



## Overview

The Comtech EF Data 1:1 Modem Redundancy Switches are companion products for the following modems:

Modem	Switch	Remarks	Modem	Switch	Remarks
CDM-625	CRS-170A CRS-180	L-Band 70/140 MHz	CDM-700	CRS-170A CRS-180	L-Band 70/140 MHz
CDM-600	CRS-150	70/140 MHz	CDM-710	CRS-170A CRS-180	L-Band 70/140 MHz
CDM-600L	CRS-170A + CRS-150	L-Band	CDM-710G	CRS-170A CRS-180	L-Band 70/140 MHz
CDM-570	CRS-180	70/140 MHz	CDM-750	CRS-170A CRS-180	L-Band 70/140 MHz
CDM-570L	CRS-170A	L-Band			

Their purpose is to continuously monitor a pair of modems in a redundant configuration, so that the unit automatically switches data and IF signals from the primary unit to the standby unit if an equipment failure or undesired traffic condition occur. This fully protects traffic paths, and the operator can have increased confidence that equipment failures will not adversely affect system availability.

There are two types of 1:1 switches; active and passive. The CRS-150 is an active type, which provides a copy of the TX traffic data that is delivered to the offline modem so that both modems units see identical traffic signals. The CRS-170A and CRS-180 are both passive switches that perform IF switching, and the data is passively switched within the pair of modems interconnected by a Y-cable. The net result is the same: both modems see the identical TX and RX traffic signals permitting the continual comparison of fault status.

A significant feature of the switches is the Auxiliary Serial connections between the two modems in the pair. 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 switches.

## 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 switch 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 switch does not introduce any attenuation of output signal level. The switches support all interfaces that each modem supports, including, RS-232/422, G.703, ASI, Ethernet, OC-3 copper, etc. Operators do not have to configure the interface type – control signals from the modems perform the selection automatically.

## Specifications

Please consult the applicable manuals for more details.

Operating Modes	<ul style="list-style-type: none"> <li>Fully automatic</li> <li>Manual (via the front panel of the online modem, or via the modem's remote control interface)</li> </ul>
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Architecture	<ul style="list-style-type: none"> <li>Full bridging architecture, with configuration synchronization</li> <li>TX Clock and Data signals fed to both online and standby units</li> <li>RX IF signal fed to both online and standby units</li> <li>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)</li> </ul>
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Audio	2 x 4-wire 600 $\Omega$ audio interface, per Intelsat IESS-308 (9-pin D-type female)
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IDR Backward Alarms	Backward Alarm Outputs BA-1 through BA-4 (Form C relays) per Intelsat IESS-308 (15-pin D-type female)
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### CRS-150 Specifications

Fault Detection Time (maximum)	1 second
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Switchover Time (after fault detection)	CRS-150: Within 0.5 seconds typical with RS-422
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Main Data Interfaces	RS-422/EIA-530 DCE (25-pin D-type female, per EIA-530) to 10 Mbps, V.35 DCE to 10 Mbps, synchronous RS-232 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)
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G.703 Interfaces	G.703, T1, E1, T2 and E2, bal. and unbal. (BNC connectors for 75 $\Omega$ unbal., and 15-pin D-type for 120 $\Omega$ balanced) <i>Note that for T1 and E1 Drop and Insert applications the unit supports RX, TX connections, Drop Data Out (DDO), and Insert Data In (IDI) 'G.703-like' signals at 512 kbps and 1024 kbps (through DDO and IDI ports)</i>
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Overhead Interface	Intelsat IESS-308/-309/-310 Open Network overhead signals, including: IDR overhead data channels (64 kHz, 8 kHz, and Octet clocks), IBS ESC and high-rate ESC, balanced external reference input, IDR backward alarm inputs, (25-pin D-type male)
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IF Switching	Transmit IF: Switched by RF relay (0.3 dB max. loss) Receive IF: Passive power splitting (3.5 dB max. loss)
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IF Impedance	Optimized for 50 $\Omega$ (> 20 dB return loss on external IF ports) 75 $\Omega$ supported with the use of external RF transformers (supplied)
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IF Connectors	BNC female
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IF Freq. Range	52 - 176 MHz
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Dimensions (1RU) (height x width x depth)	1.75" x 19" x 4.2" (4.45 x 48.25 x 10.7 cm)
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Weight	4.6 lbs (2.1 kg)
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Power Requirements	4.5 W maximum + 12 volts DC @ 250 mA, -12 volts DC @ 120 mA 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 main data interface, such as a CIC-20 Interface Converter.
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Approval	CE as follows: EN 55022 Class B (Emissions), EN 50082-1 (Immunity), EN 60950 (Safety) FCC Part 15 Class B
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Fault Detection Time (maximum)	1 second
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### CRS-170A Specifications

Fault Detection Time (maximum)	0.5 seconds
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Switchover Time (after fault detection)	Within 0.1 seconds typical with RS-422 or HSSI
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Main Data Interfaces	Refer to the modems' datasheets
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IF Switching	Transmit IF: Switched by RF relay (1.5 dB max. loss) Receive IF: Passive power splitting (7.0 dB max. loss)
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Dimensions (height x width x depth)	1.7" x 5.7" x 4.1" (4.3 x 14.3 x 10.4 cm)
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Weight	1.1 lbs (0.5 kg)
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Power Requirements	+12 VDC @ 200 mA (max.)
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Approval	CE
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### CRS-180 Specifications

Fault Detection Time (maximum)	0.5 seconds
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Switchover Time (after fault detection)	Within 0.1 seconds typical with RS-422 or HSSI
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Main Data Interfaces	Refer to the modems' datasheets
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IF Switching	Transmit IF: Switched by RF relay (1.5 dB max. loss) Receive IF: Passive power splitting (4.0 dB max. loss)
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Dimensions (height x width x depth)	1.7" x 5.7" x 4.1" (4.3 x 14.3 x 10.4 cm)
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Weight	1.1 lbs (0.5 kg)
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Power Requirements	+12 VDC @ 80 mA (max.)
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Approval	CE
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