



CIC-35 LVDS to ASI

Interface Converter
Installation and Operation Manual
(Accessory Product for use only with Comtech EF Data CDM-600 Modems)

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ABOUT THIS MANUAL

This manual provides installation and operation information for the Comtech EF Data CIC-35 LVDS to ASI Interface Converter. This is a technical document intended for earth station engineers, technicians, and operators responsible for the operation and maintenance of the CIC-35 LVDS to ASI Interface Converter.

RELATED DOCUMENTS

Comtech EF Data CDM-600 Digital Satellite Modem Installation and Operation Manual

Comtech EF Data CDM-600L Digital Satellite Modem Installation and Operation Manual

CONVENTIONS AND REFERENCES

CAUTIONS AND WARNINGS



Indicates information critical for proper equipment function.



Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury. CAUTION may also be used to indicate other unsafe practices or risks of property damage.



Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

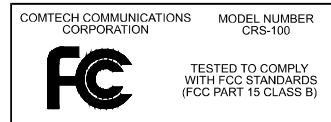
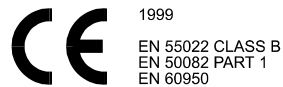
TRADEMARKS

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REPORTING COMMENTS OR SUGGESTIONS CONCERNING THIS MANUAL

Comments and suggestions regarding the content and design of this manual will be appreciated. To submit comments, please contact the Comtech EF Data Customer Support Department.

IMPORTANT INFORMATION - PLEASE READ BEFORE INSTALLATION AND USE



SAFETY NOTICES

ELECTRICAL SAFETY

The equipment is rated for operation at +12 volts DC. It has a maximum power consumption of 2.4 watts. The power supply current is, in all circumstances, supplied by a single Comtech CDM-600/600L Modem.

Observe the following instructions:

EQUIPMENT CONNECTION

The CIC-35 is designed for operation **ONLY** with Comtech CDM-600/600L Modems. These Modems supply DC operating current (electronically fused and protected) and control signals for the correct functioning of this unit. Connection to other manufacturer's equipment could result in damage to the unit.

ENVIRONMENTAL

The CIC-35 must not be operated in an environment where the unit is exposed to temperature extremes outside the ambient range 0 to 50⁰C, precipitation, condensation, or humid atmospheres above 95% RH, altitudes (un-pressurised) greater than 2000 meters, excessive dust or vibration, flammable gases, corrosive or explosive atmospheres.

Operation in vehicles or other transportable installations that are equipped to provide stable environments are permitted. If such vehicles do not provide a stable environment, safety of the equipment to EN60950 may not be guaranteed.

TELECOMMUNICATIONS TERMINAL EQUIPMENT DIRECTIVE

In accordance with the Telecommunications Terminal Equipment Directive 91/263/EEC, this equipment should not be directly connected to the Public Telecommunications Network.

EMC (ELETROMAGNETIC COMPATIBILITY)

(PRELIMINARY) The CIC-35 is designed to comply with the following standards:

- ▶ Emissions: EN 55022 Class B – Limits and methods of measurements of radio interference characteristics of Information Technology Equipment.
- ▶ FCC Part 15 Class B
- ▶ Immunity: EN 50082 Part I – Generic immunity standard, Part I: Domestic, commercial, and light industrial environment.

In order that the CIC-35 continues to comply with these standards, observe the following instructions:

- ▶ The equipment must be operated with its cover on at all times. If it becomes necessary to remove the cover, the User should ensure that the cover is correctly re-fitted before normal operation commences.
- ▶ The converter box must have good mechanical contact with the metal chassis of the CDM-600/600L modem.

WARRANTY POLICY

This Comtech EF Data product is warranted against defects in material and workmanship for a period of two years from the date of shipment. During the warranty period, Comtech EF Data will, at its option, repair or replace products that prove to be defective.

For equipment under warranty, the customer is responsible for freight to Comtech EF Data and all related custom, taxes, tariffs, insurance, etc. Comtech EF Data is responsible for the freight charges **only** for return of the equipment from the factory to the customer. Comtech EF Data will return the equipment by the same method (i.e., Air, Express, Surface) as the equipment was sent to Comtech EF Data.

LIMITATIONS OF WARRANTY

The foregoing warranty shall not apply to defects resulting from improper installation or maintenance, abuse, unauthorized modification, or operation outside of environmental specifications for the product, or, for damages that occur due to improper repackaging of equipment for return to Comtech EF Data.

No other warranty is expressed or implied. Comtech EF Data specifically disclaims the implied warranties of merchantability and fitness for particular purpose.

EXCLUSIVE REMEDIES

The remedies provided herein are the buyer's sole and exclusive remedies. Comtech EF Data shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory.

DISCLAIMER

Comtech EF Data has reviewed this manual thoroughly in order that it will be an easy-to-use guide to your equipment. All statements, technical information, and recommendations in this manual and in any guides or related documents are believed reliable, but the accuracy and completeness thereof are not guaranteed or warranted, and they are not intended to be, nor should they be understood to be, representations or warranties concerning the products described. Further, Comtech EF Data reserves the right to make changes in the specifications of the products described in this manual at any time without notice and without obligation to notify any person of such changes.

Chapter 1. INTRODUCTION

**CIC-35
LVDS to ASI
Interface Converter**



While the CDM-600/600L modem is capable of data rates up to 20 Mbps, its standard interface is limited to RS-422, V.35 and RS-232 and LVDS formats only. In order to accommodate the ASI format, a small converter box is available which attaches to the rear of the modem at the 25-pin data connector. No external power is required.

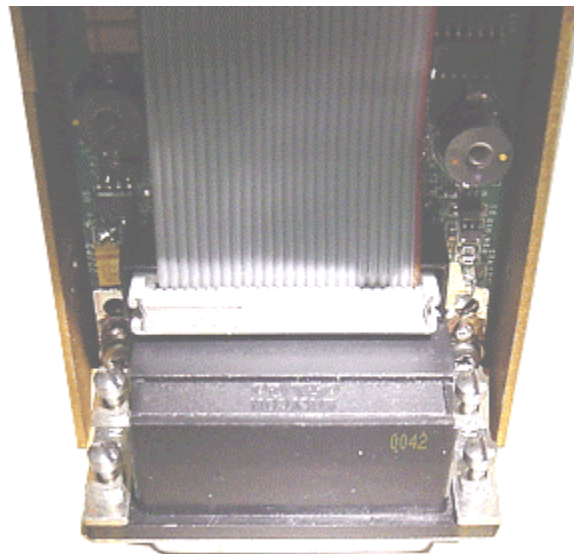
Chapter 2. INSTALLATION

Power down the modem before installing the converter box and remove any coaxial cables attached to the converter box.

Remove the four Philips head screws on the sides, and lift the cover off the CIC-35.

Attach the CIC-35 to the CDM-600/600L by mating the two pairs of 25-pin D-sub connectors together, then tighten the four captive screws (refer to the picture below).

Re-attach the cover and replace the four Philips head screws. The metal surfaces of the modem and the CIC-35 should be flush.



2.1 CONNECTOR OVERVIEW

The rear panel connectors provide all the necessary external connections between the modem and other equipment. Refer to the CDM-600/600L manual for more information.

2.2 OVERHEAD INTERFACE CONNECTOR

The overhead interface connector is a 25-pin D male interface on the CIC-35.

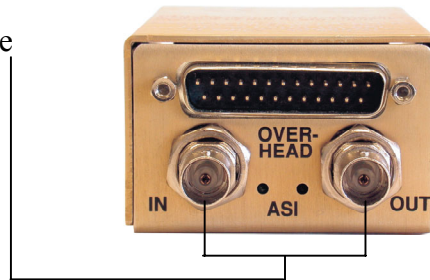


Pin assignments are listed in the table below:

Pin #	Signal Function	Signal Name	Direction
14	IDR 64 kbps ESC Tx Data +	TX-422DAT-B	In
2	IDR 64 kbps ESC Tx Data -	TX-422DAT-A	In
12	IDR 64 kHz ESC Tx Clock +	TX-422CLK-B	Out
15	IDR 64 kHz ESC Tx Clock -	TX-422CLK-A	Out
11	IDR 1 kHz Tx Octet Clock +	TX-OCT-B	Out
24	IDR 1 kHz Tx Octet Clock -	TX-OCT-A	Out
16	IDR 64 kbps ESC Rx Data +	RX-422DAT-B	Out
3	IDR 64 kbps ESC Rx Data -	RX-422DAT-A	Out
9	IDR 64 kHz ESC Rx Clock +	RX-422CLK-B	Out
17	IDR 64 kHz ESC Rx Clock -	RX-422CLK-A	Out
19	IDR 1 kHz Rx Octet Clock +	RX-OCT-B	Out
4	IDR 1 kHz Rx Octet Clock -	RX-OCT-A	Out
20	Balanced Ext. Ref. Clock +	EXT-CLK-B	In
23	Balanced Ext. Ref. Clock -	EXT-CLK-A	In
13	IBS ESC RS232 Tx Data	TX-232-DATA	In
22	IBS ESC RS232 Tx Clock	TX-232-CLK	Out
8	IBS ESC RS232 Rx Data	RX-232-DATA	Out
10	IBS ESC RS232 Rx Clock	RX-232-CLK	Out
5	IBS Tx High-Rate ESC Data	TX-ASYNC	In
6	IBS Rx High-Rate ESC Data	RX-ASYNC	Out
1	IDR Back Alarm 1 H/W input	BW-IN1	In
18	IDR Back Alarm 2 H/W input	BW-IN2	In
21	IDR Back Alarm 3 H/W input	BW-IN3	In
25	IDR Back Alarm 4 H/W input	BW-IN4	In
7	Signal Ground	Ground	-

2.3 ASI INTERFACE CONNECTORS

The ASI interface connectors are BNC type connectors clearly labelled as IN or OUT.



Chapter 3. OPERATION

After applying power to the modem, make the following configuration changes to the modem so that it will operate with the CIC-35.

- Program the transmit and receive data between 1 and 20 Mbps. Both directions must use the same rate.
- Set the data interface type to LVDS. The modem operates in this electrical format while the converter translates between LVDS and ASI.
- Set the transmit clocking to EXT. The Phase-Locked-Loop in the interface converter recovers the byte clock and data on the transmit ASI signal and reformats this to serial data and clock using LVDS format.

Chapter 4. TROUBLESHOOTING

The CIC-35 may take several seconds to acquire the input data stream. This is normal since the clock recovery PLL is required to acquire the input clock over a decade range of rates without prior knowledge of the input rate.

The ASI converter expects a 188 byte MPEG format at the input. The frame consists of a sync byte (0x47) followed by 187 bytes of payload. The data rate programmed into the CDM-600 / 600L is the serial data rate of the entire framed stream. So if the ASI stream is 5 Mbps, the modem data rate is also programmed to 5 Mbps.

The converter also expects the input data to be a continuous stream rather than a bursty format. Contact the factory if there are any questions about operation with bursty ASI formats.

4.1 LED INDICATORS

There are two LED indicators on the CIC-35. The GREEN LED is the transmit side PLL indicator lock. When the converter is locked to the incoming byte rate, this LED will be lit.

Ensure that the modem is programmed to the incoming framed serial bit rate correctly as indicated above. If the modem reports FIFO slips on the transmit side while the GREEN LED is lit, the modem is most likely programmed to the incorrect data rate.

If the input ASI signal is absent or if the signal level is too low, the LED will be OFF, and the CDM-600/600L modem will recognize this condition and respond with an active alarm.

The red LED is a Receive Violation Symbol (RVS) indicator. When lit, it indicates that the ASI receiver chip (transmit side) is seeing line code violations.

The serial stream in the ASI interface is encoded in an 8B/10B line encoding format. If the receiver chip encounters any line code violations, a one-shot circuit will turn on the RED LED for approximately one second. The primary cause of this condition is an ASI signal that has experienced severe slope attenuation from excessively long cable runs. Another is use of low quality coax cable or impedance mismatches. Though the interface may run error-free with code violations, it is highly recommended that the anomalous condition be corrected.

Chapter 5. SPECIFICATIONS SUMMARY

Type	DVB-ASI interface converter per EN 50083-9 plus overhead connector for optional IBS / IDR overhead (modem option)
Operating Modes	Full duplex or simplex
Data Rate	1 to 20 Mbps, symmetric only
ASI Connector	BNC-F
Cable Length	150 meters, typical (Belden 8281)
Tx / Rx	75 Ohms 15 dB Return Loss, 5MHz to 270 MHz
Impedance	
Frame Type	188 byte MPEG-2 Transport per DVB-ASI, continuous stream
Voltage Levels	Unbalanced 800 mv pp typical
Overhead Connector	25 pin D Male
Power Supply	2.8 Watts maximum, power from modem +12 Vdc at 230 mA maximum (fused)
Dimensions	1.6H x 2.5W x 4.7L inches 4.1H x 6.4W x 11.9L centimeters
Approvals (Planned)	EN 55022 Class B Emissions EN 50082-1 (Immunity) EN 60950 (Safety) FCC Part 15 Class B
Weight	0.4 lb 0.2 kg
Temperature	0 to 50° C

METRIC CONVERSIONS

Units of Length

Unit	Centimeter	Inch	Foot	Yard	Mile	Meter	Kilometer	Millimeter
1 centimeter	—	0.3937	0.03281	0.01094	6.214×10^{-6}	0.01	—	—
1 inch	2.540	—	0.08333	0.2778	1.578×10^{-5}	0.254	—	25.4
1 foot	30.480	12.0	—	0.3333	1.893×10^{-4}	0.3048	—	—
1 yard	91.44	36.0	3.0	—	5.679×10^{-4}	0.9144	—	—
1 meter	100.0	39.37	3.281	1.094	6.214×10^{-4}	—	—	—
1 mile	1.609×10^5	6.336×10^4	5.280×10^3	1.760×10^3	—	1.609×10^3	1.609	—
1 mm	—	0.03937	—	—	—	—	—	—
1 kilometer	—	—	—	—	0.621	—	—	—

Temperature Conversions

Unit	° Fahrenheit	° Centigrade
32° Fahrenheit	—	0 (water freezes)
212° Fahrenheit	—	100 (water boils)
-459.6° Fahrenheit	—	273.1 (absolute 0)

Formulas
$C = (F - 32) * 0.555$
$F = (C * 1.8) + 32$

Units of Weight

Unit	Gram	Ounce Avoirdupois	Ounce Troy	Pound Avoir.	Pound Troy	Kilogram
1 gram	—	0.03527	0.03215	0.002205	0.002679	0.001
1 oz. avoir.	28.35	—	0.9115	0.0625	0.07595	0.02835
1 oz. troy	31.10	1.097	—	0.06857	0.08333	0.03110
1 lb. avoir.	453.6	16.0	14.58	—	1.215	0.4536
1 lb. Troy	373.2	13.17	12.0	0.8229	—	0.3732
1 kilogram	1.0×10^3	35.27	32.15	2.205	2.679	—



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