CDD-564AEN, CDD-564ALEN & CDD-562ALEN IP Demodulators

Overview
The CDD-564AEN, CDD-564ALEN and CDD-562ALEN are our next generation integrated IP demodulators with 3DES data decryption providing industry leading performance in a 1 RU package at a competitive price. They are designed to receive up to four independent 70/140 MHz or L-Band channels (depending on model) and combine the receive data into a single 10/100Base-T Ethernet port for transmission onto the LAN. The demodulators are designed to operate with Comtech EF Data’s CDM-570/L-IPEN and CDM-570A/L-IPEN IP-enabled modems with 3DES encryption.

Features
- Independent demodulators
  - CDD-564AEN: Four 70/140 MHz demodulators
  - CDD-564ALEN: Four L-band demodulators
  - CDD-562ALEN: Two L-band demodulators
- CDD-564AEN: 50 to 90 or 100 to 180 MHz
- CDD-562ALEN & CDD-564ALEN: 950 to 2250 MHz
- 16 kbps to 10.239 Mbps data rate
- BPSK, QPSK, 8PSK/8-QAM, 16-QAM demodulation
- VersaFEC® low latency LDPC forward error correction (Constant Coding & Modulation Mode)
- 2nd Generation Turbo Product Coding (TPC) forward error correction
- 5%, 10%, 15%, 20%, 25% and 35% Filter Rolloff
- 3DES data decryption
- Static IP routing for unicast and multicast
- Management via SNMP, Web or Telnet
- IGMP v1 and v2
- 10/100Base-T Ethernet data interface (RJ-45)
- 10/100Base-T Ethernet management interface (RJ-45)
- Firmware upgrade via FTP
- Front panel LEDs for unit status, stored event indication and the status of each receive channel
- LNB support: 10 MHz reference and LNB power
- Compatible with the CDM-570/L-IPEN (TPC) and CDM-570A/L-IPEN (TPC or VersaFEC)

Network Topologies
The CDD-562ALEN and CDD-564A/LEn are intended for use as hub receivers for Hub Spoke networks consisting of a shared outbound carrier with multiple return carriers from remote sites. The CDD-562ALEN and CDD-564A/LEn simplify hub deployment by reducing rack space and costs by providing two and four independent demodulators respectively in a 1RU chassis. At remote sites, the CDD-562ALEN or CDD-564A/LEn is used to enable single hop mesh connectivity between remote sites. Operating in mesh topology with direct connectivity between sites eliminates double-hop through the hub, thereby conserving bandwidth and reducing latency.

Data Decryption
The CDD-562ALEN and CDD-564A/LEn support 3DES data decryption to prevent unauthorized access to data over the satellite link.

Quality Of Service (QoS)
The CDD-564A/LEn and CDD-562ALEN transparently pass the QoS prioritization established at the transmit end by the CDM-570A/L-IPEN Satellite Modem.

Header Decompression Option
Header compression reduces the bandwidth required for Voice over Internet Protocol (VoIP) by as much as 60%. Example: A G.729 voice codec, operating at 8 kbps, requires 32 kbps bandwidth once encapsulated into an IP/UDP/RTP frame. With IP/UDP/RTP header compression, the same voice call needs only 10.8 kbps total WAN satellite bandwidth. Typical Web/HTTP traffic can be reduced by 10% via IP/TCP header compression. Each demodulator can be independently configured for header decompression.

Typical Users
- Enterprise
- Broadcasters
- Internet Service Providers
- Oil Field Service Providers
- Maritime
- Government & Military

Common Applications
- Disaster Recovery & Emergency Communications
- Enterprise
- Offshore & Maritime Communications
- Satellite News Gathering

Satellite Modems
Payload Decompression Option

Implemented in the hardware for maximum throughput and efficiency, payload compression can typically reduce the required satellite bandwidth by 20-30%.

VersaFEC Forward Error Correction

VersaFEC is a patent-pending system of high-performance low latency LDPC codes designed to provide maximum coding gain while minimizing latency. CDD-564A/LEN and CDD-562ALEN support VersaFEC’s Constant Coding & Modulation (CCM) mode of operation.

Vipersat Management System Integration

A Vipersat powered network integrates these advanced demodulators with a powerful network management tool, the Vipersat Management System (VMS). In addition to the traditional Monitoring and Control of the CDM-570A/L-IPEN modems and the CDD-564A/LEN and CDD-562ALEN demodulators, the VMS allows these devices to share bandwidth, and when needed, switch automatically to a dedicated SCPC channel on demand.

VMS provides for dynamic bandwidth allocation while in SCPC mode, automatically altering the bandwidth based on traffic conditions. This effectively enables the network to better handle connection oriented applications and reduce network congestion, jitter and latency. The VMS also allows for dynamic point-to-point mesh connections to be established between remotes.

Specifications

Data Rate Range

<table>
<thead>
<tr>
<th>Data Rate Range</th>
<th>16 kbps to 10.239 Mbps (VersaFEC)</th>
<th>16 kbps to 9.98 Mbps (TPC)</th>
</tr>
</thead>
</table>

Maximum Symbol Rate

3.0 Msps

Traffic Interface

10/100Base-T Ethernet (RJ-45)

M&C Interface

10/100Base-T Ethernet (RJ-45)

Command Line Interface (CLI)

RS-232, RJ-11

Describing

Comtech or iESS-315

Demodulation, FEC and Data Rate Range – Each demodulator independently configurable in 1 bps increments (See the User’s Manual for details)

VersaFEC

8-QAM 0.576 (ECCM) 16 kbps to 5.179 Mbps
8-QAM 0.642 16 kbps to 5.782 Mbps
8-QAM 0.711 16 kbps to 6.401 Mbps
8-QAM 0.780 16 kbps to 7.021 Mbps
16-QAM 0.644 (ECCM) 16 kbps to 7.726 Mbps
16-QAM 0.731 16 kbps to 8.776 Mbps
16-QAM 0.780 16 kbps to 9.361 Mbps
16-QAM 0.829 16 kbps to 9.946 Mbps
16-QAM 0.853 16 kbps to 10.239 Mbps

TPC

BPSK 5/16 16 kbps to 0.937 Mbps
BPSK 21/44 16 kbps to 1.430 Mbps
QPSK/OQPSK 21/44 16 kbps to 2.860 Mbps
QPSK/OQPSK 3/4 16 kbps to 4.500 Mbps
QPSK/OQPSK 7/8 16 kbps to 5.250 Mbps
QPSK/OQPSK 0.95 16 kbps to 5.866 Mbps
8PSK/8-QAM 3/4 16 kbps to 6.750 Mbps
8PSK/8-QAM 7/8 16 kbps to 7.875 Mbps
8PSK/8-QAM 0.95 16 kbps to 8.500 Mbps
16-QAM 3/4 16 kbps to 9.000 Mbps
16-QAM 7/8 16 kbps to 9.980 Mbps

Demodulator

Frequency Range

CDD-564ALEN: 50 to 90 or 100 to 180 MHz, CDD-564ALEN & CDD-562ALEN: 950 to 2250 MHz, 100 Hz frequency resolution

Inputs

CDD-564ALEN: 4 separate BNC female
CDD-564ALEN: 4 separate Type N female
CDD-562ALEN: 2 separate Type N female

Input Impedance

CDD-564ALEN: 50 or 75 Ω user selectable, 17 dB minimum return loss
CDD-564ALEN & CDD-562ALEN: 50 Ω, 17 dB minimum return loss

Input Power

CDD-564ALEN: -30 to –60 dBm

Range

CDD-562ALEN & CDD-564ALEN: -130 + 10 log(symbol rate) dBm to -90 + 10 log(symbol rate) dBm

Max Composite Level

CDD-562ALEN & CDD-564ALEN: +40 dBc, up to -10 dBm
CDD-564ALEN: +35 dBc, up to -5 dBm

Acquisition Range

± 1 to ± 32 kHz (1 kHz steps) < 625 kbps
± 1 to ± 200 kHz ≥ 625 kbps (CDD-562ALEN & CDD-564ALEN)

Frequency Reference

CD564ALEN & CDD-562ALEN: Internal ±0.06 ppm, 32 to 122°F (0 to 50°C)
CDD564ALEN: Internal ±1 ppm, 32 to 122°F (0 to 50°C)

Monitor Functions

E_CM, E_N, Frequency offset, BER, LNB current and voltage, RX receive signal level

LNB Support (CDD-562ALEN & CDD-564ALEN)

LNB Voltage +13 VDC, +18 VDC or OFF at 500 mA max. per RX input
10 MHz Reference Power

0 dBm ± 5 dB via RX center conductor. Selectable ON or OFF per RX input

Network Protocols

RFC 768 – UDP
RFC 791 – IP
RFC 792 – ICMP
RFC 793 – TCP
RFC 826 – ARP
RFC 856 – Telnet
RFC 862 – Ping
RFC 894 – IP
RFC 959 – FTP
RFC 1112 – IP Multicast
RFC 1213 – SNMP MIB II

Network Protocols

RFC 1812 – IPv4 Routers
RFC 2045 – MIME
RFC 2236 – IGMP v2
RFC 2474 – Diff Serv
RFC 2475 – ADS
RFC 2578 – SMIP
RFC 2616 – HTTP
RFC 2821 – SMTP
RFC 3412 – SNMP
RFC 3416 – SNMPv2
RFC 3418 – SNMP MIB

Vipersat Operation Mode

Vipersat operation is enabled via a FAST feature code. Networks can easily start off in point-to-point or point-to-multipoint configurations. As the network grows and users wish to take advantage of the bandwidth on demand savings by implementing a Vipersat network, demodulators can easily be upgraded to Vipersat mode. Vipersat mode provides for the ability to operate in the following demodulation/FEC rates:

STDMA QPSK, rate 3/4 Turbo FEC – all STDMA modes.
Data rate range: 64 kbps – 4.5 Mbps
SCPC All VersaFEC and TPC rates as detailed herein.
### Available Options

<table>
<thead>
<tr>
<th>How Enabled</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>Data rate to 512 kbps</td>
</tr>
<tr>
<td>FAST</td>
<td>Data rate to 1.1 Mbps</td>
</tr>
<tr>
<td>FAST</td>
<td>Data rate to 2.5 Mbps</td>
</tr>
<tr>
<td>FAST</td>
<td>Data rate to 5.0 Mbps</td>
</tr>
<tr>
<td>FAST</td>
<td>Data rate to 10.239 Mbps</td>
</tr>
<tr>
<td>FAST</td>
<td>8PSK/8-QAM demodulation</td>
</tr>
<tr>
<td>FAST</td>
<td>16-QAM demodulation</td>
</tr>
<tr>
<td>FAST</td>
<td>VersaFEC (CCM Only)</td>
</tr>
<tr>
<td>FAST</td>
<td>TPC Codec for Rate 5/16, 21/44, 3/4 and 7/8 (Rate 5/16, 21/44, 3/4 and 7/8 can be supported with or without the TPC board) Not required if TPC board is present.</td>
</tr>
<tr>
<td>FAST</td>
<td>5%, 10%, 15%, 20% and 25% filter rolloff</td>
</tr>
<tr>
<td>FAST</td>
<td>Header decompression</td>
</tr>
<tr>
<td>FAST</td>
<td>Payload decompression</td>
</tr>
<tr>
<td>Hardware</td>
<td>Turbo Product Code (TPC) Board (Required for Rate 0.95. Rate 5/16, 21/44, 3/4 and 7/8 can be supported with or without the TPC board)</td>
</tr>
<tr>
<td>Hardware</td>
<td>-48 VDC Prime power supply</td>
</tr>
</tbody>
</table>

### Environmental & Physical

<table>
<thead>
<tr>
<th>Temperature: Operating Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 50°C (32 to 122°F)</td>
</tr>
<tr>
<td>-40 to 85°C (-40 to 185°F)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Humidity: Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>95% maximum, non-condensing</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Power Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 to 240 volts AC, 50/60 Hz</td>
</tr>
<tr>
<td>optional 48 VDC Input</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power Consumption</th>
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</thead>
<tbody>
<tr>
<td>55 W typical (106 W max. – powering 4 LNBs)</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(height x width x depth)</td>
</tr>
<tr>
<td>1.75” x 19” x 17.3”</td>
</tr>
<tr>
<td>(44 x 483 x 438 mm)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>CE Mark</th>
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<tbody>
<tr>
<td>EN 301 489-1 (ERM)</td>
</tr>
<tr>
<td>EN55022 (Emissions)</td>
</tr>
<tr>
<td>EN55024 (Immunity)</td>
</tr>
<tr>
<td>EN 61000-3-2</td>
</tr>
<tr>
<td>EN 61000-3-3</td>
</tr>
<tr>
<td>EN60950 (Safety)</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>FCC</th>
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<tbody>
<tr>
<td>FCC Part 15, Subpart B</td>
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<table>
<thead>
<tr>
<th>Weight</th>
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<tbody>
<tr>
<td>7 lbs (3.2 kg)</td>
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</table>

### Rear Panels

- CDD-562ALEN
- CDD-564AEN
- CDD-564ALEN