues to display until you click **Yes** or **No** in response to the following question:

Is video present on the TV?

After responding to this question, another dialog window opens and continues to display until you click **Yes** or **No** in response to the following question:

Is audio present on the TV?

Purpose: The SCART test verifies that both audio and video on the SCART connector is working properly.

Results:

- **Passed**—The SCART connection port is working properly.
- **Failed**—The SCART connection port is not working properly.

Example:

```
SCART Test Results
Video: Pass
Audio: Pass
Passed
```

HDMI

The high-definition multimedia interface (HDMI) output connector is located on the back panel of the STB and is labeled HDMI.

To perform this test, you must connect an HDMI cable from an HDTV to the STB.

When the HDMI test begins, video and audio is played using the HDMI output. A dialog window opens and continues to display until you click **Yes** or **No** in response to the following question:

Is video present on the TV?

After responding to this question, another dialog window opens and continues to display until you click **Yes** or **No** in response to the following question:

Is audio present on the TV?

Purpose: The HDMI test verifies that the digital audio and video on the HDMI output connector is working properly when the STB is connected to an HDTV.

Results:

- **Passed**—The HDMI connection port is working properly.
- **Failed**—The HDMI connection port is not working properly.

Example:

```
HDMI Test Results:
Video: Pass
Audio: Pass
Passed
```

Optical Audio

The optical audio output connector is located on the back panel of the STB and is labeled **OPTICAL AUDIO**.

To perform this test, you must connect an optical cable from an audio receiver to the STB.

When the optical audio output test begins, audio is played using the optical output. A dialog window opens and continues to display until you click **Yes** or **No** in response to the following question:

Do you hear audio on the stereo speakers?

Purpose: The Optical Audio test verifies that the digital audio output connector is working properly when the STB is connected to an audio receiver using an optical cable connector.

Results:

- **Passed**—The optical audio output connection port is working properly.
- **Failed**—The optical audio output connection port is not working properly.

Example:

```
Optical Audio Test Results:
Audio: Pass
Passed
```

Destructive Tests

Destructive tests remove any owner-configured data (for example, the NVM Reset test returns the STB to factory defaults).

Destructive tests include the following test types:

- ***HDD*** (on page 50)
- ***HDD Reformat*** (on page 51)
- ***NVM Reset*** (on page 51)

HDD

The hard disk drive (HDD) is permanently mounted in the STB and can contain programs recorded by the previous subscriber.

Important: On some STB models, this test may remove the file structure. Therefore, you should always select the HDD Reformat test to run after this test has completed.

Purpose: The HDD test verifies the recording surface of the HDD to ensure that it has no defects.

Results:

- **Passed**—The recording surface on the hard drive has no defects.
- **Failed**—The recording surface on the hard drive has defects.

Example:

```
HDD Test Results:
Passed
```

HDD Reformat

The HDD Reformat test clears the hard drive to remove any previously recorded programs.

You should always run the HDD Reformat test after the HDD test has completed.

Purpose: The HDD Reformat test clears the content of the HDD and sets up clean partitions on the HDD.

Result:

- **Passed**—The HDD was successfully reformatted.
- **Failed**—The HDD was not successfully reformatted.

Example:

```
HDD Test Results:
Passed
```

NVM Reset

The NVM Reset test clears out all of the data stored in non-volatile memory except those values that were set at the factory.

All operating system, application site-specific, and user-specific data items are reset to their default values by their respective owners the next time the box is booted or the application is launched.

Purpose: The NVM Reset test clears the NVM on the STB, and maintains all data in the NVM assigned at the factory.

Results:

- **Passed**—The NVM was successfully cleared.
- **Failed**—The NVM was not successfully cleared.

Example:

```
NVM Factory Defaults Test Results:
Passed
```

5

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.

Glossary

bit rate

The number of bits of information that can be transmitted over a channel in a given second (usually express in bits per second [bps]).

CPU

Central processing unit.

CRC

Cyclic redundancy check. Error-checking technique.

DOCSIS

Data over cable service interface specification. This specification defines interface requirements for cable modems involved in high-speed data distribution over cable television system networks. This standard was developed by CableLabs in North America and approved by the International Telecommunication Union (ITU).

DRAM

Dynamic random access memory.

DVB

- Short for Digital Video Broadcasting Project (DVB), DVB is an industry-led consortium of more than 260 broadcasters, manufacturers, network operators, and regulatory bodies and others in over 35 countries committed to designing global standards for the global delivery of digital television and data services.

- DVB is also the name used to describe the various European systems for television, radio and data broadcasting in all areas of the world outside of North America.

Ethernet

A type of network technology for local area networks; coaxial cable carries radio frequency signals between computers at a rate of 10 or 100 megabits per second.

flash memory (ROM)

Nonvolatile storage that can be electrically erased and reprogrammed so that software images

can be stored, booted, and rewritten as necessary.

HDMI

High definition media interface. A multi-pin connection port used to transfer uncompressed digital video with HDCP copy protection, while also having the capability to transmit multi-channel audio.

LED

light-emitting diode. Semiconductor device that converts electrical energy into light. Status lights on hardware devices are typically LEDs.

MAC address

Media Access Control address. A unique physical address embedded into a network device. Similar to a serial number.

MPEG-2

Intended for higher quality video-on-demand applications and runs at data rates between 4 and 9 Mbps.

NVM

non-volatile memory. Memory that holds its content when the device it is associated with is turned off.

PCR

program clock reference. Used to synchronize audio and video in a program.

PID

packet/program identifier. A number assigned to MPEG transport packets to identify the contents of the data and the information stream to which they belong. The 13-bit PID number is assigned in the MPEG-2 transport packet headers. All packets from the same stream have the same PID number.

reboot

The reloading of the operating system (OS) and application programs into the main memory or random access memory (RAM) of the system.

SCART

SCART is a 21-pin connector plug found on most European electronics, such as televisions, VCR, and DVD players. SCART is also known as a *Euroconnector*. SCART supports stereo audio and analog video.

signal level

The signal power or intensity at a specified point and with respect to a specified reference level.

tuner

A hardware device that allows live video content, such as from cable or broadcast television, to display on a local host.

USB

universal serial bus. A port on a PC or other device that provides connection to peripherals, such as CD-ROM drives, printers, modems, and keyboards.

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Cisco Systems, Inc.
5030 Sugarloaf Parkway, Box 465447
Lawrenceville, GA 30042

678 277-1120
800 722-2009
www.cisco.com

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