CDM-710 Broadcast Satellite Modem

INTRODUCTION

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

The modulation types supported include QPSK and 8-PSK. 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 initial data interfaces are the CDI-40 with ASI and CDI-70 Gigabit Ethernet.

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.

FEATURES

- 52-88 MHz or 104 to 176 MHz in 100 Hz Steps
- 950-1750 MHz Tx and 950-2150 MHz Rx (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 – modulator only
- DVB-S2 (QPSK, 8-PSK) per EN 302 307
  - 1 to 30 Msps
  - Constant Coding and Modulation (CCM) operation
- Spectral rolloff of 20, 30 or 35%
- 50Ω or 75Ω Impedance (70/140 MHz)
- 50Ω Impedance (L-Band)
- Remote Control: RS-232 / RS-485, 2 Wire / 4 Wire or 10/100 BaseT Ethernet
- Flash Upgrade
- FAST Options
- CDI-40 ASI Interface
- CDI-70 Gigabit Ethernet Interface

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.

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

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.

REMOTE CONTROL

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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[1] ID Number 3424 for CDM-710

DVB and DVB S2 logos are trademarks of the DVB Digital Video Broadcasting Project (1991 to 1996).

Modems

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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	8PSK 2/3, 5/6, 8/9 to 45 Msps, modulator only 16QAM 3/4, 7/8 to 45 Msps, modulator only
DVB-S2	QPSK 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 to 30 Msps 8-PSK 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 to 30 Msps
Alpha (Rolloff)	20%, 25% or 35%
M&C / Remote Interface	RS-232 /485, 10/100 BaseT
Reflash	Ethernet or 10/100 BaseT
Frequency Stability	Internal, stability ±1.5 ppm
External Reference (BNC Female)	None, 5, or 10 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

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	950-1750 MHz in 100 Hz steps, modulator
Impedance / Connector	50Ω, Type N Female (Optional SMA 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
External Tx Carrier Off	TTL Low signal
Quadrature Phase Error and Amplitude Imbalance	Sideband 35 dB below unmodulated carrier

DEMODULATOR (Typical)

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) dBm
AGC	45 dB above minimum
L-Band	950-2150 MHz in 100 Hz steps, demodulator
Impedance / Connector	50Ω, Type N Female (Optional SMA Female)
Input Power, Minimum	-125 + 10Log(Symbol Rate) dBm
AGC	45 dB above minimum
Es/No at QEF	Ideal + 1 dB typical

BASE UNIT CONNECTOR (Excluding Data Interface)

Alarm	DB-15 Male, Form C Tx, and unit faults External Tx Carrier Off
M&C Remote	DB-9 Male with RS-232 and RS 485 2W/4W
M&C	RJ-45 Ethernet
Tx & Rx –IF Connectors	BNC-female (70 / 140 MHz) Type-N female or SMA-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
CDI-70	Gigabit Ethernet, Pro-MPEG COP3

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 - 240 AC 50 /60 Hz
Power Consumption	75 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
FAST	To 30 Msps (Max for DVB-S2)
FAST	To 45 Msps (Max for DVB-S, DVB-DSNG)
Hardware	CDI-40 ASI Data Interface
Hardware	CDI-70 Gigabit Ethernet Interface
Hardware	70 MHz or L-Band
Hardware	Rack Slides