

FOCUS Primary Multiplexer

FOCUS is a fully integrated drop and insert, intelligent multiplexing communications system. Its unique modular architecture allows for operation at T1 or E1 rates over fiber optic cables or through 1.544 or 2.048mbps pipes within PDH, Sonet and SDH systems. A network of FOCUS chassis can be configured for point-to-point, linear drop and insert or self-healing ring applications, with spur and multiple ring capability.

The Integrated DACS (Digital Access and Cross-Connect System), with flexible optical and electrical transceiver combination options, make it an ideal choice for your primary multiplexer and LDFO (Low Density Fiber Optic) applications. Designed from the ground up to operate in harsh electrical environments, such as the power substation, FOCUS provides a wide range of user interfaces, including voice, data, protective relaying and SCADA. The highly reliable design provides the unparalleled flexibility desired for power utility network applications.

Features

- Standard telephony and relay channels available
- Can be customized to meet most applications
- Easily modified, while the system is in service
- Can be field programmed for T1 or E1
- Built-in full TSI (Time Slot Interchange), non-blocking cross-connect with 4 external line ports (optical or electrical) plus local channel drops
- Redundant Power Supply Module option
- Hot Standby optical links option
- Self-Healing rings with two & four-fiber configurations
- One expansion chassis can be added to accommodate additional channel modules when needed
- Rapid squelch on channel failure
- The FOCUS Configuration Software (FCS) uses an intuitive, windows-based interface to simplify configuration and troubleshooting
- A two-level system alarm status is provided via contacts

Diagnostics

- Designed for quick and easy fault identification
- Diagnostic information available locally by LEDs, alarm contacts or communications port (serial or Ethernet)
- Diagnostic information of any node is available from any other FOCUS node or via optional SNMP gateway

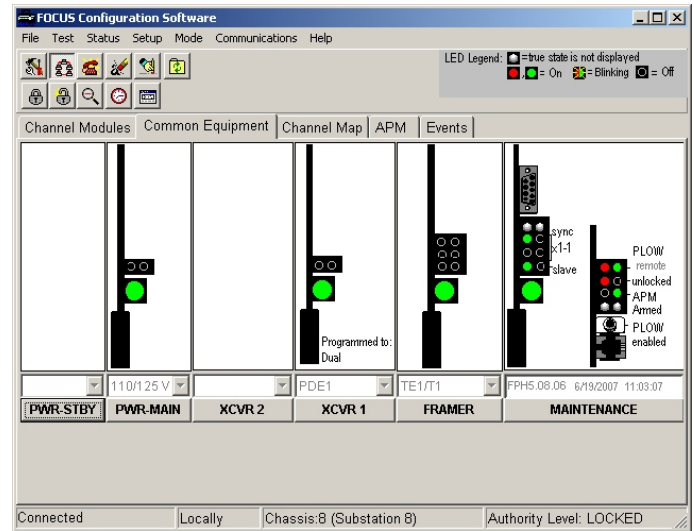
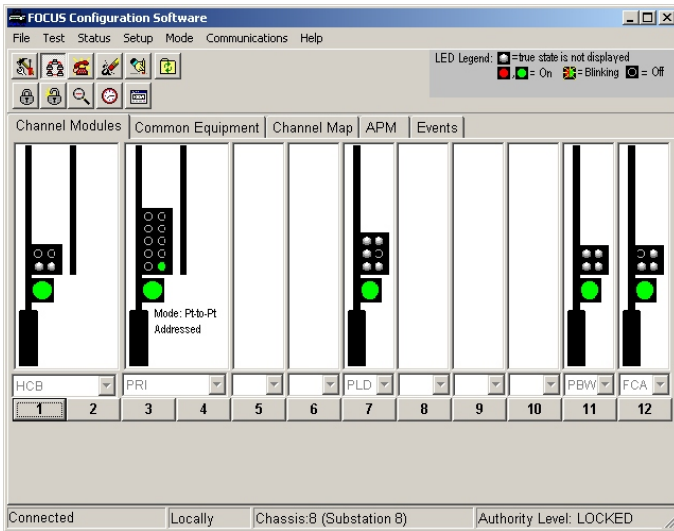
Environmental

- Interfaces are designed to meet applicable ANSI, IEEE, & IEC standards for surge and transient protection
- Built for an ambient temp. range of -20°C to +60°C
- Powered from common dc and ac voltages (24Vdc, 48/60Vdc, 110/125Vdc/Vac and 220/250Vdc/Vac)



Channel Modules communicate with other equivalent Channel Modules using one or more of the full duplex DS0 channels within the FOCUS network. Available Channel Modules include:

Protective Relay Interface Module	PRI, PRS	Full-rate RS-232 Data Module, 19,200 kbps	232
Pilot Wire Interface Module	HCB/SPD	Party Line Data Module, RS-232	PLD
2-Wire Voice, (FXS/FXO) Module	V2W/V2T, FXS/FXO	Contact Transfer Module	CTR
Party Line Exchange Orderwire (PLE) System	PBW/PBT	Sub-rate data Module (4 x 232 or 2 x 232 & 2 x 485)	SRD
4-Wire, E&M Signaling Module	V4W	Nx64k Data Modules (V.35, RS-449)	6NV/6NR
56/64kbps Data Module, V.35/RS-449 Interface	64V/64R	ANSI C37.94 Data Module	6NF
64kbps Data Module, G.703 Interface	64G	Ethernet LAN Module	6NE



Framer Error Counts

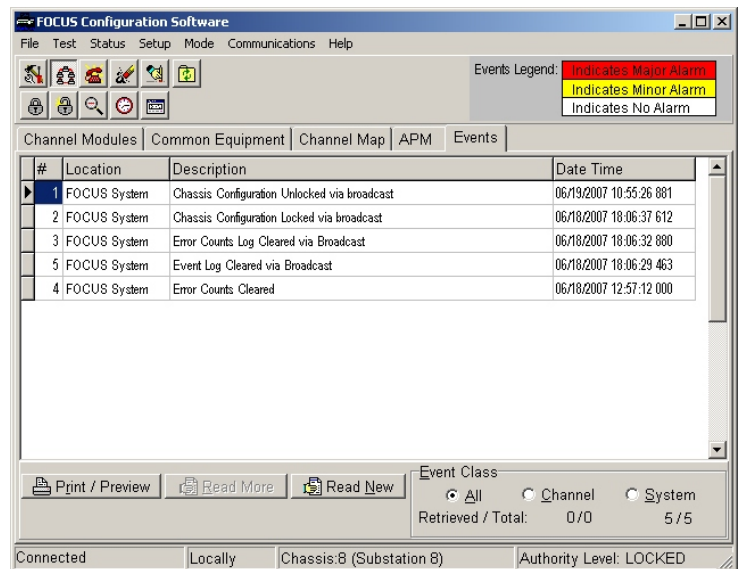
	SYNC	CRC	ESF YELLOW	BPV	BLUE	LOW SIGNAL
X1-1	0	0	0	0	0	0
X1-2	0	0	0	0	0	0
N/A	0	0	0	0	0	0
N/A	0	0	0	0	0	0

Shaded box indicates count has rolled over and is > than 255.
Error Counts Last Reset On: 6/18/2007 18:06:32

Print/Preview Reset Error Counts Update Close Auto Update

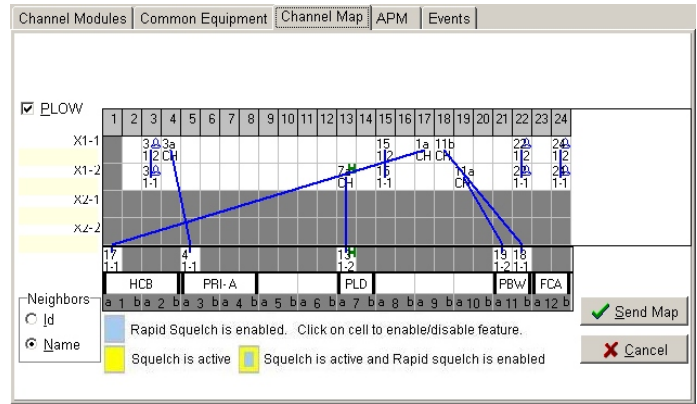
The FOCUS system is completely software configurable, through the craft interface of the Maintenance Module, with the FOCUS Configuration Software (FCS). FCS is used to view channel and system module status graphically, and to retrieve alarm and target information.

Most events are time tagged to 1ms resolution, providing a sequence of events log. Cyclic Redundancy Check (CRC) alarms, Remote Alarm Indications (AIS or ESF Yellow), Synch Alarms, Bipolar violations and Low Signal alarms are also recorded to help trouble shoot T1/E1 link problems.

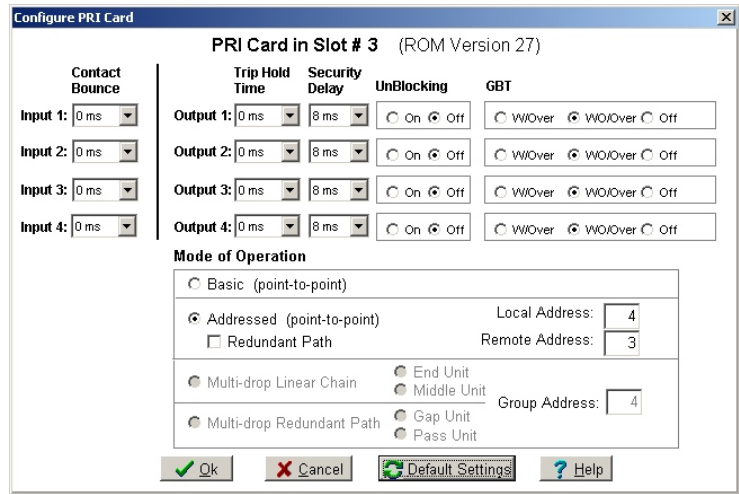


FCS is used to configure the FOCUS system, along with the complete monitoring capability. Using a point and click technique, channel time slots, T1/E1 ports, DS0 cross connects as well as Channel Module settings can be easily configured.

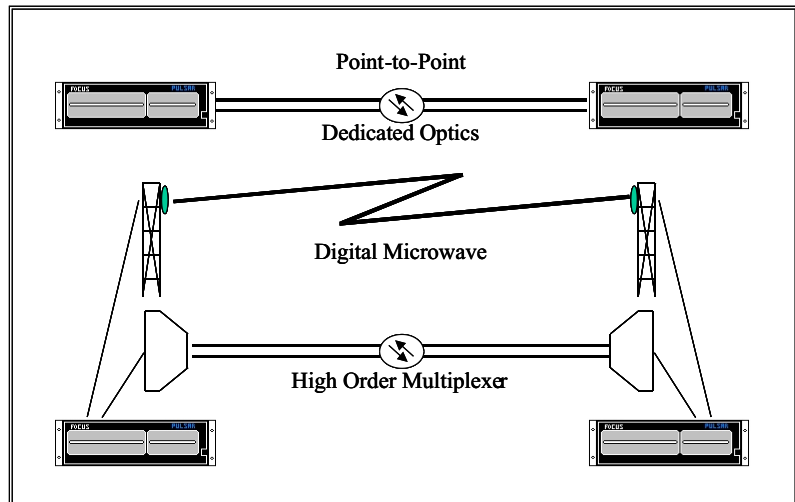
Any Channel Module, in any chassis slot can be configured to communicate in any DS0 channel of any of the four available T1/E1 ports in the FOCUS chassis.



Channel Module configuration is achieved through the module's configuration dialog box where you set that module's specific operation parameters. The 232, 64G, CTR & SRD modules have no configurable items.



A FOCUS point-to-point network is comprised of two terminal nodes and a communications link. The link can be dedicated fiber optic cables or digital transmission equipment. Channel Modules provide the interface to the communications circuits by communicating with equivalent Channel Modules at the remote end of the point-to-point system. They may use one or more of the full duplex DS0 channels within the link.

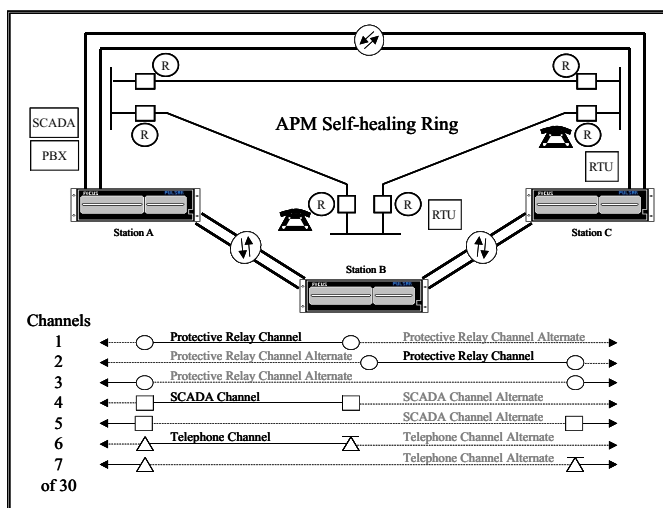
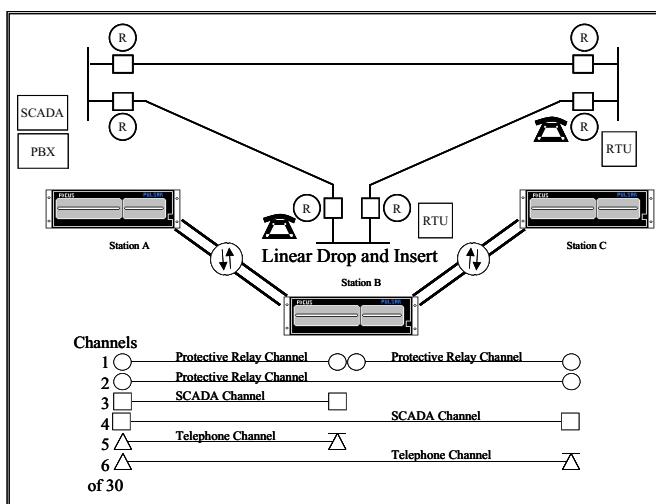


The FOCUS hot standby capability provides alternate routing should any optical link fail where a self-healing ring topology is impractical. Using primary and secondary transceivers, the hot standby will automatically switch from a failed link to the secondary link within 125 microseconds.

Fiber Optic Communications for Utility Systems

A FOCUS Drop and Insert Network includes more than two locations, in a linear configuration, with T1/E1 links between nodes. The FOCUS drop and insert system provides the capability for communications circuits to be configured between any two nodes within the system by taking advantage of the integrated, full TSI, non-blocking cross-connect.

It is important to note that once a channel has been "dropped" the bandwidth can be re-used downstream by "inserting" a channel on the same DS0.



The self-healing FOCUS Alternate Path Mode ring capability provides full connectivity and alternate routing should any link fail. The primary path of each DS0 is assigned by the network designer and can be programmed to travel in either direction around the ring. The alternate path for the circuit is on the same DS0 channel in the opposite direction around the ring. In the event of a link failure, the intelligence of the FOCUS system will re-route every affected "switch-over" channel in the opposite direction around the ring, such that service for that DS0 channel will be restored. No user pre-configuration is required for this feature.

The FOCUS Four Fiber Hot Standby self-healing ring capability provides full connectivity and alternate routing should any link fail, by utilizing two pairs of fibers between all adjacent nodes. This option does not limit the overall bandwidth of the system to 24 (30 for E1) DS0 channels. In a normally operating system, all DS0 traffic is passing over the primary fiber pairs. The second fiber pair is reserved as a redundant, standby communications path. A break in the primary link between any two nodes initiates rerouting of all 24/30 DS0 channels through the standby fibers in the opposite direction around the ring. This line-switched scheme allows the full T1/E1 bandwidth between each node to be utilized to its maximum capacity.

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