Cisco DCM Series D9901
Digital Content Manager – IP Video Gateway
Uncompressed and JPEG2000 Transports

Today's video contribution networks are evolving rapidly, driven both by increased demand, including high definition TV, and a need for reduced cost of ownership. The Cisco® DCM Series D9901 Digital Content Manager (DCM) IP Video Gateway, shown in Figure 1, is a compact 1 rack unit (1RU), serial digital interface (SDI) video gateway platform capable of supporting the delivery at full quality of a high number of uncompressed video signals, as well as JPEG2000 compressed video signals over cost-effective Ethernet links.

Figure 1. Cisco DCM Series D9901 Digital Content Manager – IP Video Gateway

The DCM Series D9901 IP Video Gateway provides simultaneous transport of uncompressed standard-definition (SD), high-definition (HD), and 3G high definition (3G-HD) SDI video, as well as compressed video using JPEG2000. At the transmitter site, the DCM IP Video Gateway enables SDI video to be carried over 1 Gigabit Ethernet or 10 Gigabit Ethernet. At the receiving site, the DCM IP Video Gateway converts the IP-encapsulated stream back to a baseband SDI video signal.

Because of its quality, flexibility, and very compact design, the DCM Series D9901 IP Video Gateway is adaptable for a wide range of applications, including professional broadcast contribution, studio-to-studio media exchange, in-house signal distribution and routing, post-production, and live event coverage, including transport of full resolution 3D signals.

As IP is becoming more and more the transport network of choice, it’s important to maximize quality of service. The DCM IP Video Gateway’s extensive set of IP over Gigabit Ethernet features including extensive protocol support allows for a seamless integration with these IP networks. For highest quality of service transport the DCM IP Video Gateway provides a Hitless Merge feature that allows for uninterrupted video transport in case of severe network failures.

Physical Configuration
The DCM IP Video Gateway comes in a compact 1RU chassis. The unit can be configured with up to two gateway cards, with each card having dual Gigabit Ethernet ports and up to six SDI video ports.

The gateway cards can be individually configured with either electrical video interfaces or optical video interfaces, or a combination of both.
With electrical interfaces, the gateway can be equipped with either six electrical SDI inputs, or six electrical SDI outputs, or the combination of three SDI inputs and three SDI outputs. With optical interfaces, the gateway can be equipped with either six optical ports, or a combination of three optical SDI ports and three electrical SDI ports (either three inputs or three outputs). The optical ports are based on unidirectional video small form-factor pluggables (SFPs). The user defines the port direction by plugging in either a receiver SDI SFP or a transmitter SDI SFP.

Each gateway card is equipped with a main and a backup Ethernet port. The ports are software switchable to function as either 1 Gigabit Ethernet or 10 Gigabit Ethernet. With 1 Gigabit Ethernet, the ports can be equipped with SFP connectors, giving each card a total throughput of 1 Gbps bidirectional. With 10 Gigabit Ethernet, the ports can be equipped with SFP+ connectors, giving each card a total throughput of 10 Gbps.

Each gateway card can optionally be equipped with a JPEG2000 plug-in that enables encoding or decoding of the video while still allowing video to be transported uncompressed. For example, this enables uncompressed transport of SD video while compressing HD signals in order to fit onto a 1 Gigabit Ethernet. With 10 Gigabit Ethernet connectivity, you can have uncompressed transport of up to six SD/HD video signals, or any combinations of uncompressed transport of HD and SD while simultaneously compressing other input signals using JPEG2000.

**Scalable Platform**

The Cisco DCM IP Video Gateway has been designed to provide processing of up to 12 video signals. However, the platform is scalable in hardware as well as in software. The chassis can be equipped with one card only, and a basic card always comes with one SD video stream enabled. If the physical configuration is for three inputs and three outputs, the network operator can freely select either to transmit or receive a video stream over IP. The operator can choose over time to enable additional video signals to be processed, as well as to add HD video, Forward Error Correction (FEC) and Hitless Merge (redundancy features described in the next section), and 10 Gigabit Ethernet through software licenses. The capital expenses can therefore be adapted to the existing situation and subsequently to future growth needs.

**Redundancy and Reliability**

The DCM IP Video Gateway has been designed to allow operators to configure highly reliable networks. The DCM IP Video Gateway supports hot-swappable and redundant power supplies and hot-swappable cooling fans. In addition, each DCM IP Video Gateway Card is also hot-swappable. When the chassis is equipped with two cards, one of the cards can be hot-swapped while the other card continues to operate uninterrupted.

The DCM IP Video Gateway can be configured in a hot 1:1 configuration to support a maximum uptime with minimum switchover interruption.

Each DCM IP Video Gateway card optionally supports a very powerful redundancy mechanism to protect against network failures. The feature is called Hitless Merge, and it relies on dual transmission of the stream in a diverse-path mode. The transmitting DCM IP Video Gateway card provides a copy of the stream on the two Ethernet ports, and the receiving DCM IP Video Gateway card receives the two streams on the two individual Ethernet ports as well. The receiving Gateway card performs a Hitless Merge of the two streams and ensures there is no impact on the outgoing SDI video signal in case of network failures impacting one of the two streams. Hitless Merge is supported with unicast as well as multicast transport.

In applications and networks where dual streaming is not viable, the DCM IP Video Gateway provides forward error correction (FEC) to protect against packet loss.

**User Interface and Management**

You control the DCM IP Video Gateway through an easy and intuitive GUI. To keep things simple, there is no software to load: the GUI of the DCM IP Video Gateway is a pure HTML-based user interface that can be opened...
using Microsoft Internet Explorer 6.0 and later or Firefox 3.0 or later. The GUI supports simple program provisioning through drag and drop functionality. The interface provides detailed information, including the DCM IP Video Gateway configuration, input and output video integrity monitoring, and video stream alarms as well as other information.

For integrated network monitoring and control, the DCM IP Video Gateway is integrated with ROSA® Network Management and Control (NMC) system.

**Features**

This section describes the features of the Cisco DCM Series D9901 IP Video Gateway.

**Note:** The software and hardware features and releases described in this data sheet are in varying stages of development and are subject to change at the sole discretion of Cisco without liability to Cisco. Contact Cisco for estimated commercial availability.

**Interfaces**

- Up to 12 video interface ports (6 video ports per gateway card)
  - Each card can be equipped with electrical video interfaces or optical video interfaces or a combination of electrical and optical interfaces.
  - With electrical (BNC) interfaces, each card can have three inputs and three outputs or six inputs or six outputs.
  - With optical interfaces, each card can house up to six video SFPs and each SFP can be either a Tx or an Rx SFP.
  - In a mix of electrical and optical, the electrical section can be either three inputs or three outputs.
- Flexible video signal monitoring
  - Each card has a dedicated electrical monitor output, which can mirror any of the six video ports selected by the user.
  - Any video output port can also be configured as a duplicate of another active video output port or input port.
- Each gateway card is equipped with dual Ethernet ports capable of either 1 Gigabit Ethernet (connectors: SFP) or 10 Gigabit Ethernet (connectors: SFP+).
  - Unicast and multicast support
  - Protocols supported: 802.3, Ethernet, Real-Time Transport Protocol (RTP), User Datagram Protocol (UDP), Internet Protocol (IP), Address Resolution Protocol (ARP), Internet Control Message Protocol (ICMP), Internet Group Management Protocol Version 2 and 3 (IGMPv2 / v3), and VLAN
  - Quality of service (QoS): Diffserv/ToS 802.1p

**Video Signals and Formats**

- Standard Definition 625i25 and 525i29.97
- High Definition 720p50, 720p59.94, 720p60, 1080i25, 1080i29.97, 1080i30, 1080p25, 1080p29.97, 1080p30
- 3G High Definition 1080p50, 1080p60, 1080p59.94 (for uncompressed transport)
- Adaptive clock recovery
- Genlocking with user-tunable phase adjustment to the external reference signal
- Built-in SDI signal generators assist in easy setup of the gateway during installation without the need for a dedicated signal generator
Uncompressed Video Transport — Per Gateway Card
- 1 Gigabit Ethernet interface: Up to three SD transmit and 3 SD receive
- 10 Gigabit Ethernet interface:
  - Up to six SD/HD transmit or receive, or any combination depending on the interface configuration.
  - Up to three 3G-HD transmit or receive or any combination of transmit and receive.
    - One 3G-HD can be combined with 4 SD/HDs.
    - Two 3G-HD can be combined with 2 SD/HDs.

Flexible JPEG2000 Compression Engine Plug-on — Per Gateway Card
- Encodes up to three SD/HD signals or decodes up to three SD/HD signals
- Each encode or decode engine has a compressed video bit rate bandwidth of 900 Mbps that can be shared across three channels.

Audio and VBI/Ancillary Data Support— With JPEG2000
- User selection of embedded audio channels— from one stereo pair to eight stereo pairs
- HD: Transparent transport of Vertical Interval Timecode (VITC), closed captions, OP47, Active Format Description (AFD) acc SMPTE-2016
- SD: VITC, World System Ticket (WST), Video Index Information. In addition, you can select transparent transport of luminance samples of vertical blanking interval (VBI) lines (select from 1 to all VBI lines).

IP Transport Protection Schemes— For Uncompressed Transport and JPEG2000
- Dual-Streaming mode (IP port mirroring)
- Hitless Merge in a Live-Live streaming configuration using multicast
- Forward Error Correction (FEC) according to CoP4

3D Contribution – Transport of full resolution Left and Right signals
- Synchronization of left and right channel signals
- Receiver outputs are aligned to either the external reference or adaptive clock recovery
- Supported with Uncompressed Video Transport as well as JPEG2000 Transport

Redundancy
- 1:1 Redundant device configuration
- 1:1 Gigabit Ethernet port backup
- Video input ports can act as backup inputs for each other.

ASI Trunk Interface
- With the interface combination of three inputs and three outputs, the gateway is capable of transporting JPEG2K compressed video over asynchronous serial interface (ASI).
- Three ports are used for video interfaces and three ports are used as ASI interfaces.
- The same gateway card hardware can therefore be used as either an encoder or a decoder simply switched by a configuration in the user interface.
- The same gateway card can also be switched between being an ASI trunk-based JPEG2K adapter or an IP trunk-based JPEG2K/uncompressed adapter.

System
- User hot-swappable gateway cards, power supplies, and fans
Redundant load sharing power supplies, supports both AC and DC power supplies
Configuration settings stored on compact flash card (transferable to cold standby unit)
Configurations can also be copied through the user interface from either one chassis to another or from one gateway card to another.
Software licenses stored in the chassis and not on the gateway cards, which means the number of spare parts is set to a minimum.
Software licenses can be moved from chassis to chassis.

Management
- Simple Network Management Protocol (SNMP) traps
- ROSA management
- Easy control using a web browser
- Ethernet interface for communication with management system and web browser
- IP Security (IPsec)

Product Specifications

Table 1 lists product specifications for the Cisco DCM Series D9901 IP Video Gateway.

Table 1. Product Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Video Interfaces</strong></td>
<td></td>
</tr>
<tr>
<td>Number of video ports per card</td>
<td>Up to 6 ports</td>
</tr>
<tr>
<td></td>
<td>In addition:</td>
</tr>
<tr>
<td></td>
<td>• Loop-through output: can monitor any active input or output video stream</td>
</tr>
<tr>
<td></td>
<td>• Reference Input: common to all the video outputs on one gateway card</td>
</tr>
<tr>
<td></td>
<td>Note: Output ports can also be configured as a monitor of another active video output port or input port.</td>
</tr>
<tr>
<td>Hardware configuration of ports</td>
<td>Electrical:</td>
</tr>
<tr>
<td></td>
<td>One of the following per gateway card:</td>
</tr>
<tr>
<td></td>
<td>• Three inputs and three outputs</td>
</tr>
<tr>
<td></td>
<td>• Six inputs</td>
</tr>
<tr>
<td></td>
<td>• Six outputs</td>
</tr>
<tr>
<td></td>
<td>Optical:</td>
</tr>
<tr>
<td></td>
<td>One of the following per gateway card:</td>
</tr>
<tr>
<td></td>
<td>• Six optical video SFP cages</td>
</tr>
<tr>
<td></td>
<td>• Three optical video SFP cages and three electrical inputs</td>
</tr>
<tr>
<td></td>
<td>• Three optical video SFP cages and three electrical outputs</td>
</tr>
<tr>
<td>Connector type</td>
<td></td>
</tr>
<tr>
<td>Video ports (Note 2)</td>
<td>Electrical</td>
</tr>
<tr>
<td></td>
<td>• Electrical: BNC (in groups of 3)</td>
</tr>
<tr>
<td>Reference input</td>
<td>Optical:</td>
</tr>
<tr>
<td>Loop-through output</td>
<td>• Video SFP (for use with Video SFP compliant to SMPTE-297)</td>
</tr>
<tr>
<td></td>
<td>BNC (internally terminated)</td>
</tr>
<tr>
<td>Impedance</td>
<td>75 ohms</td>
</tr>
<tr>
<td>Specification</td>
<td>Value</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Video formats</strong></td>
<td><strong>Standard:</strong> Video ports and loop-through output, Reference input</td>
</tr>
<tr>
<td></td>
<td>- 625i25, 525i29.97 (SMPTE-259-C, Type B)</td>
</tr>
<tr>
<td></td>
<td>- Transparency of SDTI @ 270 Mbps (SMPTE-305) – for uncompressed transport</td>
</tr>
<tr>
<td></td>
<td><strong>Option:</strong> Video ports and loop-through output, Reference input</td>
</tr>
<tr>
<td></td>
<td>- 720p50, 720p59.94, 720p60 (SMPTE-292 – SMPTE-296 System 1, 2 &amp; 3, Type B)</td>
</tr>
<tr>
<td></td>
<td>- 1080i25, 1080i29.97, 1080i30 (SMPTE-292 – SMPTE-274 System 4, 5 &amp; 6, Type B)</td>
</tr>
<tr>
<td></td>
<td>- 1080p25, 1080p29.97, 1080p30 (SMPTE-292 – SMPTE-274 System 7, 8 &amp; 9, Type B)</td>
</tr>
<tr>
<td></td>
<td><strong>3G HD-SDI:</strong> Video ports and loop-through output, Reference input</td>
</tr>
<tr>
<td></td>
<td>- 1080p50, 1080p60, 1080p59.94 (SMPTE-424 – SMPTE-274 System 1, 2 &amp; 3, Type B)</td>
</tr>
<tr>
<td>Return loss</td>
<td><strong>Video ports and loop-through output</strong></td>
</tr>
<tr>
<td></td>
<td>- SD: &gt;15 dB, 5 MHz – 270 MHz</td>
</tr>
<tr>
<td></td>
<td>- HD: &gt;15 dB, 5 MHz – 1.485 GHz</td>
</tr>
<tr>
<td></td>
<td>- 3G-HD: &gt;15 dB, 5 MHz – 1.485 GHz, &gt;10 dB 1.485 GHz – 2.97 GHz</td>
</tr>
<tr>
<td>Cable length</td>
<td><strong>Video input ports</strong></td>
</tr>
<tr>
<td></td>
<td>- SD: &gt;350 m (using Belden 1694A)</td>
</tr>
<tr>
<td></td>
<td>- HD: &gt;200 m (using Belden 1694A)</td>
</tr>
<tr>
<td></td>
<td>- 3G-HD: &gt;120 m (using Belden 1694A)</td>
</tr>
<tr>
<td>Video resolution</td>
<td>10 bit</td>
</tr>
<tr>
<td>ASI Interfaces</td>
<td><strong>Number of ASI Input ports per card</strong> Three ports The other three output ports on a three-input and three-input electrical port configuration are SDI video ports.</td>
</tr>
<tr>
<td></td>
<td><strong>Number of ASI Output ports per card</strong> Three ports (packet mode only) The other three input ports on a three-input and three-input electrical port configuration are SDI video ports.</td>
</tr>
<tr>
<td></td>
<td><strong>Connector</strong> BNC-type</td>
</tr>
<tr>
<td></td>
<td><strong>Impedance</strong> 75 ohms</td>
</tr>
<tr>
<td></td>
<td><strong>Interface type</strong> Asynchronous Serial Interface (ASI) (according to EN 50083-9)</td>
</tr>
<tr>
<td></td>
<td><strong>Packet format</strong> 188 byte packets</td>
</tr>
<tr>
<td></td>
<td><strong>Bit rate</strong> 10 – 213 Mbps</td>
</tr>
<tr>
<td></td>
<td><strong>Syntax</strong> SPTS (according to ISO/IEC 13818)</td>
</tr>
<tr>
<td>IP Interfaces</td>
<td><strong>Number of ports per card</strong> Two Ethernet ports, 1+1 (for redundancy)</td>
</tr>
<tr>
<td></td>
<td><strong>Connector type (see Note 1)</strong> Standard: 1 Gigabit Ethernet: Optical or electrical Small Form Factor Pluggable (SFP) Optional: 10 Gigabit Ethernet: Optical or electrical Small Form Factor Pluggable+ (SFP+)</td>
</tr>
<tr>
<td></td>
<td><strong>Interface type</strong> Standard – 1 Gigabit Ethernet: 1 Gigabit Ethernet (GbE) according to IEEE 802.3ab (Electrical) or IEEE 802.3z (optical) Optional – 10GbE: 10 Gigabit Ethernet (GbE) according to IEEE 802.3ae</td>
</tr>
<tr>
<td></td>
<td><strong>Protocols</strong> IP/UDP/RTP, ARP, IGMPV2/v3, Diffserv/TOS 802.1p Support for IEEE 802.Q VLAN Tagging</td>
</tr>
<tr>
<td></td>
<td><strong>Maximum throughput per gateway card</strong> With 1 GbE interface: 1 Gbps input and 1 Gbps output per gateway card With 10 GbE interface: 10 Gbps input and output per gateway card</td>
</tr>
</tbody>
</table>
### Specification

<table>
<thead>
<tr>
<th>Processing</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video encapsulation</td>
<td>Uncompressed transport: According to RFC3497 with CoP4 extensions. JPEG2000: MXF over RTP according to SMPTE-2022-6 draft.</td>
</tr>
<tr>
<td>Forward Error Correction (FEC)</td>
<td>Based on ProMPEG CoP4.</td>
</tr>
<tr>
<td>Hitless Merge</td>
<td>User controllable merge-buffer that compensates for network delay differences.</td>
</tr>
<tr>
<td>JPEG2000 compression</td>
<td>Based on ProMPEG CoP4.</td>
</tr>
<tr>
<td>Video encoding bitrates</td>
<td>SD: 0 – 200 Mbps. HD: 0 – 450 Mbps.</td>
</tr>
<tr>
<td>Embedded Audio</td>
<td>1 – 8 stereo pairs, user selectable, 20/24-bit resolution, uncompressed.</td>
</tr>
<tr>
<td>VBI (SD)</td>
<td>VITC, WST, Video Index Information.</td>
</tr>
<tr>
<td>Ancillary Data (HD)</td>
<td>Transparent transport of luminance samples of entire VBI lines – user can select from 0 to all VBI lines in both fields.</td>
</tr>
<tr>
<td>Lip-sync (Audio/Video)</td>
<td>Closed captions (line 21) and WSS (line 23) are transported as active video.</td>
</tr>
<tr>
<td>Programmable output control</td>
<td>Transition to a user selectable monochrome color or 0 VDC in case of loss of RTP stream.</td>
</tr>
</tbody>
</table>

### Management and Monitoring

| Number of ports on chassis | Two |
| Connector type | RJ-45 |
| Interface type | 10/100 and 10/100/1000BASE-T |
| Protocols | HTTP, SNMP, IIOP |
| User interface | Embedded HTML user interface |

### Environmental Specifications

| Operating temperature | 0°C – + 50°C / +32°F – +122°F |
| Storage temperature | –40°C – +70°C / –40°F – +158°F |
| Humidity | 5% – 95% (non condensing) |
| Altitude | –200 to 10000 feet (–61 to 3048 m) |

### Power Consumption

| Chassis fully loaded | < 185 W |
| One card (chassis included) | < 120 W |

### Input Voltage

| DC input voltage | Nominal: –48 VDC. Normal service voltage range: –38 – –58 VDC. |

### Chassis Mechanical Specifications

| Height | 1RU 1.74 in. / 44 mm |
| Width | 19 in. / 483 mm |
| Depth | 22.13 in. / 562 mm |
| Weight (fully loaded) | 27.6 lbs / 12.5 kg |
| Cooling | Front to back, forced air. Units are stackable. |

1. SFP, SFP+ or video SFP module not included.

Figure 2 shows the Cisco DCM Series D9901 IP Video Gateway Rear Panel with two AC power supplies, two gateway cards with SFP modules applied, and electrical video interfaces.
Ordering Information

Table 2 shows ordering information for the Cisco DCM Series D9901 IP Video Gateway components.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chassis</strong></td>
<td></td>
</tr>
<tr>
<td>D9901 DCM MKI Chassis, 1RU, No PSU, Main</td>
<td>DCM-MK1-1RU</td>
</tr>
<tr>
<td><strong>Hardware Upgrades (Boards delivered as separate kits)</strong></td>
<td></td>
</tr>
<tr>
<td>D9901 DCM Gateway card – Electrical: 3 Inputs/3 Outputs</td>
<td>DCM-GW-E-3I3O</td>
</tr>
<tr>
<td>D9901 DCM Gateway card – Electrical: 6 Inputs</td>
<td>DCM-GW-E-6I</td>
</tr>
<tr>
<td>D9901 DCM Gateway card – Electrical: 6 Outputs</td>
<td>DCM-GW-E-6O</td>
</tr>
<tr>
<td>D9901 DCM Gateway card – Optical: 6 Ports</td>
<td>DCM-GW-O-6P</td>
</tr>
<tr>
<td>D9901 DCM Gateway card – Electrical/Optical: 3 Inp/3 Ports</td>
<td>DCM-GW-EO-3I3P</td>
</tr>
<tr>
<td>D9901 DCM Gateway card – Electrical/Optical: 3 Out/3 Ports</td>
<td>DCM-GW-EO-3O3P</td>
</tr>
<tr>
<td>D9901 DCM Gateway card – El: 3 Inputs/3 Outputs, JPEG2K</td>
<td>DCM-GW-E-3I3O-J2K</td>
</tr>
<tr>
<td>D9901 DCM Gateway card – Electrical: 6 Inputs, JPEG2K 3ch</td>
<td>DCM-GW-E-6I-J2K</td>
</tr>
<tr>
<td>D9901 DCM Gateway card – 6 Outputs, JPEG2K 3ch</td>
<td>DCM-GW-O-6P-J2K</td>
</tr>
<tr>
<td>D9901 DCM Gateway card – Optical: 6 ports, JPEG2K 3ch</td>
<td>DCM-GW-O-6P-J2K</td>
</tr>
<tr>
<td>D9901 DCM Gateway card – El/Opt: 3 Inp &amp; 3 Ports, JPEG2K 3ch</td>
<td>DCM-GW-EO-3I3P-J2</td>
</tr>
<tr>
<td>D9901 DCM Gateway card – El/Opt: 3 Out &amp; 3 Ports, JPEG2K 3ch</td>
<td>DCM-GW-EO-3O3P-J2</td>
</tr>
<tr>
<td>DCM blank plate for I/O slot</td>
<td>DCM-BLANK-IO</td>
</tr>
<tr>
<td>DCM 16G Compact Flash upgrade kit (select version in Cisco’s Dynamic Configuration Tool)</td>
<td>MEM-DCM-CF16</td>
</tr>
<tr>
<td><strong>Power Supplies</strong></td>
<td></td>
</tr>
<tr>
<td>AC power supply (AC power cord needs to be ordered separately)</td>
<td>PWR-350-AC-1RU</td>
</tr>
<tr>
<td>DC power supply</td>
<td>PWR-350-DC-1RU</td>
</tr>
<tr>
<td><strong>Software</strong></td>
<td></td>
</tr>
<tr>
<td>Software license CD-ROM (Add licenses in Cisco’s Dynamic Configuration Tool)</td>
<td>DCM-LIC-UPGR</td>
</tr>
<tr>
<td>Here you can add:</td>
<td></td>
</tr>
<tr>
<td>• Enabling of additional video streams</td>
<td></td>
</tr>
<tr>
<td>• Enabling of HD-SDI</td>
<td></td>
</tr>
<tr>
<td>• Enabling of 3G HD-SDI</td>
<td></td>
</tr>
<tr>
<td>• Enabling of FEC and Hitless Merge</td>
<td></td>
</tr>
<tr>
<td>• Enabling of the 10 GbE</td>
<td></td>
</tr>
<tr>
<td><strong>AC Power Cords</strong></td>
<td></td>
</tr>
<tr>
<td>Argentina</td>
<td>CAB-PWR-DMN-ARG</td>
</tr>
<tr>
<td>Australia</td>
<td>CAB-PWR-DMN-AUS</td>
</tr>
<tr>
<td>China</td>
<td>CAB-PWR-DMN-CHN</td>
</tr>
<tr>
<td>Europe</td>
<td>CAB-PWR-DMN-EU</td>
</tr>
<tr>
<td>Italy</td>
<td>CAB-PWR-DMN-IT</td>
</tr>
<tr>
<td>Japan</td>
<td>CAB-PWR-DMN-JPN</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>CAB-PWR-DMN-UK</td>
</tr>
<tr>
<td>United States</td>
<td>CAB-PWR-DMN-US</td>
</tr>
</tbody>
</table>
Table 3 shows ordering information for SFP plug-ins. See Notes 2 and 3 for additional information about SFP plug-ins.

Table 3. Ordering Information for SFP Plug-ins

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SFP Plug-ins – WDM types</strong></td>
<td></td>
</tr>
<tr>
<td>GbE SFP module 850 nm (LC, up to 500 m)</td>
<td>SFP-WDM-850-0500</td>
</tr>
<tr>
<td>GbE SFP module 1310 nm (LC, up to 5 km)</td>
<td>SFP-WDM-1310-5</td>
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<td>Video SFP 1310nm – Rx</td>
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3. Please find further details on the Cisco data sheet for 10 Gigabit BASE SFP+ modules.
Service and Support

Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. For more information about Cisco services, refer to Cisco Technical Support Services or Cisco Advanced Services.