



ODM-840



ODMR-840

## Overview

Comtech EF Data's Advanced VSAT Solutions portfolio provides high-performance satellite-based communication solutions for a diverse range of applications, including mobile backhaul with RAN optimization, IP trunking and backhaul, maritime and offshore networks, corporate and enterprise networks, emergency and disaster recovery. Incorporating advanced technologies developed by Comtech EF Data, AHA Products Group, Memotec and Stampede, the solutions provide unmatched performance, industry-leading bandwidth efficiencies and network optimization – while minimizing Total Cost of Ownership.

Designed for use at remote sites, the ODM-840 and ODMR-840 Remote Routers combine a wide range of advanced technologies in an outdoor, rugged package, eliminating the need for shelter and/or air conditioning. The products enable the most efficient bandwidth utilization for hub-spoke networks:

- DVB-S2 and VersaFEC® low-latency LDPC Forward Error Correction
- Ultra low overhead encapsulation
- Lossless Payload compression
- Header compression
- E1 RAN Optimization (ODM-840 only)

## Features

- Outdoor package
  - Extended operating temperature
    - ODM-840: -40° to +55°C
    - ODMR-840 (-20° to +55° C)
  - IP67 Ingress Protection Rating
- Integrated Packet Processor
  - Ultra low overhead Streamline Encapsulation (TX)
  - Low overhead Enhanced Generic Stream Encapsulation (GSE) (RX)
  - Header compression
  - Lossless payload compression
  - Quality of Service (QoS)
- Integrated E1 RAN optimization (ODM-840 only)
- Simultaneous IP/Ethernet and E1 operation (ODM-840 only)
- Advanced Forward Error Correction
  - VersaFEC low-latency LDPC transmit
  - DVB-S2 receive
- Adaptive Coding and Modulation (ACM) capable transmit and receive
- Variable Coding and Modulation (VCM) capable receive
- Transmit
  - Data rate: 16 kbps to 15.35 Mbps
  - Symbol rate: 16 ksps to 4.5 Msps
  - Modulation: BPSK, QPSK, 8-QAM, 16-QAM
  - Rolloff : 20%, 25%, 35%
  - Ultra low overhead Streamline Encapsulation
- Receive
  - Frequency: 950 to 2150 MHz
  - Data rate: 1 Mbps to 160 Mbps
  - Symbol rate: 1 Msps to 62 Msps
  - Rolloff : 20%, 25%, 35%
  - Demodulation: QPSK, 8PSK, 16APSK, 32APSK
  - Low overhead enhanced Generic Stream Encapsulation
- Operating Frequency: 950 to 2150 MHz
- Traffic interfaces:
  - 10/100/1000Base-T Ethernet
  - G.703 E1 (ODM-840 only)
- Management interface: 10/100Base-T Ethernet for web and SNMP
- BUC support (ODM-840 only)
- LNB support
- 1:1 redundancy (ODM-840 only)

## Typical Users

- Mobile Operators
- Telecom Operators
- Offshore & Maritime
- Enterprise
- Internet Service Providers (ISPs)

## Common Applications

- Mobile Backhaul with RAN Optimization
- IP Trunking & Internet access (ISP)
- Maritime & offshore communications

## Specifications

### Transmit

Data Rate	16 kbps to 15.35 Mbps, in 1 bps step (CCM mode) (Modulation and FEC dependent)
Symbol Rate	16 ksps – 4.5 Msps
FEC	VersaFEC encoder (ACM and CCM modes)
<b>Modulation &amp; Code Rate</b>	<b>Data Rate Range</b>
BPSK 0.488	16.00 kbps – 2.19 Mbps
QPSK 0.533	17.07 kbps – 4.80 Mbps
QPSK 0.631	20.19 kbps – 5.67 Mbps
QPSK 0.706	22.577 kbps – 6.34 Mbps
QPSK 0.803	25.69 kbps – 7.22 Mbps
8-QAM 0.642	30.83 kbps – 8.67 Mbps
8-QAM 0.711	34.14 kbps – 9.60 Mbps
8-QAM 0.780	37.44 kbps – 10.53 Mbps
16-QAM 0.731	46.80 kbps – 13.16 Mbps
16-QAM 0.780	49.92 kbps – 14.04 Mbps
16-QAM 0.829	53.04 kbps – 14.91 Mbps
16-QAM 0.853	54.60 kbps – 15.35 Mbps
Encapsulation	Ultra low overhead Streamline Encapsulation

### Receive

Receive Data Rate (Pilots On)	QPSK	0.479 – 108.255 Mbps
	8PSK	1.740 – 160.0 Mbps
	16APSK	2.575 – 160.0 Mbps
	32APSK	3.623 – 160.0 Mbps
Receive Symbol Rate	QPSK	1 to 62 Msps
	8PSK	1 to 62 Msps
	16APSK	1 to 47 Msps
	32APSK	1 to 37 Msps
FEC	DVB-S2 decoder (ACM, CCM and VCM modes) short frame, normal frame	
<b>Modulation &amp; FEC</b>	<b>Data Rate Range (Normal FEC frame, pilots off)</b>	
QPSK 1/4	0.479 – 29.672 Mbps	
QPSK 1/3	0.641 – 39.731 Mbps	
QPSK 2/5	0.771 – 47.779 Mbps	
QPSK 1/2	0.965 – 59.850 Mbps	
QPSK 3/5	1.160 – 71.922 Mbps	
QPSK 2/3	1.291 – 80.029 Mbps	
QPSK 3/4	1.452 – 90.029 Mbps	
QPSK 4/5	1.549 – 96.064 Mbps	
QPSK 5/6	1.615 – 100.148 Mbps	
QPSK 8/9	1.724 – 106.914 Mbps	
QPSK 9/10	1.746 – 108.255 Mbps	
8PSK 3/5	1.740 – 107.853 Mbps	
8PSK 2/3	1.936 – 120.011 Mbps	
8PSK 3/4	2.178 – 135.007 Mbps	
8PSK 5/6	2.422 – 150.181 Mbps	
8PSK 8/9	2.586 – 160.000 Mbps	
8PSK 9/10	2.618 – 160.000 Mbps	
16APSK 2/3	2.575 – 121.007 Mbps	
16APSK 3/4	2.896 – 136.127 Mbps	
16APSK 4/5	3.090 – 145.253 Mbps	
16APSK 5/6	3.222 – 151.428 Mbps	
16APSK 8/9	3.440 – 160.000 Mbps	
16APSK 9/10	3.483 – 160.000 Mbps	
32APSK 3/4	3.623 – 134.063 Mbps	
32APSK 4/5	3.866 – 143.051 Mbps	
32APSK 5/6	4.031 – 149.132 Mbps	
32APSK 8/9	4.303 – 159.207 Mbps	
32APSK 9/10	4.357 – 160.000 Mbps	
Pilots	On	
Encapsulation	Low overhead Enhanced GSE	

### Modulator Specifications

Operating Frequency	950 to 2150 MHz L-Band, 100 Hz frequency resolution										
Frequency Stability	± 0.06 ppm (± 6 x 10 <sup>-8</sup> ), 0° to 50°C (32° to 122° F)										
Frequency Reference	Internal										
Scrambling	Comtech, disabled										
Spectral Inversion	Normal or inverted										
Transmit Filtering	Per IESS-308/-309 spectral mask										
Transmit Filter Rolloff (Alpha)	20%, 25% and 35%										
Output Power	0 to -40 dBm, in 0.1 dB steps										
Power Accuracy	± 1.0 dB over frequency, data rate, modulation type and temperature range of 0 to 50° C										
Transmit On/Off Ratio	-60 dBc minimum										
Harmonics and Spurious	Better than -60 dBc/4 kHz (typically < -65 dBc/4KHz) Measured from Fo +/- 300 MHz										
Output Phase Noise	< 1° rms double sided, 100 Hz to 1MHz (minimum of 6 dB better overall than the Intelsat IESS-308/309 requirement)										
	<table border="1"> <thead> <tr> <th>dB/Hz</th> <th>Frequency Offset</th> </tr> </thead> <tbody> <tr> <td>-66.0</td> <td>100 Hz</td> </tr> <tr> <td>-76.0</td> <td>1 kHz</td> </tr> <tr> <td>-86.0</td> <td>10 kHz</td> </tr> <tr> <td>-96.0</td> <td>100 kHz</td> </tr> </tbody> </table>	dB/Hz	Frequency Offset	-66.0	100 Hz	-76.0	1 kHz	-86.0	10 kHz	-96.0	100 kHz
dB/Hz	Frequency Offset										
-66.0	100 Hz										
-76.0	1 kHz										
-86.0	10 kHz										
-96.0	100 kHz										
	Fundamental AC line spurious is -42 dBc or lower The sum of all other single sideband spurious, from 0 to 0.75 x symbol rate, is -48 dBc or lower										
Connector	Type N (female)										
Impedance	50 Ω										
Return Loss	20 dB, minimum										
External TX Carrier Off	By TTL 'low' signal										
Test Modes	CW, 1/0 pattern, 2 <sup>N</sup> 23-1 and 2047 patterns										
BUC Reference (10 MHz)	Via TX IF center conductor, 10.0 MHz ± 0.06 ppm, selectable on/off, 0.0 dBm ± 3 dB										
BUC Power Supply (HW Option, ODM-840 only)	24 VDC, 4.17 amps max., 90 W @ 50° C 48 VDC, 3.125 amps max., 150 W @ 50° C Supplied through TX IF center conductor and selectable on/off via M&C control										
<b>Demodulator Specifications</b>											
Operating Frequency	950 to 2150 MHz L-Band, 100 Hz frequency resolution										
Connector	Type N (female)										
Impedance	50 Ω										
Input Power Range, Desired Carrier	-65 dBm + 10 log (symbol rate in MHz) to -25 dBm										
Maximum Composite Operating Level	-5 dBm total composite power 20 dBc within 10 MHz band from the desired carrier for QPSK, 8PSK, and 16APSK 10 dBc within 10 MHz band from the desired carrier for 32APSK 30 dBc outside of 10 MHz from carrier										
Absolute Maximum, No Damage	-10 dBm										
Rolloff	20%, 25%, 35%										
Acquisition Range	+/- 100 kHz										
Adaptive Equalizer	Corrects up to 3 dB tilt										
Return Loss	12 dB, minimum (typical 15 dB)										
LNB Reference (10 MHz)	Via RX IF center conductor, 10.0 MHz ± 0.06 ppm Selectable on/off, -3.0 dBm ± 3 dB										
LNB Voltage	Selectable on/off, 13 VDC, 18 VDC, 24 VDC										
LNB Current	500 mA, maximum										

Monitor Functions	Es/No estimate, receive signal level, frequency offset
Es/No Monitor Accuracy	+/- 0.3 dB
Receiver Signal Level Monitor Accuracy	+/- 6 dB (typical)

### Packet Processor

#### Supported Protocols

RFC 768 – UDP	RFC 1812 – IPv4 Routers
RFC 791 – IP	RFC 2045 – MIME
RFC 792 – ICMP	RFC 2474 – Diffserv
RFC 793 – TCP	RFC 2475 – Diffserv
RFC 826 – ARP	RFC 2578 – SMI
RFC 856 – Telnet	RFC 2597 – AF PHB
RFC 862 – Ping	RFC 2598 – Expedite Forwarding
RFC 894 – IP	RFC 2616 – HTTP
RFC 959 – FTP	RFC 3412 – SNMP
RFC 1112 – IP Multicast	RFC 3416 – SNMPv2
RFC 1213 – SNMP MIB II	RFC 3418 – SNMP MIB
Statistics	Detailed packet and throughput stats

### Connectors

L-Band Transmit and Receive	2 x N-type (female)
10/100/1000 Base-T Ethernet interface	RJ-45
G.703 E1, 2.048 Mbps (Unbalanced 75 Ω) (ODM-840 only)	BNC (female)
Console / Redundancy Interface (Redundancy not available for ODMR-840)	19-pin circular connector

### Available Options

Model	Option	Type
ODM-840	-48 VDC, Primary Power Supply	Hardware
ODM-840	24 VDC, 90 W @ 50°C BUC Power Supply	Hardware
ODM-840	48 VDC, 150 W @ 50°C BUC Power Supply	Hardware
ODM-840	Extended (Low) Temperature Version: -40°C to +55°C	Hardware
ODM-840	Transmit Data Rate	FAST
ODM-840	E1 RAN Optimization	FAST
ODM-840	G.703 Clock Extension	FAST
ODMR-840	-24 VDC, Primary Power Supply (External)	Hardware
ODMR-840	-48 VDC, Primary Power Supply (External)	Hardware
ODMR-840	Extended (Low) Temperature Version: -20°C to +55°C	Hardware
ODMR-840	Transmit Data Rate	FAST

### Physical, Power & Environmental

#### ODM-840

Dimensions (height x width x depth)	9" x 5.5" x 16.75" (22.7 x 13.9 x 42.2 cm) approximate
Weight	22 lbs
Power Supply	100-240 VAC, 47Hz-63Hz -48 VDC (HW option)
Operating Temperature	0° to 55°C -40° to 55°C (Extended Temperature Version, HW option)
Storage Temperature	-40° to 70°C
Ingress Protection Rating	IP67

#### ODMR-840

Dimensions (height x width x depth)	9" x 2.8" x 13" (modem) 2.8" x 4.8" x 7.5" (power supply)
Weight	10.3 lbs (modem) 4.2 lbs (power supply)
Power Supply	-24 VDC (external, HW option) -48 VDC (external, HW option)
Operating Temperature	0° to 55°C -20° to 55°C (extended temperature version, HW option)
Storage Temperature	-40° to 70°C
Ingress Protection Rating	IP67

### Accessories

Mounting kit

### Regulatory

CE Mark	EN 301 489-1 (ERM) EN55022 (Emissions) EN55024 (Immunity) EN 61000-3-2 EN 61000-3-3 EN60950 (Safety)
FCC	FCC Part 15, Subpart B



ODM-840 connectors



ODMR-840 connectors



ODMR-840 Power Supply



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