



Cisco DSAN Auxiliary Input Box (DAXI) Installation Guide

For Your Safety

Explanation of Warning and Caution Icons

Avoid personal injury and product damage! Do not proceed beyond any symbol until you fully understand the indicated conditions.

The following warning and caution icons alert you to important information about the safe operation of this product:

-  You may find this symbol in the document that accompanies this product. This symbol indicates important operating or maintenance instructions.
-  You may find this symbol affixed to the product. This symbol indicates a live terminal where a dangerous voltage may be present; the tip of the flash points to the terminal device.
-  You may find this symbol affixed to the product. This symbol indicates a protective ground terminal.
-  You may find this symbol affixed to the product. This symbol indicates a chassis terminal (normally used for equipotential bonding).
-  You may find this symbol affixed to the product. This symbol warns of a potentially hot surface.
-  You may find this symbol affixed to the product and in this document. This symbol indicates an infrared laser that transmits intensity-modulated light and emits invisible laser radiation or an LED that transmits intensity-modulated light.

Important

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

Notices

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Cisco DAXI Product Notices

System Release

The DAXI is compatible with DSAN System Release 1.1.45 and greater.

Important Safety Instructions

Read and Retain Instructions

Carefully read all safety and operating instructions before operating this equipment, and retain them for future reference.

Follow Instructions and Heed Warnings

Follow all operating and use instructions. Pay attention to all warnings and cautions in the operating instructions, as well as those that are affixed to this equipment.

Terminology

The terms defined below are used in this document. The definitions given are based on those found in safety standards.

Service Personnel - The term *service personnel* applies to trained and qualified individuals who are allowed to install, replace, or service electrical equipment. The service personnel are expected to use their experience and technical skills to avoid possible injury to themselves and others due to hazards that exist in service and restricted access areas.

User and Operator - The terms *user* and *operator* apply to persons other than service personnel.

Ground(ing) and Earth(ing) - The terms *ground(ing)* and *earth(ing)* are synonymous. This document uses *ground(ing)* for clarity, but it can be interpreted as having the same meaning as *earth(ing)*.

Electric Shock Hazard

Because of the potential for higher humidity, the presence of moisture, the proximity to ground potential and the possibility that hazardous voltages may be present on network connected cables, there is a greater risk of electric shock when working with electronic equipment in the outdoor environment.

To minimize the likelihood and effect of electric shock, follow the instructions in this warning and the precautions below.



WARNING:

To reduce risk of electric shock, perform only the instructions that are included in the operating instructions. Refer all servicing to qualified service personnel only.

Important Safety Instructions

- Do not work in rain, fog or snow conditions.
- Ensure equipment and cables are dry.
- Wear shoes with soles made of insulated material e.g. rubber, vinyl, etc.
- When making electrical connections, work with one hand in your pocket and avoid accidental contact with grounded surfaces.
- Use insulated tools to make electrical connections.
- Make all other connections before connecting power to the equipment.

Installation

This equipment should be installed by qualified service personnel and should comply with national and local requirements.

Note to the Installer

<p>Note to CATV System Installer (U.S.A. and Canada Only)</p> <p>This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC (Section 54, Part I of the Canadian Electrical Code), that provides guidelines for proper grounding and, in particular, specifies that the CATV cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.</p>	 <p>CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN</p> <p>AVIS RISQUE DE CHOC ÉLECTRIQUE NE PAS OUVRIR</p>
 <p>This symbol is intended to alert you that uninsulated voltage within this product may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any inside part of this product.</p>	<p>CAUTION: To reduce the risk of electric shock, do not remove cover (or back). No user-serviceable parts inside. Refer servicing to qualified service personnel.</p> <p>WARNING TO PREVENT FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.</p>  <p>This symbol is intended to alert you of the presence of important operating and maintenance (servicing) instructions in the literature accompanying this product.</p>

Equipment Placement

 **WARNING:**
Avoid personal injury and damage to this equipment. An unstable mounting surface may cause this equipment to fall.

To protect against equipment damage or injury to personnel, comply with the following:

- If this equipment uses AC power, place this equipment close enough to a mains AC outlet to accommodate the length of this equipment's power cord.
- Route all power cords so that people cannot walk on, place objects on, or lean objects against them. This may pinch or damage the power cords. Pay particular attention to power cords at plugs, outlets, and the points where the power cords exit this equipment.
- Make sure the mounting surface or rack is stable and can support the size and weight of this equipment.

Outdoor Equipment Placement

Cisco equipment intended for outdoor installation is designed to be water-resistant, not water-proof. To protect against equipment damage or injury to personnel, install outdoor equipment so that it is:

- Protected from rain or accumulations of snow as much as possible.
- Not subject to direct water jets from sprinkler systems or garden hoses.
- Not subject to flooding.
- Positioned with cable connectors on the underside to minimize water entry by gravity.

Outdoor Equipment Cabling

To protect outdoor equipment cables, comply with the following:

- Protect cables from chaffing and sharp edges when routing them through building walls or around corners.
- Provide adequate support for cables to prevent strain or sagging.
- Provide a low loop in the cable close to its connection point to the equipment to minimize water ingress and to provide strain relief for the connector.
- Seal outdoor cable/connector joints against moisture ingress using silicone caulk or outdoor sealing tape.

Ventilation



WARNING:

Avoid electric shock and fire hazard! Never push objects through the openings in this equipment. Foreign objects can touch dangerous voltage points or cause electrical shorts that can result in electric shock or fire.

Important Safety Instructions

This equipment may have openings for ventilation that protect it from overheating. To ensure the reliability of this equipment, do not obstruct the openings.

- Do not place other equipment, lamps, books, or other objects on top of this equipment.
- Do not place this equipment in any of the following locations.
 - On a bed, sofa, rug, or similar surface
 - Over a radiator or a heat register
 - In an enclosure, such as a bookcase or equipment rack, unless the installation provides proper ventilation

Handling Precautions

When moving a cart that contains this equipment, check for any of the following possible hazards:



WARNING:



Avoid personal injury and damage to this equipment! Move any equipment and cart combination with care. Quick stops, excessive force, and uneven surfaces may cause this equipment and cart to overturn.

Cleaning the Equipment

Before cleaning this equipment, disconnect it from its electrical power source. Use a damp cloth to clean this equipment. Do not use a liquid cleaner or an aerosol cleaner. Do not use a magnetic/static cleaning device (dust remover) to clean this equipment.

Object and Liquid Entry

Never push objects of any kind into this equipment through openings, as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Do not expose this equipment to liquid or moisture. Do not place this equipment on a wet surface. Do not spill liquids on or near this equipment.

Overloading

For equipment that uses AC power, do not overload electrical outlets, extension cords, or integral convenience receptacles, as this can result in a risk of fire or electric shock. For equipment that requires battery power or other sources to operate, refer to the operating instructions for that equipment.

Lightning and Power Surges

To protect this equipment against damage from lightning storms and power-line surges, do the following where applicable:

- Disconnect the power cord from the grounded mains electrical outlet and disconnect the antenna or cable system under the following circumstances.
 - During lightning storms, or
 - When you are not using this equipment for an extended period
- Ground your antenna system to provide some protection against voltage surges and built-up static charge.

Power Sources



WARNING:

Avoid electric shock and fire hazard! Do not overload electrical outlet and extension cords. For equipment that requires battery power or other sources to operate, refer to the operating instructions for that equipment.

- A label on this equipment indicates the correct power source for this equipment. If this equipment uses AC power, operate this equipment only from an electrical outlet with the voltage and frequency indicated on the equipment label.
- If this equipment plugs into an outlet, the outlet must be near this equipment, and must be easily accessible.
- This equipment may have two power sources. Be sure to disconnect all power sources before working on this equipment.
- If this equipment **does not** have a main power switch, the power cord connector serves as the disconnect device.
- Always pull on the plug or the connector to disconnect a cable. Never pull on the cable itself.
- Unplug this equipment if it will be unused for long periods of time.
- If you are uncertain of the type of power supply to your home or business, consult your local power company.

Grounding

This section provides instructions for verifying that the equipment is properly grounded.

Important Safety Instructions

Safety Plugs (USA Only)

If this equipment uses AC power, it may be equipped with either a 3-terminal (grounding-type) safety plug or a 2-terminal (polarized) safety plug. The wide blade or the third terminal is provided for safety. Do not defeat the safety purpose of the grounding-type or polarized safety plug.

To properly ground this equipment, follow these safety guidelines:

- **Grounding-Type Plug** - For a 3-terminal plug (one terminal on this plug is a protective grounding pin), insert the plug into a grounded mains, 3-terminal outlet.
Note: This plug fits only one way. If this plug cannot be fully inserted into the outlet, contact an electrician to replace the obsolete 3-terminal outlet.
- **Polarized Plug** - For a 2-terminal plug (a polarized plug with one wide blade and one narrow blade), insert the plug into a polarized mains, 2-terminal outlet in which one socket is wider than the other.
Note: If this plug cannot be fully inserted into the outlet, try reversing the plug. If the plug still fails to fit, contact an electrician to replace the obsolete 2-terminal outlet.

Grounding Terminal

If this equipment is equipped with an external grounding terminal, attach one end of an 18-gauge wire (or larger) to the grounding terminal; then, attach the other end of the wire to a ground, such as a grounded equipment rack.

Safety Plugs (European Union)

- **Class I Mains Powered Equipment** – Provided with a 3-terminal AC inlet and requires connection to a 3-terminal mains supply outlet via a 3-terminal power cord for proper connection to the protective ground.
Note: The equipotential bonding terminal provided on some equipment is not designed to function as a protective ground connection.
- **Class II Mains Powered Equipment** – Provided with a 2-terminal AC inlet that may be connected by a 2-terminal power cord to the mains supply outlet. No connection to the protective ground is required as this class of equipment is provided with double or reinforced and/or supplementary insulation in addition to the basic insulation provided in Class I equipment.
Note: Class II equipment, which is subject to EN 50083-1, is provided with a chassis-mounted equipotential bonding terminal. See the section titled **Equipotential Bonding** for connection instructions.

Equipotential Bonding

If this equipment is equipped with an external chassis terminal marked with the IEC 60417-5020 chassis icon () , the installer should refer to CENELEC standard EN 50083-1 or IEC standard IEC 60728-11 for correct equipotential bonding connection instructions.

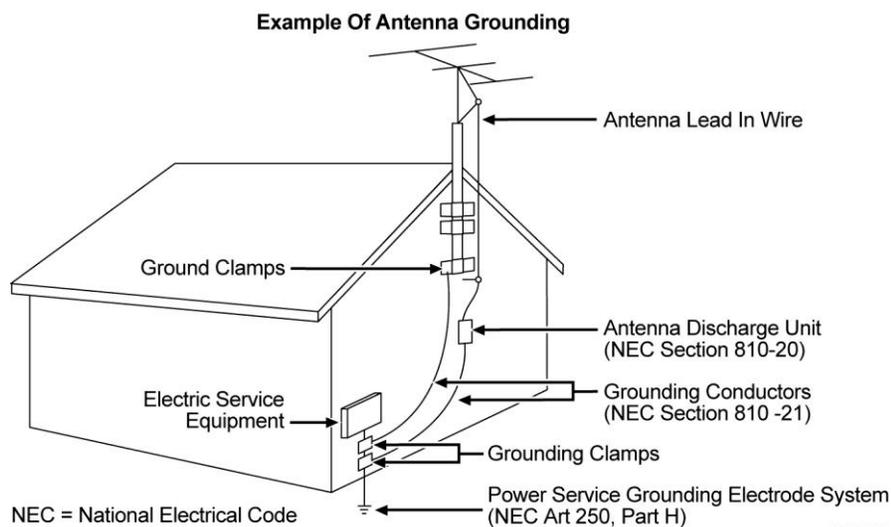
Outdoor Grounding System

If this equipment connects to an outdoor antenna or cable system, be sure the antenna or cable system is grounded. This provides some protection against voltage surges and built-up static charges.

Section 810 of the National Electric Code (NEC), ANSI/NFPA No. 70-1999, provides the following information:

- Grounding of the mast and supporting structure
- Grounding the lead-in wire to an antenna discharge unit
- Size of the grounding conductors
- Location of the antenna-discharge unit
- Connection to grounding electrodes
- Requirements for the grounding electrodes

For European Union countries, refer to CENELEC standard EN 50083-1 for grounding information.



Important Safety Instructions

Servicing



WARNING:

Avoid electric shock! Opening or removing this equipment's cover may expose you to dangerous voltages.

Do not open the cover of this equipment. Refer all servicing to qualified personnel only. Contact us for instructions.

Damage that Requires Service

For damage that requires service, disconnect this equipment from its electrical power source. Refer service to qualified service personnel when any of the following occurs:

- There is damage to the power cord or plug.
- Liquid enters the equipment.
- A heavy object falls on the equipment.
- Operation is not normal (the instructions in this manual describe the proper operation).
- You drop this equipment, or damage the cabinet of this equipment.
- This equipment exhibits a distinct change in performance.

Upon completion of any service or repairs to this equipment, ask the service technician to perform safety checks to determine that the equipment is in proper operating condition.



CAUTION:

Avoid damage to this equipment! Adjust only what the operating instructions describe. Improper adjustment of controls may result in damage that may require extensive corrective work by qualified service personnel.

Replacement Parts

When replacement parts are required, be sure the qualified service personnel has used parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.

Safety Check

Upon completion of any service or repairs to this equipment, ask the service technician to perform safety checks to determine that this equipment is in proper operating condition.

Modifications

This equipment has been designed and tested to comply with applicable safety, laser safety, and EMC regulations, codes, and standards to ensure safe operation in its intended environment. Refer to this equipment's data sheet for details about regulatory compliance approvals.

Do not make modifications to this equipment. Any changes or modifications could void the user's authority to operate this equipment.

Modifications have the potential to degrade the level of protection built into this equipment, putting people and property at risk of injury or damage. Those persons making any modifications expose themselves to the penalties arising from proven non-compliance with regulatory requirements and to civil litigation for compensation in respect of consequential damages or injury.

Accessories

Use only attachments or accessories specified by the manufacturer.



CAUTION:

Maintain electrical safety! Power-operated equipment or accessories that you connect to this equipment should bear the UL listing mark or CSA certification mark on the accessory itself, and should not be modified so as to defeat the safety features. This will help avoid any potential for electric shock or fire. If in doubt, contact qualified service personnel.

Mounting Accessories



CAUTION:

Use this equipment only with a cart, stand, bracket, table, or other mounting accessories that meet Cisco specifications. Carefully follow all instructions for proper mounting.

Electromagnetic Compatibility Regulatory Requirements

This equipment meets applicable electromagnetic compatibility (EMC) regulatory requirements. Refer to this equipment's data sheet for details about regulatory compliance approvals. EMC performance is dependent upon the use of correctly shielded cables of good quality for all external connections, except the power source, when installing this equipment.

- Ensure compliance with cable/connector specifications and associated installation instructions where given elsewhere in this manual.

Otherwise, comply with the following good practices:

- Multi-conductor cables should be of double-braided shielded type and have

Important Safety Instructions

conductive connector bodies and backshells with cable clamps that are conductively bonded to the backshell and capable of making 360° connection to the cable shielding. Exceptions from this general rule will be clearly stated in the connector description for the excepted connector in question.

- Ethernet cables should be of the double-shielded type.
- Coaxial cables should be of the double-braided shielded type.

EMC Compliance Statements

Where this equipment is subject to USA FCC and/or Industry Canada rules, the following statements apply:

FCC Declaration of Conformity

This device complies with *Part 15 of FCC Rules*. Operation is subject to the following two conditions: 1) The device may not cause harmful interference, and 2) The device must accept any interference received, including interference that may cause undesired operation.

FCC Statement for Class B Equipment

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 a 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 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 or more of the following measures:

- Reorient 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.

Industry Canada - Industrie Canadienne Statement

This apparatus complies with Canadian ICES-003.
Cet appareil est conforme à la norme NMB-003 du Canada.

1

Introduction

This chapter gives an overview of the purpose, features, and operation of the Cisco DSAN Auxiliary Input Box (DAXI).

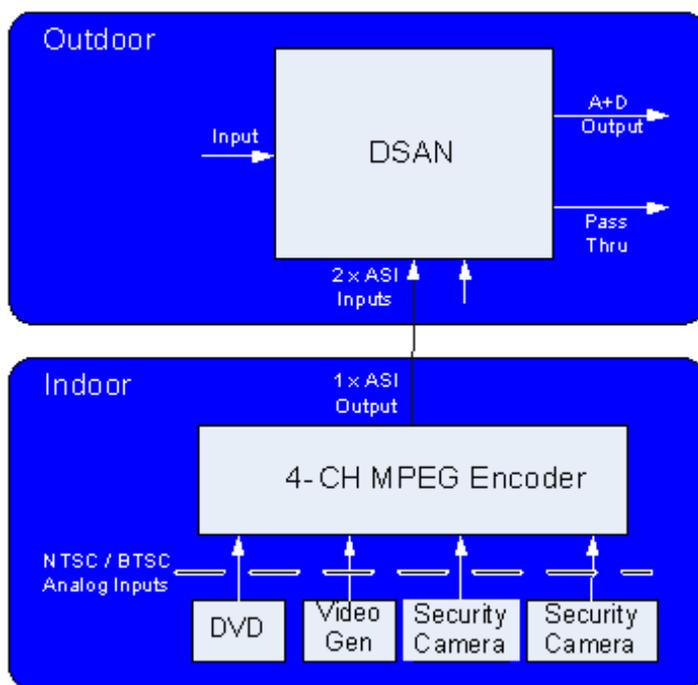
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■ In the Box	3
■ DAXI Features	4
■ DAXI Operation	5

Product Overview

The DAXI is an accessory for the Cisco DSAN System that converts up to four analog video channels to digital format for distribution via the DSAN.

The DAXI provides baseband video and audio conversion to MPEG-2 Transport Stream (TS). The output is carried over one Asynchronous Serial Interface (ASI) channel at 270 Mbps to the DSAN Aux1 or Aux2 input port. The content that the DAXI converts can come from external sources such as a DVD player, analog security camera, or character generator.



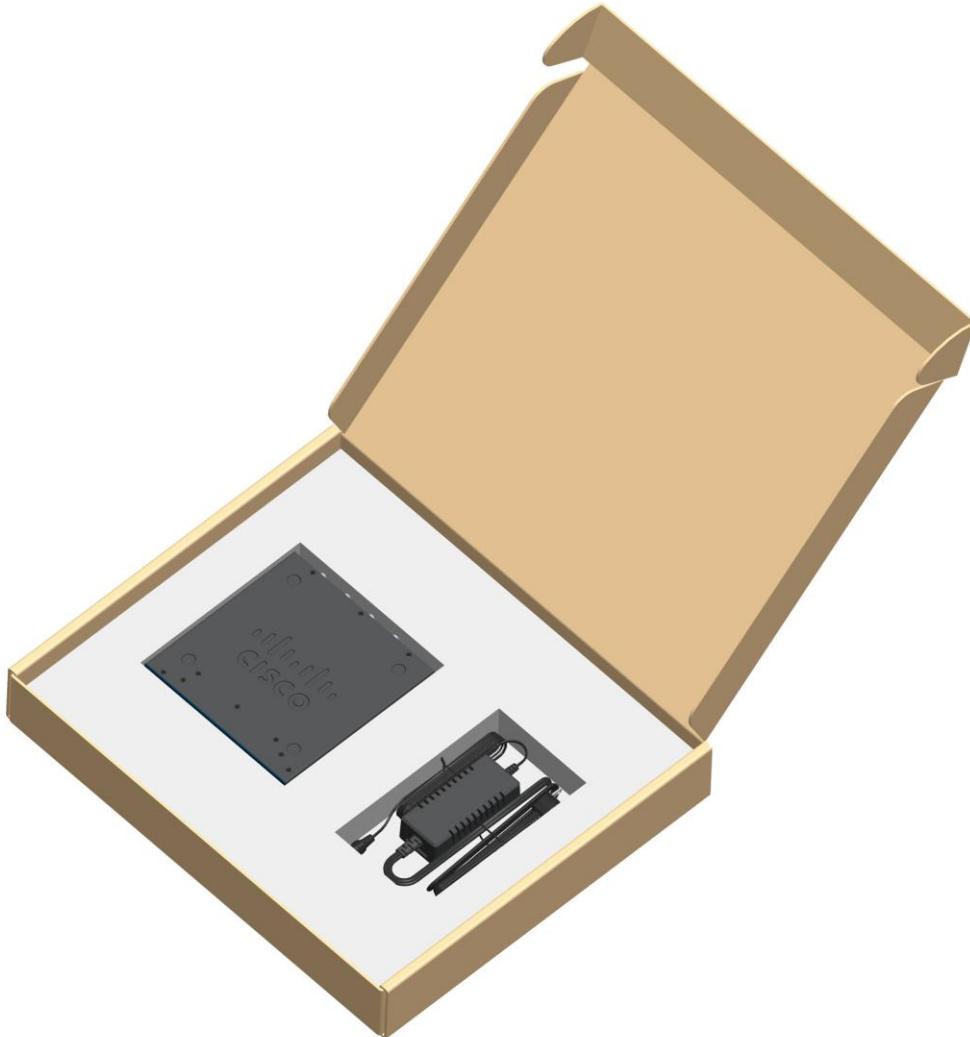
The DAXI is targeted for indoor applications. It is simple to install and requires no maintenance or remote management. It can be mounted on a rack, wall, or shelf.

The DAXI accepts four analog baseband video composite signals over RCA jacks, and their corresponding analog stereo baseband audio signals over female RCA connectors. The DAXI also provides one standard ASI output on an F jack connector.

The DAXI is powered by an external power supply at +12 VDC.

In the Box

The DAXI ships with an external +12 VDC power supply module, as shown below.



DAXI Features

- 4:1 baseband to MPEG-2 encoding
- ASI output
- Requires no user configuration
- Stackable, 1 RU profile
- SCTE 21 Closed Caption support
- Automatic Gain Control for video
- Integrated frame synchronizer with internal reference

DAXI Front Panel

The DAXI front panel contains the LED indicators and air inlets for the dual cooling fans.



DAXI Back Panel

The back panel contains all input and output connections:

- ASI output
- Video and audio inputs 1-4
- DC power input



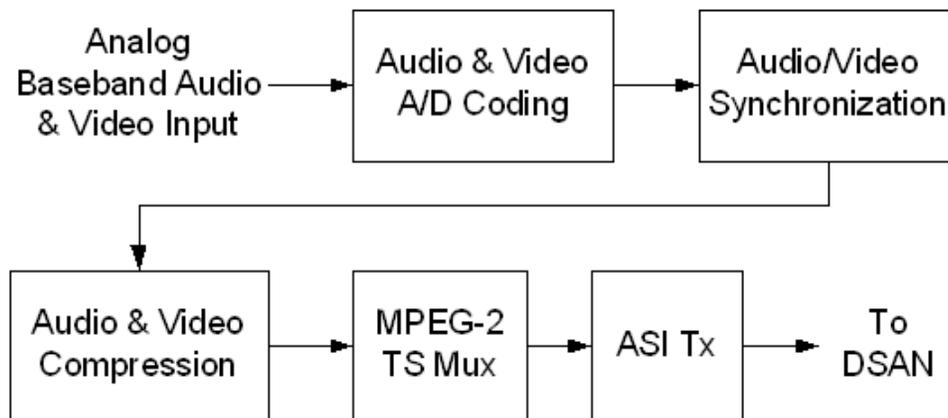
DAXI Operation

The DAXI converts up to four auxiliary channels of analog video and audio content to a single digital data stream for input to the DSAN via its Aux1 or Aux2 input port. Both DSAN Aux ports can be active at the same time, allowing for connection of two DAXI units to support up to eight auxiliary channels.

The DSAN recovers the individual content channels from the DAXI data stream and assigns them to EIA channels in accordance with its current configuration.

Signal Processing

The DAXI accepts analog baseband audio and video signals, converts these signals to digital form, and synchronizes the audio and video data from each channel. It then compresses audio using AC-3 encoding and video using MPEG-2 encoding, multiplexes the channels into an MPEG-2 transport stream, and sends this transport stream to the DSAN over a DVB ASI link.



Status Reporting

The ASI stream that the DAXI sends to the DSAN includes telemetry for status reporting. The DAXI reports its unit ID, video input states, and any alarms in a status report to the host DSAN.

The DAXI operates in an allowable environment of 0 to 50°C (32 to 122°F). Control circuitry inside the DAXI periodically reads the output of an on-board temperature sensor and compares it to defined upper and lower thresholds. The DAXI sends an alarm if the temperature is higher or lower than the threshold, or if it detects that one or both internal fans is inoperative.

2

Installation

This chapter provides instructions for installing the DAXI in your cable system.

In This Chapter

- Before You Begin..... 8
- Installing the DAXI..... 10
- Connecting Cables to the DAXI..... 14

Before You Begin

Before you start installing the DAXI, make sure you have all of the tools and accessories needed for installation.

No tools are needed when mounting the DAXI on a shelf or countertop. Wall or rack mounting requires screwdrivers of the appropriate type and size. Wall mounting may also require tools for drilling holes into the mounting surface.

The main accessories needed for installation are the cables that interconnect various source components to the DAXI, and an ASI cable that connects the DAXI to the DSAN unit.

Auxiliary Channel Mapping

You also need to know how the host DSAN maps EIA channels to auxiliary inputs. You can obtain this information from plant documentation or by examining the DSAN configuration through its command line interface (CLI). For additional information on CLI, see the *Cisco DSAN System Installation and Operation Guide*, part number 4032302.

Tools and Accessories

You may need one or more of the following items to install the DAXI:

- #2 Phillips screwdriver for attaching the DAXI to a wall or rack mounting bracket
- #8 mounting hardware (not provided) for attaching the DAXI to a wall or rack mounting bracket
- #10-32 screws and nuts (not provided) for securing the DAXI rack mounting bracket in a rack
- Screwdriver for attaching the DAXI power supply wall bracket
- ASI cable for connecting the DAXI output to the DSAN Aux1 or Aux2 input
- RCA cables for connecting source component audio and video outputs to DAXI inputs

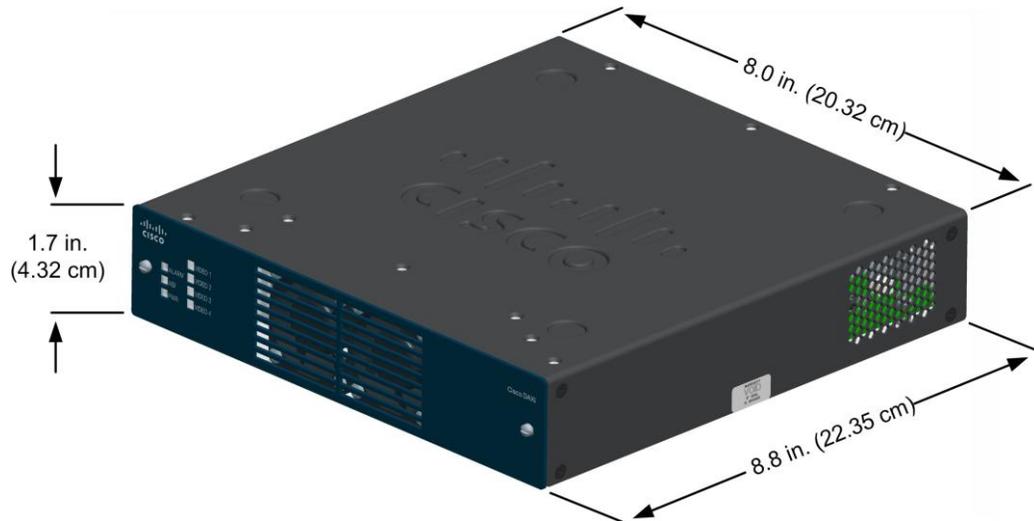
Weight Specifications

When mounting the DAXI unit or pair of units on a shelf or other flat surface, note that each DAXI and its power supply together weigh 4.4 lb (2 kg). The mounting surface should be sturdy enough to hold this weight in addition to any other load that may be present.

Housing Dimensions

This illustration shows the dimensions of the DAXI unit and the power supply bracket. Use these measurements to calculate clearance requirements for your installation.

DAXI Dimensions



Installing the DAXI

You can install the DAXI and its power supply in any of the following ways:

- On a shelf
- On a wall
- In a 19-inch equipment rack

The following procedures explain how to install the DAXI using each method.

Note: Wall or rack mounting requires accessory kit part number 4036620, available separately.

To Install the DAXI on a Shelf

Complete the following steps to install the DAXI on a shelf.

- 1 Carefully select and prepare the area to receive the DAXI.
 - For proper ventilation, choose a location that allows at least 1 inch of free space at the rear and on each side for cooling air to exit the unit.
 - For proper ventilation, choose a location that allows at least 6 inches of free space at the front for air to enter the unit.
 - Consider the weight of the DAXI and all attached cabling and accessories.
 - Consider any possible accidental impact from passing foot traffic or moving objects. Avoid mounting the unit in high-traffic areas.
 - Consider any additional stress that may be placed on the mounting surface and hardware by accidental snagging of attached cabling.
- 2 Position the DAXI on the shelf.
- 3 Proceed to *Connecting Cables to the DAXI* (on page 14).

Note: When stacking a pair of DAXI units to provide up to 8 auxiliary program channels, use the four dimples in the top of the lower unit to cradle the feet of the upper unit, as shown below.



To Install the DAXI on a Wall

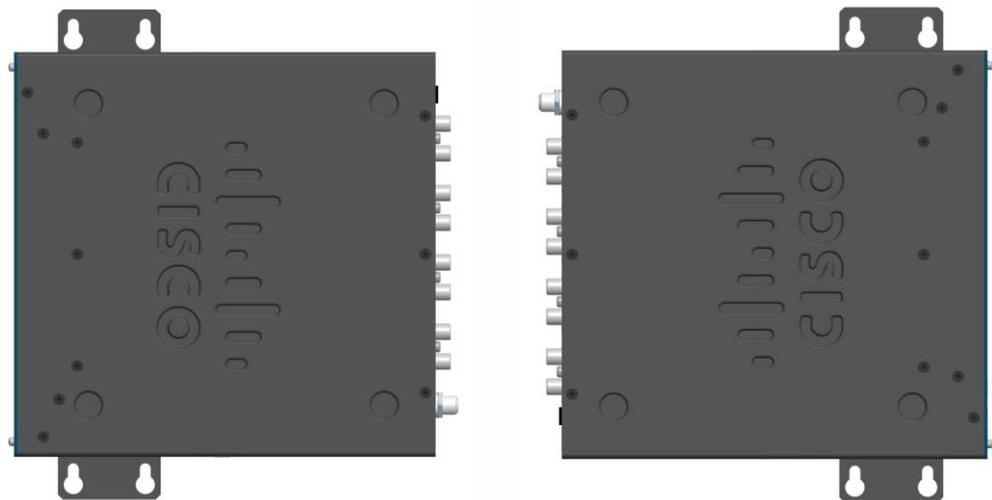
Complete the following steps to install the DAXI and its power supply on a wall.

- 1 Carefully select and prepare the area to receive the DAXI unit.
 - Consider the weight of the DAXI, DC power supply, mounting brackets, and all attached cabling.
 - Consider any possible accidental impact from passing foot traffic or moving objects. Avoid mounting the unit in high-traffic areas.
 - Consider any additional stress that may be placed on the mounting surface and hardware by accidental snagging of attached cabling.
 - When mounting the unit on a wall, choose a location that allows for mounting into studs, if possible. Use the DAXI and DC power supply mounting brackets as guides.

Note: You can wall-mount the DAXI in any of four orientations: facing up, facing down, facing left, or facing right.

Chapter 2 Installation

- 2 Using the wall-mounting bracket as a guide, mark the location of four screw holes in the mounting surface. Prepare the screw holes for installation as needed, possibly by drilling pilot holes or installing wall anchors.
- 3 Install four #8 mounting screws (not provided) in the holes. Choose a thread type suitable for the wall material, and leave the heads at least three threads from the mounting surface.
- 4 Attach the mounting bracket (part number 4033734, included in accessory kit part number 4036620) to the DAXI as follows:
 - Place the DAXI upside-down on a firm surface with the DAXI wall-mounting bracket resting loose on top.
 - If necessary, flip the mounting bracket to position its keyed mounting holes correctly with respect to gravity in the final installation. For example, when mounting the DAXI facing left, position the keyed mounting holes so the bracket slides over and down to lock behind the heads of the wall mounting screws.



- Align the four mounting holes in the wall mounting bracket with the mounting holes in the bottom of the DAXI.
 - Install four #8-32 flat-head screws through the mounting bracket and into the threaded holes in the bottom of the DAXI.
- 5 Holding the DAXI housing in its final orientation, slip the keyed holes in the mounting bracket over the heads of the wall-mounting screws installed earlier.
 - 6 Proceed to *Connecting Cables to the DAXI* (on page 14).

To Install the DAXI in a Rack

The DAXI rack mount bracket holds one or two DAXI units and installs in a standard 19-inch equipment rack.

Complete the following steps to install the DAXI in a rack.

- 1 Place the DAXI unit upside-down on the work surface.

Note: When mounting a pair of DAXI units, lay the units side-by-side with their front panels facing the same direction and about one inch apart.

- 2 Lay the rack mount bracket (part number 4031305, included in accessory kit 4036620) on top of the DAXI unit(s) and line up the bracket with the four mounting holes on the bottom of the DAXI housing(s).



- 3 Install four #8-32 flat-head screws through the mounting bracket and into the tapped holes in the DAXI enclosure(s).
- 4 Invert the assembly and confirm that it appears as shown in the accompanying illustration.
- 5 Install the assembly in an available 19-inch rack using four #10-32 machine screws and compatible nuts. The screws should be long enough to extend at least two threads beyond the outer face of the nut. Torque the screws from 25 to 30 in-lb (2.8 to 3.4 Nm).
- 6 Proceed to *Connecting Cables to the DAXI* (on page 14).

Connecting Cables to the DAXI

All input, output, and power connections to the DAXI are made via the DAXI back panel, as shown in the following illustration.



To Connect the Output Cable

Insert the plug from the ASI cable in the jack labeled ASI OUT at far left on the DAXI back panel.

Note: To allow for connection to an outside DSAN, the ASI output port is surge protected, and the length of the ASI cable from DAXI to DSAN can be up to 250 meters of Belden 8281 or equivalent.

To Connect Input Cables

For the first auxiliary program source, connect the video output and left and right audio output cables to the RCA jacks marked VIDEO 1, AUDIO 1 L, and AUDIO 1 R on the DAXI back panel.

For each additional program source, connect the video and audio output cables to the appropriate RCA jacks on the DAXI back panel.

Note: Double-check that all RCA cables are firmly inserted into their respective jacks. These non-locking connectors can back out easily. Be especially mindful of this using a BNC to RCA adapter on the video cable.

To Connect Power

Insert the plug from the +12 VDC power supply in the jack labeled +12V at far right on the DAXI back panel.

3

Operation

Introduction

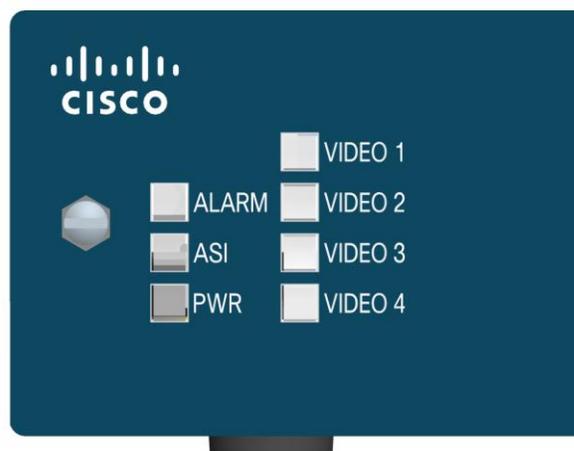
This chapter provides instructions for confirming normal operation of the DAXI and for confirming the correct program output.

In This Chapter

- Confirming Normal Operation 16
- Confirming Program Output 17

Confirming Normal Operation

After installing the DAXI, confirm normal operation of the unit by checking the status of the front-panel LED indicators.



PWR Indicator

Check that the PWR LED is ON. This indicates that the unit is receiving +12 VDC power.

ALARM Indicator

Verify that the ALARM LED is OFF. This indicates that there are no alarm conditions present in the DAXI that would prevent normal operation or cause it to report status to the DSAN, resulting in traps being sent to the network management system.

VIDEO Indicators

Check the status of the LEDs labeled VIDEO1-VIDEO4. These LEDs represent the four analog program input channels on the DAXI. If a channel receives video, its corresponding LED is ON.

ASI Indicator

Finally, confirm that the ASI LED is ON. This indicates that the DAXI has completed initialization and is sending program data to the DSAN.

Confirming Program Output

After verifying normal DAXI operation, you should confirm the quality of video and audio on each active Aux program channel.

To do this, you must know which EIA channels the host DSAN uses to display Aux content. This information is often available from system records. If it is not, you can use the DSAN CLI to examine the DSAN Auxiliary Input Status page and learn which channels are used for Aux content.

The following illustration shows an example of a DSAN channel map as displayed in the CLI.

```

----- Auxiliary Input Status -----
AUX ID      Port      Type      EIA Ch      Status
  1          A1        DAXI       6           OK
  2          A1        DAXI      95           OK
  3          A1        DAXI      96           OK
  4          A1        DAXI      97           OK
  5          A2        DAXI      98           OK
  6          A2        DAXI      99           OK
  7          A2        DAXI      14           OK
  8          A2        DAXI      15           OK

PORT A1      OK
Sw: 1.0.0.37  Temp: 25 deg C   Fan1: OK      Fan2: OK
Model: 2      Serial: AAJAHEB  Mfg Date: 03/01/11  TOS: 195 hours
Uptime: 5 days 7 hr 2 min 27 sec

PORT A2      OK
Sw: 1.0.0.37  Temp: 25 deg C   Fan1: OK      Fan2: OK
Model: 2      Serial: ABHEAJH  Mfg Date: 12/01/10  TOS: 302 hours
Uptime: 0 days 3 hr 2 min 27 sec

--- Pg: 11.0  <CR>:Refresh  p<CR>:Pg 10.0  n<CR>:Pg 12.0  x<CR>:Exit ---
>>>

```

This example shows all eight auxiliary channels in use (Status = OK). This indicates that two DAXI units are connected, and that each DAXI has a program source connected at VIDEO1, VIDEO2, VIDEO3, and VIDEO4. The source connected to the PORT A1 DAXI at VIDEO1 is mapped to EIA channel 6, while the source connected to the PORT A2 DAXI at VIDEO1 is mapped to EIA channel 98.

Chapter 3 Operation

Information displayed for PORT A1 and PORT A2 includes the following:

Parameter	Description
Status	Status for the DAXI box attached to the corresponding port; OK = in use
SW	Software version number
Temp	Temperature in degrees Celsius
Fan1 or Fan2	Fan status; operational = OK
Model	Model number
Serial	Serial number
Mfg Date	Manufacturing date code in mm/dd/yyyy format
TOS	Time of service
Uptime	Time since last DAXI reboot

For further details on using the CLI, see the *Cisco DSAN System Installation and Operation Guide*, part number 4032302.

4

Troubleshooting

Introduction

In the unlikely event of a problem with DAXI operation, use the information in this chapter to help identify and resolve the issue.

In This Chapter

- Troubleshooting Common Problems..... 20
- Alarm Troubleshooting..... 22

Troubleshooting Common Problems

The problems most likely to arise when operating the DAXI fall into the following categories:

- Unit does not power up at all
- Unit powers up but provides no ASI output to DSAN
- Unit provides ASI output but a video or audio channel is missing

The information in this chapter may help in identifying and resolving these common problems. For further assistance if needed, please contact your local customer support representative. See *Customer Support Information* (on page 23) for contact information.

No Power-Up

If the PWR LED is OFF, the DAXI is not receiving the +12 VDC power needed to operate. Possible causes include:

- Power supply unplugged from wall outlet
- Power supply disconnected from back of DAXI
- Blown circuit breaker or fuse affecting wall outlet
- Defective +12 VDC power supply

Visually inspect for an unplugged or disconnected power supply and verify that the wall outlet has AC power by plugging in a lamp or other simple AC appliance.

If these steps do not clearly identify the cause of the problem, suspect a defective DC power supply. Refer the unit to your local customer support center for servicing. See *Customer Support Information* (on page 23) for contact information.

No ASI Output

When power is applied to the DAXI, the PWR LED should come on immediately. The ASI LED should come on about 100 seconds later, after the DAXI has booted up and is ready to provide output. The ASI LED will turn on and a transport stream will be output even if no audio or video input is attached.

If the ASI LED remains off, the most likely cause is an internal problem with the DAXI. Refer the unit to your local customer support center for servicing. See *Customer Support Information* (on page 23) for contact information.

Missing Video

If a DAXI with two or more auxiliary sources connected boots up normally (PWR LED and ASI LED both ON) but the video portion of one or more channels is missing (VIDEO LED OFF), check for one or more of the following:

- The missing service or services are not provisioned on the DSAN.
- The DAXI ASI output is either not connected to the DSAN or the ASI interconnecting cable has excessive loss. The use of no more than 250 meters of Belden 8281 cable or equivalent should ensure that the signal reaching the DSAN exceeds its input sensitivity threshold.
- There is a loose video cable connection between the program source and the DAXI. To verify a loose or defective video cable, swap the input connections at the DAXI back panel and see if the problem goes away or moves to a new channel. If the missing video problem remains with a particular auxiliary channel for two or more sources and cables, there may be an internal fault in the DAXI.

Refer the unit to your local customer support center for servicing, if needed. See *Customer Support Information* (on page 23) for contact information.

Alarm Troubleshooting

If the DAXI ALARMS LED is ON, one or more alarm conditions may be present. When ON, this LED has two possible states:

- It glows red to indicate failure of both internal fans.
- It glows yellow to indicate failure of one internal fan, or to indicate that the operating temperature of the unit is above or below allowable operating range.

For a yellow ALARM LED, you can determine whether the problem is fan or temperature related by visual inspection for fan movement, or by examining the Alarm Status page in the DSAN CLI. For details on using the CLI, see the *Cisco DSAN System Installation and Operation Guide*, part number 4032302.

The allowable operating temperature range of the DAXI is 0 to 50°C (32 to 122°F) ambient. (The operating temperature inside the DAXI is typically 3 to 5 degrees above ambient.) If the ALARM LED glows yellow and both fans appear to operate normally, the DAXI may be operating outside these limits. If the problem is temperature related, the unit may be operating in a location that is too cool or too warm, or that blocks one or more of the DAXI air vents. If so, correct this problem and see if the alarm clears.

If the problem is fan related, refer the unit to your local customer support center for servicing or to order replacement fan kits, part number 4036946. See *Customer Support Information* (on page 23) for contact information.

5

Customer Support Information

Introduction

This chapter contains information on obtaining product support.

Obtaining Product Support

IF...	THEN...
you have general questions about this product	contact your distributor or sales agent for product information or refer to product data sheets on www.cisco.com .
you have technical questions about this product	call the nearest Technical Support center.
you have customer service questions about this product	call the nearest Customer Service center.

In This Chapter

- Support Telephone Numbers..... 24

Support Telephone Numbers

This table lists the Technical Support and Customer Service numbers for your area.

Region	Centers	Telephone and Fax Numbers
North America	Cisco Services Atlanta, Georgia United States	For <i>Technical Support</i> , call: <ul style="list-style-type: none"> ■ Toll-free: 1-800-722-2009 ■ Local: 678-277-1120 (Press 2 at the prompt) For <i>Customer Service</i> , call: <ul style="list-style-type: none"> ■ Toll-free: 1-800-722-2009 ■ Local: 678-277-1120 (Press 3 at the prompt) ■ Fax: 770-236-5477 ■ Email: customer-service@cisco.com
Europe, Middle East, Africa	Belgium	For <i>Technical Support</i> , call: <ul style="list-style-type: none"> ■ Telephone: 32-56-445-197 or 32-56-445-155 ■ Fax: 32-56-445-061 For <i>Customer Service</i> , call: <ul style="list-style-type: none"> ■ Telephone: 32-56-445-444 ■ Fax: 32-56-445-051 ■ Email: service-elc@cisco.com
Japan	Japan	<ul style="list-style-type: none"> ■ Telephone: 81-3-5908-2153 or +81-3-5908-2154 ■ Fax: 81-3-5908-2155
Korea	Korea	<ul style="list-style-type: none"> ■ Telephone: 82-2-3429-8800 ■ Fax: 82-2-3452-9748 ■ Email: songk@cisco.com
China (mainland)	China	<ul style="list-style-type: none"> ■ Telephone: 86-21-2401-4433 ■ Fax: 86-21-2401-4455 ■ Email: xishan@cisco.com
All other Asia Pacific countries & Australia	Hong Kong	<ul style="list-style-type: none"> ■ Telephone: 852-2588-4746 ■ Fax: 852-2588-3139 ■ Email: saapac-support@cisco.com
Brazil	Brazil	<ul style="list-style-type: none"> ■ Telephone: 11-55-08-9999 ■ Fax: 11-55-08-9998 ■ Email: fattinl@cisco.com or ecavalhe@cisco.com
Mexico, Central America, Caribbean	Mexico	For <i>Technical Support</i> , call: <ul style="list-style-type: none"> ■ Telephone: 52-3515152599 ■ Fax: 52-3515152599 For <i>Customer Service</i> , call: <ul style="list-style-type: none"> ■ Telephone: 52-55-50-81-8425 ■ Fax: 52-55-52-61-0893 ■ Email: sa-latam-cs@cisco.com
All other Latin America countries	Argentina	For <i>Technical Support</i> , call: <ul style="list-style-type: none"> ■ Telephone: 54-23-20-403340 ext 109 ■ Fax: 54-23-20-403340 ext 103 For <i>Customer Service</i> , call: <ul style="list-style-type: none"> ■ Telephone: 770-236-5662 ■ Fax: 770-236-5888 ■ Email: keillov@cisco.com

Glossary

ac, AC

alternating current. An electric current that reverses its direction at regularly recurring intervals.

AC-3

audio compression - 3.

analog channel

A channel that occupies a fixed location in a 6 MHz bandwidth within the 54 MHz to 550 MHz range of the RF band. Analog video channels deliver one traditional broadcast television channel in each 6 MHz band.

ASI

asynchronous serial interface. Allows the intermittent transfer of data one bit at a time rather than in a steady stream.

attenuation

The difference between transmitted and received signal strength due to loss through equipment, lines, or other transmission medium. Usually expressed in decibels.

baseband

The original band of frequencies occupied by the signal before it modulates the carrier frequency to form the transmitted signal. Characteristic of any network technology that uses a single carrier frequency and requires all stations attached to the network to participate in every transmission.

BTSC

Broadcast Television Systems Committee. An EIA committee created to develop a standard for Multi-channel Television Sound (MTS) broadcasting. The standard adopted was developed by Zenith Electronics Corporation (transmission parameters) and dbx, Inc. (noise reduction system).

CATV

cable television.

Glossary

channel map

A logical element that links a service with a channel so that the service can be viewed or used by the subscriber. For example, a channel map could link The Golf Channel with channel 63 so that when subscribers tune to channel 63, they view The Golf Channel.

CLI

command line interface. A command reference software that allows the user to interact with the operating system by entering commands and optional arguments.

CMTS

Cable Modem Termination System. A device, located at the headend or a distribution hub, that provides complimentary functionality to the cable modems to enable data connectivity over a hybrid fiber coax (HFC) network.

composite video

A video connection in which the brightness and color portions of the signal are combined into one signal (signal for broadcast TV).

CW

continuous wave.

DAVIC

Digital Audio/Video Council. An international group of approximately 250 companies developing an "end-to-end" standard for interactive digital media, including interfaces and requirements for applications, systems, and networks. The group includes members of the original MPEG Joint Technical Committee (JTC).

DAXI

DSAN auxiliary input box.

dB

decibel. One tenth of a bel, the number of decibels denoting the ratio of two amounts of power being ten times the common logarithm of this ratio.

dBm

decibels relative to 1 milliwatt.

dBmV

decibels relative to 1 millivolt.

dc, DC

direct current. An electric current flowing in one direction only and substantially constant in value.

DES

data encryption standard.

DHCP

dynamic host configuration protocol. TCP/IP protocol that manages a pool of IP addresses.

DNCS

Digital Network Control System. A computer workstation that defines, organizes, monitors, and controls the components, features, and applications supported by the digital broadband delivery system.

DOCSIS

data over cable service interface specification.

DSAN

digital service access node.

DVB

A standard developed by the Digital Video Broadcasting (DVB) Group, which is a European organization that has authored many specifications for satellite and cable broadcasting of digital signals. Part of the DVB work has been focused specifically on conditional access.

EAS

Emergency Alert System.

eCM

Embedded cable modem.

EIA

Electronic Industries Association. A United States association that provides standards for use between manufacturers and purchasers of electronic products.

EQ

equalizer.

Glossary

equalizer

Controls the tilt to the drop ports. It does not affect the feeder cable signal. An EQ value is selected for each installation to provide the specified output tilt.

F-connector

A screw-on coaxial connector typically used inside homes or on drop cabling.

FEC

forward error correction. System of data transmission in which redundant bits generated at the transmitted end are used by the receiver to detect, locate, and correct transmission errors before delivering the data to the local data communications link. This avoids requiring the transmitter to resend information.

forward path

Signal direction from the headend to the set-top terminal.

ft-lb

foot-pound. A measure of torque defined by the application of one pound of force on a lever at a point on the lever that is one foot from the pivot point.

gain

A measure of the increase in signal level, relative to a reference, in an amplifier. Usually expressed in decibels.

GHz

Gigahertz. A unit of frequency equal to one billion cycles per second.

headend

The local switching or processing center for the cable network in a hybrid fiber/coax network. Location for equipment that receives data from a satellite (or other) source and reformats that data for input to a broadband distribution network.

HFC

hybrid fiber/coaxial. A network that uses a combination of fiber optics and coaxial cable to transport signals from one place to another. A broadband network using standard cable television transmission components, such as optical transmitters and receivers, coaxial cable, amplifiers, and power supplies. The broadband output stream is transmitted as an optical signal, over the high-speed, fiber optic transmission lines to local service areas where it is split, converted to electrical RF signals, and distributed to set-tops over coaxial cable.

in-lb

inch-pound. A measure of torque defined by the application of one pound of force on a lever at a point on the lever that is one inch from the pivot point.

IP address

Internet protocol address. A 32-bit sequence of numbers used for routing IP data. Each IP address identifies a specific component on a specific network. The address contains a network address identifier and a host identifier.

IP68

In the IEC classification system for ingress protection (IP) of electrical equipment, the number 6 indicates a dust-tight enclosure, while 8 indicates protection against complete, continuous submersion in water from 15 meters or 50 feet.

LCI

local channel insertion.

LED

light-emitting diode. An electronic device that lights up when electricity passes through it.

Mbps

megabits per second. A unit of measure representing a rate of one million bits (megabits) per second.

MDU

multiple dwelling unit.

MHz

megahertz. A unit of measure representing one million cycles per second; measures bandwidth.

Motorola DTA

headend configuration service that enables video service subscribers to continue using their analog television equipment to access programming over an all-digital cable network.

MPEG

Moving Picture Experts Group. An international video compression standards-setting group working under the supervision of the International Standards Organization (ISO) and the International Electrotechnical Commission (IEC). MPEG's mission is to develop standards for compressed full-motion video, still image, audio and other associated information.

Glossary

MPEG-2

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

MPTS

Multi-program transport stream.

Nm

Newton meter. A measure of torque defined by the application of one Newton of force on a lever at a point on the lever that is one meter from the pivot point. (1 Nm = 0.737561 ft-lb)

node

Any device, such as a DSAN unit, that is connected to a network, or a branching or exchange point.

NTSC

National Television Standards Committee. A committee that determines video signal standards for television displays in the United States, Canada, Mexico, and Japan, as well as other Latin American and Asian countries. The NTSC standard calls for fixed-resolution, interlaced displays that are updated 30 times per second with a resolution of 525 lines.

OID

object identifier.

PID

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

provisioning

The process of preparing a device or service so that it operates properly and its control system recognizes it.

PWR

power.

QAM

quadrature amplitude modulation. An amplitude and phase modulation technique for representing digital information and transmitting that data with minimal bandwidth. Both

phase and amplitude of carrier waves are altered to represent the binary code. By manipulating two factors, more discrete digital states are possible and therefore larger binary schemes can be represented.

QAM256

A QAM technique that produces 256 discrete states, each state representing 8 bits of information. The most complex of common QAM techniques.

QAM64

A QAM technique that produces 64 discrete states, each state representing 6 bits of information.

QPSK

quadrature phase-shift keying. A phase modulation technique for representing digital information. QPSK produces four discrete states, each state representing two bits of information.

RCA

A type of electrical connector commonly used in consumer products to carry audio and video signals. The name derives from Radio Corporation of America, which originally developed the connector.

reverse path

Signal flow direction toward the headend.

RF

radio frequency. The frequency in the portion of the electromagnetic spectrum that is above the audio frequencies and below the infrared frequencies, used in radio transmission systems.

RX

receive or receiver.

S/N or SNR

signal-to-noise ratio. The ratio, in decibels, of the maximum peak-to-peak voltage of the video signal, including synchronizing pulse, to the root-mean-square voltage of the noise. Provides a measure and indication of signal quality.

SAP

second audio program. In a BTSC-encoded television sound carrier, a separate monaural audio subcarrier that accompanies the main audio channel. Typically used to transmit audio in a different language.

Glossary

SCTE

Society of Cable Telecommunications Engineers, Inc. A not-for-profit professional organization formed in 1969 to promote the sharing of operational and technical knowledge in the field of cable television and broadband communications.

SI

system or service information. Tuning information sent from the DNCS to DHCTs which provides the information that DHCTs need to be able to tune to a particular service.

SNMP

simple network management protocol. A protocol that governs network management and the monitoring of network devices and their functions.

strand mount

Installed equipment on an above-ground strand.

TFTP

trivial file transfer protocol.

tilt

Spectral display slope caused by different attenuation of high frequencies and low frequencies through a medium.

TLV

Type Length Value

torque

A force that produces rotation or torsion. Usually expressed in lb-ft (pound-feet) or N-m (Newton-meters). The application of one pound of force on a lever at a point on the lever that is one foot from the pivot point would produce 1 lb-ft of torque.

trap

An unsolicited message sent by a network device to notify a network or element management system of an alarm or other condition that requires administrative attention.

TS

transport stream.

TX

transmit or transmitter.

UDSAN

universal digital service access node.

V

volt.

VDC

volts direct current.

voltage

electrical potential as measured in volts (V), millivolts (mV), or other related units.

W

watt. A measure of electrical power required to do work at the rate of one joule per second. In a purely resistive load, 1 Watt = 1 Volt x 1 Amp.

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