

*User Guide*

*DCT3400 Series  
High-Definition  
DVR Set-Top Box*





**WARNING: TO PREVENT ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**

Graphical symbols and supplemental warning markings are located on the back and bottom of the terminal.

## WARNING

TO REDUCE THE RISK OF FIRE OR SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

## 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.



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of "uninsulated dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Product identification and supply rating are provided on the label found on the bottom of the unit.

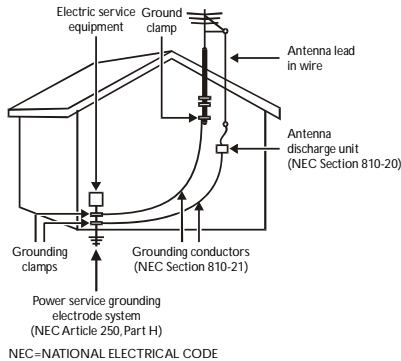
## REPAIRS

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

## 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



# 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 a dry cloth.
- 7** Do not block any ventilation openings. Install according to 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.

# Regulatory Information

## **Federal Communications Commission Radio and Television Interface Statement for a Class 'B' Device**

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 in the residential installation. 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. However, there is no guarantee that interference will not occur in a particular installation.

If the 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:

- Increase the separation between the equipment and the affected receiver
- Connect the equipment on a circuit different from the one the receiver is on
- Ensure that the cover plate for the security card is secured and tight

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

## 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, 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 found 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 15.101 to 15.109. The Class B digital apparatus meets all requirements of the Canadian Interface Causing Equipment Regulations.

## 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.

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## Contact Us

For technical support for your cable terminal, call Motorola Support at **1-866-668-2271** or **1-866-MOT-BCS1**.

For questions about your cable TV service, call your service provider.

For Motorola consumer cable products, education, and support:  
[http://broadband.motorola.com/consumers/home\\_entertainment.asp](http://broadband.motorola.com/consumers/home_entertainment.asp)

For an overview of high-definition television (HDTV):  
<http://broadband.motorola.com/consumers/hdtv>

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## **CONTENTS**

Introduction .....	3
Overview .....	4
Front Panel .....	4
Rear Panel .....	6
Operation .....	8
Turning Power On and Off .....	8
Changing Channels .....	8
Adjusting the Volume .....	8
Interactive Program Guide .....	8
Digital Video Recorder (DVR) .....	9
Optimizing Your Cable Terminal For HDTV .....	10
On-Screen Graphics .....	14
<b>ADDITIONAL HDMI SETTINGS</b> .....	<b>15</b>
Connecting Your Cable Terminal .....	17
Video Connection Options .....	18
Important Safety Considerations .....	19
Connecting to an HDTV – Video Only .....	20
Connecting to an HDTV – Audio Only .....	22
Connecting to an A/V Receiver – Audio Only .....	24
Connecting to a Stereo TV .....	26
Connecting to a Stereo TV and Stereo VCR .....	28
Connecting to an A/V Receiver, TV, and VCR .....	30



Optional IR Blaster .....	32
Installing the Optional IR Blaster .....	32
Connecting the IR Blaster .....	34
Recording Your Connections .....	35
Data Devices .....	36
Troubleshooting .....	37



## **INTRODUCTION**

Congratulations on receiving a Motorola® DCT3412 High-Definition Advanced DVR Cable Terminal. Motorola has merged the extraordinary features of digital cable - the seemingly endless programming options, interactive program guides, video on demand (VoD), and commercial free, CD quality music - with the flexibility of a dual-tuner digital video recorder (DVR) and the incredible picture quality and sound of high-definition TV (HDTV). HDTV provides up to twice the color resolution and up to six times the sharpness of standard-definition TV.

The DCT3412 enables a direct digital connection to consumer audio and video devices through IEEE 1394 DTV and HDMI® interfaces. It contains a hard drive for hours of DVR functionality, including recording high-definition (HD) programs and watch and record functionality.

This User Guide introduces the basic features, outlines important safeguards, and provides options for integrating your cable terminal into your entertainment system. Please take a few moments to read through this User Guide. The configuration diagrams, on-screen menu description, and troubleshooting section will help you make the most of your home entertainment experience.

To determine which digital cable features are provided in your area, please check with your cable operator. They will be happy to provide instructions for these optional services.

## OVERVIEW

### 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.

Figure 2-1  
Front panel

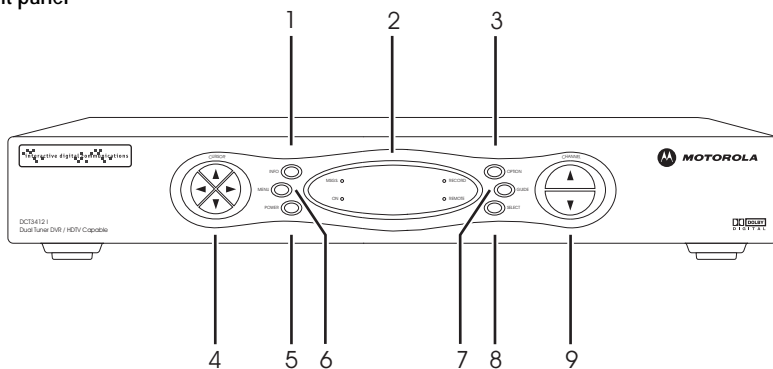


Table 2-1  
Front panel

Key	Feature	Function
1	INFO	Displays the current channel and program information (not supported by all applications)
2	LED DISPLAY	Displays the channel number or time of day. The indicators are:  MSGS — the DCT3412 has received messages for you to read  ON — the DCT3412 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 (USB, ETHERNET) are not enabled and require the support of application software.*

Figure 2-2  
Rear panel

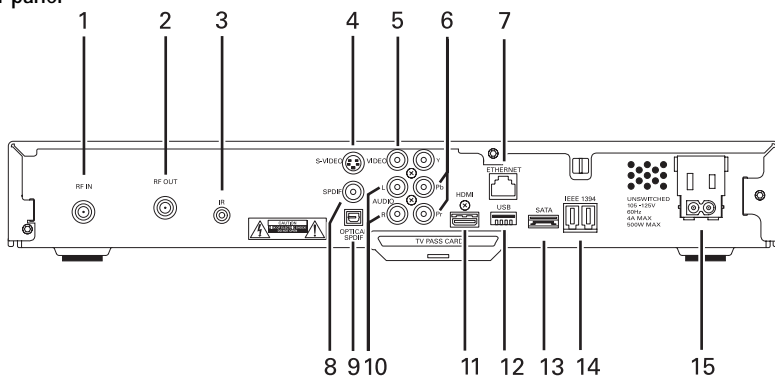


Table2-2

Rear panel connections

Key	Item	Function
1	RF IN	F-type coaxial cable input
2*	RF OUT	RF video output
3	IR	Mini phono jack enabling the DCT3412 to control a VCR using an optional, low-power IR Blaster transmitter (not all IPGs support this feature)
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	Y Pb Pr	Component video output to an HDTV
7**	ETHERNET	Ethernet 10/100Base-T input
8	SPDIF	Coaxial Dolby® Digital 5.1 or PCM audio output
9	OPTICAL SPDIF	Optical digital Dolby Digital 5.1 audio or PCM audio output
10	AUDIO OUT	L and R (left and right) RCA-type stereo audio output jacks
11	HDMI	HDMI video output to an HDTV (can connect to a DVI input using an HDMI-to-DVI converter cable)
12**	USB	USB 2.0 connector for devices such as keyboards, joysticks, scanners, disk storage, PCs, printers, or digital cameras
13	SATA	Connector for optional external hard drive
14	IEEE 1394	IEEE 1394 connector for connecting to audio and video devices such as a digital television (DTV).
15	AC power	AC power connector: <ul style="list-style-type: none"> <li>• The bottom plug is an input for the AC power cord</li> <li>• The top plug is an unswitched power outlet for a device such as a TV or VCR</li> </ul>

\* The RF OUT connection is an optional feature and may not be present on your DCT3400 model

\*\* These connectors (USB and ETHERNET) are not enabled and require the support of the application software



## OPERATION

### Turning Power On and Off

Press **POWER** on the front panel to turn the cable terminal on or off. When using the remote control, be sure it is in cable mode by pressing **CABLE** before pressing **POWER**.

### Changing Channels

You can change channels in two ways:

- Press **CHANNEL ▲** or **▼** on the cable terminal front panel, or press **CHANNEL +** or **-** on the remote control to step through the channel selection.
- Enter the number of the channel you wish to view using the number keys on the remote control.

### Adjusting the Volume

Press **VOLUME +** or **-** on the remote control to adjust the volume. When you adjust the volume, the volume scale is displayed on the screen. Press **MUTE** on the remote control to turn the sound off and on again.

For best audio quality, use the remote control to set the cable terminal to approximately  $\frac{3}{4}$  of the maximum volume level, and then adjust the audio levels on external devices such as your TV or audio/visual (A/V) Receiver.

### Interactive Program Guide

The interactive program guide (IPG) displays information about TV programs and enables you to access features such as Parental Control or Pay-Per-View. IPGs can vary with each cable provider. Refer to your IPG manual for detailed instructions.

## DIGITAL VIDEO RECORDER (DVR)

The DCT3412 contains a hard drive for the DVR to record standard- and high-definition TV programs.

A standard VCR records and plays analog video. DVR records and plays digital video. Unlike an analog tape, the hard drive allows simultaneous recording and playback.

*A DVR offers the ability to control your viewing experience by pausing (time-shifting) live TV and providing trick playback modes (pause, fast forward, slow forward, fast rewind, slow rewind). You may experience a slight delay between time-shifted and live TV.*

With the DCT3412, you can:

### **Record Programming**

Record hours of TV programming. The total hours of recorded content depend on your hard drive capacity and setting type (digital, analog, or HD) at which you record.

### **Maintain a Personal Program Library**

Maintain a personal library of recorded programming, accessed using the interactive program guide (IPG).

### **Control Live TV**

Pause, rewind, or fast-forward live TV.

### **Simultaneously Watch Two Programs**

Watch two programs and easily switch between them using the **SWAP** key on your remote control, dependent upon program guide support.

### **Simultaneously Watch and Record**

Record one program in the background while viewing another live broadcast at the same time.

### **Simultaneously Record Two Shows**

Record two programs from two different channels at the same time.

### **Simultaneously Record Two Shows and Watch a Recorded Program**

Watch a recorded program while recording up to two other programs at the same time. You can also easily switch between viewing the pre-recorded program and either of the programs you're recording currently.



## OPTIMIZING YOUR CABLE TERMINAL FOR HDTV

The DCT3412 outputs HD video through its Y Pb Pr (component), HDMI, or IEEE 1394 connectors. This section describes how to optimize standard and HD video based on your system's HDTV capabilities and personal preferences.

*If you use the IEEE 1394 output, no adjustments to the settings are required.*

*For a TV with an HDMI connection, be sure the TV is on and connected to the HDMI OUT connector before adjusting the settings. Motorola recommends using HDMI cables less than 65 feet long for optimal performance.*

You can configure the TV type, HDMI, and/or Y Pb Pr video output, and closed captioning.

For the best standard and HD viewing:

- 1 Power off the DCT3412, 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:

USER SETTINGS	
> TV TYPE	16:9
HDMI/YpbPr OUTPUT	1080I
4:3 OVERRIDE	480I
ADDITIONAL HDMI SETTINGS>>>	
CLOSED CAPTION	DISABLED
SERVICE SELECTION	
DIGITAL	PRIMARY LANGUAGE
FONT SIZE	AUTO
FONT COLOR	AUTO
FONT OPACITY	AUTO
FONT EDGE TYPE	AUTO
FONT EDGE COLOR	AUTO
BACKGROUND COLOR	AUTO
BACKGROUND OPACITY	AUTO
SETTINGS	AUTO
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 Section 5, “Troubleshooting.”

The User Settings menu options are:

Setting	Description
<b>TV Type</b>	<p>Sets the aspect ratio. The front panel display indicates the type you select. Defaults to 16:9. Options are 16:9 for widescreen TVs or 4:3 LETTERBOX or 4:3 PAN/SCAN for standard TVs.</p> <ul style="list-style-type: none"> <li>• 4:3 LETTERBOX fits widescreen programming on the screen by placing black bars at the top and bottom.</li> <li>• 4:3 PAN/SCAN fills the screen by cropping the left and right edges of widescreen programming.</li> </ul>
<b>HDMI/YPbPr Output</b>	<p>Sets the video display format for the HDMI or component video outputs. The front panel display indicates the format you select. Defaults to 1080i. Options are 1080i, 720p, 480p, or 480i. For HDMI <i>only</i>, additional options you can use to display video on a computer monitor are PC1-VGA (640x480) and PC2-XVGA (800x600).</p> <p>Some TVs only support certain display formats. Check your TV user manual for more information.</p> <p>If you are not using the HDMI connection, the HDMI/YPbPr OUTPUT setting displays as YPbPr OUTPUT.</p>



Setting	Description
<b>4:3 Override</b>	<p>Sets the display format for 4:3 standard-definition programming. If the YPbPr Output is set to 1080i, 720p, or 480p, this setting defaults to 480i. If the YPbPr Output is set to 480i, this setting defaults to OFF and cannot be changed. Options are:</p> <ul style="list-style-type: none"><li>• <b>OFF</b> displays standard-definition programs having a 4:3 aspect ratio in widescreen 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.</li><li>• <b>480i</b> displays standard-definition programs in their original 480i format. Some TVs cannot display 480i format on their component video inputs (Y Pb Pr). Check the TV user manual for more information.</li><li>• <b>480p</b> converts standard-definition programs to a higher-quality 480p format. Some TVs cannot display 480p format on their component video inputs (Y Pb Pr). Check the TV user manual for more information.</li><li>• <b>Stretch</b> automatically stretches all standard-definition programming to fill your widescreen display. Stretch can only be selected if you have the TV Type set to 16:9.</li></ul>
<b>Additional HDMI Settings &gt;&gt;&gt;</b>	<p>If an HDMI TV or home theater receiver is connected to the HDMI port, this option is available. It displays a screen of HDMI-specific settings. For information, see “Additional HDMI Settings” on page 15.</p>
<b>Closed Caption</b>	<p>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.</p>
<b>Service Selection</b>	<p>Sets the service used for closed captions:</p> <ul style="list-style-type: none"><li>• <b>Analog:</b> CC1, CC2, CC3, CC4, T1, T2, T3, or T4. The default is CC1.</li><li>• <b>Digital:</b> PRIMARY LANGUAGE, SECONDARY LANGUAGE, 3, 4, 5, or 6. The default is PRIMARY LANGUAGE.</li></ul>
<b>Font Size</b>	<p>Sets the font size for closed captions. Defaults to AUTO. Options are AUTO, STANDARD, LARGE, or SMALL.</p>
<b>Font Style</b>	<p>Sets the font style. Defaults to AUTO. Options are AUTO, MONO SERIF, PROPORTION SERIF, MONO NO SERIF, PROPORTION NO SERIF, CASUAL, CURSIVE, or SMALL.</p>

Setting	Description
<b>Font Color</b>	Sets the font color. Defaults to AUTO. Options are AUTO, WHITE, BLACK, RED, GREEN, BLUE, YELLOW, MAGENTA, or CYAN.
<b>Font Opacity</b>	Sets the opacity. Defaults to AUTO. Options are AUTO, TRANSPARENT, TRANSLUCENT, SOLID, or FLASHING.
<b>Font Edge Type</b>	Sets the edge appearance — AUTO, NONE, RAISED, DEPRESSED, UNIFORM, LEFT SHADOWED, or RIGHT SHADOWED. The default is AUTO.
<b>Font Edge Color</b>	Sets the edge color — AUTO, WHITE, BLACK, RED, GREEN, BLUE, YELLOW, MAGENTA, or CYAN. The default is AUTO.
<b>Background Color</b>	Sets the background color for closed captions. Defaults to AUTO. Options are AUTO, WHITE, BLACK, RED, GREEN, BLUE, YELLOW, MAGENTA, or CYAN.
<b>Background Opacity</b>	Sets the background opacity for closed captions. Defaults to AUTO. Options are AUTO, TRANSPARENT, TRANSLUCENT, SOLID, or FLASHING.
<b>Settings</b>	Sets the default settings for closed captions (AUTO) or the settings you have configured (USER). Defaults to AUTO. Options are AUTO or USER.
<b>Restore All Defaults</b>	<p>To reset all User Settings to their defaults, select this option and press the ► key.</p> <p>For HDMI only, when you first connect a TV to the DCT3412 using the HDMI connection, the TV and the DCT3412 exchange information to automatically determine the best possible TV TYPE and HDMI/YPbPr OUTPUT settings. You can change these settings at any time.</p> <ul style="list-style-type: none"><li>• To cause the HDMI TV and DCT3412 to re-exchange information to restore the automatic settings, select Restore All Defaults with the HDMI connection in place and the TV powered on.</li><li>• If you connect another HDMI TV to the DCT3412, select Restore All Defaults. This causes the TV and DCT3412 to exchange information, enabling settings suited to your new TV.</li></ul>

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



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## **ON-SCREEN GRAPHICS**

The DCT3412 can generate on-screen 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 interactive program guides. The cable terminal overlays these graphics whenever you display a menu, enable closed captions, or scroll through a program grid.

On-screen graphics are available for all DCT3412 video outputs except IEEE 1394.

## ADDITIONAL HDMI SETTINGS

If an HDMI TV or home theater receiver is connected to the HDMI port, you can display the Additional HDMI Settings screen. These settings are based on the preferred settings of the display device when initially connected to the set-top. These settings are not available if a DVI device is connected to the set-top using an HDMI-to-DVI adapter.

**ADDITIONAL HDMI SETTINGS**

NOTE: CHANGING THESE VALUES MAY RESULT  
IN LOSS OF AUDIO AND/OR VIDEO

> HDMI/DVI MODE: HDMI  
COLOR SPACE: RGB  
AUDIO OUTPUT: AUTO

RETURN TO MAIN PAGE >>>

RESTORE AUTOMATIC SETTINGS

### CAUTION!



*We recommend not changing the Additional HDMI Settings unless you have problems with your HDMI connection. Changing these settings may cause the loss of audio and video.* These settings are established automatically when the HDMI device is connected to the set-top based on data shared between the device and the set-top. The Additional HDMI Settings are intended for use by advanced users for troubleshooting *only*.



The Additional HDMI Settings are:

Setting	Description
<b>HDMI/DVI Mode</b>	Set the HDMI port to <i>one</i> of the following: <ul style="list-style-type: none"><li>• HDMI — recommended for an HDMI display device</li><li>• DVI — the HDMI audio capability is disabled, and the DVI signal format is used for video so that the HDMI port operates as a DVI port</li></ul>
<b>Color Space</b>	Sets the palette of colors available to create the display image. Each HDMI device works better with a particular color space: <ul style="list-style-type: none"><li>• RGB — most HDMI devices prefer this color space</li><li>• YCC 4:4:4</li></ul>
<b>Audio Output</b>	Sets the audio mode for the HDMI connection: <ul style="list-style-type: none"><li>• Auto — the set-top supplies audio in the format supported by the HDMI device</li><li>• L-PCM — two-channel digital audio format similar to a compact disc</li><li>• Pass Through — the audio formats received by the set-top are automatically passed out of the HDMI port, even if the HDMI device has not indicated support for those formats</li></ul>
<b>Return to Main Page</b>	Returns to the User Settings menu.
<b>Restore Automatic Settings</b>	Restores the Additional HDMI Settings on this screen <i>only</i> as preferred by the HDMI device

## CONNECTING YOUR CABLE TERMINAL

This section describes connecting the cable terminal to your home entertainment system.

Instructions and diagrams are included for connections to:

- High-definition television (HDTV)
- A/V Receiver – Audio
- Stereo TV
- Stereo TV and Stereo VCR
- A/V Receiver, TV, and VCR

Before you move or change components on your entertainment system, review the following:

- For basic cable connections, use 75-ohm coaxial cables equipped with F-type connectors.
- Disconnect power from the cable terminal before connecting or changing cable connections.

*For information on connecting for HDTV, see “Video Options” on the next page.*

### CAUTION!



*Do not place anything on top of the cable terminal, especially other home entertainment components. Be sure to provide adequate ventilation to prevent overheating.*



## Video Connection Options

The DCT3412 offers the following video outputs:

**HDTV**      Component video, HDMI, or IEEE 1394

**Standard**    Composite video, S-Video, or RF coaxial

To determine the available inputs on your TV, check the manual supplied with the TV or the TV itself.

Use the following guidelines to determine the best video connection for your home entertainment system:

- **Component video (Y Pb Pr) – HDTV and standard**

The Y, Pb, and Pr outputs provide component video, which is the most widely supported HDTV connection.

- **HDMI or IEEE 1394 – HDTV and standard**

HDMI and IEEE 1394 offer higher video quality than component video. If your TV has an HDMI input, use the HDMI output instead of IEEE 1394. For optimal performance, *Motorola recommends using HDMI cables less than 65 feet long.*

HDMI and IEEE 1394 are video *and* audio connections. If you use HDMI or IEEE 1394, no separate audio connection to your TV is required.

HDMI is compatible with DVI. *If your TV has a DVI input, you can use an HDMI-to-DVI converter cable to connect to the DCT3412 HDMI connector.*

*If you use IEEE 1394, on-screen graphics do not display.*

- **S-Video – standard only**

If your TV has an S-Video input, use S-Video. S-Video is the highest quality standard-definition video output on the DCT3412.

- **Composite video – standard only**

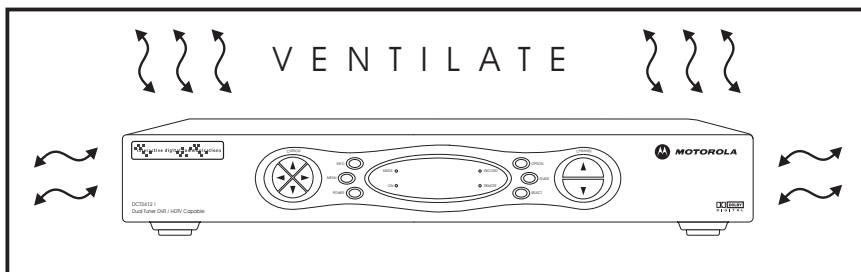
If your TV does not have an S-Video input, use the composite video (VIDEO) output.

- **RF coaxial – standard only**

If your TV only has a coaxial RF input, connect it to the DCT3412 RF OUT connector.



## Important Safety Considerations



Follow these important safety guidelines when positioning and connecting your cable terminal:

- Do not block the slots and openings
- Do not place anything on top of the cable terminal
- Do not position the cable terminal in an enclosed space that would restrict airflow around the unit
- Do not position the cable terminal near any external heat source that could raise the temperature around the unit. Do not place the terminal on top of another heat-producing electronic device.
- Allow for adequate ventilation around the cable terminal to maintain normal operating temperature. Do not place it in a sealed enclosure without providing for adequate airflow.
- Do not plug the AC power cord into a switched power outlet.

## CONNECTING TO AN HDTV - VIDEO ONLY



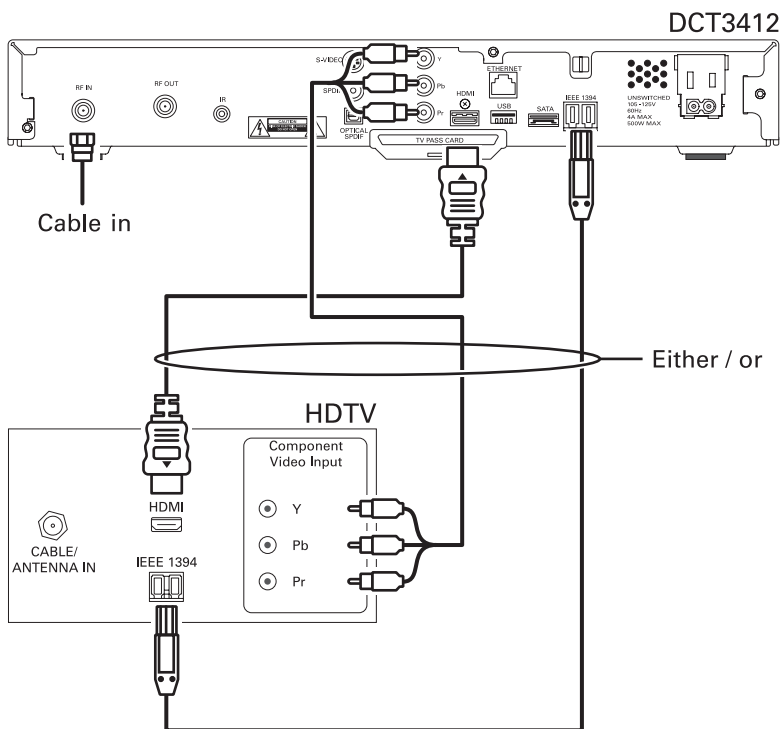
HDMI connection



Component video connection



IEEE 1394 connection



## Connecting HDTV – Video Only

- 1 Connect an RF coaxial cable to the cable wall outlet and the **CABLE IN** connector on the cable terminal.
- 2 Connect the HDTV using component video, HDMI, or IEEE 1394.

### Component video (Y Pb Pr)

Connect the component video cables to the **Y**, **Pb**, and **Pr** connectors on your cable terminal and the HDTV.

*This connection carries video only. To connect the audio connections for your HDTV, refer to the following page. To connect your audio connections for a home theater receiver, refer to “Connecting To an A/V Receiver – Audio Only.”*

### HDMI

If your HDTV has a HDMI input, connect an HDMI cable less than 65 feet long to the **HDMI OUT** connector on your HDTV and the DCT3412.

*If you use the TV as the primary audio source or your home theater receiver has an HDMI input and output, the HDMI connection carries video and audio.*

If your TV has a DVI input, you can use an HDMI-to-DVI converter cable to connect to the DCT3412 HDMI connector.

For information on configuring your DCT3412 settings, see “Optimizing Your Cable Terminal for High-Definition TV.”

### IEEE 1394

If your HDTV has an IEEE 1394 connector, you can connect an IEEE 1394 cable to the **IEEE 1394** connector on your HDTV and the cable terminal.

*If you use the TV as the primary audio source, the IEEE 1394 connection carries video and audio.*

*If you use the IEEE 1394 connection, on-screen graphics cannot display.*

## CONNECTING TO AN HDTV – AUDIO ONLY



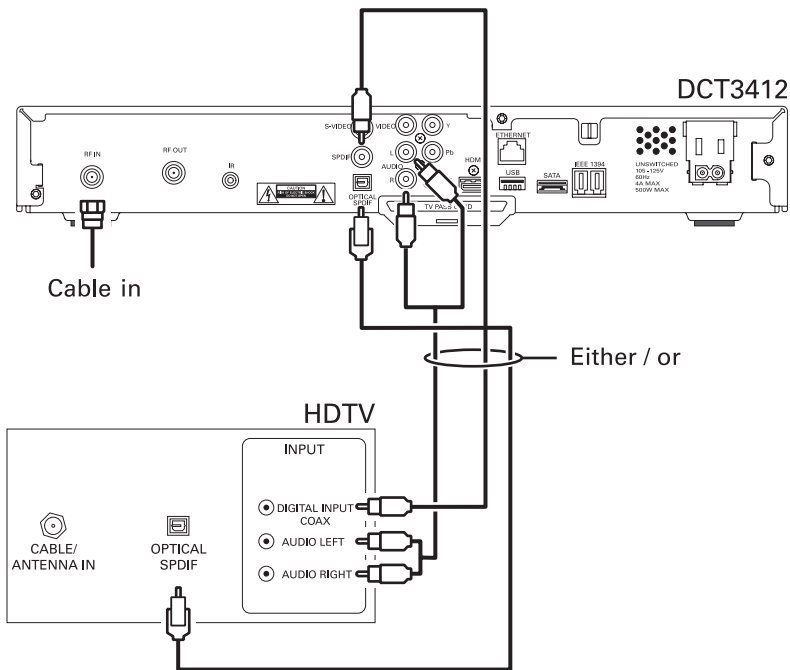
Audio connection



Optical SPDIF connection



SPDIF audio connection



## Connecting HDTV – 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.

HDMI and IEEE1394 carry video and audio. If you connect the DCT3412 to your HDTV using HDMI or IEEE1394, no additional audio connections to the TV are necessary.

For information on configuring your DCT3412 settings, see “Optimizing Your Cable Terminal for High-Definition TV.”

## CONNECTING TO AN A/V RECEIVER – AUDIO ONLY



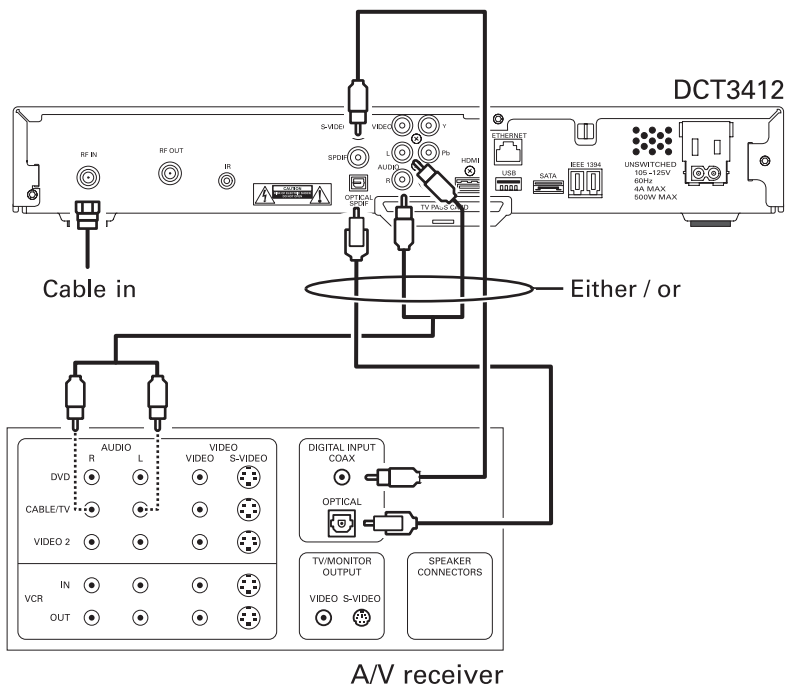
Stereo audio connection



Coaxial SPDIF audio connection



Optical SPDIF audio connection



## Connecting an A/V Receiver – Audio Only


The audio connections options to your A/V receiver or home theater receiver are:

- **Optical SPDIF:** Connect the optical SPDIF cable to the **OPTICAL SPDIF** connector on the cable terminal and the corresponding connector on the A/V receiver.
- **Coaxial SPDIF:** Connect the digital audio cable to the SPDIF connector on the cable terminal and the corresponding connector on the A/V receiver.
- **Stereo audio R and L:** Connect the stereo audio cable to the **AUDIO R** and **L** connectors on the cable terminal and the corresponding connectors on the A/V receiver.

If your A/V receiver supports it, use the OPTICAL SPDIF or coaxial SPDIF outputs on the cable terminal instead of its stereo AUDIO R and L outputs. In most cases, SPDIF offers better audio quality, including support for Dolby 5.1 Surround Sound.

For information on configuring your cable terminal settings, see “Optimizing Your Cable Terminal for High-Definition TV.”

## CONNECTING TO A STEREO TV



RF (75 ohm)  
connection



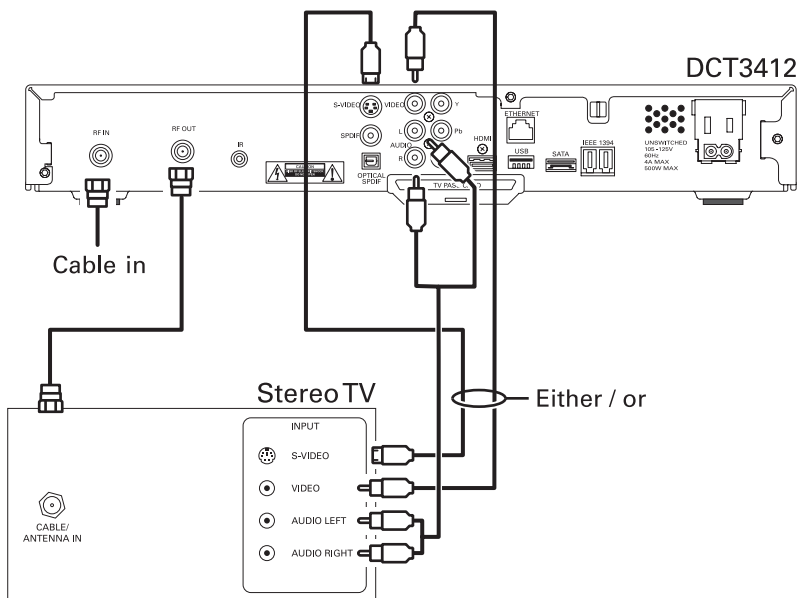
S-Video  
connection



Video  
connection



Audio  
connection





Depending on the TV's inputs:

- 1 If possible, use the **S-VIDEO** and **AUDIO** connectors on the DCT3412.
- 2 If the TV has no S-Video input, use the composite **VIDEO** and **AUDIO** connectors on the DCT3412.
- 3 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

- 1 Connect an RF coaxial cable to the cable wall outlet and the **CABLE IN** connector on the cable terminal.
- 2 Connect the stereo audio cable to the **AUDIO R** and **L** connectors on the cable terminal and the corresponding connectors on the stereo TV.
- 3 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

- 1 Connect an RF coaxial cable to the cable wall outlet and the **CABLE IN** connector on the cable terminal.
- 2 Connect an RF coaxial cable to the **RF OUT** connector on the cable terminal and the RF connector on the TV.

*This video connection method does not support HD video. For more information, see "Connecting an HDTV – Video Only."*

## CONNECTING TO A STEREO TV AND STEREO VCR



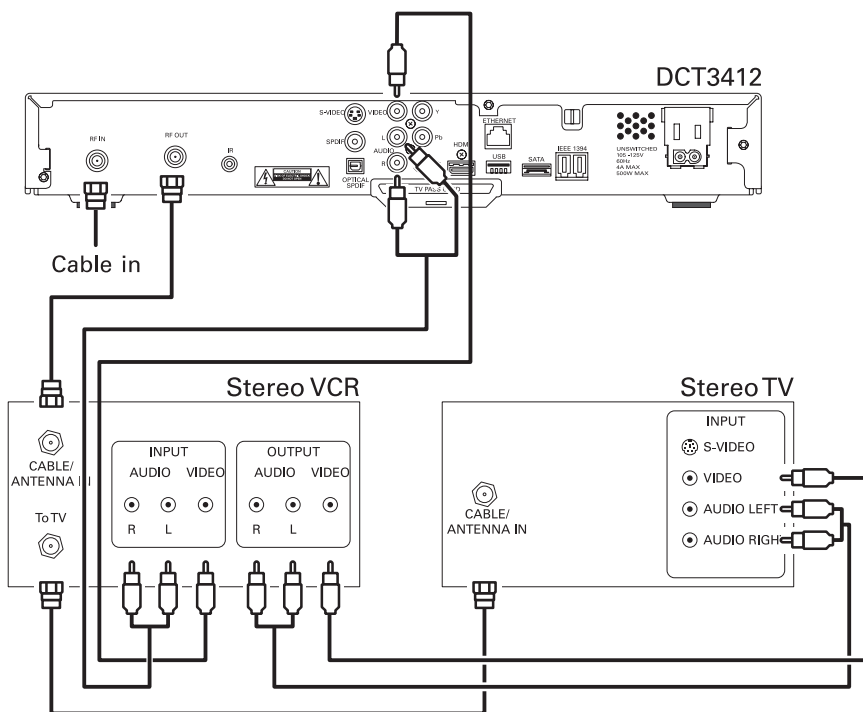
RF (75 ohm)  
connection



Video  
connection



Audio  
connection

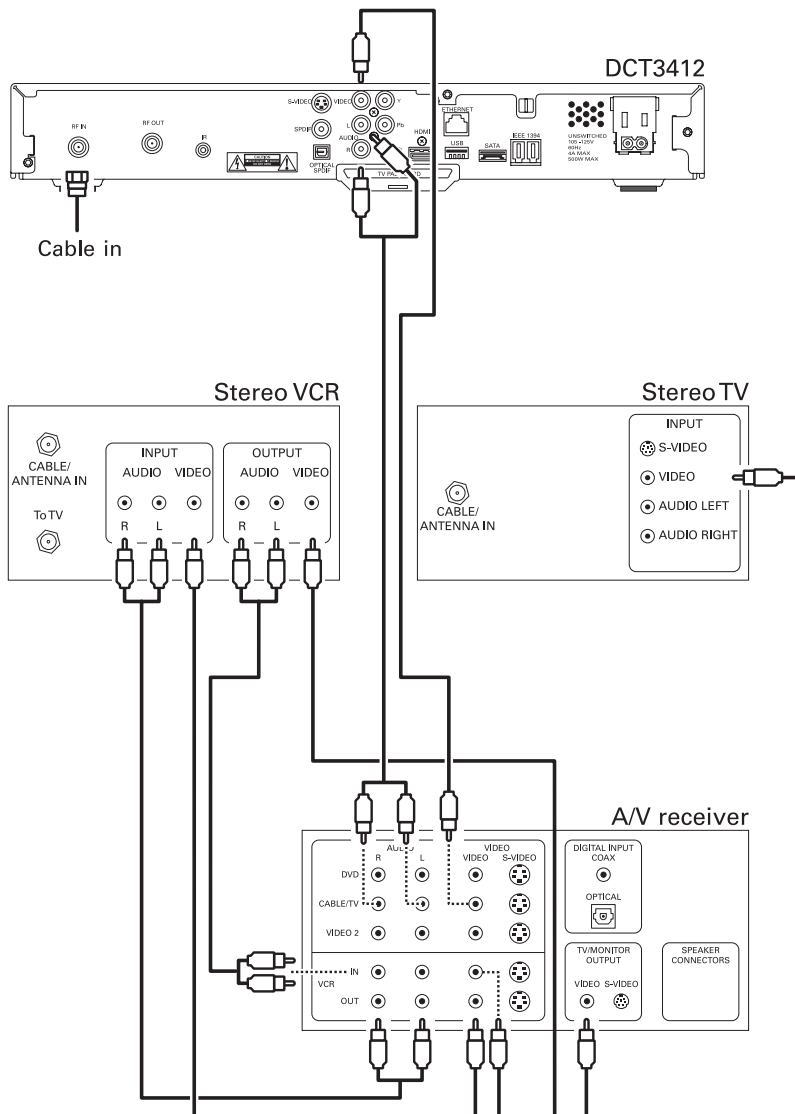
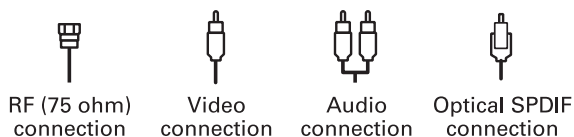


## Connecting a Stereo TV and Stereo VCR

- 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.

*This video connection method does not support HD video. For more information, see “Connecting to an HDTV – Video Only.”*

## CONNECTING TO AN A/V RECEIVER, TV, AND VCR



## Connecting an A/V Receiver, TV, and 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 R** and **L** connectors on the A/V receiver.
- 3 Connect a video cable to the **VIDEO OUT** connector on the cable terminal and the **CABLE/TV VIDEO** connector on the A/V receiver.
- 4 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.
- 5 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.
- 6 Connect a video cable to the **INPUT VIDEO** connector on the stereo VCR and the **VIDEO VCR OUT** connector on the A/V receiver.
- 7 Connect a video cable to the **OUTPUT VIDEO** connector on the stereo VCR and the **VIDEO VCR IN** connector on the A/V receiver.
- 8 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.

*This video connection method does not support HD video. For more information, see “Connecting to an HDTV – Video Only.”*

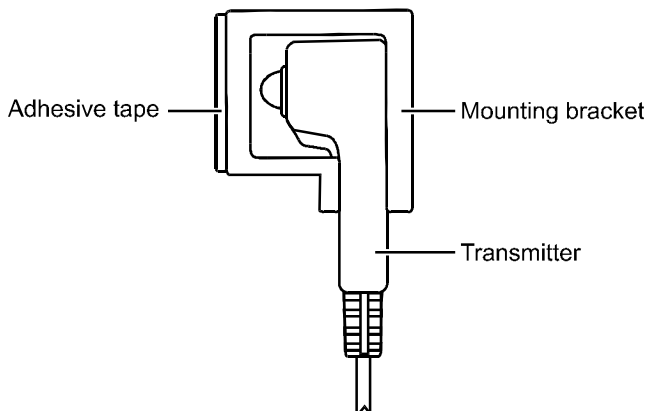
## OPTIONAL IR BLASTER

### Installing the Optional IR Blaster

The optional IR Blaster provides control of the subscriber VCR from the cable terminal. It consists of a low-power infrared transmitter attached to a six-foot cord and a mounting bracket. The mounting bracket is a clear plastic holder that has a pad of adhesive tape that enables you to install the IR Blaster near the VCR-IR receiver. A mini-pin connector at the end of the cord connects the IR Blaster to the terminal. The IR Blaster is sold separately as an accessory item.

*The availability and functionality of the IR Blaster depends on the installed application software. Some IPGs may not support the IR Blaster.*

Figure 2-3  
IR transmitter installed in mounting bracket



Once installed, the IR Blaster is activated automatically through the electronic program guide. Individual VCR codes are broadcast through the out-of-band data channel and are updated periodically as new codes are added.

The procedure for installing the IR Blaster is described in the following paragraphs.

### **Locating the IR Receiver on the VCR**

The IR receiver area is not visible on some VCRs. To locate it:

Obtain a piece of opaque material, such as a 3- by 5-inch index card.

Use the card to block off areas of the VCR where the IR receiver might be located. Try to turn the VCR on and off with the remote control pointed directly at it, and stand close enough to reduce the possibility that the receiver will see IR reflections.

Note the blocked area where the VCR is unresponsive to the remote control. This region contains the sensor and can be marked by loosely taping the index card to the area.

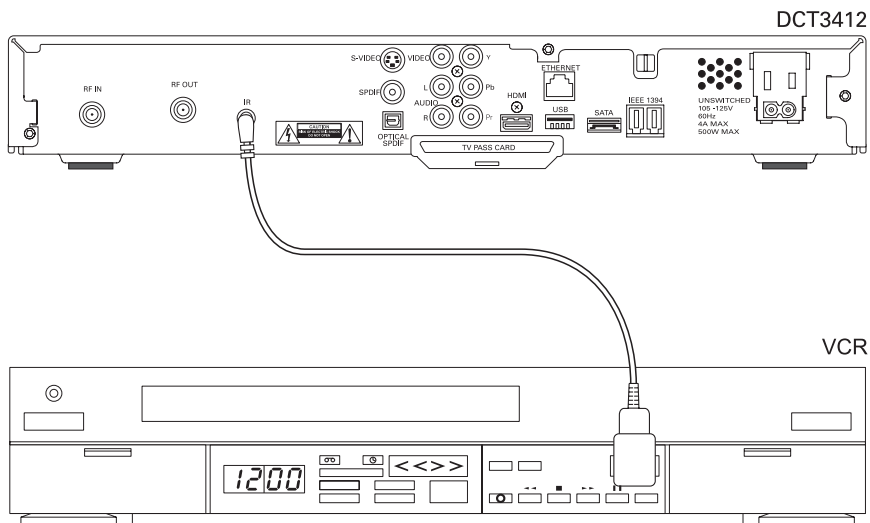
Because the IR Blaster radiates in an area approximately 40 degrees wide, you do not need to be precisely on target with the receiver. You may prefer to offset the location of the IR Blaster transmitter so that it is less likely to interfere with operation of the VCR remote control.

## Connecting the IR Blaster

To connect the IR Blaster:

- 1 Fit the transmitter into the mounting bracket (refer to Figure 2-3).
- 2 Plug the mini-pin connector into the ir jack on the rear panel:

Figure 2-4  
IR Blaster installed



- 3 Remove the adhesive tape cover from the mounting bracket.
- 4 Position and press firmly to attach the mounting bracket to the IR receiver on the VCR. Be careful to route the wire so that it does not prevent loading tapes.

### Checking the IR Blaster

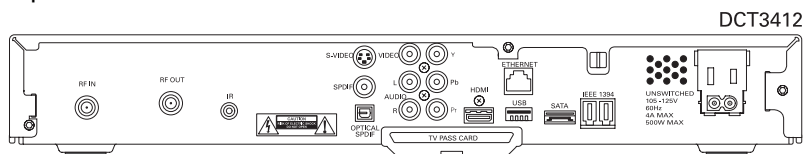
The IR Blaster is now located near the receiver and the VCR can be controlled through the cable terminal. As a final check, operate the VCR using the remote control from various positions in the room. If the IR Blaster is obstructing the IR receiver on the VCR, move it slightly.



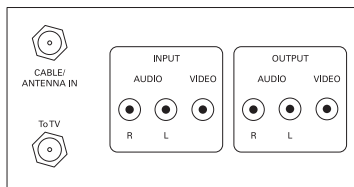
## RECORDING YOUR CONNECTIONS

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

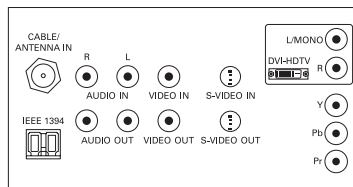
Disconnect the power from the cable terminal before connecting or changing cable connections. Do not place another component or object on top of the cable terminal.



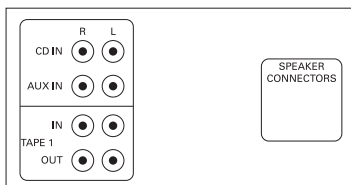
VCR



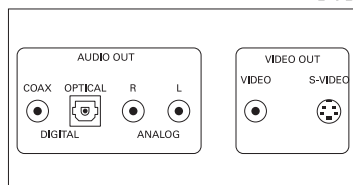
HDTV/Standard-definition TV



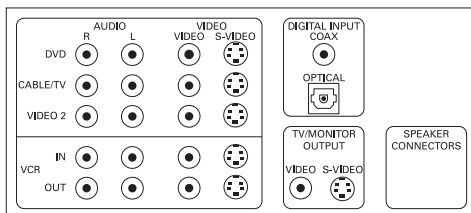
Stereo receiver



DVD

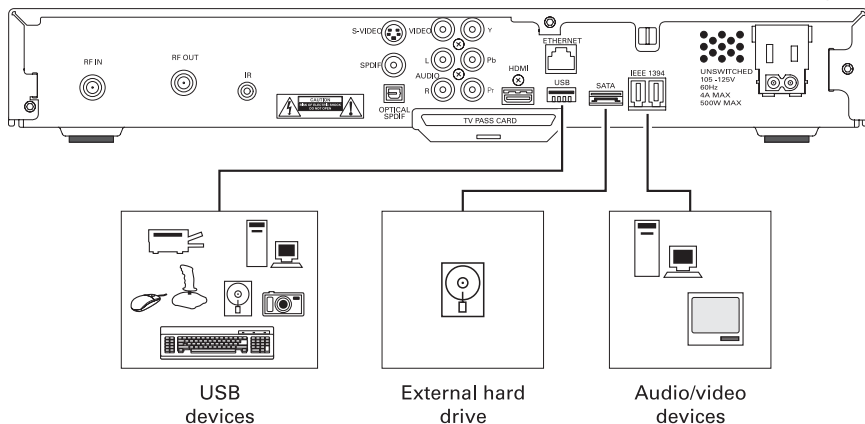


A/V receiver



## DATA DEVICES

DCT3412



*Do not attempt to connect data devices without contacting your service provider. Advanced data features require the proper application and network infrastructure to operate.*

In addition to high quality audio and video, the DCT3412 can deliver high-speed data services such as Internet access, e-mail, IP Telephony, E-Commerce, and home banking.

*The functionality of the illustrated interfaces depends on the services offered by your service provider.*

## **TROUBLESHOOTING**

Before calling your service provider, review this troubleshooting guide. This information is to help you quickly solve a problem. If your problem still exists, contact your service provider.

<b>Problem</b>	<b>Possible Solution</b>
<b>The cable terminal will not power on</b>	<p>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.</p> <p>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 <b>POWER</b> button.</p> <p>If the cable terminal is connected to a switched outlet on another unit, verify that that unit is powered on.</p> <p>Press the <b>POWER</b> button on the cable terminal front panel instead of the remote control. The batteries in the remote control may be depleted.</p>
<b>The remote control does not work</b>	<p>Verify that the remote control is in "Cable" mode.</p> <p>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.</p> <p>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.</p> <p>Press and release operation keys one at a time, firmly and deliberately.</p> <p>Try changing channels using the buttons on the cable terminal front panel.</p> <p>Check the batteries in the remote control. Install new batteries if needed.</p>



---

<b>Problem</b>	<b>Possible Solution</b>
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**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<sup>®</sup>, or Dolby Pro Logic II).

Verify that the receiver is properly configured to work with all connected speakers.

---

<b>Problem</b>	<b>Possible Solution</b>
<b>There is no video on the TV screen</b>	<p>Verify that the TV is powered on and set to the appropriate input source for the cable terminal.</p> <p>Verify that the cable terminal is powered on and tuned to an authorized cable channel.</p> <p>Verify that all video cables between the cable terminal and the TV are firmly connected.</p> <p>Verify that the coaxial cable feed is firmly connected to the cable terminal and the wall jack.</p> <p>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.</p> <p>If the cable terminal is connected to a TV through its HDMI connection, power off the TV and then power off the cable terminal. Wait one second and then power on the devices.</p> <p>Not all HDTVs can display every output format (1080i, 720p, 480p, or 480i) available on the cable terminal. To select a different format:</p> <ol style="list-style-type: none"><li>1 Ensure that your cable terminal is plugged into a power outlet and is turned off.</li><li>2 Press the <b>MENU</b> key on the front panel. Your settings are displayed on the cable terminal front panel display.</li><li>3 Press the <b>▲</b> and <b>▼</b> keys to display the <b>HDMI/YPbPr OUTPUT</b> setting.</li><li>4 Press the <b>▶</b> key to cycle through the available output formats until a picture displays on the TV.</li></ol>
<b>No graphics or program guides appear on the TV screen</b>	<p>If you use the IEEE 1394 connection, on-screen graphics, including closed captions and program guides, are not displayed. If possible, use HDMI or component video instead.</p>
<b>No closed captions display</b>	<p>Verify on the User Settings menu that closed captions are enabled on the cable terminal.</p> <p>Verify that closed captions are enabled on the TV.</p>



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**Problem**

**Possible Solution**

---

**There are black bars to the right and left of the picture**

Widescreen TVs display 4:3 programs in this format unless set to Stretch. Turn on the 4:3 OVERRIDE feature in the User Settings menu. This enables most widescreen TVs to stretch the video to fill the screen (see your TV manual for information about stretching 4:3 video).

If the cable terminal is connected to a widescreen TV, verify that the TV TYPE is set to 16:9 in the User Settings menu.

Many HD programs are broadcast in pillar-box format with black bars to the left and right of the picture. These programs are broadcast in 16:9 HD formats, even though the video is not 16:9.

---

**There are black bars above and below the picture**

All 4:3 HDTVs display HD programs in letterbox format (black bars above and below the picture) because of the shape of the display screen.

Turn on the 4:3 OVERRIDE feature in the User Settings menu. This enables most standard screen TVs to display a full screen picture when the cable terminal is tuned to a 4:3 program.

Set the TV TYPE to 4:3 Pan-Scan. This enables the cable terminal to remove the black bars above and below the picture when possible.

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 (see your TV manual for information about zooming 4:3 video).

---

<b>Problem</b>	<b>Possible Solution</b>
<b>There are black bars on all four sides of the picture</b>	<p>This may occur on a 4:3 TV if the 4:3 OVERRIDE setting is OFF. To set 4:3 SD programming to fill the screen, depending on the capabilities of the TV, set 4:3 OVERRIDE to 480i or 480p.</p> <p>This may occur on a 16:9 TV if the active video for an SD broadcast is in letterbox format. To confirm, wait for a commercial or look for a graphic, such as a network logo. If the commercial fills the screen from top to bottom, or the graphic appears below the active video, the program is being letterboxed by the broadcaster. You can minimize this by activating the zoom feature on the TV.</p> <p>A broadcaster may include black bars on either side of a widescreen 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. You may be able to minimize the border using the zoom feature on the TV.</p>
<b>The cable terminal is making a humming noise.</b>	<p>The DCT3412 includes an integrated hard drive and a fan for cooling. During normal operation, the DCT3412 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 DCT3412. Please note the hard drive will stay on even when the DCT3412 is turned off.</p>

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