C-Band & Ku-Band Converter Switching

DISTRIBUTED PROTECTION SWITCHING

Comtech EFData's proprietary **Daisy Chain** is the most cost effective and space efficient method of performing converter protection switching available. Older generations of protection switches relied upon performing all fault determination and backup substitution in a central unit. This method was costly, added cable losses and actually contributed to the degradation of availability by the MTBFs of the added logic hardware and extra power supplies. Comtech EFData's **Daisy Chain** overcomes the difficulties of the older units by distributing the converter protection switching functions to the converters themselves and can backup from 1 to 12 online converters. The 1+1 minimum configuration is just as economical, but more powerful than typical stand alone 1+1 centralized switches.

DETACHABLE SWITCH MODULES

The Comtech EFData T–4500 series of up and down converters are equipped with detachable Input/Output Modules (IOM) containing the signal path connectors. The basic IOM is utilized for single thread operation and/or testing of the units. The IOM is inserted into an internal chamber at the rear panel of the converter. The **Daisy Chain** is implemented by replacing the IOM with a detachable switch module. The module contains all of the transfer switches and looping connectors required to chain each converter to the adjacent converter with very short cables. When a faulted converter is removed, it is detached from the switch module leaving the chain intact. The chain can be extended without affecting the online converters.

THE BACKUP CONVERTER

The Daisy Chain terminates in the backup converter. The backup converter's own microprocessor performs fault detection, self reconfiguration and logical switching functions. Since these functions are not duplicated in a central switching unit, no extra degradation in availability is introduced by them. If the backup converter is faulted, it will not attempt to perform protection switching tasks. If the backup converter is not faulted, it will assume the frequency and attenuation of the faulted converter and compensate for chain losses.

HIGH SPEED BUSS

The backup converter in the **Daisy Chain** communicates with the online converters by a high speed interface bus and is able to detect faults in under a millisecond and reconfigure itself to replace the faulted converter. The backup converter also uses the buss to monitor configuration changes made to an online converter by either remote control or front panel entry. Changes in frequency, gain or polarity are immediately entered into the backup tables as well as information from new online units. The high speed buss does not interfere with access to any of the converters in the **Daisy Chain** by the serial remote control port.

UP CONVERTER SWITCHING

Up converter switching uses detachable Transmit Switch Modules(TSM). The TSM contains transfer switches for both RF and IF. Options for TSMs include Type N connectors for C–Band, SMA connectors for Ku–Band and either 50 or 75Ω BNC connectors for IF.

DOWN CONVERTER SWITCHING

Down converter switching uses detachable Receive Switch Modules (RSM). The RSM contain IF transfer switches and BNC connectors for looping. RSM options include Type N connectors for C–Band and SMA connectors for Ku–band. BNC connectors are 50 or 75Ω.

POLARITY SWITCHING

A detachable Polarity Switch Module can be installed in the backup down converter. The PSM contains an RF transfer switch that accepts inputs from two LNA subsystems. The backup converter will call for the polarity selected for an online converter via the high speed buss and set the polarity transfer switch. Options for the PSM include Type N connectors for C–Band or SMA connectors for Ku–Band as well as BNC connectors at either 50 or 75Ω for IF.

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Typical 1+4 Uplink
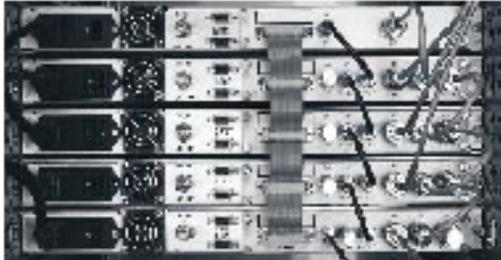
UPLINK SWITCHING

Typical 1+4 Downlink
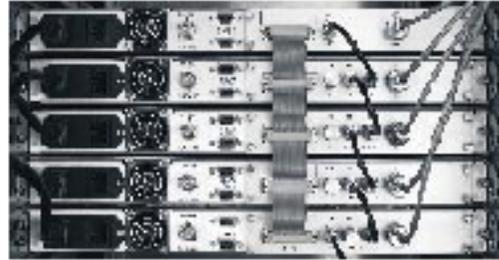
DOWNLINK SWITCHING
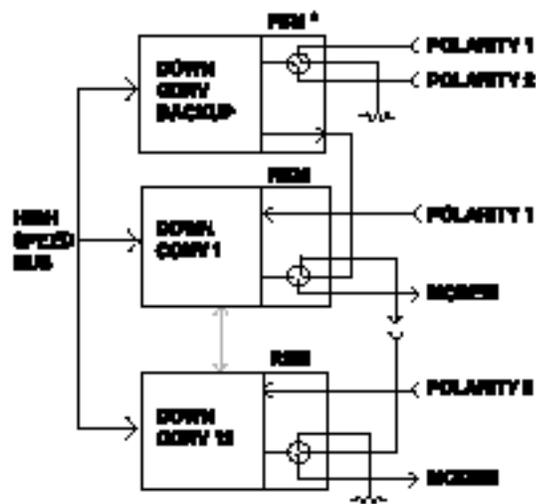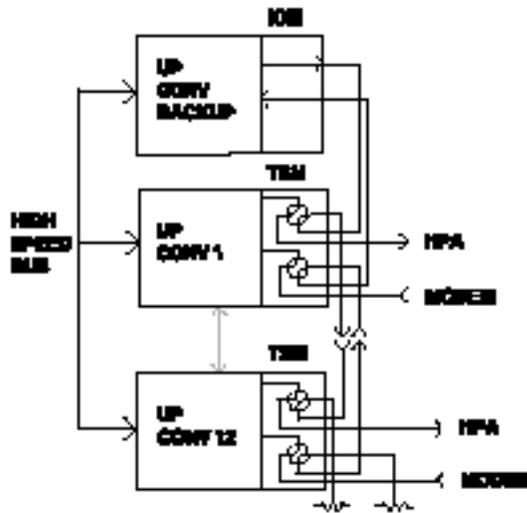
IOM   Input / Output Module
TSM   Transmit Switch Module
RSM   Receive Switch Module
PSM   Polarity Switch Module

* For systems with only one polarity, an IOM is used.