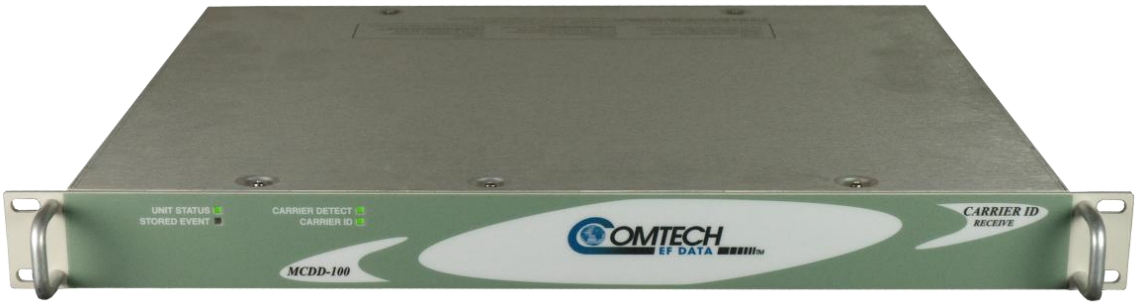
MCDD-100 Detecting Device

Satellite Modems



Overview

The MetaCarrier® Carrier Identification detecting device, the (MCDD-100) builds on our leadership in providing equipment to optimize the quality of satellite links. The MCDD-100 is used to detect the Carrier Identification (CID) of a host carrier that has embedded the DVB-CID ETSI TS 103 129 standards-based Carrier ID technology. DVB-CID ETSI TS 103 129 uses spread spectrum technology at very low signal levels to enable identification of host carriers. The MCDD-100 is compliant to the DVB-CID ETSI TS 103 129 standard for combating satellite interference and is based on Comtech's award-winning MetaCarrier technology.

Satellite interference has a significant financial impact on both satellite operators and end users. Comtech EF Data developed the MetaCarrier technology to address this industry-wide challenge. This new standard will directly benefit users and operators in the avoidance of accidental interference.

Typical Users

- Satellite Operators
- Satellite Service Providers
- Government & Military
- Broadcasters

Common Applications

- Reduction of interference in SCPC, MCPC and Video Satellite Carrier Transmissions
- DVB-CID ETSI TS 103 129 Standards Based

MetaCarrier technology works by embedding and detecting a small message and unique ID within a video or data satellite carrier. Modulators supporting DVB-CID ETSI TS 103 129 embed the information using a low-speed data sequence containing information about the transmission carrier and spread this sequence using Direct Sequence Spread Spectrum (DSSS). This spread spectrum carrier is then combined with the transmission carrier to produce a composite carrier with the transmitted video or data and an embedded CID. The embedded CID significantly reduce the time to identify and clear interference sources. This technique does not add appreciable noise or power to the host carrier. The robust spread spectrum signal enables the transmission carrier to be identified even when the transmission carrier is well below another carrier or near the noise floor itself because of interference.

The MCDD-100 is used to decode an embedded unique carrier identification sequence for a host carrier. In an interference situation, the MCDD-100 may be used to decode the CID of an interfering carrier that may not be part of one's own transmission network, as long as the interfering carrier has an embedded CID. The MCDD-100 can operate in both non-interfered and interfered conditions, and is ideally suited for SCPC, MCPC and video satellite carrier transmissions.

Features

- Supports L-Band (950 MHz to 2150 MHz) or IF (50 MHz to 180 MHz) input for decoding and demodulating the MetaCarrier sequence
- Can detect multiple carriers per transponder and resolve their MetaCarriers via external center frequency and bandwidth input
- Remote control via Ethernet management
- Can be commanded via SNMP by an external carrier monitoring system

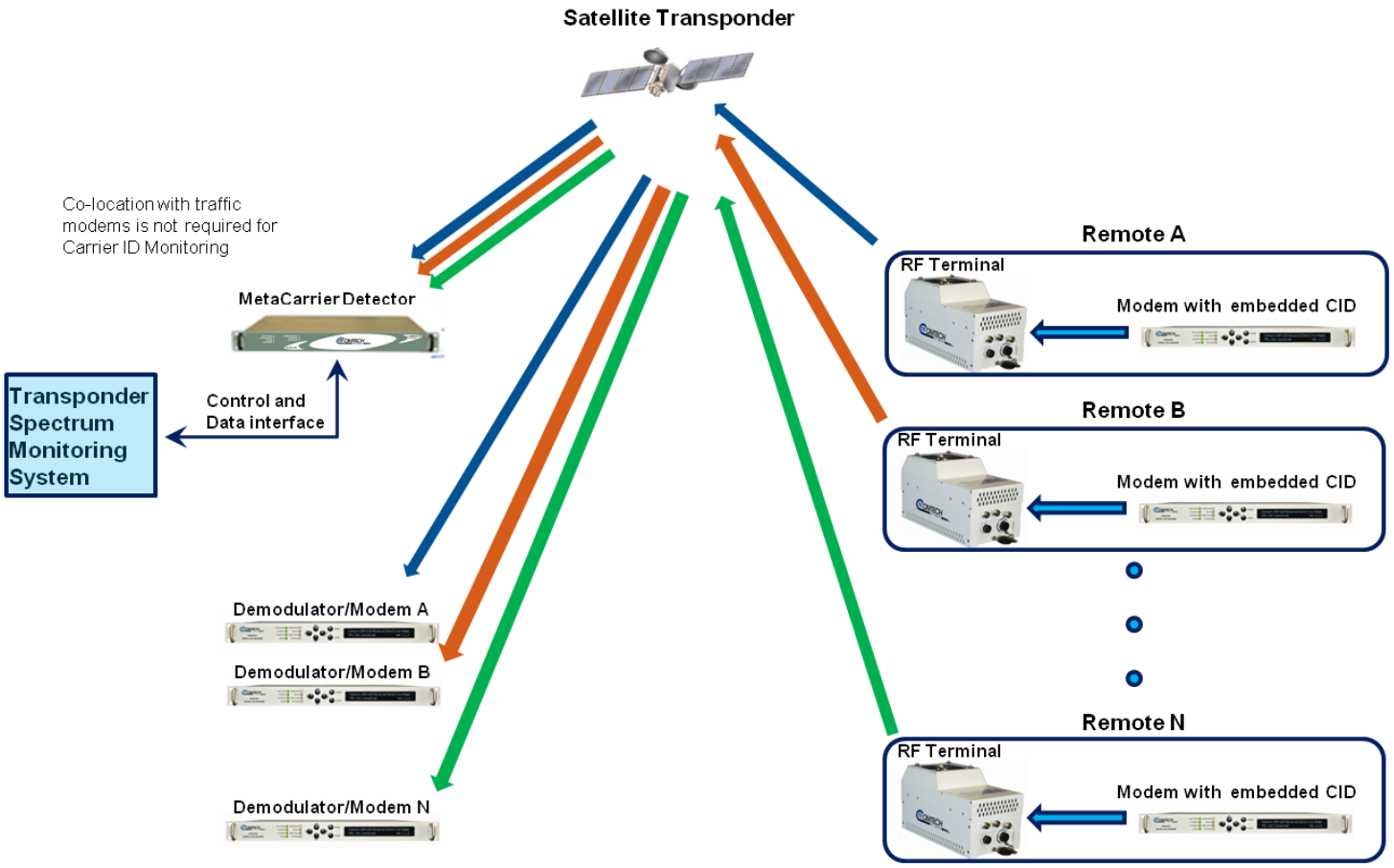


Figure 1: Carrier ID Implementation Topology - SCPC

MetaCarrier Technology

The MetaCarrier name is derived from the method of providing transmission information via metadata. With Carrier ID, this is accomplished by spread spectrum modulation of a very low data rate carrier (containing metadata information about the video or data transmission carrier) over a portion of the video or data transmission carrier. A large spreading factor is used that results in spreading the MetaCarrier's energy over a significantly large amount of bandwidth – many orders of magnitude of the original metadata rate. The resulting energy becomes a nearly undetectable amount of noise being added to the transmission carrier spectrum. De-Spreading results in a coding gain that is used to extract and separate the MetaCarrier from the transmission carrier.

MetaCarrier Carrier Identification has a minimal effect on the carrier quality and the quality of the carrier's content. It can be read in the clear, by an MCDD, even if the referenced carrier is transmitted with conditional access or is otherwise encrypted. The MetaCarrier embedding can be used on any static carrier, SCPC, video or other. In the below depiction, the MetaCarrier is placed 22 dB below the peak of the carrier it is identifying, at roughly the center frequency of the carrier.

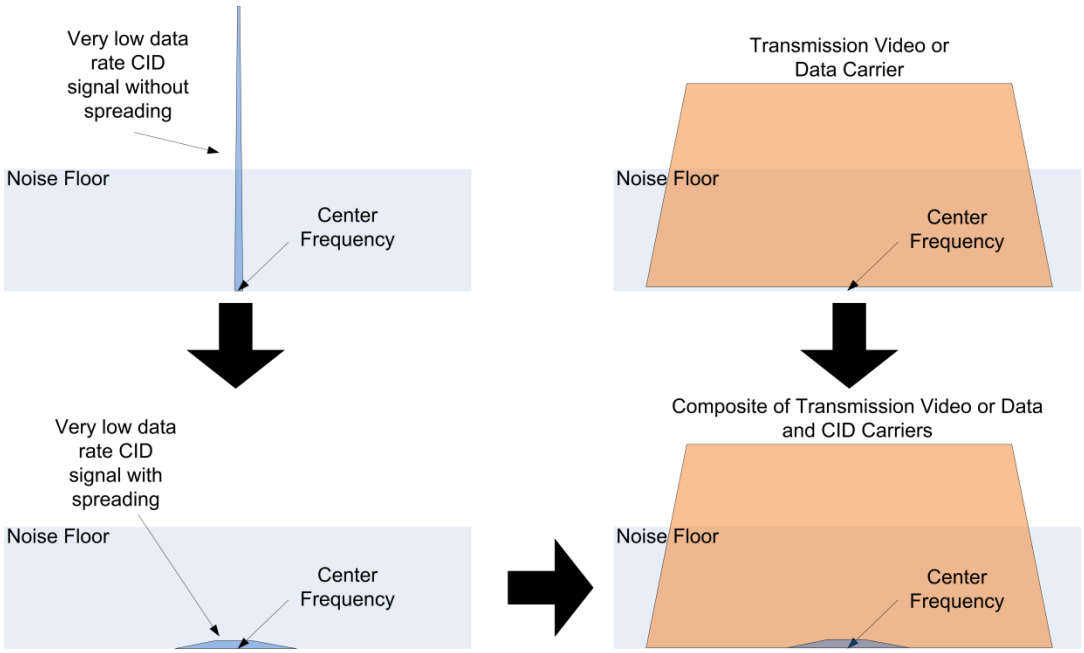


Figure 2: Carrier Overlay

Specifications

MCDD-100

Frequency	50-180 MHz or 950-1250 MHz (±0.06 ppm) in 100 Hz steps		
Impedance			
L-Band	50 Ω, 14 dB minimum return loss		
70/140 MHz	50 Ω or 75 Ω, 18 dB minimum return loss		
Connector			
L-Band	Type N female		
70/140 MHz	BNC		
Input Power Range			
950 – 2150 MHz band	-130 + 10log (symbol rate) to -80 + 10log (symbol rate) dBm		
50 – 180 MHz band	-105 + 10log (symbol rate) to -70 + 10log (symbol rate) dBm		
Maximum Composite Operating Level			
950 – 2150 MHz band	102 – 10log (symbol rate, desired carrier) dBc, + 10 dBm maximum; within ±10 MHz of the desired carrier, composite power is ≤ +30 dBc		
50 – 180 MHz band	94 – 10log (symbol rate, desired carrier) dBc, +10 dBm maximum; within ±10 MHz of the desired carrier, composite power is ≤ +30 dBc		
Absolute Maximum, no damage	+20 dBm		
Acquisition Range	±10% of true carrier symbol rate (normal operation); ±30 Ksps narrow range		
Return Loss	12 dB min. (typical 15 dB)		
FEC Mode	(112, 70) BCH code		
De-Modulation	BPSK		
Chip Rate	112 Kcps, 224 Kcps		
Data Rate	**Chip Rate**	**Spreading Ratio**	**Data Rate (bps)**
≥ 128 Ksps to <512 Ksps	112 Kcps	4096	28.00
≥ 512 Ksps	224 Kcps	4096	56.00

Redundancy	N/A

Environmental and Physical

Temperature	
Operating	32° to 122°F (0° to 50°C)
Storage	-4° to 158°F (–20° to 70°C)
Humidity	
Operating	95% maximum, non-condensing
Storage	99% maximum, non-condensing
Vibration	Per MIL-STD-810F Method 514.5 Category 4a
Dimensions (1RU) (height x width x depth)	1.7” x 19” x 16.2” (44 x 483 x 411 mm)
AC Power Supply	Rear panel-installed module includes on/off switch
AC Operating Voltage	100 V – 240 V AC, +6%/-10% autosensing (Total absolute maximum range is 90 V – 254 V AC)
DC Power Supply	Includes on/off switch and an input filter per PL-0000551 & PL/10312-1 kits
DC Operating Voltage	48 V nominal (total range is 36 – 60 V)

Hardware Interfaces

Ethernet management	1 port 10/100 auto-sensing full/half duplex Ethernet, RJ-45
IF Interfaces	
L-Band Input	950 – 2150 MHz L-Band input, N-Type, F
70/140 MHz Input	50 – 180 MHz IF input, BNC-F

MCDD-100 Back Panel

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