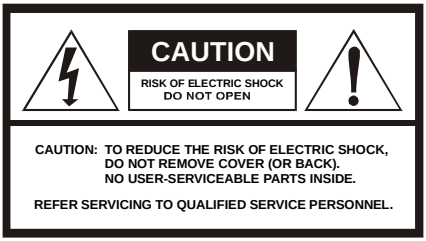
Installation Manual

DCT3080
DVR Set-Top Box

MOTOROLA



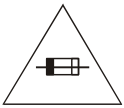
Caution

These servicing instructions are for use by qualified personnel only. To reduce the risk of electrical shock, do not perform any servicing other than that contained in the Installation and Troubleshooting Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

Special Symbols That Might Appear on the Equipment

This symbol indicates that dangerous voltage levels are present within the equipment. These voltages are not insulated and may be of sufficient strength to cause serious bodily injury when touched. The symbol may also appear on schematics.

The exclamation point, within an equilateral triangle, is intended to alert the user to the presence of important installation, servicing, and operating instructions in the documents accompanying the equipment.



For continued protection against fire, replace all fuses only with fuses having the same electrical ratings marked at the location of the fuse.

This equipment operates over the marked Voltage and Frequency range without requiring manual setting of any selector switches. Different types of line cord sets may be used for connections to the mains supply circuit and should comply with the electrical code requirements of the country of use. The line cord provided with the equipment is acceptable for use with NEMA Style 5-15R ac receptacles supplying nominal 120 Volts.

WARNING: TO REDUCE THE RISK OF FIRE OR SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. THE APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING AND NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.

CAUTION: TO PREVENT ELECTRICAL SHOCK, DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE, OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

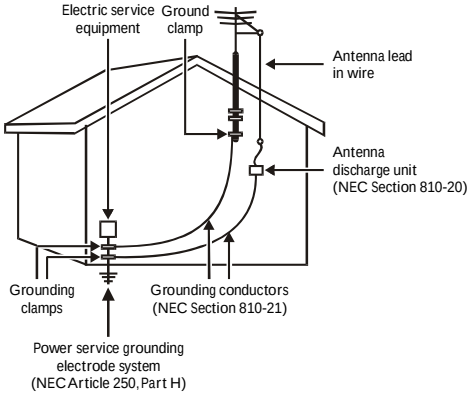
CAUTION: TO ENSURE REGULATORY AND SAFETY COMPLIANCE, USE ONLY THE PROVIDED POWER CABLES.

It is recommended that the customer install an AC surge arrestor in the AC outlet to which this device is connected. This is to avoid damaging the equipment by local lightning strikes and other electrical surges.

NOTE TO CATV SYSTEM INSTALLER

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close as possible to the point of cable entry as practical.

EXAMPLE OF ANTENNA GROUNDING



NEC=NATIONAL ELECTRICAL CODE

IMPORTANT SAFETY INSTRUCTIONS

1 Read these instructions.

2 Keep these instructions.

3 Heed all warnings.

4 Follow all instructions.

5 Do not use this apparatus near water.

6 Clean only with dry cloth.

7 Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8 Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9 Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10 Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11 Only use attachments/accessories specified by the manufacturer.

12 Unplug this apparatus during lightning storms or when unused for long periods of time.

13 Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

REPAIRS

If you find the unit in need of repair, call Motorola Support at **1-866-668-2271** or **1-866-MOT-BCS1**.

FCC Compliance

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. Any changes or modifications not expressly approved by Motorola could void the user's authority to operate this equipment under the rules and regulations of the FCC. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Re-orient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

You may find the following booklet, prepared by the Federal Communication Commission, helpful: How to Identify and Resolve Radio-TV Interference Problems, Stock No. 004-000-0342-4, U.S. Government Printing Office, Washington, DC 20402.

Changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Declaration of Conformity

According to 47 CFR, Parts 2 and 15 for Class B Personal Computers and Peripherals; and/or CPU Boards and Power Supplies used with Class B Personal Computers, Motorola, Inc., 6450 Sequence Drive, San Diego, CA 92121, 1-800-225-9446 or 101 Tournament Drive, Horsham, PA 19044, 1-888-944-4357, declares under sole responsibility that the product identifies with 47 CFR Part 2 and 15 of the FCC Rules as a Class B digital device. Each product marketed is identical to the representative unit tested and founded to be compliant with the standards. Records maintained continue to reflect the equipment being produced can be expected to be within the variation accepted, due to quantity production and testing on a statistical basis as required by 47 CFR 2.909. Operation is subject to the following condition: This device must accept any interference received, including interference that may cause undesired operation. The above named party is responsible for ensuring that the equipment complies with the standards of 47 CFR, Paragraphs 15.107 to 15.109

Canadian Compliance

This Class B digital device complies with Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

NOTE TO CATV SYSTEM INSTALLER: This reminder is provided to call CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close as possible to the point of cable entry as practical.

Table of Contents

Introduction

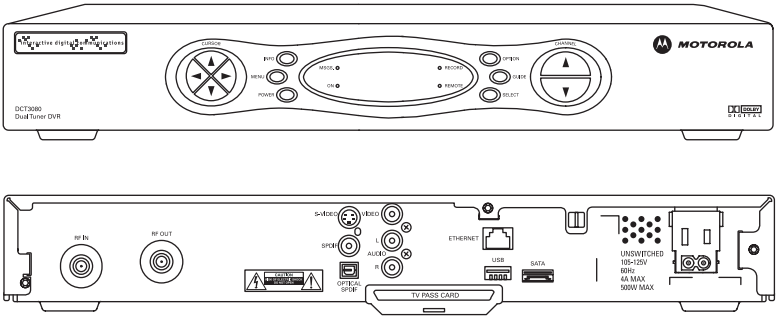
This manual provides instructions for cable operator personnel to install the Motorola DCT3080 high-definition digital video recorder (DVR) cable terminals. The DCT3080 terminals include a high-end processor, expanded memory and enhanced graphics to support digital and on-demand, broadcast, and interactive services. They provide a full complement of interconnection options.

The DCT3080 advanced capabilities include:

- Authorization and purchase of on-demand programming
- HDTV support through down-conversion that allows high-definition programming to be viewed in standard definition format
- Surround-sound audio through a variety of digital interconnection options
- Dual-tuner DVR functionality to pause and time shift live video and seamlessly record in conjunction with the interactive programming guide (IPG)
- Built-in DOCSIS® cable modem
- Ethernet and Universal Serial Bus (USB) 2.0 ports for future home networking applications
- Adaptability to various software platforms

As with all Motorola digital cable terminals, the hardware features are enabled by core operating and third party application software.

Figure 1-1
Front and rear views



Features

Tuners

- Two 54 to 860 MHz video tuners with digital MPEG-2 main profile high level video processor
- One dedicated tuner for the DOCSIS high-speed data/voice services channel, up to 860 MHz
- One dedicated tuner for the out-of-band (OOB) control channel

Standard Audio/Video Features

- ITU standard 64/256 QAM/FEC enhanced adaptive equalizer
- DES based encryption/DCII access control
- Out-of-band data receiver (70-130 MHz) 2.048 Mbps
- Digital video scaling (picture in graphics)
- 32-bit 2D/3D graphics support in hardware
- Macrovision® copy protection
- Standard-definition (and down-converted high-definition) video output through:
  - S-Video
  - Baseband
  - RF
- Audio output through:
  - S/PDIF ATSC standard Dolby Digital® AC-3 electrical or optical
  - Baseband L/R

Standard DVR Functionality

DVR functionality integrated with the IPG enables subscribers to:

- Pause, rewind, fast-forward, or record live TV
- Maintain a personal recorded program library and access it using the IPG
- Select programs to record across multiple channels and time slots
- Rewind and replay recorded programs
- Simultaneously watch two programs, switching easily between them using the SWAP key
- Record a program in the background while viewing another live program
- Simultaneously record programs from two channels while watching a different pre-recorded program, with the ability to switch viewing between any of the three programs

Motorola cannot guarantee the exact amount of programming that each subscriber will be able to record. The approximate time depends on the programming type and the drive size:
All times are approximate. The actual hours a subscriber can record are a function of program bit rate, the IPG type, and the reserved buffer space. A SATA port is available to connect an external drive to add DVR recording capacity (advanced feature requiring firmware support).

Table 1-1
DVR Recording Time Guidelines

Model	Drive Size	Estimated Recording Hours for Standard Digital Channels	Estimated Recording Hours for Digital HDTV Channels
DCT3080	80 GB	25 to 35	7 to 12

Standard Data Features

Integrated DOCSIS 1.0/1.1 capable cable modem

16 MB flash memory

128 MB SDRAM

One rear Universal Serial Bus (USB) 2.0 port

10/100 Base-T Ethernet Port (RJ-45)

On-board real-time RF return (DOCSIS compliant)

Renewable security connector

Standard Miscellaneous Features

Unswitched accessory outlet

Messaging capabilities

On-screen diagnostics

Full feature access from front panel using a four-digit, seven-segment LED display

Available Optional Features

Factory-installed expansion flash memory (32 MB)

Using This Manual

This manual provides instructions to install and configure a DCT3080:

Section 1	**Introduction** provides a product description, a list of related documentation, the technical help line telephone number, and the repair/return procedure.
Section 2	**Overview** describes the DCT3080 and provides an overview of its use. This section also identifies the front-panel displays and keys and describes the rear-panel features.
Section 3	**Installation** provides subscriber location installation and testing instructions.
Section 4	**Diagnostics** provides instructions on accessing and interpreting the built-in diagnostics.
Section 5	**Troubleshooting** provides information on common error conditions and their resolution.
Appendix A	**Specifications** provides the technical specifications.
Appendix B	**Connection Record** provides a diagram for recording the connections between the DCT3080 and other devices.
Abbreviations and Acronyms	The **Abbreviations and Acronyms** list contains the full spelling of the short forms used in this manual.

Related Documentation

The following documentation may be helpful when operating the DCT3080:

- *DCT3080 User Guide*
- User documentation for the remote control, audio receiver, TV, and other components

Separate instruction manuals are available for associated components.

Document Conventions

Before you begin working with this manual, familiarize yourself with the following stylistic conventions:

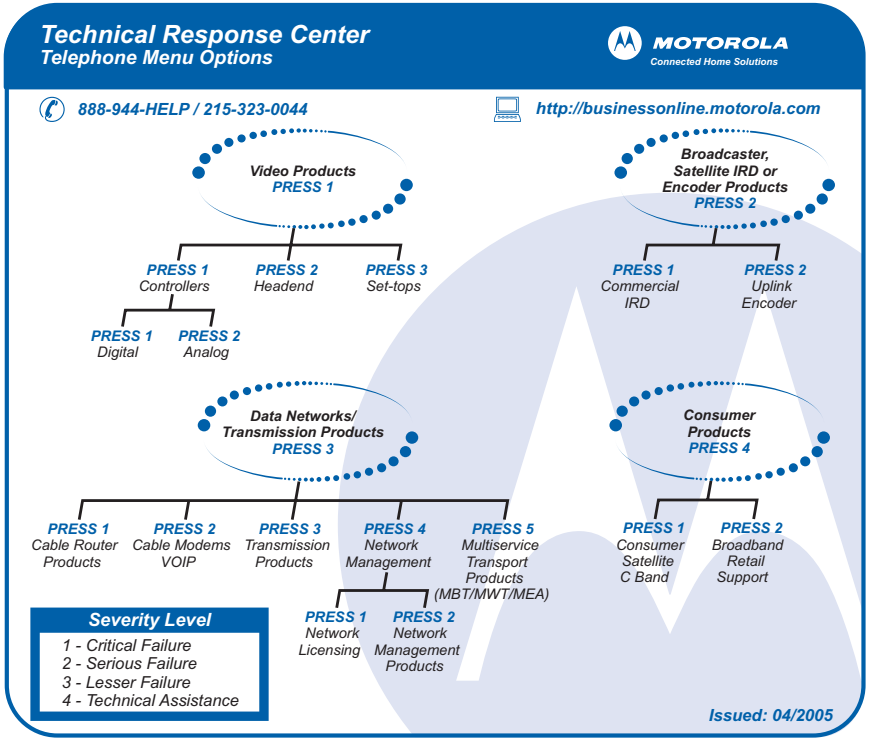
SMALL CAPS	Denotes silk screening on the equipment, typically representing front- and rear-panel controls, input/output (I/O) connections, and LEDs
*** (asterisk)**	Indicates that several versions of the same model number exist and the information applies to all models; when the information applies to a specific model, the complete model number is given
Italic type	Used for emphasis
`Courier font`	Displayed text

If You Need Help

If you need assistance while working with the DCT3080, contact the Motorola Technical Response Center (TRC):

- Inside the U.S.: **1-888-944-HELP** (1-888-944-4357)
- Outside the U.S.: **1-215-323-0044**
- Motorola Online: http://businessonline.motorola.com

The TRC is on call 24 hours a day, 7 days a week. In addition, Motorola Online offers a searchable solutions database, technical documentation, and low-priority issue creation and tracking.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Telephone Menu Options
MOTOROLA
Connected Home Solutions
888-944-HELP / 215-323-0044
http://businessonline.motorola.com
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Controllers
PRESS 2
Headend
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Commercial IRD
PRESS 2
Uplink Encoder
Data Networks/ Transmission Products
PRESS 3
PRESS 1
Cable Router Products
PRESS 2
Cable Modems VOIP
PRESS 3
Transmission Products
PRESS 4
Network Management
PRESS 5
Multiservice Transport Products (MBT/MWT/MEA)
PRESS 1
Network Licensing
PRESS 2
Network Management Products
Consumer Products
PRESS 4
PRESS 1
Consumer Satellite C Band
PRESS 2
Broadband Retail Support
Severity Level
1 - Critical Failure
2 - Serious Failure
3 - Lesser Failure
4 - Technical Assistance
Issued: 04/2005

Calling for Repairs

If a Motorola DCT3*xxx* set-top requires repair service, please call *one* of the following Motorola Authorized Service Centers:

Company	From USA or Canada	Outside USA or Canada
World Wide Digital	1-800-227-0450	1-956-541-0600
Teleplan	1-800-352-5274	1-302-322-6088

To ensure efficient service, request a Return for Service Authorization (RSA) number. Be sure to display the RSA number prominently on all equipment boxes.

The Service Center will provide the shipping address of the location performing your repairs.
To ship your equipment for repair:

1. Pack the unit securely, if possible in its original factory shipping carton.
2. Print or display the RSA number so it is easily visible on all equipment boxes.
3. Enclose a note describing the exact problem. Complete and enclose the checklist provided with the unit.
4. Ship the unit **PREPAID** to the address provided by the Service Center.

Overview

This section describes the front and rear panel.

Front Panel

The front panel controls provide functional navigation if the remote control is lost or is temporarily out of service. Certain functions, such as those requiring a numeric entry, require a remote control. *Some connectors are not enabled and require the support of application software.*

Figure 2-2
Front panel

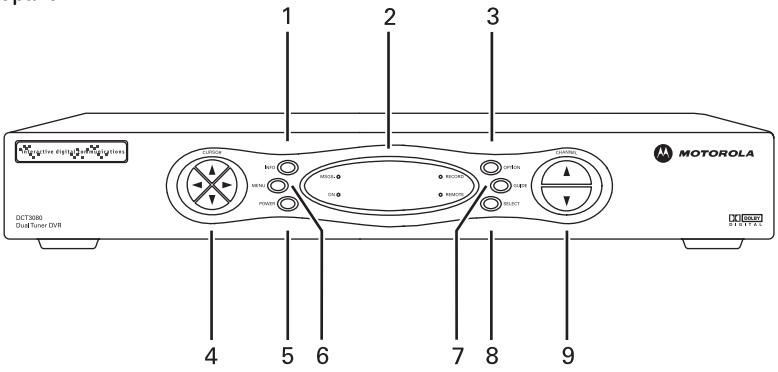


Table 2-2
Front panel

Key	Feature	Function
1	INFO	Displays the current channel and program information (not supported by all applications)

Key	Feature	Function
2	LED DISPLAY	Displays the channel number or time of day. The indicators are: MSGS — the DCT3080 has received messages for you to read ON — the DCT3080 is powered on RECORD — the DVR is recording REMOTE — the remote control is in use
3	OPTION	Reserved for future use
4	CURSOR	Moves the cursor around the program guide and menu screens
5	POWER	Turns the unit on or off
6	MENU	Displays the main menu
7	GUIDE	Displays the program guide
8	SELECT	Selects menu options or programs from the program guide
9	CHANNEL	Changes the channel

Rear Panel

The rear panel contains an unswitched power outlet; connectors for video, audio, and RF cabling; data output; and modem and data interface connectors. *Some connectors are not enabled and require the support of application software.*

Figure 2-3
Rear panel

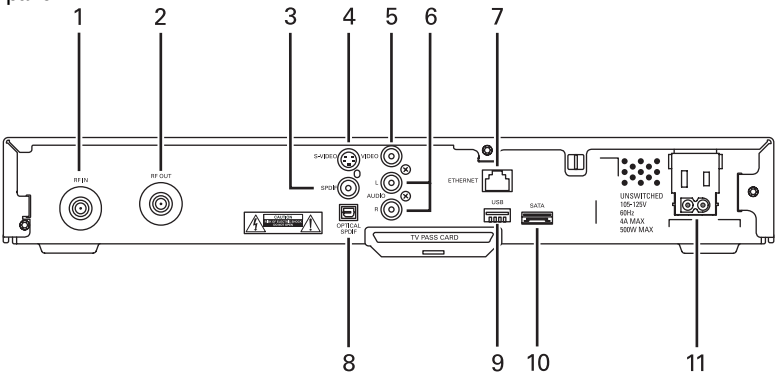


Table 2-3
Rear panel connections

Key	Item	Function
1	RF IN	F-type coaxial cable input
2	RF OUT	RF video output
3	SPDIF	Coaxial Dolby® Digital or PCM audio output
4	S-VIDEO	S-Video high-quality video output to a VCR or TV that accepts S-Video
5	VIDEO OUT	RCA-type video output to a VCR or TV
6	AUDIO OUT	L and R (left and right) RCA-type stereo audio output jacks
7*	ETHERNET	Ethernet 10/100Base-T input
8	OPTICAL SPDIF	Optical digital Dolby Digital audio or PCM audio output

Key	Item	Function
9*	USB	USB 2.0 connector for devices such as keyboards, joysticks, scanners, disk storage, PCs, printers, or digital cameras
10	SATA	Connector for optional external hard drive
11	AC power	AC power connector: ▪ The bottom plug is an input for the AC power cord ▪ The top plug is an unswitched power outlet for a device such as a TV or VCR
** These connectors (*USB *and* ETHERNET*) might not enabled and might require the support of the application software*		

Installation

This section provides instructions to cable the DCT3080 and check its operation. The cabling diagrams illustrate connections to high-definition or standard-definition TVs, home theater receivers, and stereo VCRs.

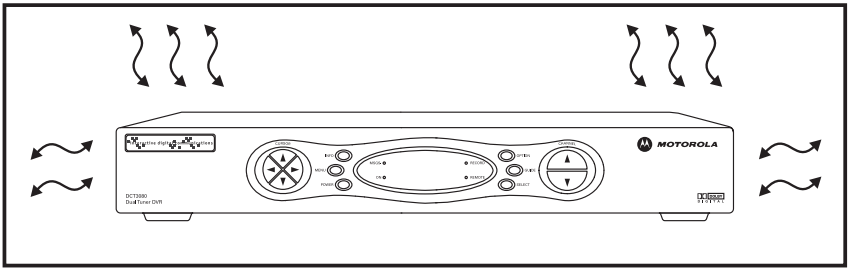
Important Safety Considerations

The DCT3080 requires careful handling to avoid potential damage to its internal hard disk drive or the loss of recorded data. *Be sure to follow these requirements during transportation and installation.*

During Transportation to the Subscriber Home

Transport the cable terminal in its shipping box or an equally padded container.
Do not expose the terminal to rain or moisture.

During Installation



- Do not place the cable terminal in an enclosed area where the cooling vents are blocked or impede the flow of air through the ventilation openings.
- Install the terminal so that its position does not interfere with its proper ventilation. For example, do not place the terminal on a bed, sofa, rug, or similar surface that could block the ventilation openings.
- Install the terminal away from heat sources such as radiators, heat registers, and stoves. Installation of the terminal near

consumer electronics devices, such as stereo receiver/amplifiers and televisions, is permitted as long as the air surrounding the terminal does not exceed 40 ºC (104 ºF).

- Place the terminal on a flat surface not prone to vibration or impact.
- Do not install the terminal in an area where condensation occurs.
- To prevent the temporary loss of guide data and cause a temporarily non-responding terminal, do not plug the AC power cord into a switched power outlet.
- To avoid shock and vibration damage to the internal hard drive, do not move the terminal while it is plugged in.
- To allow the hard drive to spin down and park its heads, wait at least 10 seconds after disconnecting power before moving the terminal.

Before You Begin

Before you move or change components on the subscriber entertainment system:

- Review the installation instructions.
- Determine if you are connecting to a standard TV, a composite (baseband) monitor, or a component monitor.
- Verify that you have the necessary cables and other required items.

Note: If the terminal was previously used, clear its hard drive before installing it at a new subscriber location.

Clearing the Hard Drive

On a previously used cable terminal, delete all recorded programs from the hard drive before installing it at a new subscriber location. This prevents your new subscriber from viewing programming they may not have purchased or may not want to see.

To prevent subscribers from accidentally deleting all of their recorded programs, a specific set of keystrokes is required to clear the hard drive. Having a TV connected is optional.

To clear the hard drive:

1 Start the Diagnostics as described in Section 4, "Diagnostics." d 01 is displayed on the front-panel LED.

2 Using a remote control, within five seconds press REPLAY, MY DVR three times, and LIVE TV. (On some remote controls, the MY DVR key may be labeled "LIST.")

If you correctly enter this key sequence in five seconds or less, the hard drive is cleared and the front-panel LED displays Clr.

3 If Clr is not displayed, re-enter the key sequence in step 2.

If Clr is displayed, press any other key to reset the terminal, turn it off, and complete the clearing process.

Video Connection Options

Use the following guidelines to determine the best video connection for the subscriber home entertainment system. To determine the available video inputs on the TV, check the manual supplied with the TV or the TV itself.

The DCT3080 offers the following video outputs:

S-Video	SDTV *only*	If your TV has an S-Video input, use S-Video. S-Video is the highest quality standard-definition video output on the DCT3080.
Video (composite)	SDTV *only*	If your TV does not have an S-Video input, use the composite video (VIDEO) output.
RF	SDTV *only*	If your TV only has a coaxial RF input, connect it to the DCT3080 RF OUT connector.

Audio Connection Options

Connect the stereo audio cable to the **AUDIO R** and **L** connectors on the DCT3080 and the audio left and right connectors on the TV. If the equipment supports it, use the **OPTICAL SPDIF** or coaxial digital **SPDIF** output instead of the AUDIO R and L outputs. In most cases, these outputs offer better audio quality, including support for 5.1 Surround Sound.
When connecting to a home theater receiver, depending on its inputs, you can use the following DCT3080 audio outputs:

OPTICAL SPDIF OR COAXIAL SPDIF	If the receiver supports it, use the OPTICAL SPDIF or coaxial SPDIF audio output to deliver Dolby AC-3 audio to a Dolby Digital home theater receiver.
BASEBAND AUDIO R AND L	If the audio receiver does not support Dolby Digital, use the baseband AUDIO R and L outputs to connect to the audio receiver.

The cabling diagrams show sample audio/video (A/V) connections to an audio receiver, where the receiver functions as an A/V router. When connecting to an audio receiver, reference its installation instructions for directions on connecting to baseband and SPDIF ports.

The VCR and TV receive their A/V signals from the currently selected input device on the audio receiver. This is important when the subscriber has another A/V device such as a DVD player, a secondary VCR, a CD player, or other electronic component. We recommend connecting the TV to the monitor output so on-screen menus for the receiver can be displayed. (In many cases, the receivers themselves have interactive on-screen menus.)

Installation Overview

You are connecting to a standard definition TV – Connect the S-VIDEO connector using an S-video cable, or connect the composite VIDEO connector using an RCA phono cable. If the TV only has a coaxial RF input, connect it to the DCT3080 RF OUT connector.
Determine if you are connecting the audio to a home theater receiver or directly to the TV:

- If the receiver or TV has an SPDIF input, use the optical spdif or coaxial spdif outputs.
- Otherwise, use the baseband left and right audio out outputs.

1 Locate the cabling diagram(s) that best match the subscriber configuration.

- Connect the audio and video cables in a manner matching that diagram.
- Determine if you are connecting to a data device (see "Data Device Connections" in this section). For installation details, refer to instructions included with the data device.

Connect the cable terminal to the coaxial cable wall outlet.

- Perform the boot cycle, including the download to the terminal, as described in "Boot Cycle" in this section.

2 Perform the operational check for the remote control.

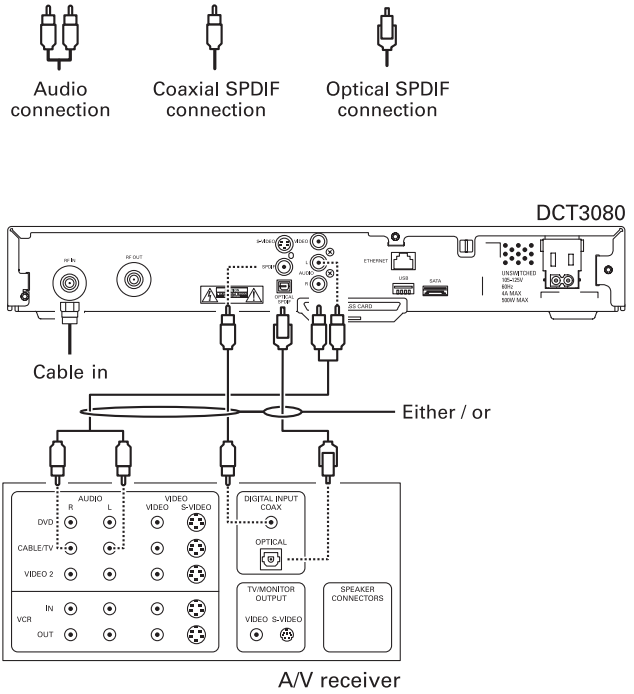
- Optimize the video settings. See "Optimizing Video Settings" in this section.

Verify that the appropriate configuration information has been downloaded using the addressable controller, such as the DAC 6000.

Connecting to an A/V Receiver – Audio Only

Connect the stereo audio cable to the **AUDIO R** and **L** connectors on the cable terminal and the corresponding connectors on the HDTV. If your equipment supports it, use the **OPTICAL SPDIF** or coaxial digital **SPDIF** outputs instead of the AUDIO R and L outputs. In most cases, SPDIF offers better audio quality, including support for Dolby 5.1 Surround Sound.

Figure 2-4
Connecting to an A/V Receiver – Audio Only



Connecting to a Stereo TV

Depending on the TV's inputs:

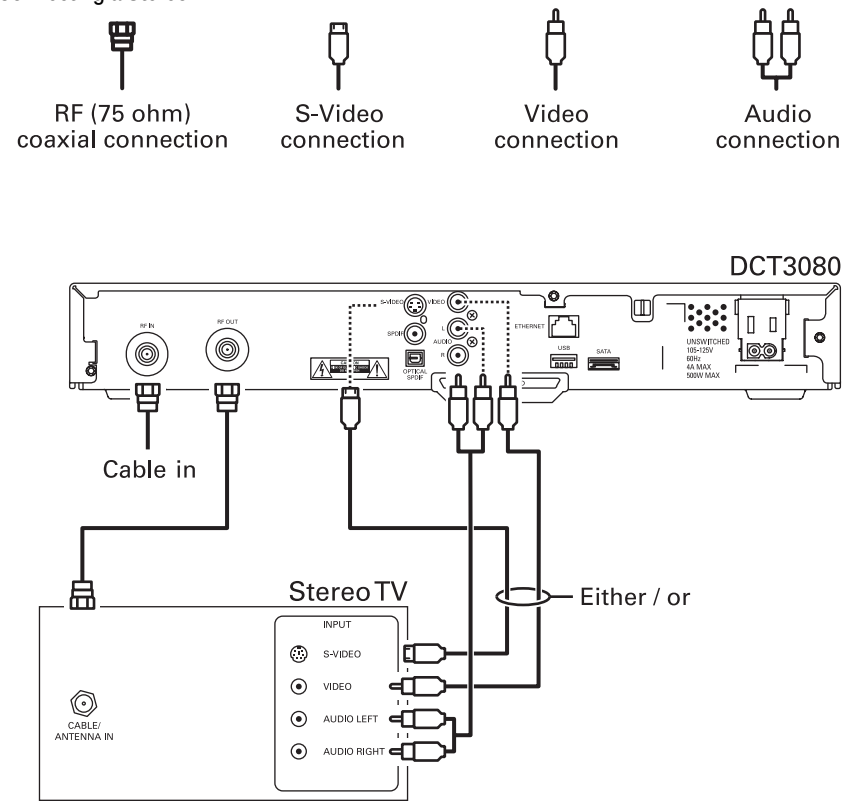
- If possible, use the S-VIDEO and AUDIO connectors on the DCT3080.
- If the TV has no S-Video input, use the composite VIDEO and AUDIO connectors on the DCT3080.
- If the TV has an RF input *only*, use the RF OUT connector on the cable terminal. The RF connection carries video and audio.

Connecting a Stereo TV

- Connect an RF coaxial cable to the cable wall outlet and the **CABLE IN** connector on the cable terminal.
- Connect the stereo audio cable to the **AUDIO R** and **L** connectors on the cable terminal and the corresponding connectors on the stereo TV.
- Connect an S-video cable to the **S-VIDEO** connectors on the cable terminal and the TV. ***or***
    - Connect a video cable to the **VIDEO OUT** connector on the cable terminal and the **VIDEO IN** connector on the TV. ***or***
    - Connect an RF coaxial cable to the cable wall outlet and the **CABLE IN** connector on the cable terminal.
- Connect an RF coaxial cable to the **RF OUT** connector on the cable terminal and the RF connector on the TV.

To connect to an audio receiver, such as a home mini system, follow a daisy-chain convention. The A/V configuration illustrated (Figure 3-4) enables digital stereo recording, including Dolby Surround sound. Use only one set of RCA input connectors on the stereo:

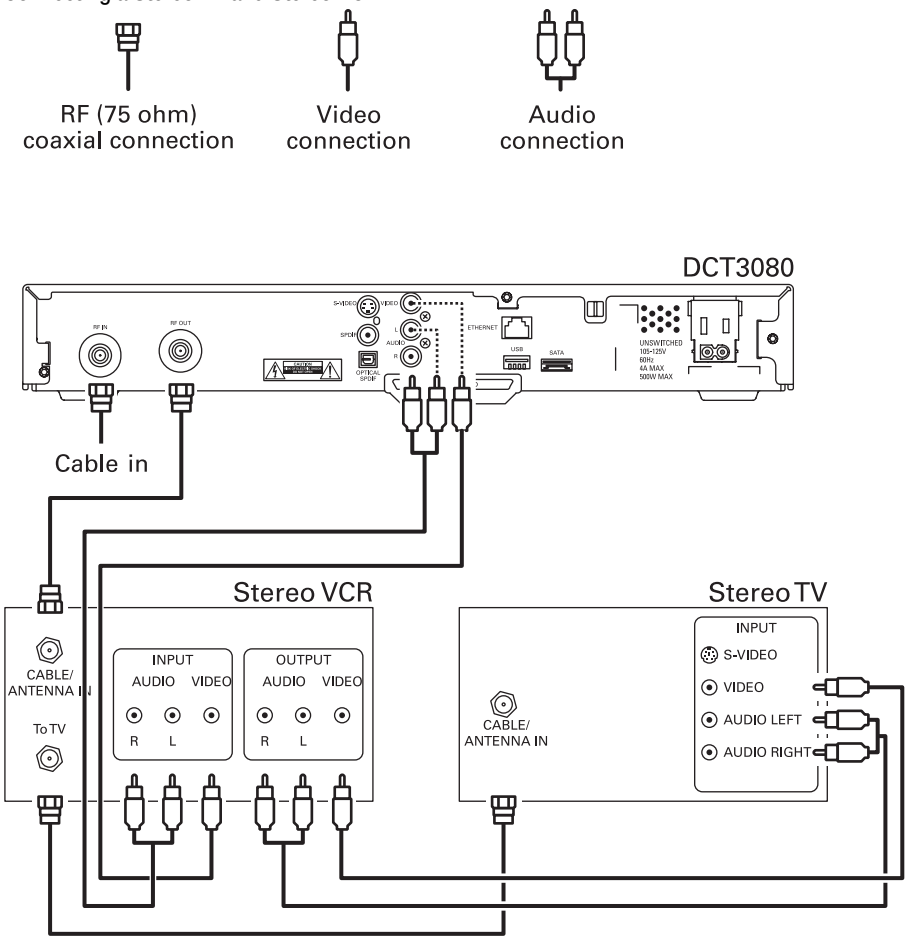
Figure 2-5
Connecting a Stereo TV



Connecting a Stereo TV and Stereo VCR

1. Connect an RF coaxial cable to the cable wall outlet and the **CABLE IN** connector on the cable terminal.
2. Connect a stereo audio cable to the **AUDIO OUT R** and **L** connectors on the cable terminal and the **INPUT AUDIO R** and **L** connectors on the stereo VCR.
3. Connect a video cable to the **VIDEO OUT** connector on the cable terminal and the **INPUT VIDEO** connector on the stereo VCR.
4. Connect a stereo audio cable to the **OUTPUT AUDIO R** and **L** connectors on the stereo VCR and the **INPUT AUDIO RIGHT** and **LEFT** connectors on the stereo TV.
5. Connect a video cable to the **OUTPUT VIDEO** connector on the stereo VCR and the **INPUT VIDEO** connector on the stereo TV.

Figure 2-6
Connecting a Stereo TV and Stereo VCR



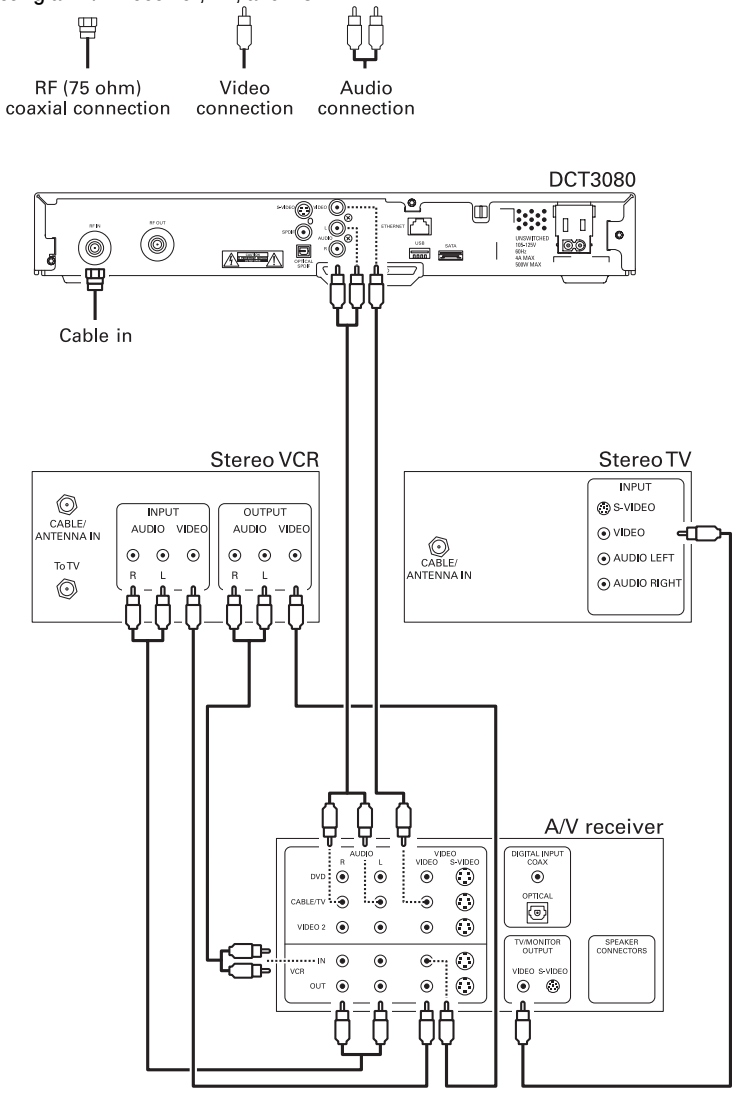
Connecting an A/V Receiver, TV, and VCR

- Connect an RF coaxial cable to the cable wall outlet and the **CABLE IN** connector on the cable terminal.
- Connect a stereo audio cable to the **AUDIO OUT R** and **L** connectors on the cable terminal and the **INPUT R** and **L** connectors on the A/V receiver.
- Connect a video cable to the **VIDEO OUT** connector on the cable terminal and the **CABLE/TV VIDEO** connector on the A/V receiver.
- Connect a stereo audio cable to the **VCR AUDIO OUT R** and **L** connectors on the A/V receiver and the **INPUT AUDIO R** and **L** connectors on the stereo VCR.
- Connect a stereo audio cable to the **OUTPUT AUDIO OUT R** and **L** connectors on the stereo VCR and the **VCR AUDIO IN R** and **L** connectors on the A/V receiver.
- Connect a video cable to the **INPUT VIDEO** connector on the stereo VCR and the **VIDEO VCR OUT** connector on the A/V receiver.
- Connect a video cable to the **OUTPUT VIDEO** connector on the stereo VCR and the **VIDEO VCR IN** connector on the A/V receiver.
- Connect a video cable to the **INPUT VIDEO** connector on the stereo TV and the **TV/MONITOR OUTPUT** video connector on the A/V receiver.

If you can:

- Use the optical spdif or coaxial spdif outputs instead of the stereo audio r and l outputs. In most cases, SPDIF offers better audio quality, including support for Dolby 5.1 Surround Sound.
- Use the S-video connections instead of the standard RCA video connections. In most cases, S-video offers better video quality.

Figure 2-7
Connecting an A/V Receiver, TV, and VCR

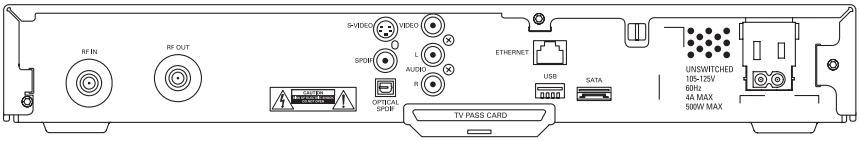


Recording Your Connections

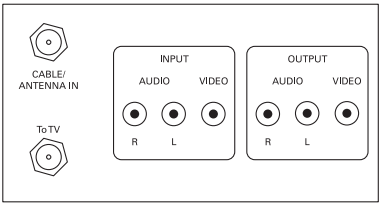
Use this diagram to record the home entertainment component connections. You can use this diagram to reconnect your system if you move the equipment or add new equipment.

Disconnect the power from the cable terminal before connecting or changing cable connections. Do not place another component or object on top of the cable terminal.

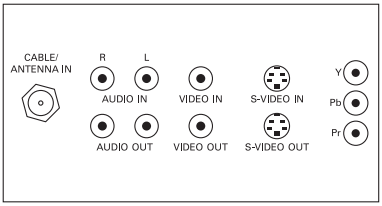
DCT3080



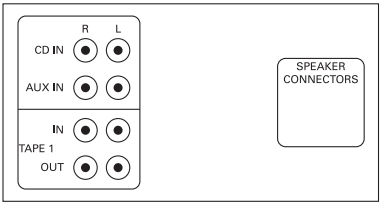
VCR



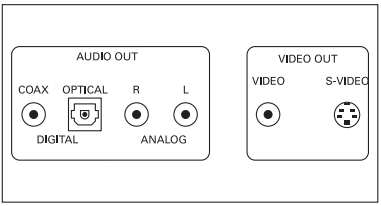
Standard-definition TV



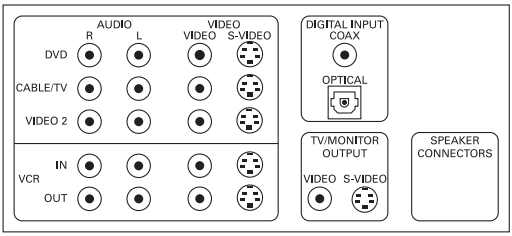
Stereo receiver



DVD



A/V receiver

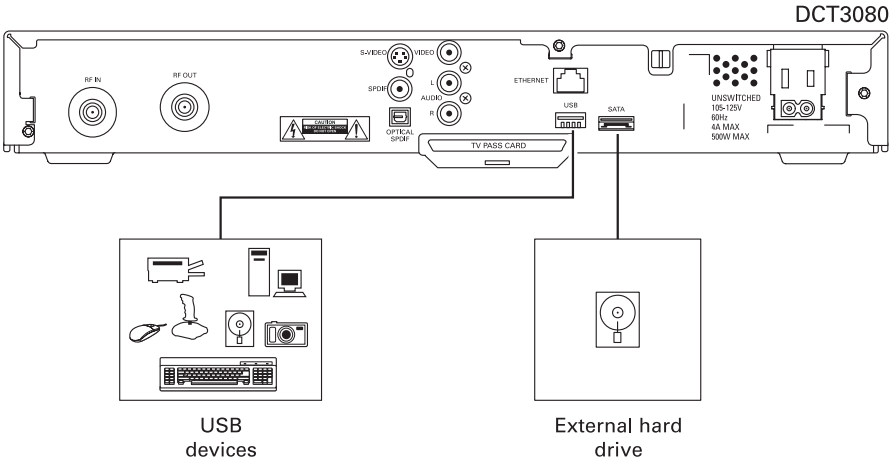


Data Device Connections

The DCT3080 provides optional high-speed data services such as Internet access, USB, Ethernet, and more. *The functionality of each data device port requires, and depends on, installed application software.* The DCT3080 rear panel provides the following data ports:

USB 2.0	Can be used to daisy-chain USB devices such as printers and storage devices, or to interface with keyboards, joysticks, and other USB PC peripherals.
Ethernet	10/100Base-T RJ-45 port
SATA	Can be used to connect an external hard drive to increase DVR capacity

Figure 2-8
Sample data devices you can connect to the DCT3080



Boot Cycle

After connecting the proper cabling to the DCT3080, plug the power cord into the DCT3080 and electrical wall outlet. Begin performing the boot cycle procedure:

- After a few moments, the LED displays `HUNT` and then `FR 1`.
- The DCT3080 searches for the headend out-of-band (OOB) frequency carrier. If the OOB frequency is not set to 75.25 MHz, the LED flashes **`FR 1`** and then flashes **`FR 2`**. This searching process repeats until the correct OOB frequency is found and the required message for the DCT3080 model is acquired.
- The LED displays and OOB frequencies are:

Table 2-4
LED displays and OOB frequencies

Display	Frequency	Description
`dl`	**N/A**	OOB network download in progress
`EF`	**N/A**	Erasing Flash memory
`FP`	**N/A**	Flash memory is being programmed
`____`	**N/A**	Network download complete
`Hunt`	**N/A**	Hunting for OOB frequency
`FR 1`	**75.25 MHz**	Attempting to lock on frequency 1
`FR 2`	**104.20 MHz**	Attempting to lock on frequency 2
`FR 3`	**72.75 MHz**	Attempting to lock on frequency 3
`FR 4`	**92.25 MHz**	Attempting to lock on frequency 4
`FR 5`	**98.25 MHz**	Attempting to lock on frequency 5
`FR 6`	**103.75 MHz**	Attempting to lock on frequency 6

Display	Frequency	Description
FR 7	**107.25 MHz**	Attempting to lock on frequency 7
FR 8	**107.40 MHz**	Attempting to lock on frequency 8
FR 9	**110.25 MHz**	Attempting to lock on frequency 9
FR 10	**116.25 MHz**	Attempting to lock on frequency 10
Au	**N/A**	Authenticating code object (displays only after download)

- When the correct OOB frequency is acquired, the LED flashes `FR number.`
- When multiple OOB frequencies are used, the DCT3080 pauses 40 seconds on each valid frequency. The LED displays `dl` and a progress indicator, which identifies a software object download. The progress indicator, or crawling ant, moves one position around the `dl` display for each segment of download received. If the `dl` stops moving up and down on the LED for an extended period of time, contact the headend operator.

The progress indicator usually moves at a consistent rate as segment downloads are received. If all the segments are retrieved in the first pass, the EF, AU, and FP messages are displayed on the LED. If segments are dropped, the progress indicator appears to stall and then inch forward after the dropped segments are retired.
The software download may take up to 45 minutes (or longer if the system is experiencing high demand). As long as the progress indicator is spinning, the download is progressing.
When the progress indicator alternates between rapid and sluggish movement, this may indicate that the stream is spinning too fast for existing plant conditions.

- When the software object download is complete, the LED displays:

EF For up to 60 seconds during flash erasure

FP For up to 60 seconds during flash programming

- When the LED display is blank, the terminal is ready for initialization and service authorization using the addressable controller. Verify that the terminal is powered up or reset within two minutes of a completed download.

Boot Cycle Error Codes

If hardware or software problems occur, the terminal displays error codes on the LED display. Table 2-5 lists error codes that can occur during boot cycle startup:

Table 2-5
Boot cycle error codes

Code	Description	When Error Occurs	Action Required
Eb 01	Object failed validation	After the LED displays `dl`, indicating validation check failed	Contact headend operator
Eb 02	Download time-out	After cycling twice through the OOB frequencies	None
Eb 03	Flash erase failed	After software object download complete and `EF` is displayed	Replace the terminal
Eb 04	Flash programming failed	After software object download complete and `FP` is displayed	Contact headend operator
Eb 05	Invalid DLC frequency	After the LED displays `dl`, indicating validation check failed	Contact headend operator
Eb 06	Hardware initialization failed	After plugging the terminal into an electrical outlet to begin the boot cycle	Replace the terminal

Code	Description	When Error Occurs	Action Required
Eb 07	Object failed validation	After software object download complete and `FP` is displayed After a successful software object download and the terminal is reset	Contact the headend operator No action required because the terminal repeats the software object download
Eb 08	Reserved		None
Eb 09	Check failed	Reset within two minutes of a complete software object download	No action required because the terminal repeats software object download process
Eb 10	SUDB recreation	After plugging the terminal into an electrical outlet to begin the boot cycle	None
Eb 11	Failed to lock OOB frequency	After cycling twice through the OOB frequencies (LED then displays `Eb 02,` indicating the software object download was unsuccessful.)	Ensure proper cable connections
Eb 12	No COAC message received	After cycling twice through the OOB frequencies (LED then displays `Eb 02,` indicating the software object download was unsuccessful.)	Contact headend operator
Eb 13	No DLC message received	After cycling twice through the OOB frequencies (LED then displays `Eb 02,` indicating the software object download was unsuccessful.)	Contact headend operator
Eb 14	Bad object type or class	After the LED displays `dl,` indicating failed during attempted download	Contact headend operator
Eb15	No matching	After cycling twice through the	Contact headend

Code	Description	When Error Occurs	Action Required
	Platform ID found	OOB frequencies (LED then displays `Eb 02`, indicating the software object download was unsuccessful.)	operator
Eb18	Object size mismatch	After the LED displays `dl`, indicating failed during attempted download	Contact headend operator
Eb19	Object size failed range check	After the LED displays `dl`, indicating failed during attempted download	Contact headend operator
Eb20	Invalid SUDB pointer	After plugging the terminal into an electrical outlet to begin the boot cycle	None

Operational Check for the Remote Control

The operational check tests communication with the remote control:

Table 2-6
Operational check procedures

Feature	Testing Procedure
Power on	Press **POWER** on the remote control to turn on the DCT3080.
	Tune to the output channel (3 or 4).
Channel selection	Scan through the channels using the **CHANNEL +** or **-** keys.
	Tune to several channels by entering the channel number using the numeric keys.
Volume control	Press **VOLUME +** or **-** on the remote control to increase the volume to its upper limit, lowest level, and to a comfortable level.
	Press **MUTE** to turn the sound off. Press **MUTE** again to restore the sound.

If the DCT3080 does not operate properly, refer to Section 5, "Troubleshooting."

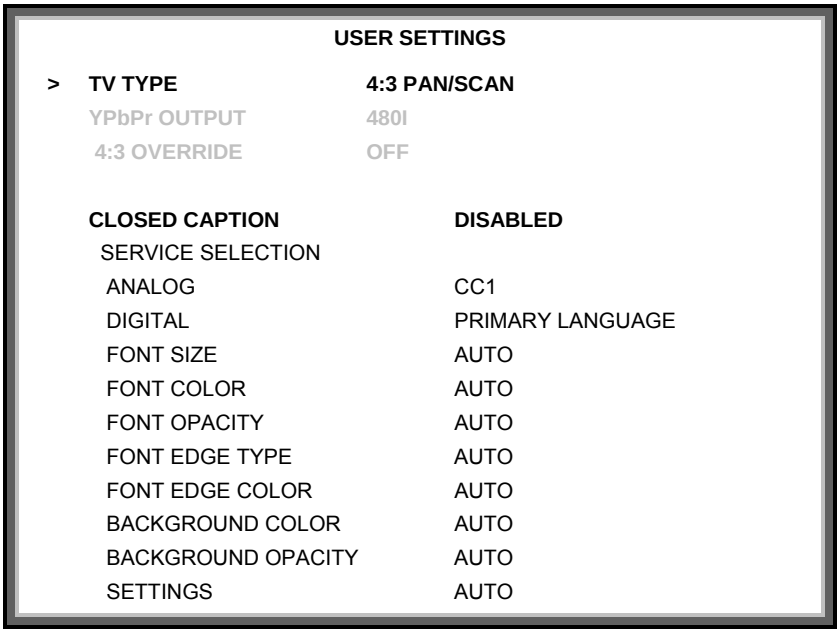
Optimizing Video Settings

This subsection describes how to optimize standard definition video settings and closed captioning based on subscriber preferences. Before you optimize the output settings:

- Connect the DCT3080 to other home entertainment devices
- Plug the DCT3080 into a power outlet
- Perform the boot cycle
- Initialize the DCT3080 and authorize services
- Turn the TV on

For optimal viewing:

1 Power off the DCT3080, and then immediately press the menu key on the front panel. If the TV is on, the on-screen menu lists the settings you can configure:



RESTORE ALL DEFAULTS

2 Use the remote control or the cursor keys on the front panel to navigate the on-screen menus:

- Press the ▲ and ▼ keys to highlight the setting you wish to change.
- Press the ► key to select an option.
- To exit the setting and move to another setting, press the ▲ or ▼ key.

If the User Settings menu does not display on the TV screen, the TV may not support the default video output setting. Use the front panel LED to adjust the settings as described in "There is no video on the TV screen" in "Troubleshooting."
The User Settings menu options are:

Setting	Description
TV Type	Sets the aspect ratio. The front panel display indicates the type you select. Defaults to 4:3 PAN/SCAN. Options are 16:9 for widescreen TVs or 4:3 LETTERBOX or 4:3 PAN/SCAN for standard TVs. ▪ 4:3 LETTERBOX fits widescreen programming on the screen by placing black bars at the top and bottom. ▪ 4:3 PAN/SCAN fills the screen by cropping the left and right edges of widescreen programming.
YPbPr Output	Not user-configurable on the DCT3080.
4:3 Override	Not user-configurable on the DCT3080.
Closed Caption	Turns closed captions off or on. The front panel display indicates the status of the closed captions. Defaults to DISABLED. Options are ENABLED or DISABLED.

Setting	Description
Service Selection	▪ Analog: Not configurable on the DCT3080. ▪ Digital: PRIMARY LANGUAGE, SECONDARY LANGUAGE, 3, 4, 5, or 6. The default is PRIMARY LANGUAGE.
Font Size	Sets the font size for closed captions. Defaults to AUTO. Options are AUTO, STANDARD, LARGE, or SMALL.
Font Style	Sets the font style. Defaults to AUTO. Options are AUTO, MONO SERIF, PROPORTION SERIF, MONO NO SERIF, PROPORTION NO SERIF, CASUAL, CURSIVE, or SMALL.
Font Color	Sets the font color. Defaults to AUTO. Options are AUTO, WHITE, BLACK, RED, GREEN, BLUE, YELLOW, MAGENTA, or CYAN.
Font Opacity	Sets the opacity. Defaults to AUTO. Options are AUTO, TRANSPARENT, TRANSLUCENT, SOLID, or FLASHING.
Font Edge Type	Sets the edge appearance — AUTO, NONE, RAISED, DEPRESSED, UNIFORM, LEFT SHADOWED, or RIGHT SHADOWED. The default is AUTO.
Font Edge Color	Sets the edge color — AUTO, WHITE, BLACK, RED, GREEN, BLUE, YELLOW, MAGENTA, or CYAN. The default is AUTO.
Background Color	Sets the background color for closed captions. Defaults to AUTO. Options are AUTO, WHITE, BLACK, RED, GREEN, BLUE, YELLOW, MAGENTA, or CYAN.
Background Opacity	Sets the background opacity for closed captions. Defaults to AUTO. Options are AUTO, TRANSPARENT, TRANSLUCENT, SOLID, or FLASHING.
Settings	Sets the default settings for closed captions (AUTO) or the settings you have configured (USER). Defaults to AUTO. Options are AUTO or USER.
Restore All Defaults	To reset all User Settings to their defaults, select this option and press the ► key.

To exit the menu and save your settings, press the **POWER** or **MENU** key.

Graphics Overlaying the Video

The DCT3080 can generate graphics that overlay the video programming or fill the entire television screen. Common examples include on-screen menus (such as the User Setting menu), closed captions, and EPG. The DCT3080 overlays these graphics whenever the subscriber opens a menu, enables closed captions, or scrolls through a program grid. On-screen graphics are available for all DCT3080 video outputs except.

Diagnostics

This section describes the diagnostics that confirm proper installation, including:

- Checking error states and signal integrity
- Identifying the cable terminal on the network
- Verify communications with the headend

Diagnostics are displayed on the on-screen display (OSD) and front-panel LEDs.
For the diagnostics described in this section:

- All indicators are in decimal notation, unless otherwise noted.
- All signal-level and quality indicators use a 1% to 100% scale, unless otherwise noted.
- All sample displays are illustrative; actual data may differ from the examples.

You can use the diagnostics when running the base platform or Thin Client software.

Note: Diagnostics are continually updated through software upgrades to provide expanded information regarding the status of the DCT-3080. Check the Motorola website for updated versions of this manual (www.motorola.com).

Using the Diagnostics

To use the diagnostics:

1 Ensure that the DCT3080 is installed with the base platform or Thin Client software and that it is connected to an AC outlet.

2 Press **POWER** and immediately press **SELECT** to enable diagnostic mode. The Diagnostics main menu is displayed on the OSD and "d01" is displayed on the front-panel LED:

DIAGNOSTICS

>	d01	GENERAL STATUS
	d02	PURCHASE STATUS
	d03	OOB STATUS
	d04	INBAND STATUS
	d05	UNIT ADDRESS
	d06	CURRENT CHANNEL STATUS
	d07	UPSTREAM MODEM
	d08	CODE MODULES
	d09	MEMORY CONFIG
	d10	KEYPAD/LED
	d11	INTERFACE STATUS
	d12	USER SETTING STATUS
	d13	PVR/HDD STATUS
	d14	DOCSIS
	d15	APPLICATION SPECIFIC INFORMATION
	d16	INTERACTIVE STATUS (displayed only when Thin Client is running)
	E	EXIT

Figure 3-1
Example of the LED for the main menu

You can use the following keys to navigate the diagnostics menus:

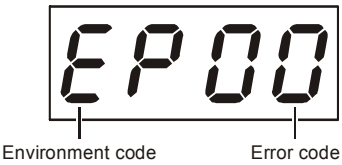
- Press **CHANNEL ▲**, **CHANNEL ▼**, **CURSOR ▲**, or **CURSOR ▼** to select **d01** through **E**.
- Press **CURSOR ◄**, **CURSOR ►**, **SELECT,** or **ENTER** to execute the selected diagnostic.
- Select **E** from the main menu or press **POWER** to exit.

d01 General Status

This diagnostic displays system status information on the OSD and LED. The information is updated each time the diagnostic is displayed.

GENERAL STATUS		
ERROR:	EP00	CONNECTED
PLATFORM ID:	0x02D0	
FAMILY ID:	0x0000	
MODEL ID:	0X34CA	
REMOD CHAN:	03	
SETTOP TIME:	*xxxxxxxxxx* GPS	

Figure 3-2
Example GENERAL STATUS LED (no error)



The General Status fields are:

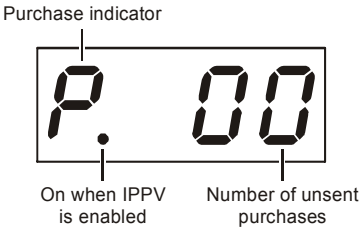
Field	Description
Error	Error codes display on the LED and OSD when an error occurs. If multiple errors occur, the last recorded error is displayed: EP00 No error EP01 Not connected EP03 DRAM error EP04 SRAM error EP07 ROM verification failure EP08 RAM test failure EP09 Battery test failure EP11 Invalid unit address EP12 Power on self test failure EP14 GITV startup failure EP15 TSI structure corrupt EP18 Driver initialization failure
Connected State	A DCT-operations connect or disconnect message determines whether the DCT3080 is CONNECTED or DISCONNECTED.
Platform ID	A unique 16-bit hexadecimal number that identifies the platform image (also called the ROM ID).
Family ID	The manufacturer and product family, in hexadecimal
Model ID	The model, in hexadecimal
Remod Chan	The interface to the subscriber TV; channel 3 or 4 in the USA
Settop Time	The current OOB time displayed in global positioning system (GPS) seconds from Jan 6, 1980. It is an integer from 0 to 4294967295.

d02 Purchase Status

This diagnostic displays the status of subscriber event purchases on the OSD and LED. The OSD and LED information displays are updated each time this diagnostic is displayed:

PURCHASE STATUS	
PURCHASES	
UNSENT:	*xx*
UNACK:	*xx*
LAST SEQ NUM:	*xxxx*
LAST RB TIME:	*xxxxxxxxxx*
IPPV STATUS:	Enabled

Figure 3-3
LED display for PURCHASE STATUS diagnostic



The Purchase Status fields are:

Field	Description
Unsent	The number of purchases in the DCT remaining to be polled. It can be an integer from 0 to 63.
Unack	The number of reports that have not been acknowledged by the controller. It is an integer.
Last Seq Num	The last acknowledged sequence number of a purchase sent by the controller. It is a 16-bit, unsigned hexadecimal number.
Last RB Time	The last time the DCT3080 attempted to report back purchases to the controller, in GPS seconds.

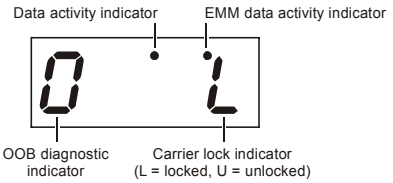
Field	Description
IPPV Status	If IPPV is enabled, the IPPV status indicator LED is on. If IPPV is disabled, the IPPV status indicator LED is off.

d03 Out-Of-Band (OOB) Status

This diagnostic indicates the out-of-band control channel status. The information is updated every 5 seconds.

OOB DIAGNOSTIC		
OOB FREQUENCY:	075.25	MHz
CARRIER LOCK:	YES	
DATA:	YES	
EMM DATA:	YES	
SNR:	22.1 dB	GOOD
AGC:	23 %	GOOD
EMM PROVIDER ID:	0x0400	
EMM PID:	0x0403	
NETWORK PID:	0x0003	

Figure 3-4
LED display for the OOB diagnostic



The Out-Of-Band Status fields are:

Field	Description
OOB Frequency	Indicates the OOB tuner center frequency, from 70 to 130 MHz.
Carrier Lock	Indicates whether the OOB receiver is locked to the carrier:

OSD	LED	Description
YES	L	Carrier locked
NO	U	Carrier unlocked

Data Indicates whether data is being carried by the OOB and EMM traffic, which is tracked separately:

OSD	LED	Description
YES	On	OOB data detected within last 5 seconds
NO	Off	OOB data not detected within last 5 seconds

EMM Data Indicates whether EMM data is being carried on the OOB stream:

OSD	LED	Description
YES	On	EMM data detected within last 5 seconds
NO	Off	EMM data not detected within last 5 seconds

SNR When carrier lock has been established, displays an estimate of the carrier signal-to-noise ratio in dB, with an explanation:

- GOOD — Good value
- FAIR — Marginal signal level; check the signal
- POOR — Unusable signal
- INVALID — Invalid SNR value

AGC When carrier lock has been established, displays an estimate of the AGC as a percentage, with an explanation:

- GOOD — Good value
- FAIR — Marginal signal level; check the signal
- POOR — Unusable signal
- INVALID — Invalid AGC value

EMM Provider ID Displays the conditional access stream for the DCT3080, in hexadecimal

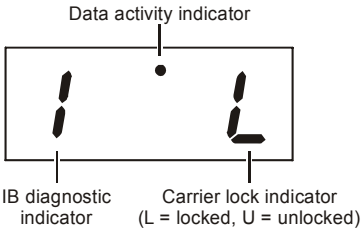
Field	Description
EMM PID	Displays the packet identifier (PID) stream the DCT3080 tunes to for EMM data, in hexadecimal
Network PID	Displays the network PID to which the DCT3080 is tuned to receive network messages, in hexadecimal

d04 In-Band Status

This diagnostic displays the in-band status for the last attempted tuned channel. The information is updated every 5 seconds.

IN-BAND DIAGNOSTIC		
IN-BAND TUNER 1		
MODE:	64 QAM	
CARRIER LOCK:	YES	
DATA:	YES	
SNR	32.0 Db	GOOD
AGC:	23 %	FAIR
5 SECOND ERROR COUNTS:		
UNCORRECTABLE: 1234	CORRECTABLE: 5678	
IN-BAND TUNER 2		
MODE:	64 QAM	
CARRIER LOCK:	YES	
DATA:	YES	
SNR	32.0 Db	GOOD
AGC:	23 %	FAIR
5 SECOND ERROR COUNTS:		
UNCORRECTABLE: 1234	CORRECTABLE: 5678	

Figure 3-5
LED display for in-band diagnostic



The In-Band Status fields are:

Field	Description
Mode	The values displayed on the OSD are: ▪ 64 QAM — 64 QAM digital channel ▪ 256 QAM — 256 QAM digital channel
Carrier Lock	Indicates whether the in-band receiver is locked to the carrier. If a digital carrier is not present, it indicates the carrier is not locked: OSD LED Description YES L Carrier locked NO U Carrier not locked
Data	Indicates whether data is being carried on the in-band stream. The indicators cover all packet processors, regardless of the stream they are monitoring: OSD LED Description YES On In-band data detected within last 5 seconds NO Off In-band data not detected within last 5 seconds
SNR	When carrier lock has been established, displays an estimate of the carrier signal-to-noise ratio in dB, with an explanation: ▪ GOOD — Good value ▪ FAIR — Marginal signal level; check the signal ▪ POOR — Unusable signal ▪ INVALID — Invalid SNR value

Field	Description
AGC	When carrier lock has been established, displays an estimate of the automatic gain control as a percentage, with an explanation: ▪ GOOD — Good value ▪ FAIR — Marginal signal level; check the signal ▪ POOR — Unusable signal ▪ INVALID — Invalid AGC value
5 Second Error Counts	Indicates the number of correctable and uncorrectable digital multiplex errors, up to 9999. It is updated every 5 seconds and reset each time the DCT3080 is power cycled or another digital multiplex is tuned. The maximum value displayed is 9999, even if there were more than 9999 errors.

d05 Unit Address

This diagnostic displays the unit address:

UNIT ADDRESS

TVPC INSTALLED NO

UNIT ADDRESS:

123-45678-90123-456

OOB ADDRESSES:

NETWORK: 123-45678-90123-456

MULTICAST 16 ADDRESS FOR: *nnnn*

0x0000 0x0000

0x0000 0x0000

MAC ADDRESSES:

DOCSIS: xx xx xx xx xx xx

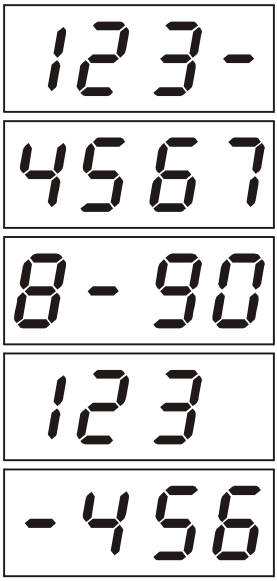
Ethernet: *xx xx xx xx xx xx*

1394: *xx xx xx xx xx xx*

USB: *xx xx xx xx xx xx*

Settop: *xx xx xx xx xx xx*

Figure 3-6
LED display of a unit address



The Unit Address fields are:

Field	Description
TvPC Installed	Indicates whether the TVPC renewable security system is installed: ▪ YES — TvPC is installed ▪ NO — TvPC is not installed
Unit Address	A unique decimal number that indicates the unit address or physical address.
OOB Addresses	
Network	The DCT3080 network address displayed in decimal format.
Multicast 16 Address For	Specifies the stream to which the OOB multicast 16 addresses are assigned. The stream type and multicast 16 addresses cycle on the OSD every 5 seconds. The valid stream types *nnnn* are: ▪ Net — Network

- EMM — EMM
- SCC — SCC_ECM
- Dnld — Download
- Data — Data
- Poll — Polling packet identifier (PID)

The 16-bit multicast address is displayed in 4-byte hexadecimal format. The Multicast 16 addressed messages filter on a 16-bit multicast address. The user processor can define up to four multicast addresses in hardware, and any message matching one of the four is processed. Messages not matching the multicast address are discarded.

MAC Addresses The DOCSIS, Ethernet, 1394, USB, and MAC addresses are stored in protected flash and displayed in hexadecimal.

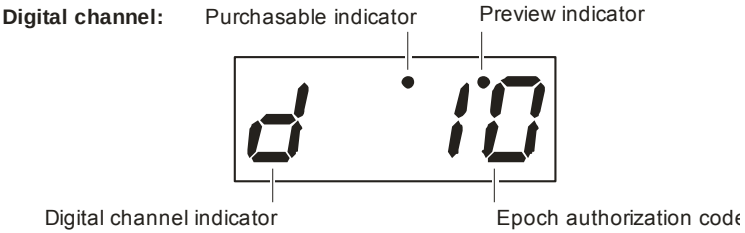
d06 Current Channel Status

This diagnostic displays a status of the last attempted tuned channel on the in-band stream. The channel type determines the status display.

This is an example for a digital channel:

CURRENT CHANNEL STATUS		
PRIMARY A/V SOURCE		IB TUNER 1
IB TUNER 1		
TYPE: DIGITAL		*aaa* 0x*bb*
INBAND FREQUENCY:		199.2500 MHz
AUTHORIZED:		YES
PURCHASABLE:		NO
PURCHASED:		NO
PREVIEW:		NO
MPEG VIDEO LOCK		YES
MPEG AUDIO LOCK		YES
PCR LOCK		YES
CCI: 0x00	APS: 0x00	RC Flag: 0x00
CIT: 0x00	DRM: 0x00	RS: Forever
Page 1 of 3		vvv Scroll Down vvv

Figure 3-7
Current channel status LED displays



The Current Channel status fields are:

Field	Description
Type	Indicates that the channel is digital: OSD LED Description DIGITAL d Digital
aaa	Displays the encryption mode for the channel on the OSD and LED. It is updated every 5 seconds. For a digital channel: ▪ ENC – encrypted ▪ UNE – unencrypted ▪ CLR – clear
bb	(Digital channels *only*) The current epoch authorization reason is displayed in the hexadecimal format 0x*bb* on the OSD and LED.
In-Band Frequency	(Digital channels *only*) The center RF carrier frequency for the digital service. It can be from 54 to 860 MHz.
Authorized	Indicates whether the DCT3080 is authorized for the currently tuned service: ▪ YES — authorized ▪ NO — not authorized
Purchasable	Indicates whether the current program can be purchased for viewing: OSD LED Description YES on Can be purchased NO off Cannot be purchased

Field	Description
Preview	Indicates whether the current program is in preview mode: OSD LED Description YES on In preview mode NO off Not in preview mode
MPEG Video Lock	Indicates whether the video processor is locked to the video stream: ▪ YES — locked ▪ NO — not locked
MPEG Audio Lock	Indicates whether the audio processor is locked to the audio stream: ▪ YES — locked ▪ NO — not locked
PCR Lock	Indicates whether the in-band receiver is locked to the program clock reference (PCR): ▪ YES — locked ▪ NO — not locked
CCI	The copy control information: ▪ 00 — copy free ▪ 01 — no more copies ▪ 10 — copy once ▪ 11 — never copy ▪ N/A — the value is invalid or cannot be retrieved
RC Flag	Displays whether the broadcast flag is present: ▪ 0 — no flag/not defined ▪ 1 — the flag is present/enabled ▪ N/A — the value is invalid or cannot be retrieved
CIT	The constrained image trigger as delivered in the PRK or the Set DRM API: ▪ 1 — set ▪ 0 — not set ▪ N/A — the value is invalid or cannot be retrieved

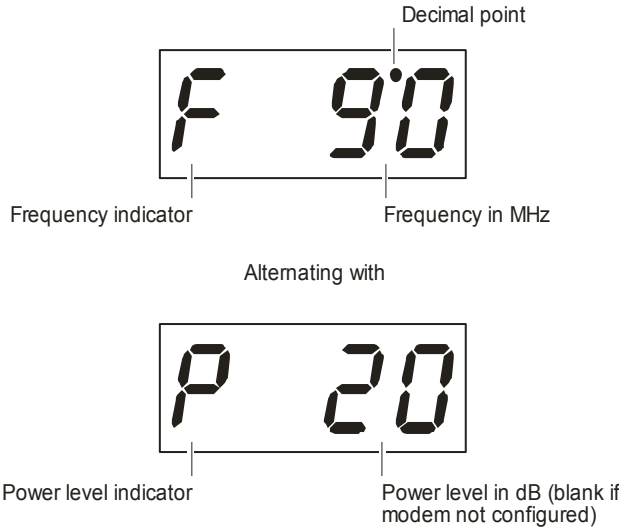
Field	Description
DRM	The digital rights management valid flag bit: ▪ 1 — set ▪ 0 — not set ▪ N/A — the value is invalid or cannot be retrieved
RS	The retention state: ▪ Forever, 1 week, 2 days, 1 day, 12 hours, 6 hours, 3 hours, 90 minutes, or Not Defined ▪ N/A — the value is invalid or cannot be retrieved

d07 RF Modem (Upstream)

This diagnostic displays the RF modem status, if an RF modem is installed in the DCT3080. The information is updated each time this diagnostic is displayed.

RF MODEM	
STATUS:	CONFIGURED
CENTER FREQUENCY:	9.0000 MHz
REQUESTED POWER LEVEL:	23 dB
ACTUAL POWER LEVEL:	20 dB
REPORT BACK ADDRESS:	*xx xx xx xx*
LAST RB ATTEMPT TIME:	*xxxxxxxxxx*

Figure 3-8
RF upstream modem LED display



The RF Modem fields are:

Field	Description
Status	CONFIGURED or NOT CONFIGURED.
Center Frequency	The RF modem center frequency is displayed on the OSD and LED in MHz.
Requested Power Level	The value assigned to the DCT3080 during RF leveling; in dB or blank if not configured.
Actual Power Level	The power level is displayed on the OSD and LED; in dB or is blank if the power level has not been set.
Report Back Address	Displayed in 4-byte hexadecimal format, if configured.
Last RB Attempt Time	The last attempted report back by the DCT3080, in GPS seconds.

d08 Code Modules

This diagnostic includes information about the firmware loaded in flash memory and all non-volatile code versions installed on the DCT3080. When the native suite is running, the diagnostics of the application operating system and all associated objects should be accessible.

ASTB INVD

Boot Code: 05.04

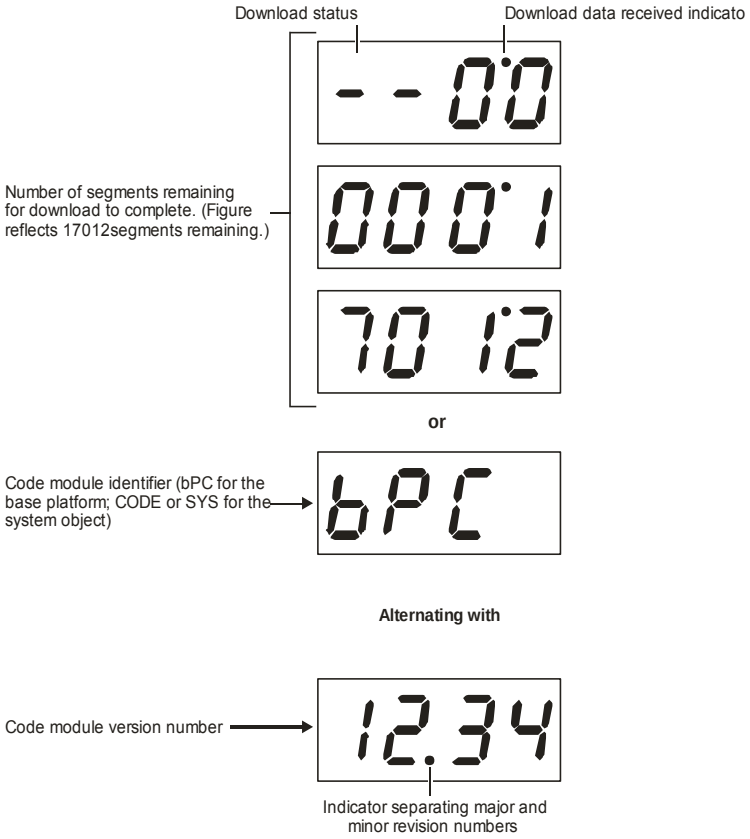
Platform Built: 12.09

Version: Mar 24 2005 13:16:16

Digital Secure Processor: M02

Object	Ver	Status	ID
ASMS____	66.04	ENABLED	0881
CONFIG	50.01	ENABLED	0890
MSTVURIS	00.03	ENABLED	0860

Figure 3-9
LED display for code modules



The Code Modules fields are:

Field	Description
Boot Code	The boot code version in ASCII format
Version	The firmware version and build date in ASCII format
Digital Secure Processor	The digital secure processor version in ASCII format
Downloadable Object Information Table	Lists all objects loaded, or being loaded, onto the DCT3080 in ASCII format. The information displayed for each object depends on the running environment. If a download is not in progress, the LED displays the current environment running and version number, as shown in Figure 4-9. On the LED, “bPC” represents base platform or Thin Client code.
Object	The object name
Ver	The object version
Status	The object status, updated on the OSD and LED every 5 seconds while you display the diagnostic:

OSD	Status	Description
MEM ALLOC	Allocated	Memory for object is allocated
LOADING	Loading	Object is being loaded
STARTING	Enabling	Object is being started (the constructor is running)
ENABLED	Enabled	Object is running
ENA–NOT RUN	Enabled_Not_ Runnable	Object is enabled, but cannot run
STOPPING	Disabling	Object is being stopped (the destructor is running)
DISABLED	Disabled	Object has been disabled
DIS-NOT RUN	Disabled_Not_ Runnable	Object is disabled and cannot run

Field	Description		
	DELETING	Deleting	Object is being deleted
	POSTPONED	Postponed	Object cannot run on the current system; it will be enabled during the next boot
	CONNECTED	Connect	Connected to download PID – awaiting data
	PEND CONNECT	TryingToConnect	Trying to connect
ID	The object identifier		

d09 Memory Configuration

This diagnostic displays the DCT3080 memory configuration. The information is updated when you display the diagnostic.

MEMORY CONFIGURATION		
SYSTEM RAM:	128	MB
FLASH:	16	MB
NVRAM:	256	KB

There is no LED display for this diagnostic.
The Memory Configuration fields are:

Field	Description
System RAM	The allocated system RAM in MB.
Flash	The allocated flash memory in MB.
NVRAM	The allocated NVRAM in KB.

d10 Keypad–LED

This diagnostic verifies the functionality of the LEDs and the front-panel keypad. Each highlighted character corresponds with a front-panel key press.

<	>	U	D	Î	M	P	B	G	S	+	-

d11 Interface Status

The Interface Status diagnostic displays when running in base platform or Thin Client. There is no LED display. The information on the OSD is updated when you display the diagnostic.

INTERFACE STATUS	
DOCSIS TUNER & XMITTER:	INST
1394 I/O DEVICE:	NOT INST
ACTIVE PORTS	0
DATA XMISSION	NO
5C IMPLEMENTATION	0
LOOP STATUS	NO
ROOT STATUS	YES
CYCLE MASTER STATUS	YES
USB I/O DEVICE:	INST
10BT ETHERNET DEVICE:	INST
PARALLEL PORT:	INST
IR BLASTER:	INST
HARD DRIVE STATUS:	INST
SMART CARD:	INST

HDMI PORT	
DEVICE CONNECTED:	YES/NO
REPEATER:	YES/NO

VIDEO XMISSION:	ACTIVE/NOT ACTIVE
HDCP ENABLED:	YES/NO
VIDEO CONSTRAINED	YES/NO
OUTPUT FORMAT	*XXXX* x *XXXX*
ASPECT RATIO:	*xx:x*

EDID DATA

The Interface Status fields are:

Field	Description
DOCSIS Tuner & Xmitter	INST (installed) or NOT INST (not installed)
1394 I/O Device	INST (installed) or NOT INST (not installed)
USB I/O Device	INST (installed) or NOT INST (not installed)
10BT Ethernet Device	INST (installed) or NOT INST (not installed)
Parallel Port	INST (installed) or NOT INST (not installed)
IR Blaster	INST (installed) or NOT INST (not installed)
Hard Drive Status	INST (installed) or NOT INST (not installed)
Smart Card	INST (installed) or NOT INST (not installed)

Field	Description
HDMI Port	If a device is connected to the HDMI port *only*, the following diagnostics display to help troubleshoot the HDMI interface. They all display "N/A" if no device is connected to the HDMI port or the value is invalid or cannot be retrieved.
Device Connected	Indicates whether a device is connected to the HDMI port — Yes or No.
Repeater	Indicates whether the connected device is a repeater — Yes or No.
Video Xmission (transmission)	Indicates whether the DCT3080 is transmitting video over the HDMI port — Not Active or Active.
HDCP Enabled	Indicates whether the DCT3080 is using HDCP to encrypt video transmitted over the HDMI link — Yes or No. If the Video Xmission status is Not Active, the HDCP Enabled status is No.
Video Constrained	Indicates whether the DCT3080 is constraining the video sent through HDMI — Yes or No. If the Video Xmission status is Not Active, the Video Constrained status is No.
Output Format	Indicates the timing format of the video sent through HDMI: ▪ 1920 x 1080I — 1920 pixels wide by 1080 pixels high, interlaced ▪ 1280 x 720P — 1280 pixels wide by 720 pixels high, progressive ▪ 720 x 480P — 720 pixels wide by 480 pixels high, progressive ▪ 720 x 480I — 720 pixels wide by 480 pixels high, interlaced ▪ 640 x 480P — 640 pixels wide by 480 pixels high, progressive
Aspect Ratio	Indicates the aspect ratio of the video sent through HDMI — 3:4 or 16:9.

Field	Description
EDID Data	Indicates the video timing formats that were read from the Extended Display Identification Data (EDID) registers for the connected device, in particular the detailed timing description blocks. The list displays all of the formats that the DCT3080 could read, up to a maximum of 12 formats. If the DCT3080 cannot read any formats, EDID Data is blank. An asterisk (*) after the aspect ratio means the DCT3080 supports the format. If more than twelve video timing formats are discovered, the supported formats *only* are listed first, followed by up to twelve remaining formats.

d12 User Setting Status

This diagnostic displays the user settings. The format may vary. The information on the OSD and LED is updated when you display the diagnostic.

USER SETTING STATUS	
TV TYPE	4:3 PAN/SCAN
YPbPr OUTPUT	480i
4:3 OVERRIDE	OFF
CLOSED CAPTION	ENABLED
PEN SIZE	STANDARD
FONT STYLE	MONO SERIF
FOREGROUND COLOR	BLACK
FOREGROUND OPACITY	AUTO
BACKGROUND COLOR	WHITE
BACKGROUND OPACITY	AUTO
SERVICE SELECTION	PRIMARY LANGUAGE
SETTINGS	USER

The User Setting Status fields are:

Field	Description
TV Type	The aspect ratio. Defaults to 16:9. Options are 16:9 for wide screen TVs or for standard TVs: ▪ 4:3 LETTERBOX places black bars at the top and bottom to fit high-definition programs on the screen ▪ 4:3 PAN/SCAN crops the left and right edges of high-definition programs to fill the screen
HDMI/YPbPr Output	The video display format for the component video outputs. Defaults to 1080i. Options are 1080i, 720p, 480p, or 480i. Some TVs only support certain display formats. Check the TV user manual for more information. If you are not using an HDTV, selecting a format other than 480i causes the on-screen display to go blank. If this occurs, view the settings on the LED panel to change the format back to 480i. If you are not using the HDMI video connection, the HDMI/YPbPr OUTPUT setting displays as YPbPr OUTPUT.
4:3 Override	The display format used for 4:3 standard-definition programming. ▪ OFF displays non-high-definition programs having a 4:3 aspect ratio in wide screen format. On an HDTV, black bars display on the left and right of the picture. Selecting OFF for a 4:3 TV may result in a small picture with black bars around it.
Closed Caption	Displays whether closed captions are ENABLED or DISABLED.
Pen Size	Displays the selected pen size — Auto (controlled by the closed caption stream), Standard, Large, or Small.

Field	Description
Font Style	Displays the selected font style: ▪ AUTO — The font style is controlled by the closed caption stream. ▪ MONO SERIF — Monospaced with serifs ▪ PROPORTION SERIF — Proportionally spaced with serifs ▪ MONO NO SERIF — Monospaced without serifs ▪ PROPORTION NO SERIF — Proportionally spaced without serifs ▪ CASUAL — Casual font type ▪ CURSIVE — Cursive font type ▪ SMALL — Small capitals
Foreground Color	Displays the selected foreground color — Auto (controlled by the closed caption stream), White, Black, Red, Green, Blue, Yellow, Magenta, or Cyan**.**
Foreground Opacity	Displays the selected foreground opacity — Auto (controlled by the closed caption stream), Transparent, Translucent, Solid, or Flashing.
Background Color	Displays the selected background color — Auto (controlled by the closed caption stream), White, Black, Red, Green, Blue, Yellow, Magenta, or Cyan**.**
Background Opacity	Displays the selected background opacity — Auto (controlled by the closed caption stream), Transparent, Translucent, Solid, or Flashing.
Service Selection	Displays the selected service selection: ▪ AUTO — Service selection is controlled by the closed caption stream. ▪ PRIMARY LANGUAGE — Primary language set by the provider. ▪ SECONDARY LANGUAGE — Secondary language set by the provider. ▪ 3, 4, 5, or 6 — Set by the provider.

Field	Description
Settings	Displays the selected setting: ▪ AUTO — Closed caption settings are determined by the closed caption stream regardless of user modification. ▪ USER — The configured closed caption user settings are used.

d13 DVR/Hard Drive Status

This two-page diagnostic displays the DVR and hard-drive status.

DVR/Hard Drive Status

DVR Status

Enabled:	True
Stream Indexer Ver:	131
Content Record Ver:	2

Encoder

Number	Type	Quality
1	MPEG2	HIGH2
2	MPEG2	HIGH2

Drive	Record Capacity Remaining
IDE0	*xxxxxxxxxxxxxxxxxxx*

vvv Scroll Down vvv

Hard Drive Status			
Number of Installed Drives: 1			
Drive: 1	INTERNAL		
Model Number:	ST3120025ACE		
Device ID:	N/A		
Type:	IDE		
Total Size:	80 GB	Used	
System		1	
GPFS		2	
PVR Content		10864	
PVR Index		35	
State	Active		
Temp (F)	118	Max Temp:	122
Over Temp	No	Count:	0

The DVR/Hard Drive Status fields are:

Field	Description
Enabled	Indicates whether the DVR is enabled, based on the DCT3080 Connected State (CONNECTED or DISCONNECTED) and resource availability (resource authorized; hard disk installed and functional): **OSD** **LED** **Description** True En DVR enabled False Un DVR disabled
Stream Indexer Ver.	The stream indexer version number, without leading zeros; for example, version 0000000065 is displayed as “65”
Content Record Ver.	The content record version number, displayed without leading zeros
Number	Indicates the encoder number — 1 or 2
Type	Indicates the encoder type — Not Inst(alled), MPEG2, Other, or Unknown
Drive	The drive type — IDE (internal), 1394, USB (external), or NOT AVAILABLE (neither enabled nor configured)
Record Capacity Remaining	The remaining recording capacity, in bytes
Number of Installed Drives	The number of internal and external hard drives, up to a maximum of 9
Drive	The identification number sequentially assigned to each installed drive and whether the drive is INTERNAL or EXTERNAL
Model Number	The drive model number assigned at the factory
Device ID	A text string of up to 20 characters that identifies the disk drive; “N/A” is displayed if the value is invalid or cannot be retrieved
Type	The drive type — IDE, 1394, USB, or Unkn(own)
Total Size	The drive size in decimal GB. (1 decimal GB = $1x10^9$ bytes. For example, 120 decimal GB = $120x10^9$ bytes.)

Field	Description
System, GPFS, PVR Content, and PVR Index	The space used and allocated for each of the internal hard drive's partitions —System, GPFS, PVR Content, and PVR Index — in MB for each partition (1 binary MB = 2^{20} bytes). "N/A" displays if the value is invalid or cannot be retrieved.
State	The hard drive state: ▪ Standby — The hard drive is working normally, but is at rest. (The State returns to Active any time disc access is necessary.) ▪ Active — The hard drive is accessing data. ▪ Failed — The hard drive hardware has failed.
Temp (F)	For an internal hard drive *only*, its temperature in degrees F
Max Temp	For an internal hard drive *only*, its maximum temperature in degrees F
Over Temp	Indicates whether the drive is excessively hot: ▪ Yes — The internal drive temperature exceeds 140º F (60º C). The LED Over-Temp Indicator is on and remains lit until the next over-temp sample is taken (at least once an hour). ▪ No — There is no over-temp problem.
Count	The cumulative number of times that the hard drive temperature has been measured over 60º C, with the temperature checked at least once an hour.

d14 DOCSIS Status

This three-screen diagnostic displays status information for the embedded cable modem (ECM):

DOCSIS STATUS	
DOCSIS Enabled:	YES
Acquire DS Channel:	YES
Obtain US Parameters:	YES
Establish IP Connectivity:	YES
Obtain Configuration File:	YES
eCM Registered:	YES
Network Access:	YES
Initialize BPI:	YES
System Up Time:	
xxx Days *xx Hours*	
xx Mins *xx Seconds*	
IP Addresses	
Cable Modem	*xxx.xxx.xxx.xxx*
Set-Top Box	*xxx.xxx.xxx.xxx*
Page 1 of 3	vvv Scroll Down vvv

DOCSIS	^^^ Scroll Up ^^^
MAC Addresses	
Cable Modem	*xx.xx.xx.xx.xx.xx*
Set-Top Box	*xx.xx.xx.xx.xx.xx*
Downstream Channel	
Carrier Lock	YES
Frequency	*xxx*
LKC:	*xxx*
Mode:	QAM 256
Power Level:	*xxx*
SNR:	xx.x
Upstream Channel	
Frequency	*xx*
Mode:	QAM 128
Channel ID:	*xxx*
Power Level:	*xxx*
Symbol Rate:	*x.xxx*
Page 2 of 3	vvv Scroll Down vvv

DOCSIS	^^^ Scroll Up ^^^
Known MAC Addresses	
xx.xx.xx.xx.xx.xx	
xx.xx.xx.xx.xx.xx	
xx.xx.xx.xx.xx.xx	

Page 3 of 3

The fields are:

Field	Description
DOCSIS Enabled	For a DOCSIS-enabled set-top, YES. Otherwise, NO.
Acquire DS Channel	The DOCSIS downstream channel acquisition status: ▪ YES — The downstream channel is acquired ▪ NO — The set-top is acquiring the downstream channel ▪ N/A — The value is invalid or cannot be retrieved, or DOCSIS is not enabled
Obtain US Parameters	The DOCSIS upstream channel descriptor (UCD) acquisition status: ▪ YES — The UCD is acquired ▪ NO — The set-top is acquiring the UCD or the downstream channel ▪ N/A — The value is invalid or cannot be retrieved, or DOCSIS is not enabled
Establish IP Connectivity	Displays whether the cable modem has acquired its IP address, typically from a Dynamic Host Configuration Protocol (DHCP) server: ▪ YES — The IP address is acquired ▪ NO — The set-top is acquiring its IP address ▪ N/A — The value is invalid or cannot be retrieved, or DOCSIS is not enabled
Obtain Configuration File	Displays whether the cable modem has downloaded its DOCSIS cable modem configuration file from the TFTP server: ▪ YES — The cable modem configuration file has been successfully downloaded ▪ NO — The set-top is downloading its cable modem configuration file ▪ N/A — The value is invalid or cannot be retrieved, or DOCSIS is not enabled

Field	Description
eCM Registered	Displays whether the embedded cable modem has registered with the cable modem termination system (CMTS): ▪ YES — DOCSIS registration is complete ▪ NO — DOCSIS registration is in progress or the set-top could not register ▪ N/A — The value is invalid or cannot be retrieved, or DOCSIS is not enabled
Network Access	Displays whether the cable modem has been granted access to the DOCSIS network: ▪ YES — The cable modem was granted DOCSIS network access ▪ NO — The set-top is obtaining DOCSIS network access ▪ N/A — The value is invalid or cannot be retrieved, or DOCSIS is not enabled
Initialize BPI	The Baseline Privacy Interface (BPI) status: ▪ YES — BPI has been successfully initialized for the cable modem ▪ NO — BPI initialization is in progress, has failed, or was not requested by the network ▪ N/A — The value is invalid or cannot be retrieved, or DOCSIS is not enabled
System Up Time	The **Days**, **Hours**, **Mins** (minutes) and **Seconds** the DOCSIS system has been operational. If the value is invalid or cannot be retrieved, or DOCSIS is not enabled, each field displays zeros.
IP Addresses	The **Cable Modem** and **Set-Top** IP addresses in dotted-decimal format *xxx.xxx.xxx.xxx*. Each byte value is padded with zeros when necessary. For example, 10.0.1.10 is displayed as 010.000.001.010. If the value is invalid or cannot be retrieved, or DOCSIS is not enabled, 000.000.000.000 is displayed.
MAC Addresses	The **Cable Modem** and **Set-Top** MAC address in hexadecimal format *xx:xx:xx:xx:xx:xx*. Each byte value *xx* ranges from 00 to FF and is padded with zeros when necessary. For example,0:0:2D:1:F1:D is displayed as 00:00:2D:01:F1:0D. If the value is invalid or cannot be retrieved, or DOCSIS is not enabled, 00:00:00:00:00:00 is displayed.

Downstream Channel (carries data from the headend to the set-top)

Carrier Lock	YES — The cable modem is locked to a DOCSIS downstream channel. NO — The cable modem is not locked to a downstream channel. N/A — The value is invalid or cannot be retrieved, or DOCSIS is not enabled.
Frequency	The center frequency of the channel to which the DOCSIS downstream channel receiver is tuned. It can be 54 to 860 MHz. If the value is invalid or cannot be retrieved, downstream Carrier Lock is NO, or DOCSIS is not enabled, N/A is displayed.
LKC	The last known carrier (LKC); the frequency of the last tuned downstream channel used if the embedded cable modem enters hunt mode. It can be 54 to 860 MHz. If the value is invalid or cannot be retrieved, Carrier Lock is NO; if DOCSIS is not enabled, N/A is displayed.
Mode	The DOCSIS downstream channel modulation: QAM 64 or QAM 256. If the value is invalid or cannot be retrieved, Carrier Lock is NO; if DOCSIS is not enabled, 000 is displayed.
Power Level	The downstream channel power level in dBmV. If the value is invalid or cannot be retrieved, Carrier Lock is NO; if DOCSIS is not enabled, 000 is displayed.
SNR	The estimated downstream channel carrier signal-to-noise ratio in the format *xx.x* dB. It is the value reported as SNR in the MIB. If the value is invalid or cannot be retrieved, Carrier Lock is NO; if DOCSIS is not enabled, 00.0 is displayed.

Upstream Channel (carries data from the set-top to the headend)

Frequency	The center frequency of the channel to which the DOCSIS upstream channel receiver is tuned. It can be 5 to 42 MHz. If the value is invalid or cannot be retrieved, Carrier Lock is NO; if DOCSIS is not enabled, N/A is displayed.
Mode	The DOCSIS upstream channel modulation: QPSK, QAM 8, QAM 16, QAM 32, QAM 64, or QAM 128. If the value is invalid or cannot be retrieved, or DOCSIS is not enabled, N/A is displayed.
Channel ID	The upstream channel identifier 0 to 255. If the value is invalid or cannot be retrieved, or DOCSIS is not enabled, N/A is displayed.
Power Level	The upstream channel power level in dBmV. If the value is invalid or cannot be retrieved, or DOCSIS is not enabled, 000 is displayed.
Symbol Rate	The upstream channel symbol rate in mega-symbols per second. If the value is invalid or cannot be retrieved, or DOCSIS is not enabled, 0.000 is displayed.
Known MAC Addresses	Displays up to 32 MAC addresses learned by the DCT3080 cable modem, including the Set-Top MAC and future MAC addresses assigned by DSG, in hexadecimal format *xx:xx:xx:xx:xx:xx* on two screens if necessary. If the value is invalid or cannot be retrieved, or DOCSIS is not enabled, no values are displayed.

d15 Application Specific Information

This diagnostic displays information about application servers:

```
APPLICATION SPECIFIC INFORMATION

NO ADDITIONAL INFORMATION

SERVER1 NAME:
SRVR 1 IP ADDR:

SERVER2 NAME:
SRVR 2 IP ADDR:

SERVER3 NAME:
SRVR 3 IP ADDR:

SERVER4 NAME:
SRVR 4 IP ADDR:

SERVER5 NAME:
SRVR 5 IP ADDR:
```

The fields are:

Field	Description
Server# Name	The application server name of up to 14 alphanumeric characters. It is blank if the value is invalid or no value can be retrieved.
Srvr # IP Addr	The application server IP address in dotted-decimal format *xxx.xxx.xxx.xxx*; each *xxx* is from 0 to 255. It is blank if the value is invalid or no value can be retrieved.

d16 Interactive Status

This diagnostic describes the interactive information that is displayed only when the Thin Client platform is running. The information on the OSD and LED is updated at least once every 5 seconds while the diagnostic is displayed. This is an example of a code module display with status descriptions:

INTERACTIVE STATUS	
IP ADDRESS:	0.0.0.0
UPM:	00000021
UPSTREAM ID:	0000
DOWNSTREAM ID:	0000
STATE:	UNCONFIG
MAC ABORT CNTR:	0000
SOCKET PORT STATE:	
0	UNUSED
1	UNUSED
2	UNUSED
3	UNUSED
4	UNUSED

Figure3-10
Interactive status LED display

The Interactive Status fields are:

Field	Description
IP Address	The IP address in dotted-decimal format *xxx.xxx.xxx.xxx* assigned by the NC 1500 to the DCT3080. 0.0.0.0 is displayed if the IP address is not configured or unknown.
UPM	The upstream modem address value is the same as the terminal ID assigned by the DAC 6000. It is a unique, system-generated eight-digit integer between 1 and 16777215. 00000000 is displayed when the UPM is not configured or unknown.
Upstream ID	A four-digit decimal value from 0000 to 9999 assigned by the DAC 6000 to the DCT3080. 0000 is displayed if the Upstream ID is not configured or unknown.
Downstream ID	A four-digit decimal value from 0000 to 9999 assigned by the DAC 6000 to the DCT3080. 0000 is displayed if the Downstream ID is not configured or unknown.

Field	Description

State The interactive status of the DCT3080:

LED	OSD	Description
U	UNCONFIG	The DCT3080 is not configured for the interactive system, and, platform should run as pre-interactive.
C	MAC_CONNECT	The DCT3080 is waiting to establish connection to MAC PID Stream.
I dc	INIT_WAIT_DC_OR_C	The DCT3080 is in the interactive initialization state and waiting for the default configuration or the contention channel list messages.
I L	WAIT_LM_ACK	The DCT3080 is in the interactive initialization state and waiting for Link Management Response ACK for Local Address Message.
I SO	WAIT_SO_ACK	The DCT3080 is in the interactive initialization state and waiting for a Sign On acknowledgement.
I LA	WAIT_LA_OR_SO	The DCT3080 is in the interactive initialization state and waiting for Logical Address or Sign On with verification Frequency message.
S I	INIT_STOPPED	The DCT3080 is in the interactive initialization state, and the TransMode has stopped.
r dc	RUN_WAIT_DC_OR_C	The DCT3080 is in the interactive state and waiting for the default configuration or the contention channel list messages.

Field	Description		
	r	RUNNING	Interactive state is running, sending idle messages, and waiting for any prepare for poll or MAC messages.
	S	RUN_STOPPED	The interactive run state has stopped and DCT3080 is waiting for status or transmission control message.
	00	INVALID	The interactive state is unknown or invalid.

MAC Abort Cntr

This counter increments every time the MAC layer reaches the cell abort count limit. It is reset by the successful upstream transmission of a cell – for example, when the DCT3080 receives an ACK. If the counter reaches the MAC abort count limit, the DCT3080 assumes the MAC layer is unavailable due to noise, congestion, or some other problem. The DCT3080 stops transmitting data upstream, reports an error to the calling function, and attempts to re-enter the network using the initialization process. 0000 is displayed as default or if the MAC Abort CNTR is not configured or unknown.

Socket Port State

The socket mode and activity:

- UNUSED — The socket is not being used.
- OPENED — The socket is open.
- READY — The socket is ready to send or receive.
- RECEIVING — The socket is receiving data from the application server.
- SENDING — The socket is sending data to the application server.
- UNKNOWN — The socket state is invalid or unknown.

Troubleshooting

This section provides troubleshooting guidelines. If problems still occur after performing the diagnostics, call the TRC for assistance as described in Section 1, "Introduction."

Problem	Possible Solutions
The cable terminal will not power on	The cable terminal may have received a software update and may not power on while the new software is being installed. Try again in a few minutes.
	Verify that the AC power cord is connected to the cable terminal and an AC outlet. Unplug the cable terminal from the AC outlet, plug it back in, and then press the **POWER** button.
	If the cable terminal is connected to a switched outlet on another unit, verify that that unit is powered on.
	Press the **POWER** button on the cable terminal front panel instead of the remote control. The batteries in the remote control may be depleted.
The remote control does not work	Verify that the remote control is in "Cable" mode.
	Verify that there are no obstructions between the remote control and the cable terminal. Aim the remote control directly at the cable terminal front panel, not the TV or VCR.
	The angle between the remote control and the cable terminal may be too large. Stand in front of the cable terminal and not too far to either side.
	Press and release operation keys one at a time, firmly and deliberately.
	Try changing channels using the buttons on the cable terminal front panel.
	Check the batteries in the remote control. Install new batteries if needed.

Problem	Possible Solutions
There is no audio when viewing cable channels	Verify that the **MUTE** button on the cable terminal or the remote control was not pressed. Press **MUTE** on the remote control to restore sound. If the cable terminal audio output is connected to the TV, verify that the MUTE button on the TV was not pressed. If the cable terminal audio output is connected to a home theater receiver, verify that the receiver is set to the appropriate input source and the mute button on the receiver was not pressed. Verify that you used the correct audio cables for the ports. Verify that the audio cables are firmly connected between the cable terminal and the audio playback device (TV, receiver, DVD player, etc.).
There is no audio from the center and/or surround speakers of a home theater receiver connected to the cable terminal	Not all Dolby Digital programs feature full 5.1 surround sound. In some cases, the programs may only contain left and right stereo audio. Verify that the coaxial or optical SPDIF cable is firmly connected to the cable terminal and the home theater receiver. Verify that the home theater receiver is set to a surround sound audio mode (Dolby Digital, Dolby Pro Logic® II, or Dolby Pro Logic). Verify that the receiver is properly configured to work with all connected speakers.

Problem	Possible Solutions
There is no video on the TV screen	Verify that the TV is powered on and set to the appropriate input source for the cable terminal. Verify that the cable terminal is powered on and tuned to an authorized cable channel. Verify that all video cables between the cable terminal and the TV are firmly connected. Verify that the coaxial cable feed is firmly connected to the cable terminal and the wall jack. If the cable terminal is connected to a home theater unit, verify that the home theater unit is powered on and set to the appropriate input source. Press the • key to cycle through the available output formats until a picture displays on the TV.
No closed captions display	Verify on the User Settings menu that closed captions are enabled on the cable terminal. Verify that closed captions are enabled on the TV.
There are black bars above and below the picture	Some SD programs are broadcast in the letterbox format with black bars above and below the picture. Some widescreens TVs offer a zoom feature that may be able to remove the black bars. Note: If tuned to HD and the TV Type = 4:3 LETTERBOX, black bars will appear above and below the picture. Try setting the TV Type to 4:3 PAN/SCAN to get a full-screen picture with no black bars.
There are black bars on all four sides of the picture	A broadcaster may include black bars on either side of a wide screen broadcast. This is called a “hybrid” aspect ratio and results in a black border surrounding the video on a 4:3 TV. Because this is part of the broadcast, the cable terminal cannot correct the video. Borders can be eliminated by selecting the 4:3 PAN/SCAN option on the TV Type setting.
The cable terminal is making a humming noise.	The DCT3080 includes an integrated hard drive and a fan for cooling. During normal operation, the DCT3080 emits a low humming noise, similar to a personal computer. The noise varies in volume occasionally when the speed of the internal fan adjusts to changes in the temperature around the DCT3080. Please note the hard drive will stay on even when the DCT3080 is turned off.

Specifications

Input frequency (video and DOCSIS)	54 to 864 MHz
HRC/IRC frequency assignments	Downloadable
Number of channels	136 carriers
Digital	More than 1 channel per carrier, content dependent
Input digital average level	64 QAM: –15 to +15 dBmV
	256 QAM: –12 to +15 dBmV
Data carrier	QPSK-modulated carrier
Frequency	Agile Receiver 70 – 130 MHz
Bandwidth	1.5 MHz
Level	–15 to +15 dBmV
Mechanical security	Standard: security screws, unichassis construction
Operating environment range	
Temperature	15° to 40°C (32° to 104°F)
Humidity	5% to 95% (noncondensing)
AC VOLTAGE	95 to 125, 57 to 63 Hz
Power dissipation	60 W nominal at 115 Vac
Size	17.13 in. × 13.13 in. × 2.75 in.
Weight	12 pounds
Hard Disk	DCT3080: 120 GB

AGC	automatic gain control
ASTB	Advanced Set-top Box

BPI	Baseline Privacy Interface (DOCSIS)
CRC	cyclic redundancy check
CSR	Customer Service Representative
DAC 6000	Digital Addressable Controller 6000
DOCSIS	Data Over Cable Service Interface Specification
DRAM	dynamic random access memory
DVI	Digital Video Interface for HDTV
DVR	Digital Video Recorder
ECM	embedded cable modem (in a cable terminal)
EDID	Extended Display Identification Data
EMM	entitlement management message(s)
FLASH	A type of nonvolatile memory
GPS	global positioning system
HDMI	High-Definition Multimedia Interface
HDTV	high-definition television
HRC	harmonically related carriers
IPG	interactive program guide
IPPV	Impulse Pay-Per-View
IR Blaster	Infrared Blaster
IRC	incrementally related carriers
ITU	International Telecommunication Union
LKC	last known carrier (DOCSIS)
MIB	management information base (DOCSIS)
MPAA	Motion Picture Advisory Association
MPEG-2	Motion Picture Experts Group-2 compression standard for digital audio and video encoding
NVRAM	non-volatile random-access memory
OSD	on-screen display

PCR	program clock reference
PID	packet identifier
PPV	Pay-Per-View
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shift Keying
RSA	Return for Service Authorization
SD	standard definition
SNR	signal-to-noise ratio
S/PDIF	Sony-Philips Digital Interchange Format
TCP/IP	Transmission Control Protocol/Internet Protocol
TRC	Technical Response Center
TvPC	TV PassCard
USB	Universal Serial Bus
VOD	video on demand
Y Pb Pr	component video connectors for HDTV

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