



D9859 Advanced Receiver Transcoder

Deliver MPEG-4 high-definition (HD) services to MPEG-2 cable TV (CATV) headends with the Cisco® D9859 Advanced Receiver Transcoder.

The Cisco D9859 platform (Figures 1 and 2) extends the distribution options for MPEG-4 Advanced Video Coding (AVC) HD from MPEG-4 only environments to existing MPEG-2 networks. Support for up to eight simultaneous high-definition or standard-definition (SD) channels of decryption and transcoding provides the advantage of density for locations requiring more than just a single channel. The Cisco D9859 can provide up to 8 down-converted MPEG-2 standard definition programs or MPEG-2 high-definition transcoded programs along with decrypted passthrough of the incoming programs. Video and two audio outputs are available for analog down-conversion for one of the decrypted incoming MPEG-4 high-definition programs. The base Cisco D9859 comes configured for 1 HD and 1 SD output with dynamic licensing options to upgrade the unit in the field locally or over the air using the Cisco PowerVu® Network Center uplink control system, supporting a pay-as-you-grow model.

Figure 1. Cisco D9859 Advanced Receiver Transcoder



Digital Program Distribution

The Asynchronous Serial Interface (ASI) and MPEG over IP (MPEGoIP) transport outputs are individually configurable and provide the capability of carrying up to eight decrypted transcoded programs for digital tier distribution. This helps the compressed video programs to be efficiently distributed to subscribers equipped with digital set-top boxes. Digital audio passthrough is synchronized to the transcoded program output. Compliant program-specific information and service information (PSI/SI) regeneration provides integration into a digital tier distribution network for eight transcoded programs.

Digital Program Mapping

Digital Program Mapping allows programmers to transparently substitute programs at the uplink. It maintains predictable and compliant transport output during service replacement, Network Information Table (NIT) retune, and channel changes, including force tunes. This feature remaps the packet identifier (PID) information from the primary service to an alternate service, allowing downstream devices to continue to operate without headend operator intervention. This helps ensure the availability of alternate programming in the digital tier.

Digital Ad Insertion

Digital Program Insertion (DPI) information is available along with the video and audio PIDs for external ad insertion in compressed digital format on all transcoded programs. In addition, the decoded program DPI can be used to drive cue tones, open collector outputs, and a relay output.

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Features and Benefits

- Four L-band inputs
- DVB-S demodulation for QPSK
- DVB-S2 Demodulation for QPSK and 8PSK
- Cisco PowerVu conditional access with Data Encryption Standard (DES) or DVB descrambling
- Support for Basic Interoperable Scrambling System (BISS) conditional access
- Decryption and transcoding of up to eight programs for digital transport output
- Two digital transport outputs available (ASI and MPEGoIP)
- Support for up to eight simultaneous high-definition or standard-definition channels of decryption and transcoding and passthrough of the original channel. Total of 16 regenerated outputs (8 transcode + 8 passthrough)
- Program transcoding to support down-conversion of a MPEG-4 HD program to a MPEG-2 SD program
- PSI/SI regeneration support on all licensed outputs (up to eight programs transcoded + up to 8 original content passthrough)
- 4:2:0 high-definition 1080i and 720p video decoding
- AFD support for down-conversion of a decoded HD program with aspect ratio conversion
- Dolby Digital (AC-3) and Dolby Digital Plus (E-AC-3) audio decoding
- Closed captioning passthrough of EIA-608 and EIA-708 for transcoded programs
- Audio passthrough synchronization for transcoded programs
- Additional ASI outputs for redundancy
- MPEGoIP output for network connectivity
- DVB subtitle passthrough with transcode programs
- Contact closure terminals for simple alarm monitoring
- Simple Network Management Protocol (SNMP) for setup, control, and monitoring
- Field-upgradeable software
- Field-upgradeable additional transcoder channel licenses
- Front panel LCD for control and monitoring
- Web browser interface for easy setup, control, and monitoring
- Uplink addressable decoder output control (vertical blanking interval [VBI], audio routing, DPI, and ASI output)
- Dual-tone multifrequency (DTMF) cue tone and cue trigger outputs for ad insertion
- Digital Program Mapping that provides uplink control for service replacements in blackout areas
- Fingerprint support in transcoded output
- DVB subtitle burn-in support
- On Screen Display support in transcoded output
- Satellite Disaster Recovery support with PNC uplink control (PNC12.5 or higher)



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Product Specifications

Table 1 lists specifications for the Cisco D9859 Advanced Receiver Transcoder.

Table 1. Product Specifications

| Category | Specification |
|--|--|
| System | |
| MPEG-2 and DVB compatible EN 300 421, EN 300 468 | |
| Demodulation | DVB-S QPSK, DVB-S2 QPSK, and 8PSK |
| Tuner | |
| Number of RF inputs | 4 (one active at a time) |
| Input level | -25 dBm to -65 dBm per carrier |
| Frequency range | 950 MHz to 2150 MHz |
| Symbol rate range | DVB-S: 1.0 to 45 MSymbols/s DVB-S2: 10.0 to 30 MSymbols/s 1.0 to 10 MSymbols/s |
| Carrier capture range | ≥ ±0.5 MHz (1-10 Msym) ≥ ±5.0 MHz (10-45 Msym) |
| Satellites | C-band and Ku-band |
| Input impedance | 75ohms |
| Analog Outputs | |
| Analog SD Video Output | |
| Number of channels | One down-converted source HD program |
| Video decompression type | MPEG-2 4:2:0 and MPEG-4 4:2:0 |
| Output level | 1.0Vpp ± 5% |
| Output impedance | 75 ohms |
| Analog Audio Output | |
| Number of channels | Two stereo pairs or four mono channels |
| Audio decompression | MPEG or Dolby Digital (AC-3) |
| Transcoder Channel Inputs | |
| HD Video Input | |
| Compression format | MPEG-2, MPEG-4 part 10 |
| V resolutions | 1080, 720 |
| H resolutions | 1080i:1920, 1440 720p:1280, 960 |
| Input bitrate | 3Mb/s to 20Mb/s main profile 3Mb/s to 25Mb/s high profile |
| Audio Input | |
| Number of channels | Two audio channels |
| Compression format | MPEG or Dolby Digital and Dolby Digital Plus |
| VBI Data Input | |
| Transmission format | EIA-708 and 608 |

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| Category | Specification |
|---------------------------------------|---|
| Transcoder Channel Outputs | |
| HD Video Output | |
| Compression format | MPEG-2 |
| V resolutions | Same as input |
| H resolutions | 1080i:1920, 1440 720p:1280, 960 |
| Output bitrate | 10Mb/s to 25 Mb/s |
| Down-Converted SD Video Output | |
| Compression format | MPEG-2 |
| V resolutions | 480, 576 |
| H resolutions | 720/704/544/528 |
| Output bitrate | 2Mb/s to 15 Mb/s |
| SD output aspect ratios | 4:3, 16:9 |
| Aspect ratio conversions | Auto, auto AFD, 16:9 L/B, 4:3 P/B, 14:9, 4:3 CCO, 16:9 SCALE |
| Audio Output | |
| Number of channels | Two stereo pairs |
| Compression format | Same as input |
| VBI Data Output | |
| Closed captioning format | EIA-708 and 608 |
| Inputs/Outputs | |
| MPEG-2 transport input | EN50083-9, DVB-ASI coaxial, 188/204 byte packets |
| MPEG-2 transport output | EN50083-9, DVB-ASI coaxial, 188 byte packets |
| MPEGoIP Output | |
| Ethernet type | 1000 Base-T |
| Format | UDP or RTP |
| IP addressing | Multicast or Unicast |
| Transport stream (TS) streaming | MPTS |
| Other Outputs | |
| Cue Trigger Output | |
| Number of outputs | 8 |
| Type | Open collector |
| Cue Tone Output | |
| Balanced audio output | -3.0 dBu \pm 3 dB, 600 ohms |
| Output impedance | < 50 ohms |
| Programmable relay output | Alarm or configurable to one of the 8 open collector outputs |
| Environmental and Physical | |
| Operating temperature | 32° to 122°F (0° to 50°C) |
| Storage temperature | (-4°F to 158°F)(-20° to 70°C) |
| Physical dimensions | 1.75 in. H x 19.0 in. W x 20.5 in. D (4.4 cm H x 48.3 cm W x 52.1 cm D) 1RU high, 19 in. EIA rack mountable |
| Weight | 16 lb (7.2 kg) approximately |



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| Category | Specification |
|-------------------|-----------------------------|
| Power | |
| Voltage range | 100 to 240 VAC |
| Line frequency | 50/60 Hz |
| Power consumption | 110W maximum |
| LNB power on RF1 | +13V/+18V at 400 mA maximum |

Figure 2. Cisco D9859 Advanced Receiver Transcoder



Ordering Information

Table 2 provides ordering information.

Table 2. Ordering Information: Cisco D9859 Advanced Receiver Transcoder

| Features | Part Number |
|--|--------------------|
| D9859 with GEN-ISE 2CH base unit with 1 HD and 1 SD channel | D9859-GEN-1RU |
| D9859 with ATP-ISE 2CH base unit with 1 HD and 1 SD channel | D9859-ATP-1RU |
| D9859 AVC to MPEG-2 HD Transcoding additional channel License | LIC-D9859-HD-CH |
| D9859 AVC to MPEG-2 SD Transcoding additional channel License | LIC-D9859-SD-CH |
| D9859 AVC to MPEG-2 SD to HD Upgrade Transcoding channel License | LIC-D9859-HD-UP-CH |
| Power Cords | |
| North American Power Cord (US, IEC, 10AMP, 2.5m) | CAB-PWR-DMN-US |
| Japan Power Cord | CAB-PWR-DMN-JPN |
| China Power Cord (IEC) | CAB-PWR-DMN-CHN |
| Australia Power Cord | CAB-PWR-DMN-AUS |
| Italy Power Cord | CAB-PWR-DMN-IT |
| European Power Cord (EU) | CAB-PWR-DMN-EU |
| Brazil Power Cord | CAB-PWR-DMN-BRA |
| India Power Cord | CAB-PWR-DMN-IND |
| Argentina Power Cord | CAB-PWR-DMN-ARG |
| UK Power Cord (IEC, 10AMP, 2.5m) | CAB-PWR-DMN-UK |