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Model 570X DNP3 Gateway Supports SCADA via Direct LAN Connection

The H&L Instruments Model 570X DNP Gateway provides improved SCADA performance and greatly reduces the cost and complexity of DNP3 Master connections. This product is downward-compatible with the current 570 family of fiberoptic rapid-healing, redundant-network transceivers. The 570X includes a Linux System-On-Module (SOM) to provide fast protocol-aware DNP3 SCADA communications over TCP and UDP. These DNP3 streams are carried via virtual channels over the fiber network to remote 570 transceivers, where they are converted to and from serial DNP3 at serial port speeds up to 115.2 kilobaud for connection to the end station.

Rapid Healing of Large Fiber Loops

The Model 570X is compatible with existing 570 network transceivers that provide fast recovery from unit or fiber failures independent of the size of the loop. The 570X/570 network solution automatically detects fiber breaks or node failures and switches from loop to radial network mode in less than one-half of a power cycle (< 8ms). That is fast enough to avoid errors in protective relay communications such as SEL Mirrored Bits™ and minimizes SCADA packet loss.

Convenience of Using DNP3 over UDP or TCP versus Serial DNP3 at head end

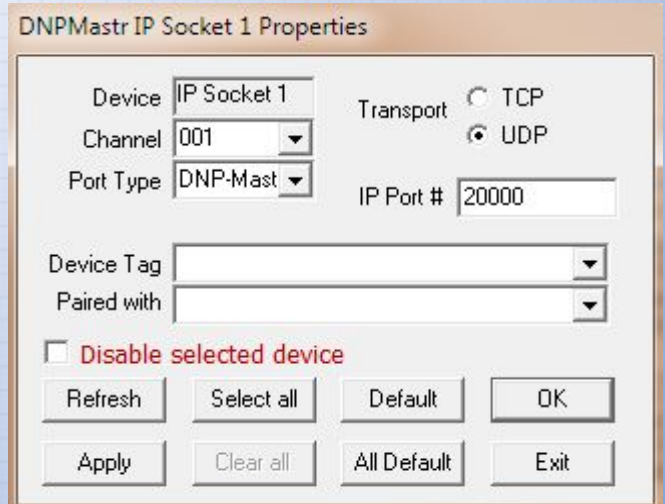
The Model 570X DNP Gateway eliminates third-party LAN-to-multiport serial converter hardware—reducing cabling complexities and improving system performance. Your SCADA master or proxy server can now use TCP or UDP transport protocols and connect via an Ethernet LAN directly to a head-end 570X transceiver. The Model 570X DNP Gateway uses its Linux SOM to provide fast protocol bridging and packet routing services for the fiber network.

How It Works

This new transceiver technology serves as a DNP3-over-IP endpoint for your SCADA master or proxy server by providing up to 16 TCP or UDP ports. Each 570X UDP or TCP port can be assigned to one of 126 virtual channels.

The FiberPanel network configuration software employs a straightforward interface for configuring 570X ports as DNP Masters and assigning virtual channels as shown in this screen of a typical DNP Master configuration session.

Configuration is intuitive and permits easy selection of TCP or UDP transport protocols, drop-down selection of virtual channel, and an IP port assignment. This object is referred to as an 'IP Socket'. It provides the 'glue' between a DNP3 LAN port and a virtual channel.

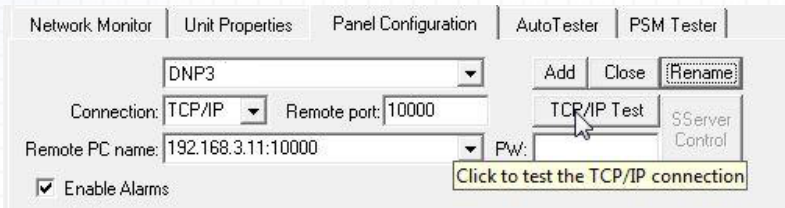




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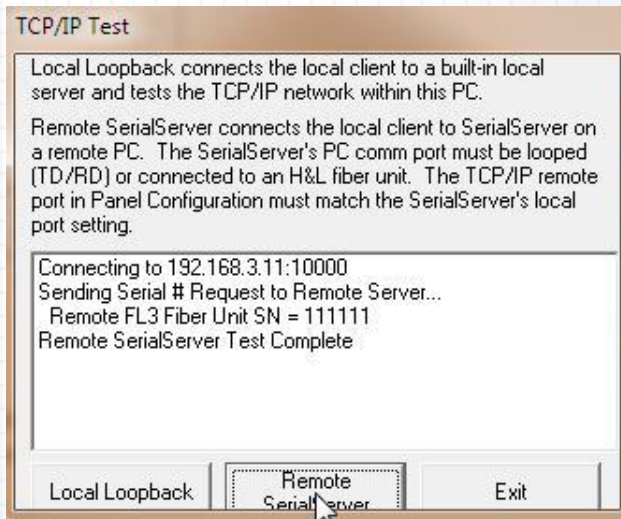
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FiberPanel provides features for setting the connection type to TCP or serial. If the connection type is TCP, you can assign a remote host name or address and a port number. Once the TCP connection type is selected and configured, a built-in test permits a quick validation of the configuration and confirms that the remote transceiver can be reached.



Prior to the 570X, it was necessary to use a terminal server since the 570 requires a standard serial port connection, so FiberPanel had to connect over TCP to the terminal server and configure it properly to talk to the 570 serial port. The 570X now supports direct TCP connections from FiberPanel to the 570X over the LAN using a built-in terminal server.

FiberPanel includes a small test utility to perform a local loopback or remote test of the connection. The remote test will return the remote 570 or 570X serial number if the configuration is correct.



Communicate With Serial DNP3 Slaves Over Fiber

A new port type has been defined for use in 570 transceivers that allows efficient communication with the head-end 570X to local serial ports connected to DNP3 devices. This new port type is called 'DNP3 Slave'. When a 570 serial port is assigned the DNP3 Slave type, the 570 uses a packet transmission technique instead of an individual byte method to send serial-DNP3 data over virtual channels. This technique permits multiplexing multiple slave responses over a single virtual channel without corruption caused by byte interleaving. The technique improves performance and eliminates transmission errors caused by collisions. Proxy servers can send simultaneous requests to multiple slaves on the same virtual channel, while unsolicited responses from slave devices are transmitted reliably without retries.



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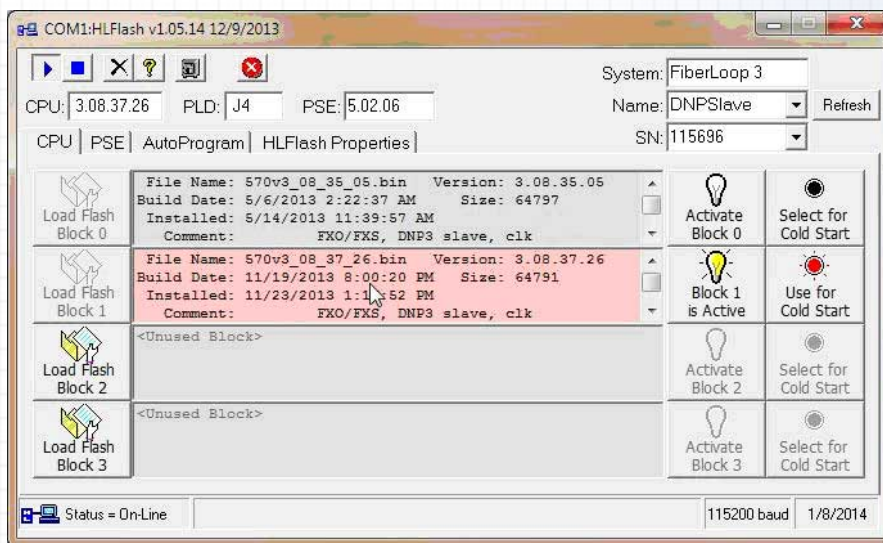
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Upgrade Existing Model 570 Transceivers for Serial DNP3 at No Cost

By connecting the Model 570X Fiberoptic Gateway to your SCADA master at the head-end, and upgrading existing Model 570 transceiver firmware in remote locations, you can eliminate LAN-to-multiport serial converter hardware and connect via the fiber network to existing serial DNP3 slave devices, such as the Eaton VaultGard.

Existing Model 570 based systems are easily upgraded, at no cost, to support the serial DNP3-aware features. The 570 transceiver firmware is upgraded by using the latest version of firmware with H&L Instruments HFlash software. The HFlash software and firmware upgrade are available from our customer support website as free downloads.

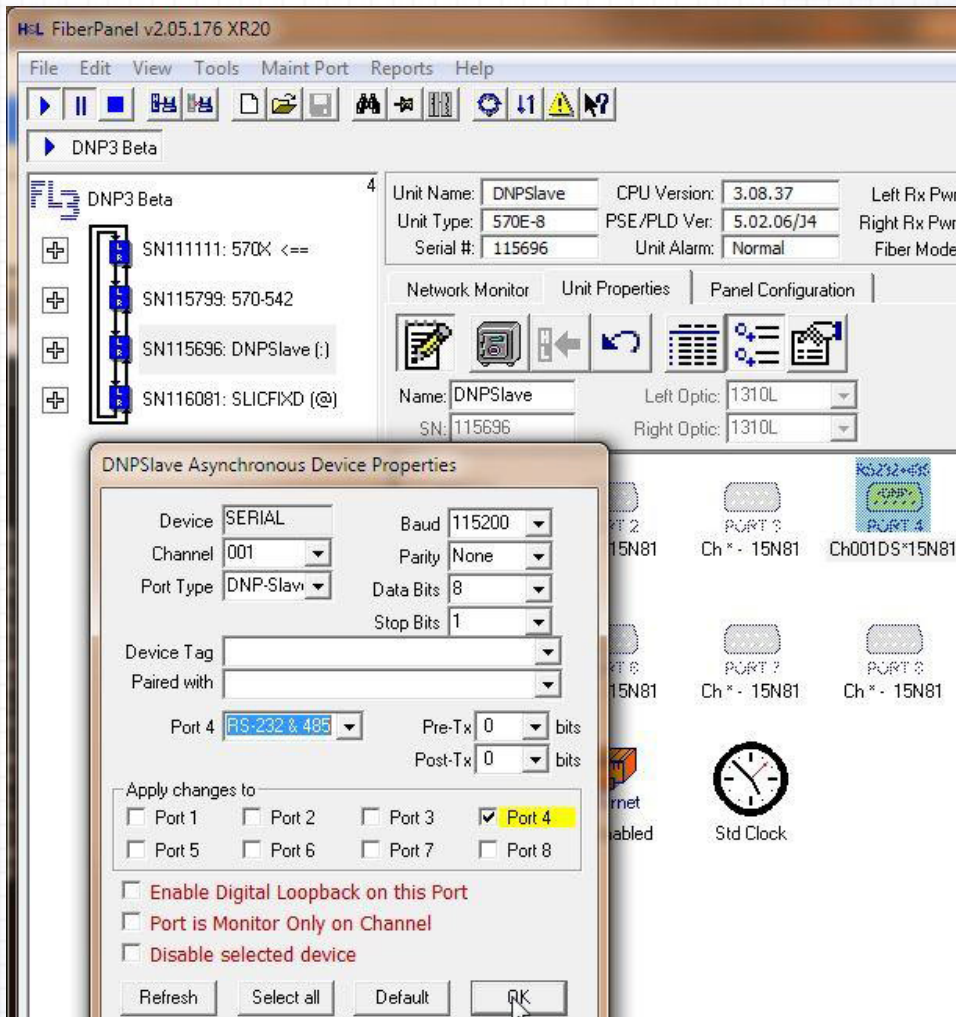
The following figure shows a typical HFlash session to upgrade a Model 570 transceiver *while in service* on a the fiber network.



Overall, both reliability and performance are improved by adding a Model 570X Fiberoptic Gateway to your network. Only one Model 570X is required per network to realize these benefits.

Remotely Configure Model 570 Transceivers for DNP-Slave Operation

A new version of FiberPanel remotely configures upgraded 570 transceivers for DNP slave operation at serial data rates up to 115.2 kilobaud. Additional FiberPanel configuration settings include enabling digital loopback and limiting the slave transceiver to a monitor-only function. A typical setup of a remote 570 transceiver for DNP slave operation is shown in the following figure.



Once configured, remote transceivers display in the FiberPanel virtual channel map to show channel assignments and DNP-slave assignments.

