



INTRODUCTION

The CRS-150 1:1 Redundancy Switch is a companion product for use with Comtech EFData CDM-600 modems. Designed to continuously monitor a pair of modems in a redundant configuration, it automatically switches data and IF signals from a failed unit to the standby unit, if an equipment failure or undesired traffic condition occurs.

With the CRS-150, traffic paths are fully protected, giving our users increased confidence that equipment failures will not adversely affect system availability.

The CRS-150 provides full protection for *all* Open Network overhead signals (IDR Backward Alarms, Overhead data channels, Audio, etc.), as well as external reference signals.

DATA TYPES SUPPORTED

The CRS-150 includes, as standard, a universal data interface that eliminates the need to exchange interface cards for different applications. The interfaces supported include:

- EIA-422 (EIA530) DCE
- V.35 DCE
- Synchronous EIA-232 DCE
- Serial LVDS
- HSSI (with optional CIC-20 module)
- G.703

The supplied G.703 interfaces support the T1, E1, T2 and E3 standards, in both balanced and unbalanced configurations. Support is also provided for 'G.703-like' signals at 512 and 1024 kbps.

Operators do not have to configure the interface type — control signals from the modems perform the selection automatically.



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OPERATION

Only one modem in the pair (the online unit) is permitted to transmit its IF carrier signal at any one instant. For total security, the offline modem mutes its TX carrier, and the CRS-150 provides further isolation by using an RF relay within the unit. Unlike some other 1:1 redundancy systems, which use a passive power combiner for this function (losing approximately 3.5 dB in output power level), the CRS-150 does not introduce any attenuation of output signal level.

Clock and data signals in the transmit direction are buffered and fed to both modems in the pair simultaneously. The receive IF signal is split and fed to both modems. This means that both modems see identical Tx and Rx traffic signals all the time, permitting the CRS-150 to continuously compare the fault status of both modems. If the CRS-150 sees an identical fault on both modems at the same time, it will infer that the fault condition exists in the external system, and eliminate an unnecessary switchover.

A significant feature of the CRS-150 redundancy system is the Auxiliary Serial connection between the two modems in the pair. When the appropriate cable connects the two modems, the online unit interrogates the standby unit at regular intervals to determine its configuration. If a difference in configuration is detected, the online unit automatically reconfigures the standby unit, so that the configurations are always synchronized. The advantage of this feature is clear: if the standby unit is replaced, it does not have to be reprogrammed to match the online unit — the process is entirely automatic.

MANUAL AND AUTOMATIC SWITCHOVER

Manual switchover is enabled from the front panel or remote control of the online modem.

Automatic switchover conditions are user-defined by setting two switches at the front of the unit. The user can select Unit Faults only, Unit Faults or Receive Traffic Faults, Unit Faults or Transmit Traffic Faults, or all three. This user-configured feature provides a great deal of flexibility in the operation of the Switch.

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Specifications

Equipment Type	1:1 Redundancy Switch
Modems Supported	Comtech EF Data CDM-600 Digital Satellite Modem
Operating Modes	Fully Automatic Manual (via the front panel of the Online Modem, or via the Modem's remote control interface)
Architecture	Full bridging architecture, with configuration synchronization Tx Clock and Data signals fed to both Online and Standby units Rx IF signal fed to both Online and Standby units Continuous fault comparison of Online and Standby units (The configuration of Online and Standby units is synchronized via the Auxiliary Serial link between the two Modems)
Switch Conditions	Switchover initiated following: Unit faults only, or: Unit faults or Receive Traffic Faults, or: Unit faults or Transmit Traffic Faults, or: Unit faults or Receive or Transmit Traffic Faults
Fault Detection Time	1 second maximum
Switchover Time	Within 0.5 seconds of fault detection
Main Data Interfaces	RS422/EIA530 DCE (25 pin D-type female, pinout per EIA530) to 10 Mbps V.35 DCE to 10 Mbps Synchronous RS232 to 300 kbps Serial LVDS to 20 Mbps (A standard HSSI interface is provided with the addition of the Comtech EF Data CIC-20 LVDS/HSSI Interface Converter module, for operation up to 20 Mbps)
G.703 Interfaces	G.703, T1, E1, T2 and E2, balanced and unbalanced (BNC connectors for 75 Ω unbalanced, and 15 pin D-type for 120 Ω balanced) Note that for T1 and E1 Drop and Insert applications the unit supports Rx, Tx connections, as well as Drop Data Out (DDO) and Insert Data In (IDI) 'G.703-like' signals at 512 kbps and 1024 kbps (through DDO and IDI ports)
Overhead Interface	Intelsat IESS-308/309/310 Open Network overhead signals, including: IDR Overhead Data Channels (64 kHz, 8kHz, and Octet clocks) IBS ESC and High-Rate ESC Balanced External Reference Input IDR Backward Alarm Inputs (25 pin D-type male)
Audio	2 x 4-wire 600 Ω audio interface, per Intelsat IESS-308 (9 pin D-type female)
IDR Backward Alarms	Backward Alarm Outputs BA-1 through BA-4 (Form C relays) per Intelsat IESS-308 (15 pin D-type female)

External Reference	75 Ω BNC, unbalanced input 120 Ω balanced input
IF Switching/Splitting	Transmit IF: Switched by RF relay (0.3 dB max loss) Receive IF: Passive power splitting (3.5 dB max loss)
IF Impedance	Optimized for 50 Ω ($>$ 20 dB return loss on external IF ports) 75 Ω supported with the use of external RF transformers (supplied)
IF Connectors	BNC female
IF Frequency Range	52 - 176 MHz
Weight	4.6 lbs (2.1 kg)
Dimensions	1.75 inches (44.5 mm) high, 19 inches (482.5 mm) wide 4.2 inches (107 mm) deep (excluding connectors)
Power Requirements	4.5 Watts maximum + 12 volts DC @ 250 mA (max) -12 volts DC @ 120 mA (max) Power is supplied by the Online and Standby Modems, and the unit current shares when both an >A= and >B= unit are present. These power supplies are electronically fused and protected. A pair of auxiliary DC inputs are provided for powering external equipment connected to the main data interface, such as a CIC-20 Interface Converter
Approvals	'CE' as follows: EN 55022 Class B (Emissions) EN 50082-1 (Immunity) EN 60950 (Safety) FCC Part 15 Class B

Rear Panel View



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