

Digital Content Manager DCM Product Overview

Today's digital systems demand powerful, flexible, and compact solutions that allow content providers and service providers to support new network architectures. The Synamedia® DCM Series D9902 Digital Content Manager is a compact and versatile 2RU platform that supports various applications from content contribution, content production, primary distribution, and secondary distribution.

The DCM Series D9902 Digital Content Manager includes the following:

- Broadcast quality and high density transrating, transcoding and encoding of MPEG-2 and H.264 compressed video and audio services.
- Multiple feed receptions of DVB-S/S2, multi-decryption and processing of MPEG-2 services.
- Flexible and versatile remultiplexing, grooming and scrambling of DVB and ATSC services.
- Highly reliable and efficient transport of SDI video, AES Audio, and ASI transport stream signals



About the DCM

Physical Configuration

The DCM Series D9902 comes in a compact 2RU chassis with hot-swappable and redundant power supplies. The unit has four individual slots. These four slots can contain any combination of the following cards:

- Multi-Format Processor (MFP) Card
- Media Interface (MIC) Card
- Dense Receiver Decrypter (DRD) Card
- ASI I/O Card

Redundancy and Reliability

The DCM Series D9902 chassis is designed to help operators configure highly reliable networks. It supports hot-swappable and redundant power supplies and hot-swappable cooling fans, and the chassis can be configured in a hot 1:1 configuration to support maximum uptime, with minimum switch-over interruption.

To maximize service availability, the DCM Series D9902 also offers port, stream, and service redundancy.

Security Functions

Today's IP attack profiles cover operating systems, networks, applications, and protocols. These attacks can cause hours or days of downtime, affecting the availability of resources and creating severe breaches in data confidentiality and integrity. Depending on the level of the attack and the type of information compromised, the consequences vary in degree, from mildly inconvenient to completely debilitating, and the cost of troubleshooting and recovery can be considerable. To cope with the increasingly complex and open nature of the IP network environment, the DCM Series D9902 is designed with robust and comprehensive security features.

User Interface and Management

The DCM Series D9902 chassis is controlled via an easy and intuitive GUI. To keep things simple, there is no software to load on the user's computer. The GUI of the DCM Series D9902 is an HTML-based user interface that can be opened using Microsoft Internet Explorer or Firefox. The GUI supports simple program provisioning through drag-and-drop functionality. The interface provides detailed information to the user, displaying the DCM Series D9902 configuration, input and output bit rate measurements, packet loss statistics, SDI video bit errors, transport stream alarms, and other information. For easy access to content details, sorting of program information can be performed on various program criteria, including input and output ports, bit rates, and program names.

For integrated network monitoring and control, the DCM Series D9902 is integrated with Video Service Manager Management (VSM) system. All functionality available via the HTML interface is available with the VSM system.

Additional Features

System

- 60 Gbps internal processing throughput, with a potential future I/O capability of up to 40 Gbps
- User hot-swappable power supplies and fans
- Redundant load-sharing power supplies, supports both AC and DC power supplies

Management

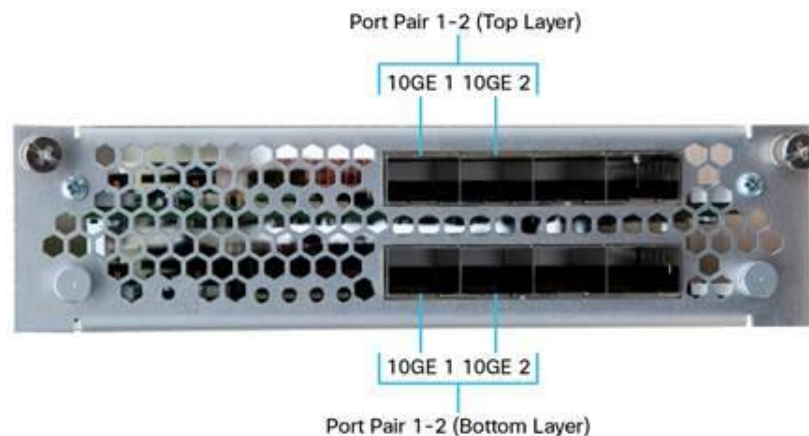
- SNMP traps
- ROSA management
- Easy control using web browser
- Ethernet interface for communication with management system and web browser
- IPsec
- General-purpose inputs

Media Interface Card

Your IP connectivity requirements are growing rapidly, driven by increased IP transport volumes along with a myriad of high-definition services. The Synamedia® Digital Content Manager (DCM) Media Interface Card is a new dense Input/output card that is capable of providing a 10 Gigabit Ethernet Input/output connectivity for up to 2500 transport streams in and 2500 transport streams out in full-duplex mode. Designed to fit in the Synamedia DCM D9902 Chassis, the Synamedia DCM Media Interface Card currently supplements the Synamedia Gigabit Ethernet card capability. In future releases, it will provide the same functionality as the card including MPEG transport processing and Forward Error Correction (FEC) capabilities.

To support an all-in-one platform through the convergence of input connectivity and video processing in the same chassis, the Synamedia DCM Media Interface Card can be configured to provide either baseband input through Serial Digital Interfaces (SDIs) or 10 Gigabit IP connectivity.

Figure 1. Synamedia DCM Series Media Interface Card



Features and Benefits

The Synamedia DCM Media Interface Card design uses the Synamedia DCM D9902 chassis switching capability. It uses the same virtual slot paradigm, with the same two-layer concept as the Synamedia DCM Multi-Format Processing Card. Each layer can be defined in terms of its I/O connectivity function, thereby allowing multiple applications to operate with a single card through software.

In each layer, the Synamedia DCM Media Interface Card provides four Small Form-Factor Pluggable (SFP) slots. Two of the slots are configured as SFP and the other two are configured as SFP+. Depending on the type of connectivity in each virtual slot, the correct SFP type should be used. For a list of configurations that the Synamedia DCM Media Interface Card supports, refer to the Configurations section. For details on the supported SFP types, refer to Table 3. As stated above, the Synamedia DCM Media Interface Card can be used for either SDI input or 10 Gigabit Ethernet connectivity and not both.

Flexible Modular Design

The Synamedia DCM Media Interface Card fits into any application slot of a Synamedia DCM 2RU chassis. Combined with existing application cards and I/O cards (such as Asynchronous Serial Interface (ASI), Gigabit Ethernet, satellite, and terrestrial), the Synamedia DCM Media Interface Card supports truly converged applications. The functionalities in this card are software activated via a flexible electronic licensing program.

Baseband Video Interfaces

The Synamedia DCM Media Interface Card provides SDI input to the DCM chassis. The SDI inputs are SDI, HD-SDI and 3G-SDI compatible. The card allows for up to 8 SD-SDI, 8 HD-SDI, or 4 3G-SDI inputs. This card enables processing of the vertical blanking interval (VBI) and the vertical ancillary (VANC) data, as well as extraction of audio signals from the horizontal ancillary (HANC) space.

Multiplexing

As is the case for the Synamedia DCM Gigabit Ethernet Card, the Synamedia DCM Media Interface Card supports MPEG-2 transport stream routing, merging and component tracking. In addition, it allows for acquisition of PSI/PSIP tables and the processing of these tables for output. The card also provides ETR error monitoring.

Redundancy

As illustrated in Figure 1, the two 10 Gigabit Ethernet ports in each layer of the Synamedia DCM Media Interface Card can be configured in port pairs where one of the port designated as the backup port would provide redundancy in the case where a loss occurs in the MAIN port. Transport stream and service redundancy features are also supported.

Fast, Easy Setup and Configuration

The Synamedia DCM Media Interface Card is fully integrated in an easy-to-use HTML-only web user interface, allowing drag-and-drop service configuration.

Configurations

The following configurations are supported.

10 Gigabit transport capabilities:

- 10 Gigabit input using SFP+ plug-in in bottom layer and 10Gbps output using SFP+ plug-in in top layer
- 10 Gigabit input port pair using SFP+ plug-ins in bottom layer and 10Gbps output port pair using SFP+ plug-ins in top layer
- 10 Gigabit full duplex using SFP+ plug-in in bottom layer
- 10 Gigabit full duplex port pair using SFP+ plug-in in bottom layer

SDI input functionality:

- 4 SD/HD-SDI inputs using SFP plug-in in bottom layer
- 4 SD/HD-SDI inputs using SFP plug-in in bottom layer and 4 SD/HD-SDI inputs using SFP Plug-in in top layer

Ad Insertion

- Single card configured as seamless MPEG-2 or AVC splicer

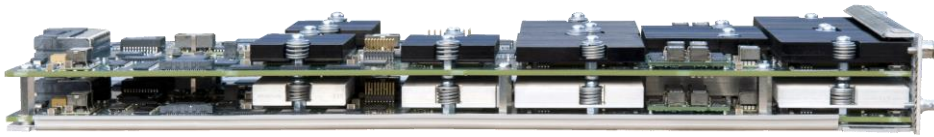
DVB-CSA3 Scrambling:

- Single card for protecting your content with DVB-CSA3

Multi Format Processor Card

The Synamedia® Digital Content Manager (DCM) Series Multi Format Processor Card (MFP Card) adds high-density, high-quality advanced processing of MPEG-2 and H.264 (AVC), High Definition (HD) and Standard Definition (SD) video, and audio for all screens to the DCM Series platform.

Figure 2. Synamedia DCM Series Multi Format Processor Card



Today's consumer channel lineup requirements are growing rapidly with the dual drivers of increased standard and high-definition channels and a need for reduced cost of ownership.

The Synamedia DCM Series Multi Format Processor Card adds high-density MPEG-2 and H.264 video and audio processing capability to the Synamedia DCM Series with low power usage.

The Synamedia DCM Series Multi Format Processor Card provides support for multiple screen transcoding and therefore is a truly converged processing solution to address all screens.

Adding to the industry proven track record of the Synamedia DCM Series, the Multi Format Processor plug-in cards provides the next generation of IP-centric headend deployments, large and small, with high reliability and excellent video quality.

With the flexibility of ASI, IP, satellite or ATSC off-air inputs, and ASI or IP outputs, the DCM can be placed at multiple points in the content acquisition subsystem, processing up to 144 SD or 48 HD channels in a 2RU appliance.

Key Features and Benefits

MPEG-2 and H.264 processing

- Performs transcoding, encoding and rate-changing of MPEG-2 and H.264, HD and SD services in single and multi-program transport streams.
- Encoding and Transcoding any input to a multiple H.264 adaptive bitrate resolutions
- Encoding and Transcoding of audio services between MPEG-1 layer II, Dolby® Digital (AC-3), , Dolby® Digital Plus (EAC-3) and Advanced Audio Codec (AAC) formats.
- Performs statistical multiplexing of mixed MPEG-2 and H.264, HD and SD video on a single card.
- High Definition services can be transcoded to Standard Definition video, regardless of the codec
- MPEG-2, H.264, SD and HD processing can be combined on a single card, maximizing your investment.

High Density Processing

- The DCM Series MFP card adds transcoding for up to 72 SD or 24 HD programs to the DCM Series D9900/D9901 Chassis.
- The DCM Series MFP card adds transcoding for up to 144 SD or 48 HD programs to the DCM Series D9902 Chassis.
- Using the DCM Series MFP card allows to add up to 300 output profiles per 2RU chassis.
- Premium Quality mode for bandwidth-constrained environments

Dense Receiver and Decrypter Card

For digital turn-around distribution applications, the Dense Receiver and Decrypter (DRD) card receives DVB-S and DVB-S2 satellite signals on all inputs simultaneously. Each of the DVB-CI slots on a card can descramble satellite feeds and programs from any input, including ASI and GbE, allowing a more efficient use of the Conditional Access Modules (CAMs).

Figure 3. Synamedia DCM Series DRD Card



Key Features and Benefits

- Satellite Reception Card with Common Interface
- 4 independent receivers on single DCM Card
- 4 CI slots on single DCM Card
- Unparalleled density: 12 RF/CI slots in DCM 2RU
- DVB-S2 Multistream (DVB MIS) capable on all inputs
- BISS - Descrambling

ASI I/O Card

The ASI cards have 10 ASI ports and support full ASI rates allowing freedom in system design. All ASI ports can be individually configured as input or output, and all ASI ports support MPTS and SPTS streams.

Figure 4. Synamedia DCM Series ASI I/O Card



- Single Layer Card using 1 physical slot
- Up to 30 ASI interface ports (10 ASI ports per ASI I/O card)
- Up to 500 streams, 2Gbps
- Full 213 Mbps ASI rate support
- ETR 290, Advanced MPEG, PSI/SI Processing
- Port, Service, TS Redundancy
- Digital Transport Formatting

Specifications

Table 1. DCM D9902 Chassis Specifications

Category	Specification
Physical and Power	
Physical Specifications	Height: 2RU 3.48 in. / 88 mm Width: 19 in. / 483 mm Depth: 21.8 in. / 554 mm Weight: <ul style="list-style-type: none"> • 14.5kg (unloaded) • 17kg (fully loaded with GbE & 3 ASI cards) • 21 kg (fully loaded with Gateway cards)
Power Consumption	Empty chassis: 100W
Input Voltage	Worldwide ranging AC <ul style="list-style-type: none"> • Nominal 100 – 240 VAC • Normal service voltage range 90 – 254 VAC • Frequency 47 – 63 Hz • Maximum current 10 A Worldwide ranging DC <ul style="list-style-type: none"> • Nominal -48 - -60 VDC • Normal service voltage range -40 to -72 VDC; • Maximum current, 29A
Cooling	Front to rear, forced air, units are stackable, fan speed is ambient temperature controlled

Environmental	
Operating Temperature	32 to 122°F – 0 to 50°C
Storage Temperature	–40 to 158°F (–40 to 70°C)
Relative Operating Humidity	5% to 85% (gradation < 10% per hour)
Relative Storage Humidity	5% to 95%
Operating Altitude	–61 to 3048m (up to 2000m conforms to IEC/EN/UL/CSA 60950 requirements)
Regulatory Compliance	
ETSI Standards	EN 300 386: Telecommunications Network Equipment (EMC)
EMC Standards	<ul style="list-style-type: none"> ● FCC 47 CFR Part 15 Class A ● ICES- 003 Class A ● AS/NZS 3548 Class A ● CISPR 22 / EN55022 Class A ● CISPR 24 / EN55024 ● VCCI Class A ● KN 22 ● IEC/EN 61000-3-2: Power Line Harmonics
Immunity	<ul style="list-style-type: none"> ● IEC/EN-61000-4-2: Electrostatic Discharge Immunity ● IEC/EN-61000-4-3: Radiated RF Immunity ● IEC/EN-61000-4-4: Electrical Fast Transient Immunity ● IEC/EN-61000-4-5: Surge Immunity ● IEC/EN-61000-4-6 : Conducted RF Immunity ● IEC/EN-61000-4-11: Voltage DIPS, Short Interruptions and Voltage Variations
Safety	<ul style="list-style-type: none"> ● UL/CSA/IEC/EN 60950-1 2nd edition ● IEC/EN 60825 Laser Safety ● ACA TS001 ● AS/NZS 60950 ● FDA: Code of Federal Regulations Laser Safety
Management and monitoring	
Number of ports on chassis	3 (1 on front, and 2 on the rear)
Connector type	RJ-45
Interface type	10/100/1000 BT
Protocols	HTTP, SNMP, IIOP
User interface	Embedded HTML user interface
Local RS-232 communication interface	Mini USB type B, to initially configure management ports
General Purpose Inputs	25 pin connector (to be supported in the future)

Figure 5. Synamedia DCM Digital Content Manager Rear Panel



Table 2. DCM MIC Card Specifications

Category	Specification
Physical and Power	
Physical specifications	Height: 39.5 mm/1.54 in
	Width: 145 mm/5.70 in
	Depth: 365 mm/14.37 in
	Weight: 1.120 kg/3.46 lbm
Power Consumption	DCM Media Interface Card: 160W maximum
Environmental Specifications	
Operating Temperature	32 - 122°F (0 to 50°C)
Storage Temperature	-40 - 158°F (-40 to 70°C)
Relative Operating Humidity	5 to 90 percent
	Note: Not to exceed 0.024 kg water or dry air
Relative Storage Humidity	5 to 95 percent
	Note: Not to exceed 0.024 kg water or dry air
Operating Altitude	-61 to 3048m (up to 2000m conforms to IEC/EN/UL/CSA 60950 requirements)
Compliance	
Network Equipment Building Standards (NEBS)	Designed for SR-3580: NEBS Criteria Levels (Level 3) GR-1089-CORE: NEBS EMC and Safety GR-63-CORE: NEBS Physical Protection
ETSI Standards	<ul style="list-style-type: none"> EN300 386: Telecommunications Network Equipment (EMC) FCC 47 CFR Part 15 Class A ICES- 003 Class A AS/NZS 3548 Class A CISPR 22/EN55022 Class A CISPR 24/EN55024 VCCI Class A KN 22
EMC Standards	<ul style="list-style-type: none"> IEC/EN 61000-3-2: Power Line Harmonics IEC/EN-61000-4-2: Electrostatic Discharge Immunity IEC/EN-61000-4-3: Radiated Immunity IEC/EN-61000-4-4: Electrical Fast Transient Immunity IEC/EN-61000-4-5: Surge
Immunity	<ul style="list-style-type: none"> IEC/EN-61000-4-11: Voltage DIPS, Short Interruptions, and Voltage Variations UL/CSA/IEC/EN 60950-1 2nd edition IEC/EN 60825 Laser Safety ACA TS001 AS/NZS 60950
Safety	<ul style="list-style-type: none"> FDA: Code of Federal Regulations Laser Safety
Baseband Video Interfaces	
Number of Ports per Card	Up to 8 ports for SD/HD-SDI inputs Up to 4 ports for 3G-SDI inputs
Connector Type	SFP plug-in - Please refer to Table 3
Video Formats	SD-SDI:
	<ul style="list-style-type: none"> 576i @ 25Hz, 480i @ 29.97 Hz (SMPTE-259)
	HD-SDI:
	<ul style="list-style-type: none"> 1080i @ 29.97 Hz, 1080i @ 25 Hz, 720p @ 59.94 Hz, 720p @ 50 Hz, 1080p@ 29.97 Hz, 1080p @ 25 Hz (SMPTE-292)
Video Formats	3G-SDI:
	<ul style="list-style-type: none"> 1080p@ 59.97 Hz, 1080p @ 50 Hz (SMPTE-424M)

Chroma Format	4:2:2
Video Resolution	10 bit
	SD: ≥ 15 dB, 5MHz - 270MHz HD: ≥ 15 dB, 5MHz - 1.485 GHz,
Return Loss	3G-HD ≥ 15 dB, 5MHz - 1.485 GHz, ≥ 10 dB, 1.485GHz - 2.97 GHz
Connector	SFP plug-in - Please refer to Table 3
Jitter Acceptance	According to SMPTE RP-184
Aspect Ratio	4:3, 16:9
AFD Signaling	SMPTE-2016, manual
Embedded Audio Specifications	
Format	SMPTE-299-1M, SMPTE-272M
Sample Frequency	48 kHz (locked to video)
Resolution	20 bits, 24 bits
VBI and Ancillary Data	
Closed Captions	CEA-608 from Line 21 (SDI) CEA-708 VANC extraction - SMPTE-334M (HD-SDI)
VBI Formats	WST, DVB-WST, OP-47, SMPTE-2031
Digital Program Insertion	SCTE-35 signaling via SCTE-104 VANC messages
IP Interfaces	
Number of Ports per Card	Four 10Gigabit Ethernet either unidirectional or full duplex, configured in two 1+1 redundant ports
Connector Type	10Gigabit Ethernet: Optical or electrical SFP+
Interface Type	10Gigabit Ethernet according to IEEE 802.3ae
Protocols	UDP/IP, RTP/UDP/IP, ARP, IGMPv2/v3, Diffserv/TOS 802.1p Support for IEEE 802.Q VLAN tagging
IP Address Format	Multicast, unicast
Redundancy	Port, TS and Service backup
TS Streaming	Multiple SPTS/MPTS streams
Number of TS Streams	Up to 2500 input streams and 2500 output streams per card
TS Tables	Input SI/PSI/PSIP acquisition, Output SI/PSI/PSIP processing

Table 3. DCM MFP Card Specifications

Category	Specification
Physical and Power	
Physical specifications	Dual layer MFP Card (DCM-MFP) that occupies 1 slot in the DCM MkII 2RU chassis: <ul style="list-style-type: none"> ● Height: 39.5 mm ● Width: 145 mm ● Depth: 365 mm ● Weight: 1,570 kg
Power Consumption	DCM-MFP : 150 W
Environmental Specifications	
Operating Temperature	32 – 122°F / 0 – 50°C
Storage Temperature	-40 – 158°F (-40 – 70°C)
Relative Operating Humidity	5 to 90% Note: Not to exceed 0.024 kg water or dry air Relative Storage Humidity

Relative Storage Humidity	5 to 95% Note: Not to exceed 0.024 kg water or dry air.
Operating Altitude	–61 to 3048 m (up to 2000 m conforms to IEC/EN/UL/CSA 60950 requirements)
Compliance	
Network Equipment Building Standards (NEBS)	Designed for SR-3580: NEBS Criteria Levels (Level 3) GR-1089-CORE: NEBS EMC and Safety GR-63-CORE: NEBS Physical Protection
ETSI Standards	<ul style="list-style-type: none"> ● EN300 386: Telecommunications Network Equipment (EMC)
EMC Standards	<ul style="list-style-type: none"> ● FCC 47 CFR Part 15 Class A ● ICES- 003 Class A ● AS/NZS 3548 Class A ● CISPR 22 /EN55022 Class A ● CISPR 24 / EN55024 ● VCCI Class A ● KN 22 ● IEC/EN 61000-3-2: Power Line Harmonics
Immunity	<ul style="list-style-type: none"> ● IEC/EN-61000-4-2: Electrostatic Discharge Immunity ● IEC/EN-61000-4-3: Radiated Immunity ● IEC/EN-61000-4-4: Electrical Fast Transient Immunity ● IEC/EN-61000-4-5: Surge ● IEC/EN-61000-4-11: Voltage DIPS, Short Interruptions, and Voltage Variations
Safety	<ul style="list-style-type: none"> ● UL/CSA/IEC/EN 60950-1 2nd edition ● IEC/EN 60825 Laser Safety ● ACA TS001 ● AS/NZS 60950 ● FDA: Code of Federal Regulations Laser Safety
Video Decoding	
HD Bitrates	<ul style="list-style-type: none"> ● MPEG-2: MP@HL up to 30 Mbps ● H.264: HP@L4.0-L4.1 up to 25 Mbps
HD Resolutions	<ul style="list-style-type: none"> ● 1080i x 1920 / 1280 @ 25 fps ● 1080i x 1920 / 1280 @ 29.97 fps ● 720p x 1280 / 960 @ 50 fps ● 720p x 1280 / 960 @ 59.94 fps
SD Bitrates	<ul style="list-style-type: none"> ● MPEG-2: MP@ML up to 15 Mbps ● H.264: MP@L3-L4.1 up to 12 Mbps
SD Resolutions	<ul style="list-style-type: none"> ● PAL: 576i x 720/ 704/ 640/ 544/ 528/ 480/ 352 @ 25 fps ● NTSC: 480i x 720/ 704/ 640/ 544/ 528/ 480/ 352 @ 29.97 fps
Video Encoding	
HD Bitrates	<ul style="list-style-type: none"> ● MPEG-2: HP@HL 0.5 Mbps to 30 Mbps ● H.264: MP@L4.0 1 Mbps to 20 Mbps ● H.264: HP@L4.0 1 Mbps to 25 Mbps ● H.264: MP@L4.1 1 Mbps to 30 Mbps
HD Resolutions	<ul style="list-style-type: none"> ● 1080i x 1920 / 1280 @ 25 fps ● 1080i x 1920 / 1280 @ 29.97 fps ● 720p x 1280 / 960 @ 50 fps ● 720p x 1280 / 960 @ 59.94 fps ● ABR: resolution freely configurable
SD Bitrates	<ul style="list-style-type: none"> ● MPEG-2: MP@ML 0.5 Mbps to 10 Mbps ● H.264: MP@L3.0 0.5 Mbps to 10 Mbps ● H.264: HP@L3.0 0.5 Mbps to 12.5 Mbps

SD Resolutions	<ul style="list-style-type: none"> ● PAL: 576i x 720/ 704/ 640/ 544/ 528/ 480/ 352 @ 25 fps ● NTSC: 480i x 720/ 704/ 640/ 544/ 528/ 480/ 352 @ 29.97 fps ● ABR: resolution freely configurable
Inverse Telecine	<ul style="list-style-type: none"> ● 3:2 pulldown inversion
Video Processing	
Number of services	DCM-MFP <ul style="list-style-type: none"> ● SD: up to 48 services per card ● HD: up to 16 services per card
Statistical Multiplexing	<ul style="list-style-type: none"> ● Mixed AVC, MPEG-2 HD and SD ● 64 services per statistical multiplexing group
GOP Control	<ul style="list-style-type: none"> ● Static, Hierarchical and Dynamic GOP
Audio Decoding	
MPEG-1 & MPEG-2 Layer II audio	<ul style="list-style-type: none"> ● Stereo, Mono ● Bitrate: 32 to 384 kbps
AAC	<ul style="list-style-type: none"> ● Stereo, Mono ● Bitrate: 32 to 640 kbps, depending on the encoding mode ● ADTS, LATM/LOAS
Dolby Digital (AC-3)	<ul style="list-style-type: none"> ● Stereo, Mono ● Bitrate: 56 to 640 kbps
Audio Encoding	
MPEG-1 & MPEG-2 Layer II audio	<ul style="list-style-type: none"> ● Stereo, Mono ● Bitrate: 32 to 384 kbps
AAC	<ul style="list-style-type: none"> ● Stereo, Mono ● Bitrate: 32 to 640 kbps, depending on the encoding mode ● ADTS, LATM/LOAS
Dolby Digital (AC-3)	<ul style="list-style-type: none"> ● Stereo, Mono ● Bitrate: 56 to 640 kbps
Number of audio services	<ul style="list-style-type: none"> ● DCM-MFP: Up to 48 audio services per card
VBI & Ancillary Data	
Closed captions	<ul style="list-style-type: none"> ● CEA-608 and CEA-708 conversion
VBI Formats	<ul style="list-style-type: none"> ● WST, DVB-WST, Inverted WST, WSS, VPS, Transparent lines, VII, OP-47

Table 4. DCM DRD Card Specifications

Category	Specification
Physical and Power	
Physical specifications	Dual layer DRD Card (DCM-DRD) that occupies 1 slot in the DCM MkII 2RU chassis: <ul style="list-style-type: none"> ● Height: 39.5 mm ● Width: 145 mm ● Depth: 365 mm ● Weight: 1.1 kg
Environmental Specifications	
Operating Temperature	32 – 122°F / 0 – 50°C
Storage Temperature	-40 – 158°F (-40 – 70°C)
Relative Operating Humidity	5 to 90% Note: Not to exceed 0.024 kg water or dry air Relative Storage Humidity
Relative Storage Humidity	5 to 95% Note: Not to exceed 0.024 kg water or dry air.

Interface Specifications	
Number of RF ports per card	2 or 4 ports, each port independently configurable
Input return loss	> 10dB
Connector	F-type, female (75 Ω)
Interface type	DVB-S (according to ETSI EN 300 421) DVB-S2 (according to ETSI EN 302 307)
Frequency range	950 to 2150 MHz
Input level range	-65 to -25 dBm
Constellation	QPSK, 8PSK, 16APSK
Symbol Rate	1 to 45 MSym/s
FEC code rate	DVB-S QPSK: 1/2, 2/3, 3/4, 5/6, 7/8 DVB-S2 QPSK: 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 DVB-S2 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 DVB-S2 16APSK: 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
FEC Frame	Normal and Short
Roll Off factor	0.20, 0.25 and 0.35
Modulation Mode	CCM and VCM
Transport stream mode	Single and Multi-stream
Number of Common Interface slots per card	2 or 4 independent PCMCIA slots
Interface type	DVB-CI (according to EN 50221)

Table 5. DCM ASI I/O Card Specifications

Category	Specification
Physical and Power	
Physical specifications	Single layer ASI I/O Card (DCM-ASI I/O) that occupies 1 slot in the DCM MkII 2RU chassis: <ul style="list-style-type: none"> ● Height: 39.5 mm ● Width: 145 mm ● Depth: 365 mm ● Weight: 0.8 kg
Environmental Specifications	
Operating Temperature	32 – 122°F / 0 – 50°C
Storage Temperature	-40 – 158°F (-40 – 70°C)
Relative Operating Humidity	5 to 90% Note: Not to exceed 0.024 kg water or dry air Relative Storage Humidity
Relative Storage Humidity	5 to 95% Note: Not to exceed 0.024 kg water or dry air.
Interface Specifications	
Number of ports per card	10 ports, each port configurable as input or output
Connector	BNC-type
Impedance	75 ohms
Interface type	Asynchronous Serial Interface (ASI) (according to EN 50083-9)
Packet format	Auto detection: 188 / 204 byte packets
Bit rate	0.1 – 213 Mbps
Syntax	SPTS or MPTS (according to ISO/IEC 13818)

Ordering Information

Feature	Part Number
Chassis	
D9902 DCM Chassis, 2RU	DCM-MK2-2RU
D9902 DCM Chassis, No PSU, SPARE	DCM-MK2-2RU=
Power Supplies	
D9902 DCM 2RU PSU, AC (AC power cord needs to be ordered separately)	PWR-850-AC-2RU
D9902 DCM 2RU PSU, AC (Spare)	PWR-850-AC-2RU=
D9902 DCM 2RU PSU, DC	PWR-850-DC-2RU
D9902 DCM 2RU PSU, DC (Spare)	PWR-850-DC-2RU=
AC Power cords	
Argentina	CAB-PWR-DMN-ARG
Australia	CAB-PWR-DMN-AUS
China	CAB-PWR-DMN-CHN
Europe	CAB-PWR-DMN-EU
Italy	CAB-PWR-DMN-IT
Japan	CAB-PWR-DMN-JPN
UK	CAB-PWR-DMN-UK
DC Power cords	
D9902 DCM DC Power Cable	DCM-D9902-CAB-DC
D9902 DCM DC Power Cable (Spare)	DCM-D9902-CAB-DC=
Mounting kit - Optional	
D9902 DCM MID-MOUNT BRACKETS	DCM-D9902-MID-BRK=
Accessories	
D9902 DCM MINI-USB-B - USB	DCM-D9902-MINIUSB=
Licenses	
Software licenses via e-delivery (Add licenses in Ordering Tool)	DCM-LIC-UPGR
MIC Hardware	
D9902 DCM Media Interface card - (req. SW, DCM, V13.10 or later)	DCM-IO-PROC
D9902 DCM Media Interface card - SPARE (req. SW, DCM, V13.10 or later)	DCM-IO-PROC=
MIC Licenses	
D9902 10Gigabit License per Card Main	LCDM-10G-IO
D9902 10Gigabit License per Card Backup	BCDM-10G-IO
Video SFPs	
Video SFP HD-BNC SD/HD/FHD Transceiver, MSA Compliant	VSFP-BNC-3G
Video SFP HD-BNC SD/HD/FHD Transceiver, MSA Compliant - Spare	VSFP-BNC-3G=
Ethernet 10G SFPs	
SFP+,10GE, LR Optical, 1310nm, DCM	VN-SFP-10G-LR
SFP+,10GE, SR Optical, 850nm, DCM	VN-SFP-10G SR

Ethernet 1G SFPs

SFP Copper (RJ45)	SFP-RJ-45
SFP WDM 850nm (LC. up to 500m)	SFP-WDM-850-0500
SFP WDM 1310nm (LC. up to 5km)	SFP-WDM-1310-5

MFP Hardware

D9902 DCM Multi Format Processor Board, Double Layer (req. SW, DCM, V10.00.05 or later)	DCM-MFP-MKII
D9902 DCM Multi Format Processor Board, Double Layer, Spare (req. SW, DCM, V10.00.05 or later)	DCM-MFP-MKII=

MFP Licenses

Software license CD-ROM (Add licenses in Cisco's Dynamic Configuration Tool)	DCM-LIC-UPGR
Main DCM Device Licenses	
D9900/01/02 MPEG-2 SD Transcoding Lic (1/prg; req MFP)	LDCM-MP2SDTC
D9900/01/02 MPEG-2 HD Transcoding Lic (1/prg; req MFP)	LDCM-MP2HDTTC
D9900/01/02 AVC SD Transcoding Lic (1/prg; req MFP)	LDCM-AVCSBTC
D9900/01/02 AVC HD Transcoding Lic (1/prg; req MFP)	LDCM-AVCHDTTC
D9900/01/02 ABR Transcoding Lic (1/engine; req MFP)	LDCM-ABRTC
D9900/01/02 MFP Statmux (1/prg; req. MFP)	LDCM-SMX
D9900/01/02 MPEG-1 LII Transcode Lic (1/stereo; req MFP)	LDCM-MP1LII-TC
D9900/01/02 Dolby AC-3 Transcoding Lic (1/stereo; req MFP)	LDCM-DLBYAC3-TC
D9900/01/02 Dolby Digital Plus Transcode Lic (1/stereo; req MFP)	LDCM-DDP-TC
D9900/01/02 AAC Audio Transcode Lic (1/stereo; req MFP)	LDCM-AAC-TC
Backup DCM Device Licenses	
D9900/01/02 BU MPEG-2 SD Transcoding Lic (1/prg; req MFP)	BDCM-MP2SDTC
D9900/01/02 BU MPEG-2 HD Transcoding Lic (1/prg; req MFP)	BDCM-MP2HDTTC
D9900/01/02 BU AVC SD Transcoding Lic (1/prg; req MFP)	BDCM-AVCSBTC
D9900/01/02 BU AVC HD Transcoding Lic (1/prg; req MFP)	BDCM-AVCHDTTC
D9900/01/02 BU ABR Transcoding Lic (1/engine; req MFP)	BDCM-ABRTC
D9900/01/02 BU MFP Statmux (1/prg; req. MFP)	BDCM-SMX
D9900/01/02 BU MPEG-1 LII Transcode Lic (1/stereo; req MFP)	BDCM-MP1LII-TC
D9900/01/02 BU Dolby AC-3 Transcode Lic (1/stereo; req MFP)	BDCM-DLBYAC3-TC
D9900/01/02 BU Dolby Digital Plus Transcode Lic (1/stereo; req MFP)	BDCM-DDP-TC
D9900/01/02 BU AAC Audio Transcode Lic (1/stereo; req MFP)	BDCM-AAC-TC

DRD Hardware

DCM DRD Satellite Reception and Decryption board with 4 RF and 4 CI inputs	DCM-DRD-4SAT4CI
DCM DRD Satellite Reception and Decryption board with 4 RF and 4 CI inputs, Spare	DCM-DRD-4SAT4CI=

DRD Licenses

D9900/D9901 DCM DRD Descrambling Lic. 1 CI Slot (req DRD)	LDCM-CI-1
D9900/D9901 DCM DRD Satellite Reception Lic. 1 RF (req DRD)	LDCM-SAT-1
D9900/D9901 DCM DRD Multistream (MIS) Lic. 1 RF (req DRD)	LDCM-MIS-1

ASI I/O Hardware

D9900/D9901 DCM ASI I/O Board MKI	DCM-ASI-MK1
D9900/D9901 DCM ASI I/O Board MKI, Spare	DCM-ASI-MK1=

Service and Support

Using the Synamedia Lifecycle Services approach, Synamedia and its partners provide a broad portfolio of end-to-end services and support that can help increase your network's business value and return on investment. This approach defines the minimum set of activities needed by technology and by network complexity to help you successfully deploy and operate Synamedia technologies and optimize their performance throughout the lifecycle of your network.


Warranty Information

Detailed warranty information can be found on [Synamedia.com](https://www.synamedia.com)

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