CDM-710 Broadcast Satellite Modem

COMTECH EF DATA

INTRODUCTION

The CDM-710 Broadcast Satellite Modem is intended for operation in Digital Video Broadcast (DVB) and generic data transmission applications. It operates over satellite links and provides programmable symbol / data rates up to 45 Msps in DVB-S2[1], DVB-S and DVB-DSNG modes.

DVB Digital Video Broadcasting®

The modulation types supported include QPSK, 8-PSK, 16-QAM, 16-APSK and 32-APSK. Constant Coding and Modulation (CCM) operation with a single input stream is provided for DVB-S2 operation. The unit is available in modulator only, demodulator only, and modem configurations.

The terrestrial data interfaces are field-removable to allow swap out of interface types. The data interfaces include the CDI-40 with ASI, CDI-70 Gigabit Ethernet and CDI-60 HSSI.

DVB S2 SATELLITE®

DVB-S2 offers new opportunities for broadcast applications. With a broad range of modulation and coding formats, it permits the user to tailor a link for the available bandwidth and power to optimize link performance. Whether a link is for Direct-to-Home (DTH) or Digital Satellite News Gathering (DSNG), Contribution or Distribution, there is a format available to suit each application.

APPLICATION

The CDM-710's bandwidth and power-efficient operation is ideal for:

- Digital Video Broadcast (DVB)
- Digital Satellite News Gathering (DSNG)
- Primary or Backhaul Transmission for:
  - Direct-to-Home (DTH)
  - Contribution
  - Distribution
- Business enterprise data distribution
- Broadband Interactive services

[1] ID Number 3424 for CDM-710
DVB and DVB S2 logos are trademarks of the DVB Digital Video Broadcasting Project (1991 to 1996).

With an ASI interface and either a 70/140 MHz or L-Band IF, the CDM-710 is equipped with the configuration most frequently requested by users. This is ideal for video or data transmission formats that take advantage of the frame structures developed for digital video applications. With the Gigabit Ethernet new opportunities are opened.

FAST

Enhancing the CDM-710's performance is easy. Additional features are added quickly on site, using FAST access codes purchased from Comtech EF Data. To enable these features, simply enter the code at the front panel. Other features are added with a simple module swap.

FEATURES

- 52 to 88 MHz or 104 to 176 MHz in 100 Hz Steps
- 950 to 2000 MHz Tx (L-Band Option)
- DVB-S (QPSK) / per EN 300 421, 1 to 45 Msps
- DVB-DSNG (8-PSK, 16-QAM) per EN 301 210, 1 to 45 Msps
- DVB-S2 (QPSK, 8-PSK, 16-APSK) per EN 302 307
  - 1 to 45 Msps (QPSK, 8-PSK), 35 Msps (16-APSK)and 28 Msps (32APSK)
  - Constant Coding and Modulation (CCM) operation
- Generic data transmission (DVB-S2)
  - HSSI data interface (CDI-60)
- Spectral rolloff of 20, 30 or 35%
- 50Ω or 75Ω Impedance (70/140 MHz)
- 50Ω Impedance (L-Band)
- Unit Management: RS-232 / RS-485, 2 Wire / 4 Wire or 10/100 BaseT Ethernet
- SNMP, Telnet or HTTP
- Flash Upgrade
- FAST Options
- CDI-40 ASI Interface (188 or 204 byte format)
- CDI-70 Gigabit Ethernet Interface (188 byte format)
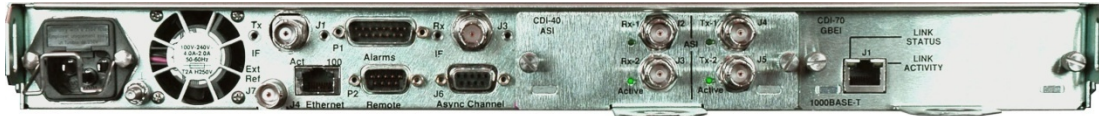- CDI-60 HSSI Interface (188 byte or generic)

The technologies and features of the CDM-710 are covered by US Patents 7117235 and 7213042.

UNIT MANAGEMENT

The operator may configure and monitor the modem from the front panel, or through the remote M&C port. Control and status is provided through the RS-232, RS-485 (2/4 wire) port or 10/100 BaseT Ethernet port.

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SYSTEM SPECIFICATIONS

Symbol/Date Rate Range	Programmable in 1 sps increments
DVB-S	QPSK 1/2, 2/3, 3/4, 5/6, 7/8 to 45 Msps
DVB-DSNG	8-PSK 2/3, 5/6, 8/9 to 45 Msps
	16-QAM 3/4, 7/8 to 45 Msps
DVB-S2	QPSK 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 to 45 Msps
	8-PSK 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 to 45 Msps, 120.5 Mbps max
	16-APSK 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 to 35 Msps, 124.8 Mbps max
	32-APSK 3/4, 4/5, 5/6, 8/9, 9/10 to 28 Msps, 124.6 Mbps max
Alpha (Rolloff)	20%, 25% or 35%
M&C / Remote Interface	RS-232 /485, or 10/100 BaseT on the base modem, SNMP, Telnet, HTTP
Reflash	Ethernet port base modem and Ethernet port of Gigabit Ethernet Interface
Frequency Stability	Internal, stability ±1.5 ppm
External Reference (BNC Female)	None, 1, 2, 5, 10, or 20 MHz for IF and Data, internally phase locked
Form C	Modulator, demodulator and Unit fault
Spectral Inversion	Normal and Inverted
Configuration Retention	Non-volatile memory; Returns upon power up
Redundancy Support 1:1	CRS-180 (70/140 MHz) & CRS-170A (L-Band)
1:N	CRS-300 with CRS-280 /280L (70/140 MHz / L-Band)

MODULATOR

70 / 140 MHz	52 to 88 and 104 to 176 MHz in 100 Hz steps
Impedance / Connector	50 Ω or 75 Ω, BNC Female
Output Power	0 to -20 dBm, 0.1 dB steps (70/140 MHz)
Power Accuracy	±0.5 dB of nominal at 25°C. Within ±0.5 dB of 25°C value over frequency and temperature range
L-Band	950-2000 MHz in 100 Hz steps, modulator
Impedance / Connector	50Ω, Type N Female
Output Power	-5 to -25 dBm, 0.1 dB steps
Power Accuracy	±0.5 dB of nominal at 25°C ±0.5 dB from 25°C value at same frequency
Harmonics and Spurs	< 55 dBc/4kHz, modulated carrier. Excludes spectral mask area.
External Tx Carrier Off	TTL Low signal
Quadrature Phase Error and Amplitude Imbalance	Sideband 35 dB below unmodulated carrier

DEMODULATOR

70 / 140 MHz	52 to 88 and 104 to 176 MHz in 100 Hz steps
Impedance / Connector	50 Ω or 75 Ω, BNC Female
Input Power, Minimum	-58 + 10Log(Symbol Rate in Msps) dBm
AGC	45 dB above minimum
L-Band	950-2000 MHz in 100 Hz steps, demodulator
Impedance / Connector	50Ω, Type N Female
Input Power, Minimum	-58+ 10Log(Symbol Rate in Msps) dBm
AGC	45 dB above minimum
Eb/No and Es/No	Please refer to product manual
DVB-S, DVB-DSNG	Better than DVB requirements
DVB-S2	Within 0.3 to 1.0 dB of ideal, depending upon modulation and coding

BASE UNIT CONNECTOR (Excluding Data Interface)

Alarm	DB-15 Male, Form C Tx, and unit faults External Tx Carrier Off
Unit Management	DB-9 Male with RS-232 and RS 485 2W/4W
	RJ-45 Ethernet
Tx & Rx IF Connectors	BNC-female (70 / 140 MHz) Type-N female (L-Band)

TEST FUNCTIONS

Data Test Pattern	2047 and 2^23-1 compatible with BERT on Tx data on applicable interfaces
CW	Modulation disabled and CW signal is transmitted
SSB Carrier	Provides suppressed carrier and suppressed sideband
Loopback	Full Duplex only

MONITOR FUNCTIONS

Status Items – Available via Rear Panel	Fault log with fault type and time stamp Es/No (Rx Only)

DATA INTERFACE CARDS

CDI-40	ASI Interface Card, ASI per DVB, 188 and 204 byte
CDI-60	HSSI Interface Card, 188 byte or DVB-S2 Generic to 70 Mbps
CDI-70	Gigabit Ethernet, Pro-MPEG COP3 to 80.3 Mbps, 188 byte

ENVIRONMENTAL AND PHYSICAL

Temperature	Operating: 0 to 50ºC (32 to 122ºF)
	Storage: -40 to 70ºC (-40 to 158ºF)
Humidity	95% maximum, non-condensing
Power Supply Input	100 to 240 AC 50/60 Hz
Power Consumption (Preliminary) 120 VAC at 60 Hz 220 VAC at 50 Hz	Power factor 0.97, 67 VA, 65 W maximum Power factor 0.77, 87 VA, 67 W maximum
Weight	15 lbs (6.8 kg)
Dimensional Envelope, 1 RU	19W x 18.65D x 1.75H inches (48W x 47.4D x 4.4H cm)
Rack Slides	Optional accessory
AC Receptacles	Includes restraint for standard IEC-320 inlet

OPTIONS

Type	Option
Standard	DVB-S
FAST	DVB-DSNG
FAST	DVB-S2
Hardware	CDI-40 ASI Data Interface
Hardware	CDI-60 HSSI Data Interface
Hardware	CDI-70 Gigabit Ethernet Interface
Hardware	70 MHz or L-Band
Hardware	Rack Slides

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