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Find the *Digital Lightwave NIC GigE* at our website: *Click HERE*

NIC GigE Online Help User's Guide

March 2006
Document No. CO 005670K – Version 5.0

This document is provided so that you can print specific online help topics. It contains the same information that appears in the unit's online help file, which is accessed by selecting the HELP tab on the unit's screen.

Digital Lightwave

15550 Lightwave Drive – Clearwater, Florida 33760 – United States
T: 727.422.6677 – F: 727.442.5660 – Toll Free: 800.548.9283 or 877.275.3445
info@lightwave.com – http://www.lightwave.com

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NIC Gigabit Ethernet (GigE)

Welcome!

Digital Lightwave, Inc. is pleased to present the Network Information Computer Gigabit Ethernet (NIC GigE) Online Help. Select GigE Overview for a shortcut to specific Gigabit Ethernet topics.

To view and select topics, press the folder icons and topics on the left. Use your finger or a blunt object, such as a pencil eraser or the back of a pen, to select touch screen items.

Have questions regarding your NIC unit? Contact our Technical Support personnel.

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Version Information

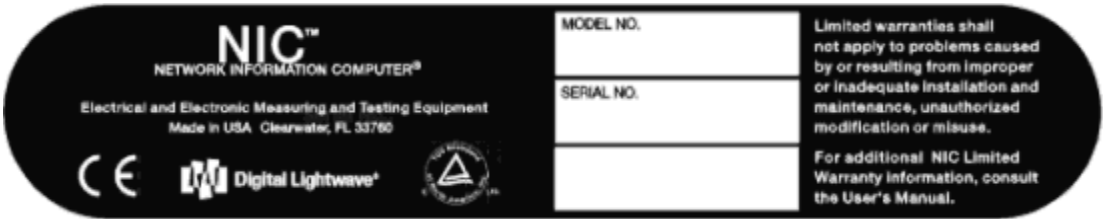
NIC Gigabit Ethernet Online Help Version 5.0

Document Number: CO 005670K

Last updated: March 2006

For unit's hardware serial number and software release information, see How to Display Serial Numbers and Software Revision.

In addition, more information is available on the unit's label:



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Agency Approvals



TUV Rheinland of North America is the test laboratory used.

For NIC 2.5G and NIC 10G:

TUV Safety File No. E2073411.01/E2073412.01/E2073414.01/.02

EMC Report File (NIC 10G) P2071068.01

EMC Report File (NIC 2.5G) P2071251.01/.02

CU License No. CU2071103.01

CDRH Accession No. 0021615

For NIC Plus:

TUV Safety File No. E2173656.01/E2173655.01

EMC Report File No. P2171264.01

CE Report File No. E2173659.01

CB Report File No. E2173657.01

CU License No. CU2173522.01

For NAA IV:

TUV Safety File No. E2171119.01/E2171120.01/E2171121.01

EMC Report No. P2171118.01

CU License No. CU2173727

GS License No. S2173726

CDRH Accession No. 9922616

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For DCA 425:

TUV Safety File No. E2173405.01/E2173406.01

EMC Report File No. P2171005.01

CU License No. CU2179070.01/.02

CDRH Accession No. 9922616

Standards products were tested to:

EMC Standards

- EN 55024
- EN 55022
- EN 61326-1
- EN 55011
- EN 300386-2 (NAA IV only)

Safety Standards

- EN 60950
- IEC950/UL1950/IEC60950
- CSA 22.2 No. 950

Return Shipping Instructions

If it is necessary to return the unit, obtain a **Return Material Authorization (RMA)** number and return shipping address by contacting Customer Service between 8:30 A.M. and 6:30 P.M. eastern time, Monday through Friday.

Please enclose a letter that briefly describes the reason for returning the unit and include the following information:

- Unit Serial Number
- Customer name and shipping address
- Customer contact name and telephone number
- Secondary customer contact name and telephone number

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- Customer supplied purchase order number (if applicable)

Shipping with the Original Container

If you have the original shipping container (box):

1. Place the unit (and letter that describes the reason for the return) into the canvas carry bag, and pack it into the original Digital Lightwave, Inc. shipping container. Do **not** include personal items such as jumper cords or connectors. Digital Lightwave, Inc. will not be responsible for these items. Use the original foam inserts to protect all six sides of the unit.
2. Securely seal the shipping container and mark **FRAGILE** on the container to ensure careful handling.
3. Include the RMA number on the outside of the shipping container.
4. Contact Technical Support for the Repair Department's return shipping address.

Shipping Without the Original Container

If you do not have the original shipping container:

- You may purchase a shipping container from Digital Lightwave, or
- You can pack the unit (and letter describing the reason for return) into the canvas carry bag, and use the following general instructions to repack the unit using commercially available materials:

    1. Use a strong shipping container, similar to the original unit shipping box. Verify that the substitute container is rated at 350 lbs. per square inch pressure durable.
    2. Make sure that the unit is satisfactorily protected by using a layer of ESD-protected short absorbing foam material. The foam padding must be three to four inches in thickness (70 to 100 mm) and applied to all six sides of the unit to provide adequate protection. Make sure that the canvas bag and unit cannot move or shift within the container.
    3. Securely seal the shipping container and mark **FRAGILE** on the container to ensure careful handling.
    4. Include the RMA number on the outside of the shipping container.
    5. Contact Technical Support for the Repair Department's return shipping address.

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When service is complete, your unit will be returned to you postage paid if the shipment is within the United States. You are responsible for paying all shipping charges, duties, taxes, and other charges for products returned to Digital Lightwave, Inc. from any location within or outside of the United States.

Warranty and Repair

Limited Warranty for Equipment

Seller warrants to the first purchaser of this Digital Lightwave, Inc. product that all components of the product will function in accordance with Seller's published specifications under normal conditions of use for a period of three (3) years from the date of shipment. Seller warrants to the first purchaser of this Digital Lightwave, Inc. product that the laser transmitter unit will function in accordance with Seller's published specifications under normal conditions of use for a period of three (3) years from the date of shipment. During the warranty period, Seller's liability is expressly limited, at Seller's election, to repairing or replacing the product or component not complying with this Limited warranty as determined by Seller's inspection, or to the repayment of, or crediting the first purchaser with, an amount equal to the purchase price of the product, whether the first purchaser's claims are for breach of warranty or negligence. The foregoing remedy as provided herein shall be the sole and exclusive remedy of the first purchaser.

Limited Warranty for Software and Firmware

Seller warrants to the first purchaser of this Digital Lightwave, Inc. product that each item of Software and Firmware included in the Product, in its unaltered form, will conform substantially to the then-current functional specifications for three (3) years from its installation date, provided such Software or Firmware is used in a manner consistent with Seller's applicable minimum equipment and software or firmware configuration specifications. Seller will make reasonable efforts to correct any errors reflecting significant deviations from the functional specifications as are reported by first purchaser to Seller during such warranty period. Because not all errors in Software or Firmware can or need be corrected, Seller does not warrant the all Software or Firmware defects will be corrected. Similarly, Seller does not warrant that the Software or Firmware will meet first purchaser's requirements or that the Software or Firmware will operate in combinations selected for use by first purchaser.

Limitations of all Warranties

All Equipment, Software and Firmware Limited Warranties apply only to the first purchaser of this Digital Lightwave, Inc. product and are not transferable without the express written permission of Seller. Any claim under any of these Limited Warranties shall be deemed waived unless submitted to Seller in writing within

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one hundred eighty (180) days from the date the first purchaser discovered, or should have discovered, the facts giving rise to the claim.

The foregoing Limited Warranties shall not apply to problems caused by or resulting from improper or inadequate maintenance, acts or omissions of first purchaser, first purchaser supplied software or interfacing, unauthorized modification or misuse, breaking the seals or otherwise attempting to open the plastic and/or metal housing, operation outside of the environment specifications for the products, improper site preparation or maintenance. Seller is not responsible for any damages caused by any person or entity through misuse, neglect or accident.

For warranty service or repair, this product must be returned in accordance with the Seller's Return Policies to a service facility designated by Seller. The first purchaser shall prepay shipping charges to Digital Lightwave, and if Digital Lightwave discovers a breach of the Limited Warranty, Digital Lightwave shall pay shipping charges to return the product to first purchaser. However, first purchaser shall pay all shipping charges, duties and taxes for products returned by Digital Lightwave to first purchaser outside the United States.

Return Policies

Approval must be obtained from Seller, prior to return of any merchandise. All material returned without a Seller Return Material Authorization (RMA) number will be refused automatically. The first purchaser must return the product in original package and in good condition, without its serial numbers or any part thereof altered, defaced or removed and accompanied by a specification in writing of the defects involved. The first purchaser shall notify Seller in each instance when first purchaser intends to return goods which first purchaser believes are not in accordance with this Limited Warranty and Seller shall be entitled, at Seller's option, to examine such goods at first purchaser's facilities prior to return.

EXCEPT FOR THE WARRANTIES EXPRESSLY SET FORTH IN WRITING IN THIS LIMITED WARRANTY AND IN OUR TERMS AND CONDITIONS OF SALE, SELLER MAKES NO OTHER WARRANTY, WHETHER WRITTEN, ORAL OR IMPLIED. ANY IMPLIED WARRANTY OF MERCHANTABILITY, TITLE, NON-INFRINGEMENT OR FITNESS FOR A PARTICULAR PURPOSE IS HEREBY DISCLAIMED BY SELLER AND EXCLUDED FROM THE AGREEMENT.

SELLER SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL LOSSES, DAMAGES OR EXPENSES, DIRECTLY OR INDIRECTLY ARISING FROM THE SALE, HANDLING OR USE OF THE PRODUCTS, OR FROM ANY OTHER CAUSE WITH RESPECT TO THE PRODUCTS OR THIS LIMITED WARRANTY. WHETHER SUCH CLAIM IS BASED UPON BREACH OF

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CONTRACT, BREACH OF WARRANTY, NEGLIGENCE, STRICT LIABILITY IN TORT OR OTHER LEGAL THEORY. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

Technical Support

Our Technical Support representatives are available to help at the following toll-free numbers:

- 1-877-929-HELP (4357)
- 1-800-548-9283

Note: International customers, call 1-727-519-2860.

Standard Service Hours

8:00 am to 6:30 pm ET, Monday through Friday.

Extended Service Hours

24 hours a day, 7 days a week

Note: Extended Service is available to all premier accounts free of charge. Ask your account manager for details.

Email

You may also contact our Technical Support reps via email at support@lightwave.com

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Technical Specifications

Specifications are subject to change without prior notice.

General Specifications

Physical Characteristics:

- Operating Temp: 0° to 50° C @ 85% RH
- Storage Temp: -20° to 60° C @ 95% RH
- Power Req: 100-120 VAC or 200-240 VAC, 50-60 Hz
- Dimensions: 10.1" H x 12.3" W x 4.7" D (257 mm x 312 mm x 120 mm)
- Weight: 10.5–14 lbs (depending on configuration)

Auxiliary Interfaces:

- LC-type LX or SX Ports 1 and 2
- 8-pin modular jack 10/100 Mbps Ports 3 and 4
- RS-232: V.24, DB-9
- Parallel Port: DB-25
- DCC: RS-449, DB-15
- Orderwire: Handset jack (A-law)
- BITS/SETS Clock: Bantam
- 10/00BaseT: RJ-45
- Input/Output Trigger: SMA
- USB: Universal Serial Bus v.1.1, type A female (System Controller 2 with Windows XP supports full USB plug and play functionality.)
- Flash memory — accepts any USB-based flash storage devices, e.g., a USB thumb drive. Also accepts flash memory cards that can be supported by a PCMCIA card adapter, such as a PCMCIA adapter card hosting a Compact Flash (CF) memory card.
- PC Card (PCMCIA): Dual-slot 32-bit PCMCIA CardBus interface for modem, GPIB, or memory storage. Supports two Type I or II or one Type III device, including GPIB interface cards. Approved cards are:
    - 33.6K and 56K Modems: Viking, 3Com, Xircom, US Robotics
    - Flash: SanDisk 48-MB Flash
    - GPIB: INES

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Getting Started

Getting Started Overview

The NIC Gigabit Ethernet (NIC GigE™) is a cost-effective, standalone diagnostic tool for metro-ring and other Gigabit Ethernet networks. The unit's intuitive, touch-sensitive GUI offers Bit Error Rate (BER) testing, RFC 2544 (throughput, frame loss, and latency) testing, and Service Disruption testing.

The following GigE related topics are discussed in this section of the online help system:

- NIC GigE Getting Started
- NIC GigE Common Functions
- NIC GigE 10/100
- NIC High-Density GigE

Safety Guidelines for Portable Products

The following safety precautions are provided to avoid injury and prevent damage to this product or any products connected to it during normal operation. Only qualified maintenance personnel should perform service procedures.

- **Use Proper Power Cord:** To avoid fire hazard, only use the power cord specified for this instrument. For use in North America, use a power cord (maximum 6-foot length) with a type SJT, 18 AWG, two conductor with ground, IEC 320 connector on one end and a NEMA 5-15 connector on the other end.
- For use outside of North America, use an HO5VV-F power cord with a 1-mm^2, two conductor plus ground, IEC 320 connector on one end, and a wall-socket plug on the other end that is certified for use in the country of installation.


The entire cord set must be certified for use in the country of installation.

- **Avoid electric overload.** This unit is designed to be powered from 100–120 and 200–240 VAC, 50–60 Hz. To avoid electric shock, fire hazard, or damage to the instrument, do not apply a higher voltage.
- **Ground the instrument.** The unit is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections

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to the input or output terminals of the instrument, ensure that the product is properly grounded.

- **Do Not Operate in Hazardous Conditions.** To avoid injury or fire hazard, do not operate this instrument in wet, damp, or other hazardous condition. Do not operate this instrument in an explosive atmosphere.
- **Eye Protection.** Users should never stare into unterminated connectors or broken fibers. In addition, fiber cables and interfaces should always be handled as if they were emitting laser light. Always leave protective covers on optical connectors to prevent damage and prevent laser emissions.
- **Field Service:** This equipment is not intended to be serviced in the field. All service is intended to be completed by Digital Lightwave, Inc.

Warning: This is a Class A product per EN55022. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures. Cables used should be less than 3-meters long for compliance with EMC directive.

- **Environmental Statement:** This product may contain lead-based solder materials and a lithium battery for computer support. Please return all Digital Lightwave products to the factory for proper disposal. Operation of this product is not hazardous to the environment.
- **Laser Safety:** The unit contains Class 1 laser devices (21 CFR 1040.10 and 1040.11 Compliant; EN60825-1:1993+A11+A2). Never look into an unterminated fiber. Always place dust caps on the optical ports when fiber is not attached to the optical ports.



Class 1 Laser Product

NOTICE

Unterminated optical connectors may emit laser radiation. Do not view with optical instruments.

Use of controls or adjustments or procedures other than those specified herein may result in hazardous radiation exposure.

CDRH Accession Numbers

NIC10G/NIC 2.5G: 0021615

DCA 425: 9922616

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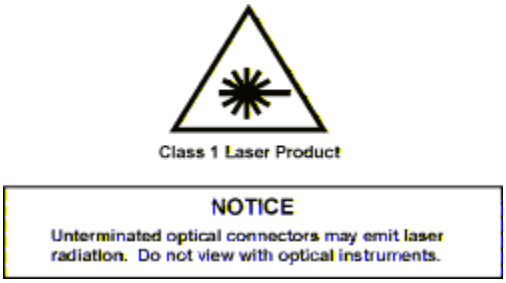
Safety Guidelines for Rackmount Products

Read and follow all warnings, cautions, and instructions marked on the product and included in this document. Only qualified personnel should perform installation or service.

This unit is designed to be NEBS Level 3 Conformant per Telcordia/Bellcore GR-1089-CORE and GR-63-CORE.

1. Always wear an ESD wriststrap and follow appropriate ESD procedures when installing or servicing the unit and its components.
2. The unit is suitable for connection to intra-building or non-exposed cabling only per Telcordia/Bellcore NEBS GR-1089-CORE.
3. Turn off the unit's subpanel circuit breakers when making power input connections.
4. Verify that the input power requirements (-42 VDC to -56 VDC) are correct before installing the unit. This product is intended to operate from a -48 VDC source derived from batteries, SELV, or an NEC Class II device.
5. Do not attempt to lift and install the unit alone. A fully configured unit can weigh up to 58 pounds (26.31 kgs.).
6. The unit is configured and shipped to mount into a 23- or 19-inch rack. A minimum of four mounting screws are required to attach the unit to a rack's mounting rails. Eight mounting screws are recommended. Mounting screws are the responsibility of the customer.
7. Always make sure that a component is installed into the correct slot. (Use the label, visible when components are removed, to verify the slot position.)
8. An empty slot should never be exposed. Always have an empty slot covered by the appropriate blank faceplate when a component is removed for any period of time. This is required for NEBS GR-1089-CORE and EMC conformance.
9. The optical circuit packs contain Class 1 laser devices. Never look into an unterminated fiber. Always place shutters on the optical ports when fiber is not attached to the optical ports. The unit contains Class 1 laser devices CDRH Accession Number: 9922616; 21CFR 1040.10 and 1040.11 compliant; EN60825-1:1993+A11+A2.

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Use of controls or adjustments or procedures other than those specified herein may result in hazardous radiation exposure.

Fiber-Optic Cleaning Procedure



With fiber optics, the tolerance to dirt is near zero. Oils, greases, airborne particles of dust, lint, and other debris are all very harmful to fiber-optic cables. They can scratch and damage fiber-optic connectors if not removed. Not only can scratches and debris harm the connectors, but they also can jeopardize the integrity and accuracy of the optical signal.

The ferrule end faces of fiber optic patch cords and receptacle connectors are some of the most critical components for fiber optical networks. *Prior to inserting any patch cord into the test equipment's receptacle connector, clean and examine the patch cord's and the receptacle's connectors to verify the quality of each.*

Inspect the Ferrule End Face of a Patch Cord Connector

WARNING: Never look into the end of a fiber through a microscope or your bare eye if the other end is connected to an operating piece of network or test equipment!

1. Prior to inserting any patch cord into the microscope, verify that the other end is not connected to an operating piece of network equipment.
2. Visually examine the end face of the connector using a fiber-optic microscope.
3. If the end face of the connector is unacceptable, properly clean the connector prior to use.

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4. If the end faces are acceptable, then use the fiber-optical patch cord as intended. If the end faces are not acceptable, then clean the connectors and reexamine them again.

To Clean a Patch Cord Connector Using Lint-Free Tissue and Alcohol

1. Using the pressurized canned air, blow away any dust particles that may be on the exterior surface of the connector, particularly the sides and end face of the ferrule. Hold the can approximately two inches from the surface to be cleaned and apply three to five short blasts of air.
2. Next, using an Optic Prep (or any lens-grade lint-free tissue moistened with isopropyl alcohol), gently and slowly slide the tissue across the tip of the ferrule end face in one sweeping move.
3. Repeat the last step again using a clean section of the tissue.

Performing Periodic Maintenance on the Patch Cord Connector Using a CLETOP Cleaner

WARNING: Only isopropyl alcohol should be used because some solvents might attack epoxy.

CLETOP cleaners provide a thorough and easy method of cleaning optical connectors. It uses a reel-type cassette of dry, woven polyester, alcohol-free, cloth film. It is a fast and reliable remover of dirt, lint, and debris from the ferrule end face of the optical connector. This cleaner should be used on the patch cord periodically if the patch cord is frequently inserted and removed from the test equipment.

1. To clean the ferrule end face of the connector, advance a clean portion of the reel by depressing the side lever with your thumb.
2. Gently stroke the tip of the connector along the exposed film in the manner according to the directions on the label.
3. While sliding the connector along the blue film, slightly twist the connector between your thumb and finger to assure a thorough cleaning.

If the end-face of the patch cord is damaged or scratched beyond cleaning or repair, replace the patch cord with a new one whose end faces are acceptable.

4. Inspect the connector receptacle of the network test equipment.

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WARNING: Always turn the test equipment's laser OFF before inserting the video micro-scope into the receptacle, or looking directly into the receptacle of the test equipment!

5. Prior to inserting the video microscope, verify that either the unit or its laser is turned OFF.
6. Using the pressurized canned air, blow away any dust particles that may be on the interior surface of the receptacle. If dirt is present inside the receptacle, it can scratch the lens of the video microscope, or the end-face of the connector.
7. Insert the video microscope into the receptacle. Using the monitor, visually examine the receptacle's end face of the connector.
8. If the receptacle's end face has a build up of dust, dirt, or any debris, clean the receptacle according to the next procedure.

To Clean a Connector Receptacle (also referred to as a bulkhead or adapter)

1. Using the pressurized canned air, blow away any dust particles that may be on the interior surface of the receptacle, particularly the inside walls of the alignment sleeve. Hold the can approximately two inches from the receptacle to be cleaned and apply three to five short blasts of air.
2. Moisten the end of a 2.5-mm foam swab with isopropyl alcohol, and insert it into one side of the receptacle. Move the swab in and out two or three times and then remove it.
3. Moisten the end of a NEW swab with alcohol, and insert it into the open side of the receptacle. Rotate the swab back and forth 90-degrees twice and then remove it.
4. Dry the inside of the receptacle by holding the pressurized canned air approximately two inches from the end of the receptacle and applying three to five short blasts of air.

Only use foam swabs; cotton swabs leave particles and threads behind.

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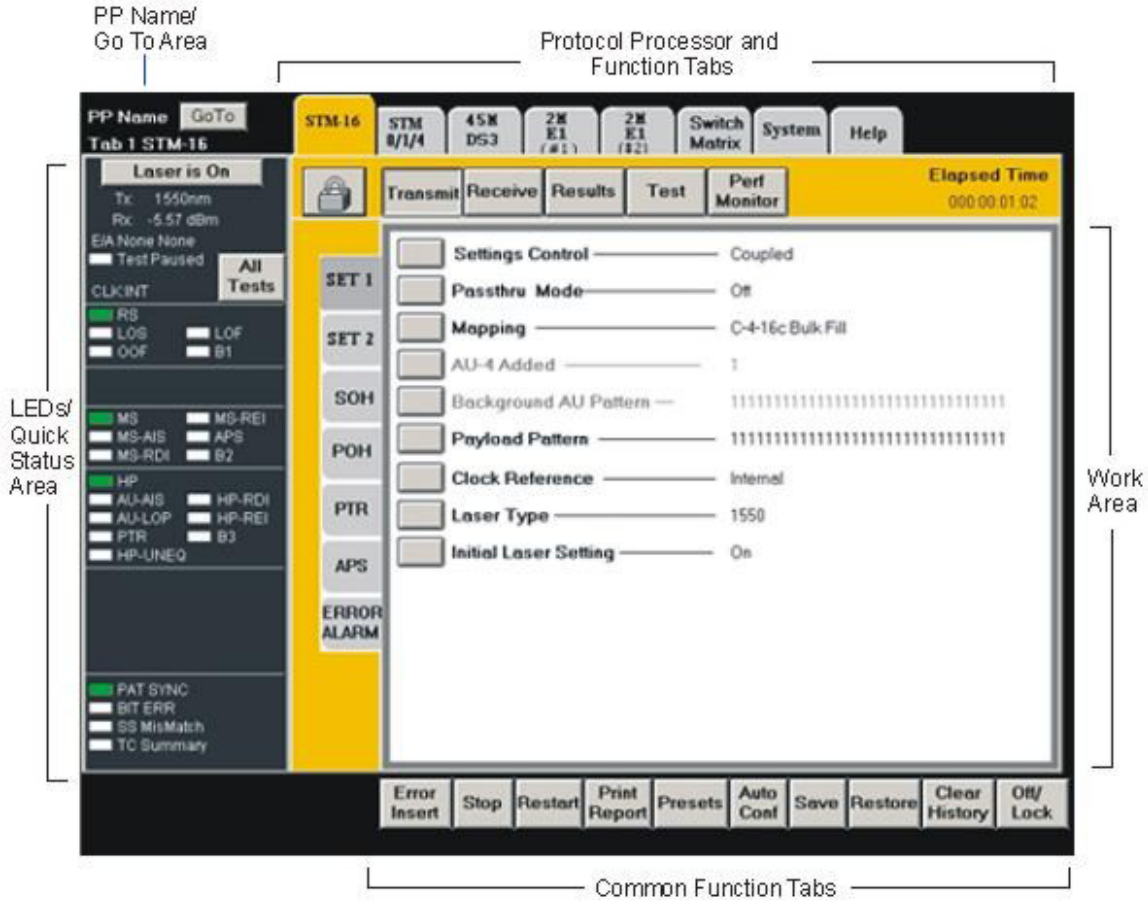
Screen Components

The main screen is the user interface to the system. Through this display, you can view the configuration of the test unit, start and stop numerous tests, and collect a variety of statistics about test unit performance.

If you are using a portable product that has a touch screen, place you finger directly onto the screen to select tabs and buttons associated with a specific function. **A blunt object, such as the back of a pen or pencil eraser, can also be used to select touch screen functions.**

Warning: Avoid using sharp instruments, such as pen tips, pencil tips, keys, and paper clips. These objects may scratch and mark the touch screen.

The following is an example of the GigE protocol processor screen with the main regions labeled.



The main screen contains five main regions:

- Quick Status LEDs

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- PP Name Go To Area
- Protocol Processor and Function Tabs
- Work Area
- Common Function Buttons

Quick Status LEDs

The left side of the screen provides an at-a-glance view of the current protocol processor's LEDs and Laser ON/Off button. The LEDs report incoming error and alarm activity, current status, and event history.

This portion of the screen allows you to quickly scan and target potential problem areas. It is broken down into the following areas:

- **Laser On/Off button:** Enables you to turn the laser on and off.
- **LEDs:** The LEDs that appear are dependent on which protocol processor is selected.
- **All Tests:** Provides a shortcut to the **All Test Status** screen (located under the System tab) which shows a general status summary of all circuit packs installed in the unit.

Turn Laser On or Off

Warning: The optical Transmit output is produced by a laser device. You should never, under any circumstances, look into an unterminated fiber.

Laser operation is controlled from the **Quick Status LEDs** area. The **Laser** button indicates if the laser is on or off. When the unit is powered on, the laser is off by default.

Laser Safety

The unit contains Class 1 laser devices. Never look into an unterminated fiber. Always place dustcaps on the optical ports when fiber is not attached to the optical ports. CDRH Accession numbers are listed in Agency Approvals.

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To turn the laser on:

- Select the **Laser** button in the **Quick Status LEDs** area. The laser status indicates **ON**.

To turn the laser off:

- Select the **Laser** button. The laser status indicates **OFF**.

SDH and SONET laser operation can be defined using the Initial Laser Setting function which controls whether the laser is on or off when the unit is turned on.

From the **Transmit** screen, select **Initial Laser Setting** and choose one of the following:

- **Off** – The unit's laser will be off when the unit is turned on.
- **On** – The unit's laser will be on when the unit is turned on.
- **Restore Previous State** – When the unit is turned on, the laser will be on or off based on its previous setting before the unit was turned off.

Using LEDs

The system uses LEDs to report alarm, error, and event activity. These visual cues help to narrow the focus if problems are detected on the incoming protocol processors' signals and provide a starting point when trying to diagnose problems.

There are two ways to view LEDs from the screen: the **Quick Status LEDs**, which are located on the left side of the screen, and the **Large LEDS** tab. The following tables describe what is indicated by the LED color.

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For LED descriptions for a specific protocol processor, go to the appropriate protocol processor section of the online help and navigate to **Screen Functions and Definitions** > **LEDs**.

Quick Status LEDs Color Description

If the LED is ...	Then this indicates ...
Green with white text	Normal operation. The LED is used as a status indicator.
White with white text	Normal operation, no errors or alarms. The LED is used as an error and alarm indicator.
Red with **red** text	An error or alarm event is in progress. The LED is used as an error and alarm indicator.
White with **red** text	An error or alarm event was detected, but is now cleared. The text serves as a history indicator.

Large LED Tab Color Description

If the LED color is ...	Then this indicates ...
Green with **black** text	The specific function is active and OK.
Red with **red** text	An error or alarm event is in progress.
White with **red** text	This function experienced an error or alarm event. This event is cleared by selecting **Restart**.
White with **black** text	No activity from this specific function.

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All Test Status

Displays a general status summary for all circuit packs (which appear as protocol processor tabs) installed in the unit. A maximum of 12 circuit packs can appear on the screen. If a circuit pack has more than one port (for example, a Quad RX circuit pack), then a status summary for all ports on the circuit pack appears.

If a unit contains more than 12 circuit packs, refer to the All Test (1 to 12) section below for status screen operation.

When in this mode, each circuit pack is polled. You may notice a slight delay in status reporting based on your unit's configuration.

The following appears for each circuit pack installed:

- Protocol processor tab name
- Elapsed time
- General status. A **green** Summary LED indicates normal operation. A **red** Summary LED indicates that an alarm or error is in progress.

If the **Summary** LED text is selected (the word Summary), the LEDs associated with that specific protocol processor tab appear. To clear the LED window, select **OK**.

All Test (1 to 12)

When a unit contains more than 12 circuit packs (protocol processor tabs), the All Test Status screen operates using the following guidelines:

- Circuit packs appear on the screen in groups of 12.
- The **All Test** button indicates which group is currently displayed, i.e., **All Test (1 to 12)**, **All Test (13 to 24)**, and so on.
- The status screen can be refreshed manually, by selecting the **All Tests** button. When a screen refresh occurs, the next group of circuit packs appear along with any new LED status activity.

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Protocol Processor and Function Tabs

The Protocol Processor and Function tabs are the first row of tabs located on the top of the screen. They remain static on the screen regardless of which tab is selected.

These tabs allow you to easily navigate and switch between protocol processor modes and functions. When a Protocol Processor and Function tab is selected, the information and option tabs displayed on the screen will change and correspond to that particular function.


The protocol processor tabs that appear depend on your hardware setup and protocol processor mode. You can toggle between various protocol processor modes using the **System** tab. In addition, protocol processor tabs can be customized. For more information, select Changing a Tab Name.

The following tabs are available:

- Protocol Processor tabs: Please see the appropriate protocol processor online help section for more information.
- Switch Matrix
- System
- Help: Accesses the online help system
- Back and Forward Scroll Arrows

Configuring the System

The System tab contains functions used to configure test set preferences, set up tests, and configure input and output settings in order to perform software upgrades, file transfers, and I/O port configurations.

The System screen contains the following function tabs:

- Misc
- I/O Settings
- File Services
- Security
- User Preference

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- All Test Status
- Service Disruption
- Monitor
- Chat
- Faults

Change Tab Name for the Go To Label

1. From the **System** tab, select **User Preference**.
2. Under **Label Preferences**, select **Local** or **Global**.
    - Local – Only changes the tab label for your session. Other users will not see the tab name that you enter.
    - Global – Changes the tab label on the unit so that all users see the same tab name that you enter.
3. Select a tab name from the **Assigned Name** column of the list box.
4. Under **PP Label Information**, enter a name in the **Assigned Name** text field. (When using the touch screen, select  to open a keypad.)
5. Select **Update List Entry**, to add the name to the User Defined Name column of the list box.
6. Repeat steps 3 through 5 to continue adding user-defined names, as desired.
7. Select **Save All List Entries**. The new tab names appear in the PP Name/Go To area of the screen when the protocol processor tab is selected.
8. Select **PP Name / Go To**, located in the top-left corner of the touch screen. The Select Protocol Processor Entry dialog box appears displaying the new name.

When the protocol is selected the new name appears below the PP Name text on the touch screen; however, the name on the tab remains the same.

To restore tab names, select Restoring Default Tab Name for the Go To Label.

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PP Name/Go To Area

The **PP Name** indicates which protocol processor (PP) tab or system function (such as System and Help tabs) on the user interface is currently selected.

For portable units, the tab position and description appear.

For rackmount units (for example, NAA IV), the slot position and description appear.

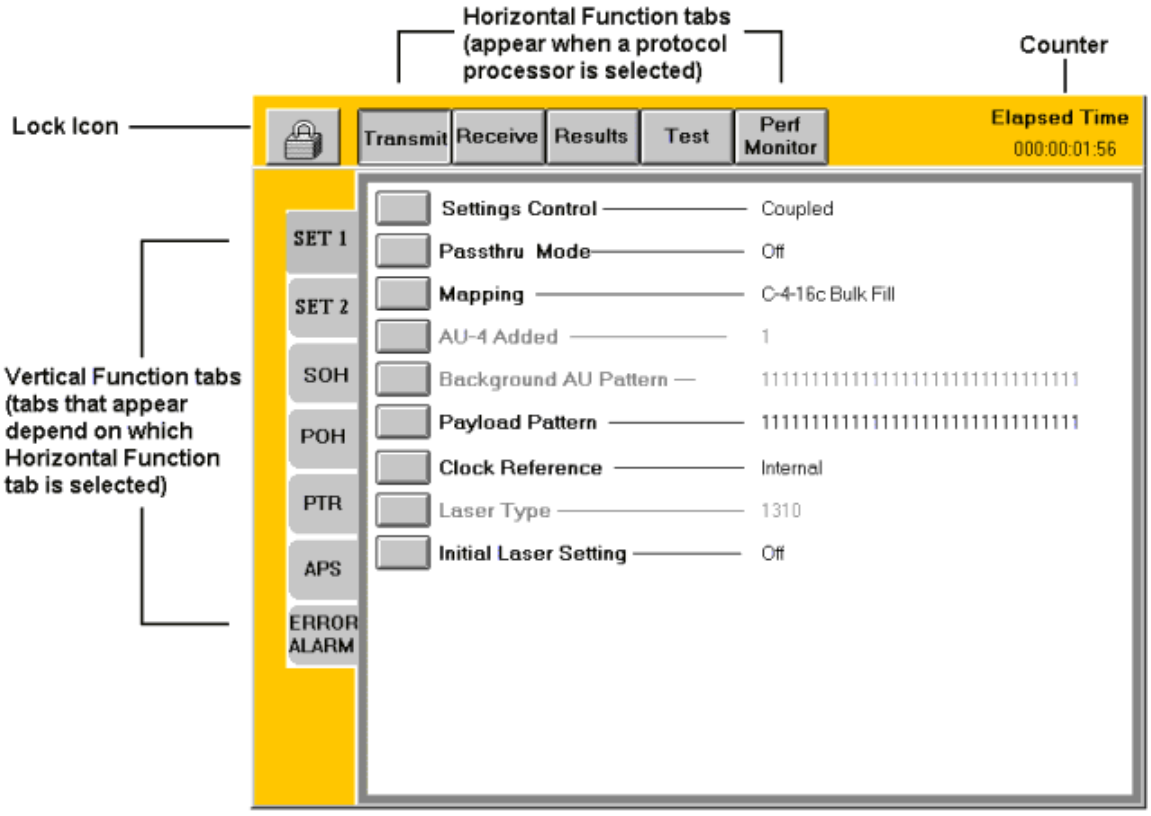

The number of protocol processor tabs that appear on the user interface will vary based on the configuration of your system. In addition, protocol processor tabs can be assigned specific names. For information, select Changing a Tab Name for the Go To Label.

Use the **Go To** button to select and quickly jump to any tabbed function that appears on the user interface.

Work Area

The work area consumes the majority of the screen. All functions are accessed from the work area and displayed in the form of tabs or buttons. Using these tabs, you can view incoming error and alarm statistics and configure the system for operation. Select Lock Icon for locking and unlocking information.

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Lock Icon

Overview

The test set's multi-user functionality allows up to eight simultaneous users to be connected to the portable device. This includes one local user, via the device's touch screen, and seven remote users using the Remote Control Application (remote GUI), SCPI commands, or TL1 commands.

To prevent users from interfering with each other, an individual user can "lock" and take control of a test unit. This is done using the Lock icon that appears on the GUI. Permission levels determine the user's ability to lock and unlock a test unit. When you lock the test unit, you can configure protocol processors, start tests, and perform general product functions without the worry of contending for resources with another user.

Using the Lock Icon

The following guidelines describe how to lock and unlock a test unit using the Lock icon. See Locking and Unlocking a Test Unit for more information. For setting the default lock state, see Configuring the Lock on Startup.)

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If I see this icon on my GUI,	It means
	The test unit is unlocked and available. No individual user has control of it. I can lock the test unit by selecting this icon and choosing **Lock** or **Lock and Exit** from the Lock/Unlock dialog box.
	I have the test unit locked. I currently control the test unit and can configure protocol processors. I can unlock the test unit by selecting the icon. Other users will see  on their GUI.
	The test unit is locked by another user, and I can only view protocol processor screens. **If I have Admin privileges –** I can select this icon and force an unlock. **If I do not have the proper user privilege –** A message appears stating that the protocol processor is locked by the current owner. For example, "Protocol Processor locked by User X."
	The circuit pack (and its associated protocol processors) is **out of service**. A counter appears indicating how long the circuit pack has been out of service. A fault is also logged.

Configuring the Lock on Startup

To control the Lock's default state when the unit is started:

1. From the **System** tab, select **User Preference.**

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2. Select **Startup Locking State**.
    - Select **Lock** to automatically lock the unit when it is started.
    - Select **Unlock** to make the unit available to anyone when it is started.

Common Function Buttons

The bottom of the touch screen contains task-oriented buttons that appear on the screen in protocol processor mode or when using the Switch Matrix. These buttons do not appear when using the System or Help tabs.

The Common Function Buttons include:

- Error Insert
- Stop
- Restart
- Print Report
- Save
- Restore
- Clear History
- Off/Lock

Error Insert

The **Error Insert** button injects single errors into the transmitted protocol processor signal. Error parameters are defined using the Error to Insert function.

Stopping a Test

The Stop Common Function Button stops the reporting of received data and takes a snapshot of error, alarm, and event activity.

When the Stop button is selected, the following occurs:

- All statistics logged and reported by the Performance Monitoring function stop.
- All alarm, error, and event statistics logged and reported by the Results function stop.
- All elapsed time and duration counters stop.

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The LEDs will continue to update and indicate current activity.

To stop a test:

- Select the **Stop** Common Function Button located at the bottom of the touch screen.

  To restart test activity and statistic reporting, select the **Restart** button.

Restart an Error, Alarm, or Event

The Restart common function button performs the following activities:

- **Starts** error, alarm, or event activity that was stopped using the Stop button.
- **Clears and resets** error, alarm, and event activity counters, statistics, and LEDs for the current protocol processor.

To restart a test or reset statistics:

- Select the **Restart** button located at the bottom of the touch screen. Configured testing on the current protocol processor is restarted.

Destination Printer

The Destination Printer functions print a report directly to a printer.

For local printing (which means that you are using the touch screen), you must have a printer attached to the unit's parallel port or serial port.

For remote printing (which means that you are using the Remote Control software to operate a unit from a PC), the report is sent to your PC's default printer. The standard Windows Print dialog appears when using the Remote Control software.

Printer Port Configuration

The unit supports both parallel and serial printers.

For Parallel Printing:

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- Attach a parallel printer cable (with a 25-pin male connector on one end) to the unit's **Parallel Port** connector. This is a DB-25 female connector.

For Serial Printing:

> Important: The following steps must be performed from the NIC unit touch screen. "Printer" is not an available Serial port assignment from the Remote Control Application.

1. Attach a serial printer cable (with a 9-pin female connector on one end) to the unit's **RS-232** port connector. This is a DB-9 male connector.
2. From the **System** tab, select **I/O Settings**.
3. Select the **Serial** button.
4. Select the **Port Assignment** button and choose **Printer**.

Printing a Report

Selecting the Print Report Common Function Button while on the allows you to print statistic and event reports to a printer or file.

1. Select **Print Report**. The Report Setup menu appears.
2. Choose one of the following:
    - From **Destination Printer**, select one or multiple reports to print directly to a printer. If printing a report from the NIC unit, make sure that a printer is attached to the unit's parallel or serial port. The following reports are available:

        Settings - (.set extension) Reports current values for all Transmit and Receive Set functions.

        Statistics - (.stat extension) Reports results for the Scan, Errors, Alarms, and PTR.

        Events - (.evt extension) Reports a detailed summary of events, such as alarms, errors, and pointer activity. This report includes the event, the number of events logged, the start and stop time of the event, and the duration of the event.

        APS - (.aps extension) Reports the results of the K1 and K2 byte sequences received by the unit.

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Performance - (.perf extension) Reports Performance Monitor results.

- From **Destination File**, choose one or multiple reports to print to a file. The File Browser dialog box appears.

> The **Comma Delimiter** option can be applied to the Settings To File and Statistics To File reports.

Enter a filename and select **OK**.

> Important: Files saved when working with the Remote Control Application will not be accessible from the NIC unit touch-screen and visa-versa. The remote application saves the files to the Remote Control (GalaxyNIC) directory on the PC. The NIC unit saves the files to its default D:\DLI... drive on the test unit.

3. In the **User Comment** box, select the **Input** button to enter notes that will display in the report. A keyboard opens.
4. Enter comment text using the keyboard. When working from NIC test set use the touch screen keyboard. Select **Enter**.

> To clear comment text, select the **Clear** button.

5. Select **OK**.

For information on retrieving saved files, see Print or View Saved Files.

> Important: Files that are created when using the Remote Control Application are saved on your PC in the Remote Control directory. This directory can be overwritten when connecting to other remote units that have the same compatibility level, but are different models (for example, a NIC Plus, a NIC 10G, and so on).
>
> If you want to keep these files, copy and save the following to a backup directory on your PC that is not in the Remote Control Application directory's path:
>
> - Any file with the .set, .stat, .evt, .aps, .perf, or .rep extension.

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- The client.prop file. Changes to this file are only needed if the remote unit uses a PCMCIA modem for its dial-up connection.

Destination File

The Destination File functions allow you to print reports to a file. This saves the report file either locally on the unit or remotely on a PC.

Using the Destination File Functions:

1. After selecting **Print Report**, the Report Setup screen appears.
2. Select any combination of reports from the **Destination File** functions.
3. Select **OK**. The File Browser appears, which allows you to name and save the report file.
4. After naming the file and deciding which subdirectory to store the file, click **OK**. The report is saved. It can later be retrieved using File Services.

Printing or Viewing Saved Files

While running tests, you have the option to save the information to a file. The instructions below tell you where and how to print or view a saved file.

Important: Files saved when working with the Remote Control Application will not be accessible from the NIC unit touch-screen and visa-versa. The remote application saves the files to the Remote Control (GalaxyNIC) directory on the PC. The NIC unit saves the files to its default D:\DLI... drive on the test unit.

To print or view a saved file:

1. From the **System** tab, select **File Services**.
2. Select a file from the **Disk** directory box. The desired report may display in the main Disk directory, or it may be stored in one of the folders in the directory. Folder names are enclosed in brackets **[foldername]**. To return to the main Disk directory after opening a folder, select **[. .]** or the **Disk** button.

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> Important: Real-time reports generated from the NIC unit touch-screen, using the Action after Duration function, are automatically stored in the [APP] folder. Select the folder to display those reports.

The following is a list of file extension used for files generated from the Print Report, Graph, or Action after Duration functions:

- **.aps** - APS Report
- **.evt** - Event Report
- **.perf** - Performance Report
- **.real** - Real-time Test Report (Stored in [APP} folder on NIC unit.)
- **.rep** - Graph Report, BERT Analysis, RFC Thru Put Analysis
- **.set** - Settings Report
- **.stat** - Results Report
- **.statE** - Event Report
- **.grp** - Graph (This is not a text file. It can only be viewed as a graph by selecting **Results,** pointing to **Graph** and choosing the **Replay Graphs** button.)

3. Choose one of the following

To **Print** the file:

a. Select **Print**. A standard Print dialog box appears.

> If you want to print a report directly from the NIC unit, make sure that a printer is attached to the unit's parallel or serial port.

b. Select the printer **Name** and choose **OK**.

To **View** the file:

a. Select **View**. The View File window appears.
b. Select **Exit** to close the window.

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Configuring the System

The System tab contains functions used to configure test set preferences, set up tests, and configure input and output settings in order to perform software upgrades, file transfers, and I/O port configurations.

The System screen contains the following function tabs:

- Misc
- I/O Settings
- File Services
- Security
- User Preference
- All Test Status
- Service Disruption
- Monitor
- Chat
- Faults

MISC

The following functions are available under the System Miscellaneous tab:

- Set the Unit's Date and Time
- Start Screen Saver
- Backlight Intensity
- Oscillator Value
- License Key
- About this product
- Protocols
- Factory Default Mode
- External Clock
- Speaker Volume
- Local Setting: User Login Required
- Recalibrate Touch Screen (portable products only)

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Set Time and Date

The system uses touch screen keypads for time and date configuration. Time is entered in a **HH/MM/SS** format. Date is entered in a **DD/MM/YYYY** format.

To set the time:

1. From the **System** tab, select **Set Unit's Date and Time**. The Set Date and Time window appear.
2. Select the **Time** button.
3. Select **Hour** and enter the hour using 2-digit, 24-hour, military time format.
4. Select **Minutes** and enter the minutes using a 2-digit format.
5. Select **Seconds** and enter the seconds using a 2-digit format.
6. Select **Set**. The time change appears in the LED/Quick Status area.

To set the date:

1. From the **System** tab, select **Set Unit's Date and Time**. The Set Date and Time window appear.
2. Select the **Date** button.
3. Select **Month** and enter the month using a 2-digit format.
4. Select **Day** and enter the day using a 2-digit format.
5. Select **Year** and enter the year using a 4-digit format.
6. Select **Set**. The date change appears next to the Set Unit's Date and Time field.

Configuring the Screen Saver

The screen saver can be turned off or configured to activate after a set period of time. When the screen saver is operating, you can clear it by touching anywhere on the touch screen.

1. From the **System** tab, select **Misc**.
2. Select **Start Screen Saver**. The Select Screen Saver Delay dialog box appears.
3. Select the desired delay period.

To disable the screen saver:

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1. From the **System** tab, select **Misc**.
2. Select **Start Screen Saver** and choose **Off**.

Adjust Touch Screen Brightness

To adjust a portable unit's touch screen intensity:

1. Select **System.**
2. Select **MISC**.
3. Select **Backlight Intensity**. A keypad appears. It accepts values ranging from **0** (brightest setting) to **255** (dimmest setting).
4. Using the keypad, enter a value, and select **OK** when you are done.

Setting Oscillator Value

1. Select **System**.
2. Select **Misc**.
3. Select **Oscillator Value**.
4. Using the touch screen key pad, enter a value between 1 and 255.
5. Click **Ok** to accept the value.

License Key

The License Key function allows you to enable functionality that you may not have initially purchased. If you wish to obtain more functionality for your unit, contact Customer Service to request new features, and you will be provided a License Key that will activate the requested features.

To enter a new license key:

1. Select **System**.
2. Select **MISC**.
3. Select **License Key**. A keypad appears.
4. Enter the new license key into the text box.
5. Select **Enter** when done.

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6. Reboot the unit for the new functions to take effect.

   Select **Re-Boot Unit** and select **Yes**.

Display Serial Numbers and Software Revision

This function displays the following information:

- Copyright Information
- Feature set number
- Graphical User Interface Version
- Customer Service Information
- Circuit Pack Information
    - Product Serial Number
    - Kit Number
    - System Control Version
    - SCPI Version
    - TL1 Version
    - SNMP Version
    - OmniOrb Version
    - UPX Version
    - zlib Version
    - Kit Numbers and Versions

To view this information:

1. Select **System**.
2. Select **About this product**. The software revision number and hardware serial numbers appear.
3. To close the **About this product** box, select **OK**.

You may also obtain some of the product information by viewing the product label located on the unit. For example:

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Configuring a Protocol Mode

The unit can be configured to operate in SONET, SDH, PDH, or DS3/DS1 networks.


The options that appear on this screen are determined by your hardware configuration.

1. Select the **System** tab and choose **Misc**.
2. Select the **Protocols** button.
3. The following options appear:

    - **SONET, SDH:** These options appear if your unit contains one or more SONET/SDH boards, but no PDH board.
    - **DS1/DS3, E1/DS3, E1/E3:** These options appear if your unit contains a PDH board, but no SONET/SDH boards.
    - **SONET/DS1/DS3, SONET/E1/DS3, SDH/E1/E3, SDH/E1/DS3, SDH/DS1/DS3:** These options appear if your unit contains a PDH board and one or more SONET/SDH boards.

4. Select a protocol mode. The screen is updated to reflect the mode selected.

Factory Default Mode

This function determines the Protocol Processor mode that the unit returns to after restoring the unit's factory default settings.

To set the Factory Default mode:

1. Select **System**.
2. Select **Misc**.
3. Select **Factory Default Mode**.

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4. Select a Protocol Processor mode.
   When factory default settings are restored, the unit will default to the selected Protocol Processor mode of operation.

If **None** is selected, the unit will use its current protocol processor's mode of operation

Setting the External Clock

This function allows you to set the external clock to Bits or SETS.

To set the external clock:

1. Select **System**.
2. Select **Misc**.
3. Select **External Clock**.
4. Select **Bits** or **SETS**.

Increase or Decrease Speaker Volume

This function allows you to increase or decrease the speaker volume in order to hear the touch screen beep.

To increase or decrease speaker volume:

1. From the **System** tab, select **Misc**.
2. From **Speaker Volume**, select the **Low** arrow to decrease the volume, or **High** arrow to increase the volume.

Establish User Login Parameters

This function allows an administrator to establish the user login parameters. The login parameters allow for the following:

- A **default login**, which means when the test set is booted up a default user name already appears in the User Name of the login dialog box. However, the user must enter a password.
- A **required login**, which means when the test set is booted up the user is required to enter a user name and password.

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Important: The login function is only applicable for the NIC unit. When connecting to a NIC via the Remote NIC application, the NIC IP Address, User ID, and Password are required.

Calibrating the Touch Screen

Touch screen calibration is performed on all portable units prior to shipping from the factory. However, if your unit's touch screen requires recalibration, perform the following:

Although touch screen calibration can be performed using your finger, a pointing device, such as a stylus, is recommended for greater accuracy.

1. Select **System**.
2. Select **Misc**.
3. Select **Recalibrate Touch Screen**. This button appears in the touch screen's lower right corner. (It does not appear when you are remotely connected to the unit using the Remote Control Application software.)
4. The Calibration dialog appears.

When the Recalibrate Touch Screen button is selected, the Calibration dialog appears. If another area of the touch screen is pressed while this dialog is open, the main System screen appears, and the Calibration dialog moves to the background. To restore the Calibration dialog (and return it to the foreground), select the Recalibrate Touch Screen button again. To exit the Calibration dialog, use the Close button that appears in the dialog's upper right corner.

5. Select **5-point Calibration**.

   Five touch screen targets (calibration points) appear on the screen.

   The hand icon indicates which target to select.

6. Place and hold your pointing device as close to the center of the target as possible.

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7. The message **Touch Enabled** appears when calibration for that specific point is complete.
8. The hand icon moves to the next target. Repeat steps 6 and 7 for the four remaining targets.

If the screen is not touched for a 20-second period or longer, the current calibration process is canceled. The calibration must be restarted using the first touch screen target.

9. When touch screen calibration is complete, a completion message briefly appears on the screen, and the Calibration dialog closes.

I/O Settings

The I/O Settings tab allows you to configure and control the unit's communications port parameters. It also allows you to reboot the unit. The following port options are available on the I/O Settings screens:

- Ethernet Configuration
- Wireless Configuration
- Serial Configuration
- GPIB Configuration

File Services

This function provides file management of saved reports. It allows you to:

- Print any saved report file
- Upload report files from the unit
- Download report files to the unit
- View any report printed to file
- Rename report files
- Delete report files
- View file details (size and modification date)
- Create a new directory for file storage

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Upload a File

A file can be transferred from the unit to a remote device (e.g., a PC), or to a local device, such as a PCMCIA or Flash storage card or a USB storage device. (Note that System Controller 2 with embedded Windows XP supports USB plug and play functionality.) If using the PCMCIA or USB function, make sure that the PC card or USB storage device is plugged into the NIC unit before selecting the File Services button. When the PC card or USB device is inserted, an audible tone indicates that the proper drivers are qualified. If using the FTP function, make sure you have the IP address of the receiving device.

See also Download a File

1. From the System tab, select **File Services**.
2. From the right File List box, select the upload method by clicking on the Drive — FTP button.

   If using *FTP*, click on that button, then enter the IP Address of the device that will receive the file (unless you are using the Remote Control Software; then enter the test set address). If this device is secured with a User ID and Password, then enter this information. Enter an FTP session on the connecting device.

   If using a PCMCIA card, Flash card, or USB device such as a thumb drive, plug the card or device into the appropriate slot. After a few seconds the system will recognize the device and update the drive selection window. New drive letters will appear in the File List box. Note that it is possible to have both a PCMCIA card and a USB device connected to the NIC at the same time. From one of the drives in the File List box, select a target directory to receive the file. Note that it is usually best to plug in the storage media before clicking the File Services button

   From the left File List box, select the current directory location of the file you want to transfer.

   Select the desired file to be transferred.

   Select the upload button.  The file will be transferred from the NIC.

Warning: When the unit is powered off, the FTP directory is automatically purged.

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Download a File

A file can be transferred to the NIC unit from a remote device (e.g., a PC), or from a local device such as a PCMCIA or Flash storage card or a USB storage device. (Note that System Controller 2 with embedded Windows XP supports USB plug and play functionality.) If using the PCMCIA or USB function, make sure that the PC card or USB storage device is plugged into the NIC unit before selecting the File Services button. When the PC card or USB device is inserted, an audible tone indicates that the proper drivers are qualified. If using the FTP function, make sure you have the IP address of the receiving device.

See also Upload a File

1. From the System tab, select **File Services**.
2. From the right File List box, select the download method by clicking on the Drive — FTP button.

   If using *FTP*, click on that button, then enter the IP Address of the device that will send the file to the NIC unit (unless you are using the Remote Control Software; then enter the test set address). If this device is secured with a User ID and Password, then enter this information. Enter an FTP session on the connecting device.

   If using a PCMCIA card, Flash card, or USB device such as a thumb drive, plug the card or device into the appropriate slot. After a few seconds the system will recognize the device and update the drive selection window. New drive letters will appear in the File List box. Note that it is possible to have both a PCMCIA card and a USB device connected to the NIC at the same time. From one of the drives in the File List box, select the directory containing the file to transfer. Note that it is usually best to plug in the storage media before clicking File Services.

   From the left File List box, select the destination directory.

   From the right File List box, select the desired file to be transferred.

   Select the download button.  The file will be transferred to the NIC.

Warning: When the unit is powered off, the FTP directory is automatically purged.

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Viewing a File

1. From the System tab, select **Files Services**.
2. Select a file from the File List box.
3. Select **View**. The contents of the file appear in the View window.
4. Use the **Display Hex / Display ASCII** toggle button to display the file in Hex or ASCII format.

View File Details

1. From the System tab, select **Files Services**.
2. Select a file from the File List box. The file name, file size, modification date, and file attributes appear below the File List box.

Deleting a File

1. Select **System**.
2. Select **File Services**. The File Services screen appears.
3. Select a file from the File List box.
4. Select **Delete**. A confirmation message appears.
5. Select **Yes**. The file is deleted.

If you do not have authorization to delete files, the **Access Denied** message appears.

Security Settings

Security is an administrative function and only appears if you are logged on as an Administrator. This screen is divided into the following main sections: User Security Information, System Services/FTP Administrator, and Reset System.

User Security Information

This function allows you to view the following security information on system users:

- User Name
- Permissions: Read Only, Read/Write, Calibrate, or Admin

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- Active User: Displays the user's current status.
- Current Permissions: If Security System Lock is enabled, shows users that may temporarily have read only privileges.
- Default User

The Security function also enables a user with administrator privileges to perform the following tasks:

- Add a User
- Delete a User
- Update a User Profile
- Enable/Disable Security System Lock
- Establish a Default Login
- Establish a Required Login

 If the Security System Lock function is enabled, only one user with Read and Write permissions (this includes Calibration and Admin users) can be logged in at a time. If a user with Read and Write permissions is already logged in, a window will appear giving you the option of logging in with Read- Only permissions only. When the user logs on with Read-Only permissions, all functionality will be disabled with the exception of the online help and the About this product function.

System Services and FTP Administrator

- **System Services:** Allows an administrator to disable specific network services to meet their network's security policies. To enable a system service, select its checkbox. To disable a system service, remove the check so that the checkbox is blank.
- **FTP Administrator:** Assigns a user ID and password so that a user can log in to a remote computer and transfer files using the file transfer protocol service.

Reset System

- Restores default Security settings.

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System Services

The following system services can be enabled or disabled by an Administrator.

A unit reboot is required if any changes are made to system services.

- **Internet Information.** The IIS (Internet Information Server) service provides the ability to host a simple web server, which uses port 80 (http). This function can be disabled (deselect the checkbox) to prevent unauthorized access to the port.
- **File Transfer Protocol.** The FTP service allows a user to remotely log in to the unit and transfer files. Disabling this function can prevent unauthorized access to ports 20 and 21.

  FTP service must be enabled if you use the Remote Control Application or the DLI Software Upgrade software. You can not connect to the unit using these applications if FTP service is disabled.

- **Remote Procedure Call.** This protocol allows an application on one PC to request a service from another application located on a different PC within in a LAN. Disabling this function can prevent unauthorized users from using the unit to access other equipment in a customer's network.
- **Telnet.** The Telnet service allows a user to log in to a remote system. Disabling this function can prevent unauthorized users from using the unit to access a customer's network.
- **NetBIOS.** The NetBIOS (Network Basic Input/Output System) program allows applications to use port 139 to communicate to different PCs within a LAN. This function can be disabled to prevent unauthorized access to the port.
- **SCPI.** The SCPI (Standard Commands for Programmable Instruments) service uses port 8090 to send and receive SCPI commands to the unit. Disabling this function will prevent unauthorized access to the port.
- **TL1.** The TL1 (Transaction Language 1) service uses port 8080 to send and receive TL1 commands to the unit. Disabling this function will prevent unauthorized access to the port.
- **SNMP.** The SNMP (Simple Network Management Protocol) service uses ports 161 and 162 to transfer commands and traps to and from the unit. Disabling this function will prevent unauthorized access to these ports.

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Resetting the System

This Administrator function clears and restores default settings to the following:

- User Accounts - deletes all user accounts and restores the default Admin account.
- FTP Administrator - deletes the FTP account and restores the default FTP user ID and password.
- System Services - restores all default system service settings.

User files, such as the protocol processor's transmit and receive settings, report statistics, graphs, and test results, are not deleted. These files are managed using File Services.

To reset the system:

1. Select **System**.
2. Select **Security**. The Security screen appears.
3. Select the **Reset System** button.
4. A message confirming that you want to reset the system appears. Select **Yes**.
5. A message stating that the system must be restarted for changes to take affect appears. Select **OK**.
6. Restart the system.

User Preference

Allows you to customize various preferences, such as how to label function tabs, how often to refresh status rates, and how to assign sounds to alarm events. The following functions appear on the User Preference screen:

- **PP Label Information:** You can assign a specific name (up to 20 characters in length) to each protocol processor function tab. When a protocol processor tab is selected, the name appears in the PP Name/Go To area of the screen. For example:



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Refer to Change Tab Name for more information.

Current Printer: When printing a report or a saved file to a network printer, you can disable or enable the Windows Print dialog. If **No Prompt Use** is selected, the report is sent to your default printer without any user intervention. If **Prompt Each Time** is selected, you can choose a printer using the Print dialog.


The Current Printer function is not available locally on a portable unit.

Alarm Beeper Status: Associates a WAV file sound with an alarm event. When using the unit's touch screen, a total of 10 sounds are available. When using the remote GUI, up to a total of 16 sounds can be used. This includes customized WAV files that you provide by copying your own WAV files into the remote GUI's installation directory.

Startup Locking State: Determines if a test set is automatically locked (see Lock Icon) when the unit is started.

Mail Notification: Allows the NIC to be configured to send automatic email alerts upon receiving user specified Error/Alarm conditions, for specified durations of time.

PP Name/Go To Area

The **PP Name** indicates which protocol processor (PP) tab or system function (such as System and Help tabs) on the user interface is currently selected.

For portable units, the tab position and description appear.

For rackmount units (for example, NAA IV), the slot position and description appear.


The number of protocol processor tabs that appear on the user interface will vary based on the configuration of your system. In addition, protocol processor tabs can be assigned specific names. For information, select Changing a Tab Name for the Go To Label.

Use the **Go To** button to select and quickly jump to any tabbed function that appears on the user interface.

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Change Tab Name for the Go To Label

1. From the **System** tab, select **User Preference**.
2. Under **Label Preferences**, select **Local** or **Global**.
    - Local – Only changes the tab label for your session. Other users will not see the tab name that you enter.
    - Global – Changes the tab label on the unit so that all users see the same tab name that you enter.
3. Select a tab name from the **Assigned Name** column of the list box.
4. Under **PP Label Information**, enter a name in the **Assigned Name** text field. (When using the touch screen, select  to open a keypad.)
5. Select **Update List Entry**, to add the name to the User Defined Name column of the list box.
6. Repeat steps 3 through 5 to continue adding user-defined names, as desired.
7. Select **Save All List Entries**. The new tab names appear in the PP Name/Go To area of the screen when the protocol processor tab is selected.
8. Select **PP Name / Go To**, located in the top-left corner of the touch screen. The Select Protocol Processor Entry dialog box appears displaying the new name.

 When the protocol is selected the new name appears below the PP Name text on the touch screen; however, the name on the tab remains the same.

To restore tab names, select Restoring Default Tab Name for the Go To Label.

Lock Icon

Overview

The test set's multi-user functionality allows up to eight simultaneous users to be connected to the portable device. This includes one local user, via the device's touch screen, and seven remote users using the Remote Control Application (remote GUI), SCPI commands, or TL1 commands.

To prevent users from interfering with each other, an individual user can "lock" and take control of a test unit. This is done using the Lock icon that appears on

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the GUI. Permission levels determine the user's ability to lock and unlock a test unit. When you lock the test unit, you can configure protocol processors, start tests, and perform general product functions without the worry of contending for resources with another user.

Using the Lock Icon

The following guidelines describe how to lock and unlock a test unit using the Lock icon. See Locking and Unlocking a Test Unit for more information. For setting the default lock state, see Configuring the Lock on Startup.)

If I see this icon on my GUI,	**It means**
	The test unit is unlocked and available. No individual user has control of it. I can lock the test unit by selecting this icon and choosing **Lock** or **Lock and Exit** from the Lock/Unlock dialog box.
	I have the test unit locked. I currently control the test unit and can configure protocol processors. I can unlock the test unit by selecting the icon. Other users will see  on their GUI.
	The test unit is locked by another user, and I can only view protocol processor screens. **If I have Admin privileges –** I can select this icon and force an unlock. **If I do not have the proper user privilege –** A message appears stating that the protocol processor is locked by the current owner. For example, "Protocol Processor locked by User X."

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	The circuit pack (and its associated protocol processors) is **out of service**. A counter appears indicating how long the circuit pack has been out of service. A fault is also logged.

Configuring the Lock on Startup

To control the Lock's default state when the unit is started:

1. From the **System** tab, select **User Preference.**
2. Select **Startup Locking State**.
    - Select **Lock** to automatically lock the unit when it is started.
    - Select **Unlock** to make the unit available to anyone when it is started.

Sending Email Alerts

Before using the email alert feature, check with your Network Administrator to verify that your email account is set up to accept and forward SMTP mail.

IMPORTANT: After the email alert settings are completed the protocol tab for which the error/alarms have been configured must be selected or you must be in All Tests mode. Email alert messages will not be generated if these conditions are not met.

To set up email alerts:

1. Select the **System** tab and then **User Preference**. The User Preference screen appears.
2. Select the **Mail From** button in the Mail Notification section.
3. Using the keypad that appears, enter the sender’s email address and press **Enter**.
4. Select the **Mail Server** button.

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5. Using the keypad that appears, enter the email server address (for example, Lightwave.com) and press **Enter**.

6. Select the **Mail To** button.

7. Using the keypad that appears, enter the recipient's email address and press **Enter**.

8. Select the **Mail Interval** button. The Select Duration of Test dialog box appears.

9. Select the desired test duration period. The test duration determines when the system checks for an error or alarm.

   For example, you set up a mail interval of 15 minutes on OC-1/3/12 for all errors/alarms and then select the OC-1/3/12 tab. At the first live error/alarm incident an email message is sent to the recipient. After 15 minutes has elapsed the system looks for the next live error/alarm incident and sends an email message. This 15-minute loop continues until you reset the email notification configuration.


This process is not active unless the configured protocol tab or All Tests is selected.

10. In the Processor / Mail Notify section, select the protocol processor that you want monitored. The Select Error/Alarm Mail Notification window appears.


Configure multiple protocols for email notification by selecting another protocol processor after the error/alarm notification step, as described in Step 11. To activate the email notification function for multiple protocols you must select **All Tests** after the configurations are completed.

11. Select the desired error/alarm type. You can select a specific error/alarm type or all errors and alarms. When monitoring multiple protocols, each protocol can be configured for its own error/alarm type.

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IMPORTANT: These configuration settings DO NOT persist after the unit has been restarted.

To terminate email alerts:

1. Select the **System** tab and then **User Preference**. The User Preference screen appears.

2. Select the **Mail Interval** button. The Select Duration of Test dialog box appears.

3. Select **OFF**.

All Test Status

Displays a general status summary for all circuit packs (which appear as protocol processor tabs) installed in the unit. A maximum of 12 circuit packs can appear on the screen. If a circuit pack has more than one port (for example, a Quad RX circuit pack), then a status summary for all ports on the circuit pack appears.

If a unit contains more than 12 circuit packs, refer to the All Test (1 to 12) section below for status screen operation.

When in this mode, each circuit pack is polled. You may notice a slight delay in status reporting based on your unit's configuration.

The following appears for each circuit pack installed:

- Protocol processor tab name
- Elapsed time
- General status. A **green** Summary LED indicates normal operation. A **red** Summary LED indicates that an alarm or error is in progress.

If the **Summary** LED text is selected (the word Summary), the LEDs associated with that specific protocol processor tab appear. To clear the LED window, select **OK**.

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All Test (1 to 12)

When a unit contains more than 12 circuit packs (protocol processor tabs), the All Test Status screen operates using the following guidelines:

- Circuit packs appear on the screen in groups of 12.
- The **All Test** button indicates which group is currently displayed, i.e., **All Test (1 to 12)**, **All Test (13 to 24)**, and so on.
- The status screen can be refreshed manually, by selecting the **All Tests** button. When a screen refresh occurs, the next group of circuit packs appear along with any new LED status activity.

Measuring Service Disruption Activity


The following only applies to SDH and SONET protocol processors.

The NIC unit can measure service disruption switching intervals in your network and can be configured to monitor for a specific event that will cause a service disruption switch. When this event occurs, the duration in both seconds and frames is logged. These statistics can be used to determine how long it takes for your network equipment to react to an service disruption event and switch to a backup path.

The SDH/SONET/OTN service disruption measurement has an accuracy of 1 µs (microsecond). GigE service disruption tests show an accuracy of 0.1 ms (millisecond).

To measure Service Disruption activity:

1. Select an SDH or SONET protocol processor.
2. Select the **Test** button.
3. Select the **Service Disrptn** button. The Service Disruption measurement screen appears.
4. Select **Protection Switch Criteria**. The alarms, errors, and patterns that can be used to trigger an APS event appear.
5. Select one or multiple measurement criteria in the Protection Switch Criteria field. The measurement criteria is the alarms, errors, and patterns that can be used to trigger a service disruption event.
6. Select **Consecutive Good Time Required** or **Consecutive Good Frames Required** (these parameters are coupled). A key pad appears.

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- If *Consecutive Good Time Required* was selected, enter the duration (in milliseconds) of valid frames to occur before Protection Switching is confirmed to be activated. The range is 0.125 to 2047.875 milliseconds.
- If *Consecutive Good Frames Required* was selected, enter the number of valid frames to occur before Protection Switching is confirmed to be activated. The range is 1 to 16383 frames.

7. Select **Action State.** The APS options appear.
8. Select **Single APS** or **Continuous APS** to begin measuring. The unit will begin monitoring the incoming signal for this event. If it occurs, the protection switch state and time will appear in both seconds and frames present. The results will not include the number of good frames, but the number of frames that elapsed before the first good frame, meeting the entered criteria, occurred.

A history of event is recorded in the History Recent Milli Seconds and History Recent Frames fields. The complete summary of event can be viewed on the Service Disruption Summary screen.

To stop monitoring Service Disruption measurement activity:

1. Select **Action State**.
2. Select **Stop APS**.

To view the Service Disruption Summary:

1. Select the **System** tab.
2. Select the **Service Disruption** button. The Service Disruption Summary screen appears.

Service Disruption

The unit can measure service disruption intervals in your network. The unit can be configured to monitor for a specific event that will cause a service disruption. When this event occurs, the duration in both seconds and frames is logged. These statistics can be used to determine how long it takes for your network equipment to react to a service disruption event and switch to a backup path.

The SDH/SONET/OTN service disruption measurement has an accuracy of 1 µs (microsecond). GigE service disruption tests show an accuracy of 0.1 ms (millisecond).

Test Service Disruption functions include:

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- **Consecutive Good Time Required**: This function allows you to enter the time-duration (in milliseconds) of consecutive error-free frames to elapse before Protection Switch measurements stop accumulating. The range is 0.1 to 409.0 milliseconds and is entered using a keypad.
- **Consecutive Bad Time Required**: This function allows you to enter the time-duration (in milliseconds) of consecutive errored frames to elapse before Protection Switch measurements begin to accumulate. The range is 0.1 to 409.0 milliseconds and is entered using a keypad.
- **State**: Starts and stops Service Disruption mode. If an event occurs, the protection switch time will appear in both seconds and frames present. The results will not include the number of good frames, but the number of errored frames that occur before the first good frame. This is based on the previously selected criteria for the consecutive time and frame requirements. The unit begins monitoring the incoming signal for a service disruption measurement event as soon as one of the following State options is selected:

  - **Single APS**: Monitors for a single service disruption event. Seconds and frames are reported and the State returns to Inactive.
  - **Continuous APS**: Constantly monitors for service disruption events, and updates the seconds and frames reported.
  - **Stop APS:** Stops service disruption monitoring. The State returns to Inactive.

- **Protection Switch Time (MilliSecs)**: Indicates the duration in seconds that it took for the service disruption event (errored frames) to occur.

For more information about monitoring service disruption activity, select *Measuring Service Disruption Activity* in the Common Tasks section of the online help.

Protection Switch Criteria

This is an **Test Service Disrptn** function that is used to measure service disruption activity.

The **Protection Switch Criteria** function determines the type of alarm, error, or pattern event that is used as a trigger to generate service disruption activity in your network. The unit monitors the incoming signal for the specified event. If it occurs, its duration in both seconds and frames is measured and logged. The SDH/SONET/OTN service disruption measurement has an accuracy of 1 µs

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(microsecond). GigE service disruption tests show an accuracy of 0.1 ms (millisecond).

The following options are available:

Options	Description
AU-AIS (for SDH)	A service disruption is generated if an AU-AIS error is received. The duration in seconds and frames is measured and logged.
B1	A service disruption is generated if a B1 error is received. The duration in seconds and frames is measured and logged.
SEF (for SONET)	A service disruption is generated if a Severely Errored Frame is received. The duration in seconds and frames is measured and logged.
AIS-L (for SONET)	A service disruption is generated if a Line AIS alarm is received. The duration in seconds and frames is measured and logged.
AIS-P (for SONET)	A service disruption is generated if a Path AIS alarm is received. The duration in seconds and frames is measured and logged.
OOF (for SDH)	A service disruption is generated if a OOF pattern is received with errors. The duration in seconds and frames is measured and logged.
MS-AIS (for SDH)	A service disruption is generated if a MS-AIS pattern is received with errors. The duration in seconds and frames is measured and logged.
PRBS	A service disruption is generated if a PRBS pattern is received with errors. The duration

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	in seconds and frames is measured and logged.

State

Indicates the current condition when monitoring and measuring received APS activity.

Protection Switch Time (Seconds)

Indicates the duration in seconds that it took for the service disruption event to occur.

Protection Switch Time (Frames)

Indicates the number of frames received during the service disruption event.

Monitoring SCPI or TL1 Commands

The Monitor screen is a command window that allows you to view SCPI or TL1 commands issued to the unit. The monitor also shows the command response (for valid commands entered) or the error code (if an invalid command is entered).

To use the Monitor feature, the communications port must be configured. The Ethernet and GPIB ports are always enabled for SCPI commands and, when licensed, they are automatically enabled for TL1. However, the port assignment (TL1 [when licensed] or SCPI) for the Serial port must be selected. Configure these ports before using the Monitor function.

To open the monitor:

1. Select the **System** tab and choose **Monitor**.
2. Choose **Select Command Processor** and point to **SCPI** or **TL1**.

To issue SCPI commands to the unit:

- Refer to the *SCPI Command Reference Guide* for procedures. The guide can be found in the Technical Documentation Library at http://www.lightwave.com.

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To issue TL1 commands to the unit

- Refer to the *TL1 Command Reference Guide* for procedures. The guide can be found in the Technical Documentation Library at http://www.lightwave.com.

Chat

Use the Chat function to send brief messages to other networked units.

To send a message:

1. From the **System** tab, select **Chat**.
2. Enter your message in the **Input Message** box.
    - Select 

if using the touch screen on a portable unit. A keypad appears allowing you to enter the message. Select **Enter** when done. The message appears in the Input Message window.
    - If using the Remote Control Application, place your mouse cursor in the Input Message box and type the message.

    > Pressing the Enter key on your keyboard will delete the message. To avoid this, select **Multi Lines** before starting to type the message. In addition, if you have a long message, select Multi Lines so that you can use the Enter key to keep your message within the Input Message window.

3. You can assign a **High Priority** level to the message, or you can require that the recipient respond to the message (**Reply Required**).

    > Another user will not see the Chat message unless High Priority or Reply Required is selected.

4. Select **Send**.

Faults

The unit maintains a fault log of critical hardware problems reported by circuit packs.

If a circuit pack is out of service, the  icon appears.

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To view system faults:

1. Select **System**.
2. Select **Faults**. If a fault has been logged, the following appears in the Fault Messages window:
    - Date and time that the fault occurred.
    - Fault description
    - Card – The circuit pack that is reporting the problem.

To clear the system fault log:

- Select **Clear**.

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NIC GigE Common Tasks

Common Tasks Overview

This section discusses some of the tasks that are frequently used during GigE operation. For specific tasks refer to the GigE 10/100 Specific Tasks or High Density GigE Specific Tasks, depending on your test set's configuration.

Please use the Online Help Contents tab, on the left side of the help window to open and view both common and specific tasks for all GigE test sets.

Add a New User

If the System Lock function is enabled, only one user with Read and Write permissions (this includes Calibration and Admin users) can be logged in at a time. If a user with Read and Write permissions is already logged in, a window will appear giving you the option of logging in with Read permissions only.

1. Select **System**.
2. Select **Security**. The Security screen appears.
3. From the User Name column, select **NEW USER**.
4. Under Account Information, select ..., which is next to the User ID field. A keypad appears.
5. Enter the user ID.
6. Select ..., which is next to the Password field. A keypad appears.
7. Enter a password.
8. Select ..., which is next to the Permissions field. The Select User Permissions window appears with the following options:
    - **Read:** Allows the user read-only privileges.
    - **Read/Write:** Allows the user to read and update information.
    - **Calibrate:** Allows the user read and write privileges and the ability to perform calibration procedures on the unit.
    - **Admin:** Allows the user to perform network administrator tasks such as calibrating, adding, deleting, and updating user profiles.

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9. Select a user permission option.
10. Select **Update**. The new user profile is added and appears on the User List.

Adding Notes to a Test Unit

When you lock a test unit, you can add notes to the Add/Lock dialog box that are pertinent to the test set. Different test units can carry their own specific notes.

To add notes to the Lock/Unlock dialog box for a test unit:

1. Choose the desired protocol processor and select the **Lock** icon. The Lock/Unlock dialog box appears.

> If the test unit is locked by someone else, select **Force Unlock** and choose **Lock and Exit** or **Lock**.

2. Select **Circuit Info:** and/or **Contact Info:**. The Enter User String keyboard opens.
3. Type notes and select **Enter**. The notes appear in their associated information box.
4. Select **Exit** to close the Lock/Unlock dialog box.

To edit notes on the Lock/Unlock dialog box for a test unit:

> To edit the notes, the test unit must be placed in locked mode by the immediate user.

1. Choose the desired protocol processor and select the **Lock** icon. The Lock/Unlock dialog box appears.
2. Select **Circuit Info:** and/or **Contact Info:** and make appropriate changes using the Enter User String keyboard. Select **Enter**.
3. Select **Exit**.

Locking and Unlocking a Test Set

To prevent users from interfering with each other, an individual user can "lock" and take control of a test set. This is done using the Lock icon that appears on the GUI. Permission levels determine the user's ability to lock and unlock a test

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set. When you lock the test set, you can configure protocol processors, start tests, and perform general product functions without the worry of contending for resources with another user.

When a test set is locked by someone else, the  icon is displayed.

To unlock a test set locked by someone else:

1. Select the icon. The Lock/Unlock dialog box appears.
2. Select **Force Unlock**. The command buttons change to "Lock and Exit" and "Lock".

> You must have **Admin** privileges to be able to force the unlock.

3. Selecting one of the following causes the command buttons to change to "Unlock and Exit" and "Unlock", and the information boxes become available.
    - **Lock and Exit** - Locks the unit and automatically closes the dialog box. To enter notes after the dialog box closes, select the locked icon to reopen the dialog box.
    - **Lock** - Allows you to enter note information in the Circuit Info: and Contact Info: boxes before closing the dialog box. The notes carry over to all protocol processors in the test set. When a different test set is locked the user can enter notes pertinent to it.
4. To enter note information, select **Circuit Info:** and/or **Contact Info:**. The Enter User String keyboard opens.
5. Type notes and select **Enter**. The notes appear in their associated information box.
6. Select **Exit** to close the Lock/Unlock dialog box.

When you have the test set locked, the  icon is displayed.

To unlock a test set that you have locked:

1. Select the icon. The Lock/Unlock dialog box appears.
2. Selecting one of the following causes the command buttons to change to "Lock and Exit" and "Lock":

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- **Unlock and Exit** - Unlocks the unit and automatically closes the dialog box.
- **Unlock** - Unlocks the unit without closing the dialog box. Select **Exit** to close the Lock/Unlock dialog box.

When the test set is unlocked, the  icon is displayed.

To lock a test set:

1. Select the icon. The Lock/Unlock dialog box appears.
2. Selecting one of the following causes the command buttons to change to "Unlock and Exit" and "Unlock", and the information boxes become available.
   - **Lock and Exit** - Locks the unit and automatically closes the dialog box.
   - **Lock** - Allows you to enter note information in the **Circuit Info:** and **Contact Info:** boxes before closing the dialog box. The notes carry over to all protocol processors in the test set. When a different test set is locked the user can enter notes pertinent to it. Select **Exit** to close the dialog box.

Adjust Touch Screen Brightness

To adjust a portable unit's touch screen intensity:

1. Select **System.**
2. Select **MISC**.
3. Select **Backlight Intensity**. A keypad appears. It accepts values ranging from **0** (brightest setting) to **255** (dimmest setting).
4. Using the keypad, enter a value, and select **OK** when you are done.

Using Alarm Beeper Status

This function associates a WAV file sound with an alarm event. When using the unit's touch screen, a total of 10 sounds are available. When using the remote GUI, up to a total of 16 sounds can be used. This includes customized WAV files that you can add by copying these files to your remote GUI installation directory.

To assign an audible notification to an alarm:

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1. Select **System**.
2. Select **User Preference**.
3. Select **Alarm Beeper Status**.
4. Select **On**. The Alarm Beep definitions appear.

   The alarm definitions that appear use the WAV file's name. For example, chord.wav appears as CHORD.
5. Select an alarm and then associate a sound with that alarm.

   
   Select **Test** to hear the sound and determine if this is the sound you want to associate with this alarm.
6. Select **Apply**.

To turn off all alarm sounds:

1. Select **Alarm Beeper Status**.
2. Select **Off**.

To add WAV files when using the remote GUI on your PC:

1. Make sure that your remote GUI is closed.
2. Copy WAV files on your PC to your remote GUI's installation directory. (The default directory is C:\Program Files\RemoteNIC).
3. Run your remote GUI.
4. Select **System**.
5. Select **User Preference**.
6. Select **Alarm Beeper Status**.
7. Select **On**.

   The Alarm Beep definitions appear and include the new WAV files copied into the remote GUI's installation directory. Only the first 16 sounds will appear in the selection window. The alarm definitions that appear use the WAV file's name.
8. Select an alarm and then associate a sound with that alarm.
9. Select **Apply**.

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Displaying All Test Status

Use the All Test Status function to view the current status of all protocol processors installed in the unit.

1. From the **System** tab, select **All Test Status**. A general summary screen appears. A maximum of 12 protocol processor tabs can appear on the screen. The elapsed time (in minutes) and general status Summary LED for each protocol processor appears.

   Select he **Summary** LED text is selected (the word Summary), to display the LEDs associated with that specific protocol processor tab. To clear the LED window, select **Close**.

2. If the unit contains more than 12 circuit packs (protocol processor tabs), the protocol processor tabs appear in groups of 12. Select the All Test button (**All Test (1 to 12)**) to scroll through the various groups.

For information about current and past events for specific protocol processors, refer to Display History.

All Test Status

Displays a general status summary for all circuit packs (which appear as protocol processor tabs) installed in the unit. A maximum of 12 circuit packs can appear on the screen. If a circuit pack has more than one port (for example, a Quad RX circuit pack), then a status summary for all ports on the circuit pack appears.

If a unit contains more than 12 circuit packs, refer to the All Test (1 to 12) section below for status screen operation.

When in this mode, each circuit pack is polled. You may notice a slight delay in status reporting based on your unit's configuration.

The following appears for each circuit pack installed:

- Protocol processor tab name
- Elapsed time
- General status. A **green** Summary LED indicates normal operation. A **red** Summary LED indicates that an alarm or error is in progress.

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If the **Summary** LED text is selected (the word Summary), the LEDs associated with that specific protocol processor tab appear. To clear the LED window, select **OK**.

All Test (1 to 12)

When a unit contains more than 12 circuit packs (protocol processor tabs), the All Test Status screen operates using the following guidelines:

- Circuit packs appear on the screen in groups of 12.
- The **All Test** button indicates which group is currently displayed, i.e., **All Test (1 to 12)**, **All Test (13 to 24)**, and so on.
- The status screen can be refreshed manually, by selecting the **All Tests** button. When a screen refresh occurs, the next group of circuit packs appear along with any new LED status activity.

Auto Conf

The Auto Conf function allows you to quickly configure the unit to match the parameters of an incoming signal. This function uses the same mapping, framing, line coding, and pattern characteristics as the incoming signal without having to manually configure the unit.

To automatically configure the unit:

1. Make sure that the unit is receiving a valid input signal.
2. Select a Protocol Processor mode that corresponds to the network and the incoming signal. (The Protocol function appears under the **Misc** tab when the **System** tab is selected.)
3. Select the protocol processor tab (located at the top of the screen) that corresponds to the signal that you want to configure.
4. Select **Auto Conf** from the Common Function Buttons that appear at the bottom of the touch screen. The Select Type of Auto Configuration dialog box appears.
5. Select the type of auto configuration to perform. See the table below for a description of the options.

   The unit starts detecting parameters about the incoming signal, such as signal rate, mapping, and payload pattern, and configures the unit accordingly. This process may take a few minutes to complete.

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The following is a list of auto configuration types; availability is based on your unit's hardware configuration.

Auto Config Type	Description
Master Configuration	The unit detects the highest line rate, mapping, framing, and pattern of the incoming signal and configures the protocol processor to match these parameters. If successful, the unit then attempts to drop a signal to tributary protocol processors. This process continues until the lowest tributary is configured. If the auto configuration process is unsuccessful, the process terminates.  For the STM-0/1/4 and the OC-1/3/12 protocol processors, Master Configuration detection starts with the incoming optical signals. For auto configuration of STM-0/1/4 and OC-1/3/12 electrical signals, refer to Master Electrical.
Configure STM-64 Only	Detects the parameters of the incoming STM-64 signal, and configures the STM-64 protocol processor to these parameters.
Configure STM-16 Only	Detects the parameters of the incoming STM-16 signal, and configures the STM-16 protocol processor to these parameters.
Configure OC-192 Only	Detects the parameters of the incoming OC-192 signal, and configures the OC-192 protocol processor to these parameters.
Configure OC-48 Only	Detects the parameters of the incoming OC-48 signal, and

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	configures the OC-48 protocol processor to these parameters.
SDH Only	Detects the parameters of the incoming STM-0/1/4 optical signals, and configures the protocol processors to these parameters.
SDH Electrical	Detects the parameters of the incoming STM-1e or STM-0e electrical signals, and configures the protocol processors to these parameters.
SONET Only	Detects the parameters of the incoming OC-1/3/12 optical signals, and configures the protocol processors to these parameters.
SONET Electrical	Detects the parameters of the incoming STS-3 or STS-1 electrical signals, and configures the protocol processors to these parameters.
Master Electrical	Detects the parameters of the incoming SDH or SONET electrical signal, and configures the protocol processor to match these parameters. If successful, the unit then attempts to drop a signal to the E3, E1, DS3, or DS1 protocol processors. This process continues until the lowest tributary is configured. If the auto configuration process is unsuccessful, the process terminates.
E4 Only	Detects the parameters of the incoming E4 signal, and configures the E4 protocol processor to these parameters.
E3 Only	Detects the parameters of the incoming E3 signal, and configures the E3 protocol processor to these parameters.

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DS3 Only	Detects the parameters of the incoming DS3 signal, and configures the DS3 protocol processor to these parameters.

Enable Boot Sound

Enabling the Boot Sound option allows a .wav sound file to play that acknowledges when the NIC unit is fully booted and available.

To enable the boot sound:

1. From the **System** tab, select **Misc**.
2. From **System Setting**, select the **Boot Sound Enabled** check box.

To disable the Boot Sound, simply clear the Boot Sound Enabled check box.

Calibrating a Protocol Processor

Calibrating the system's optical power should be done carefully. To keep unauthorized users from changing calibration settings, the Update Signal Calibration button on the protocol processor's Receive SIG screen is unavailable by default. To change the setting, a user with Admin or Calibrate privileges must enable the calibration mode. Once calibration has been enabled, each protocol processor has its own calibration procedure.

To enable protocol processor calibration:

1. From the **System** tab, select **Misc**.
2. From **Local Settings**, select **Enable Calibration**.

The user must have Admin or Calibrate privileges to enable the calibration mode.

The **Update Signal Calibration** button is now available on the protocol processor's **Receive SIG** screen.

Protocol processors have their own calibration procedures. You can find the procedures in **Specific Tasks** section of the protocol's **Online Help**.

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To view a calibration procedure described in the online help file:

1. From the **NIC Online Help**, select the **Contents** tab and choose the desired protocol processor.
2. Expand the protocol processor's **Overview** book and select **Specific Tasks**.
3. Select the **Calibrate** topic.

For local touch screen calibration procedures, select Calibrating the Touch Screen.

Calibrating the Touch Screen

Touch screen calibration is performed on all portable units prior to shipping from the factory. However, if your unit's touch screen requires recalibration, perform the following:

Although touch screen calibration can be performed using your finger, a pointing device, such as a stylus, is recommended for greater accuracy.

1. Select **System**.
2. Select **Misc**.
3. Select **Recalibrate Touch Screen**. This button appears in the touch screen's lower right corner. (It does not appear when you are remotely connected to the unit using the Remote Control Application software.)
4. The Calibration dialog appears.

When the Recalibrate Touch Screen button is selected, the Calibration dialog appears. If another area of the touch screen is pressed while this dialog is open, the main System screen appears, and the Calibration dialog moves to the background. To restore the Calibration dialog (and return it to the foreground), select the Recalibrate Touch Screen button again. To exit the Calibration dialog, use the Close button that appears in the dialog's upper right corner.

5. Select **5-point Calibration**.

   Five touch screen targets (calibration points) appear on the screen.

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The hand icon indicates which target to select.

6. Place and hold your pointing device as close to the center of the target as possible.
7. The message **Touch Enabled** appears when calibration for that specific point is complete.
8. The hand icon moves to the next target. Repeat steps 6 and 7 for the four remaining targets.

If the screen is not touched for a 20-second period or longer, the current calibration process is canceled. The calibration must be restarted using the first touch screen target.

9. When touch screen calibration is complete, a completion message briefly appears on the screen, and the Calibration dialog closes.

Screen Capture

This function allows you to print the currently displayed screen and converts it to a bitmap (.bmp) image, which is saved to your test set or PC's hard drive in the GalaxyNIC folder.

Important: You cannot print or view a saved .bmp from the System File Services list box. You must locate the .bmp in the GalaxyNIC directory on your PC. To locate the .bmp:

a. Open the Remote NIC (**GalaxyNIC**) directory. For example, the default directory is C:\Program Files\GalaxyNIC.

b. Locate the **Compat** folder from which the Remote NIC is running. The folder name represents the Feature Set operating on the NIC unit. For example, the Compat folder for Feature Set 4.1.28 appears in the GalaxyNIC directory as Compat400010028.

c. Open the .bmp file and print to a local printer.

To capture a screen:

1. Select the **Print Report** common function button.

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2. Select **Screen Capture**. The image is saved as Screen.bmp.

> A screen capture image will automatically overwrite an existing Screen.bmp file. To save previous screen capture images, use the File Services' Rename function.

3. If you are capturing screens using a portable unit, you must transfer the file from the unit to your PC to print the bitmap image. Refer to Uploading a File for file transfer procedures. After the file is copied to your PC, it can be opened and printed.

Display History

The system maintains a log of errors and alarms detected on the incoming protocol processor's signal. This history of past and current events can be viewed using the **LEDs** or **Results** button.

The LEDs provide a visual indicator of current and past activity, and are used to quickly narrow the focus of what is received and possible problem areas of the network.

The **Results** button provides broad details of error and alarm activity.

To display history using the Results button:

1. Select a protocol processor mode.
2. Select the **Results** button. The **Scan** button functions appear.
3. To view other events, select the **Errors**, **Alarms**, **PTR**, or **Graphs** buttons.

The **Scan** button displays a list of received alarms and errors, along with the number of seconds that the event occurred. This summary identifies a general area to investigate when an error or alarm is detected.

The **Errors** button provides the following details about received errors:

- Error count using an 11-digit format
- Average error rate over the error duration using an N.NNe-N format
- Current error rate using an N.NNe-N format
- Error free seconds using an 8-digit format
- Errored seconds using an 8-digit format

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- Severely errored seconds
- Unavailable errored seconds

The **Alarm** button displays the number of seconds that an alarm was present.

The **PTR** button provides the following details about received Pointer adjustments:

- Positive Justification: Indicates the number of positive Pointer adjustments
- Negative Justification: Indicates the number of negative Pointer adjustments
- Pointer Justification Seconds: Indicates the duration of a Pointer adjustment in seconds
- NDF Count: Indicates the number of New Data Flags received
- Receive Pointer Value: Indicates the Pointer value

The **Graphs** button provides an additional view of error and alarm results for the selected protocol processor. Graphs show the test history for either the current test or a previously saved test.

Automating the Remote Control Application Icon

The Remote Control Application software is a graphical user interface that allows you to remotely control portable and rackmount products from a PC. An icon for the Remote Control Application software is created and placed on your desktop when the software is installed.

You can add IP address, user ID, and password parameters to the icon to automate the log on process.

1. From the desktop, right click on the Remote Control Application icon.
2. Select **Properties** and choose the **Shortcut** tab.
3. Place the cursor at the end of the **Target** text box.
4. Press the space bar and type:

   ip=*x.x.x.x*,uid=*y*,pw=*z*

   where, *x.x.x.x* is the system's IP address
   y is the system's user ID (case sensitive)
   z is the system's password (case sensitive)

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5. Click **OK**.
6. When you double click the Remote Control Application's icon, a connection is made and the remote system's GUI appears.

If an invalid parameter is entered, the automatic log on will fail, and you must enter the appropriate data.

Change Tab Name for the Go To Label

1. From the **System** tab, select **User Preference**.
2. Under **Label Preferences**, select **Local** or **Global**.
   - Local – Only changes the tab label for your session. Other users will not see the tab name that you enter.
   - Global – Changes the tab label on the unit so that all users see the same tab name that you enter.
3. Select a tab name from the **Assigned Name** column of the list box.
4. Under **PP Label Information**, enter a name in the **Assigned Name** text field. (When using the touch screen, select  to open a keypad.)
5. Select **Update List Entry**, to add the name to the User Defined Name column of the list box.
6. Repeat steps 3 through 5 to continue adding user-defined names, as desired.
7. Select **Save All List Entries**. The new tab names appear in the PP Name/Go To area of the screen when the protocol processor tab is selected.
8. Select **PP Name / Go To**, located in the top-left corner of the touch screen. The Select Protocol Processor Entry dialog box appears displaying the new name.

When the protocol is selected the new name appears below the PP Name text on the touch screen; however, the name on the tab remains the same.

To restore tab names, select Restoring Default Tab Name for the Go To Label.

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Restore Default Tab Names for the Go To Label

1. From the **System** tab, select **User Preferences**.
2. Under Label Preferences, select **Default**.
3. Select **Save All List Entries**. The default tab names are restored.

To change tab names, select Changing a Tab Name for the Go To Label.

Change Tab Name for the Go To Label

1. From the **System** tab, select **User Preference**.
2. Under **Label Preferences**, select **Local** or **Global**.
    - Local – Only changes the tab label for your session. Other users will not see the tab name that you enter.
    - Global – Changes the tab label on the unit so that all users see the same tab name that you enter.
3. Select a tab name from the **Assigned Name** column of the list box.
4. Under **PP Label Information**, enter a name in the **Assigned Name** text field. (When using the touch screen, select  to open a keypad.)
5. Select **Update List Entry**, to add the name to the User Defined Name column of the list box.
6. Repeat steps 3 through 5 to continue adding user-defined names, as desired.
7. Select **Save All List Entries**. The new tab names appear in the PP Name/Go To area of the screen when the protocol processor tab is selected.
8. Select **PP Name / Go To**, located in the top-left corner of the touch screen. The Select Protocol Processor Entry dialog box appears displaying the new name.

When the protocol is selected the new name appears below the PP Name text on the touch screen; however, the name on the tab remains the same.

To restore tab names, select Restoring Default Tab Name for the Go To Label.

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Chat

Use the Chat function to send brief messages to other networked units.

To send a message:

1. From the **System** tab, select **Chat**.
2. Enter your message in the **Input Message** box.
    - Select 

if using the touch screen on a portable unit. A keypad appears allowing you to enter the message. Select **Enter** when done. The message appears in the Input Message window.
    - If using the Remote Control Application, place your mouse cursor in the Input Message box and type the message.

> Pressing the Enter key on your keyboard will delete the message. To avoid this, select **Multi Lines** before starting to type the message. In addition, if you have a long message, select Multi Lines so that you can use the Enter key to keep your message within the Input Message window.

3. You can assign a **High Priority** level to the message, or you can require that the recipient respond to the message (**Reply Required**).

> Another user will not see the Chat message unless High Priority or Reply Required is selected.

4. Select **Send**.

Clear History and Results (GigE)

The unit uses LEDs and Event functions to log event, alarm, and error activity monitored on the incoming signal.

- LEDs are displayed in the **Quick Status LED** area and the **Large LEDs** tab

To only clear LEDs and Status Indicator history:

- Select the **Clear History** button that appears at the bottom of the touch screen.

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To clear recorded history (results):

- Select the **Restart** button that appears at the bottom of the touch screen. The LEDs' history will clear, and the statistics collected under the Results function will reset to 0.

Clear History

The Clear History button resets all LEDs and Status Indicators (the LED text).

Refer to Using LEDs for LED color descriptions.

The Clear History button does not reset error counts, alarm counts, or data that appear in graphs. To clear this data, use the Restart button.

Using LEDs

The system uses LEDs to report alarm, error, and event activity. These visual cues help to narrow the focus if problems are detected on the incoming protocol processors' signals and provide a starting point when trying to diagnose problems.

There are two ways to view LEDs from the screen: the **Quick Status LEDs**, which are located on the left side of the screen, and the **Large LEDS** tab. The following tables describe what is indicated by the LED color.

For LED descriptions for a specific protocol processor, go to the appropriate protocol processor section of the online help and navigate to **Screen Functions and Definitions** > **LEDs**.

Quick Status LEDs Color Description

If the LED is ...	Then this indicates ...
Green with white text	Normal operation. The LED is used as a status indicator.
White with white text	Normal operation, no errors or alarms. The LED is used as an error and alarm indicator.

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Red with **red** text	An error or alarm event is in progress. The LED is used as an error and alarm indicator.
White with **red** text	An error or alarm event was detected, but is now cleared. The text serves as a history indicator.

Large LED Tab Color Description

If the LED color is ...	**Then this indicates ...**
Green with **black** text	The specific function is active and OK.
Red with **red** text	An error or alarm event is in progress.
White with **red** text	This function experienced an error or alarm event. This event is cleared by selecting **Restart**.
White with **black** text	No activity from this specific function.

Restart an Error, Alarm, or Event

The Restart common function button performs the following activities:

- **Starts** error, alarm, or event activity that was stopped using the Stop button.
- **Clears and resets** error, alarm, and event activity counters, statistics, and LEDs for the current protocol processor.

To restart a test or reset statistics:

- Select the **Restart** button located at the bottom of the touch screen. Configured testing on the current protocol processor is restarted.

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Communications Port Assignment

The unit has Ethernet, serial, and GPIB ports that can be assigned for a specific operation (for example, SCPI commands, TL1 commands, or serial printing).

When an operation is assigned to a port, that specific operation cannot be used by other ports.

Select the following links for:

- Ethernet port configuration and assignment procedures
- GPIB port configuration and assignment procedures test
- Serial port configuration and assignment procedures

Configure the Ethernet Port

The unit can be controlled using SCPI or TL1 (when licensed) commands through the unit's Ethernet port. The unit supports dynamic IP addressing, using Dynamic Host Connection Protocol (DHCP), and static IP addressing.


This must be performed from the touch screen. When Ethernet port parameters are changed, the test set must be restarted for the changes to take affect.

To configure the Ethernet port for a static IP address:

1. From the **System** tab, select **I/O Settings**.
2. Select **Ethernet**.
3. Select **Specify an IP address** from the **Ethernet Configuration** functions.
4. Enter the unit's **IP Address**, **Subnet Address**, and **Router Address**.

   
   Important: IP addresses **192.168.138.000 through 192.168.138.255** are reserved and should not be used. A system conflict can occur if these IP addresses are entered.

   If you must use an IP address in the range of **192.168.x.x**, then you **must** set the Subnet Address to **255.255.255.0**.

5. Restart the unit for changes to take affect.

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To configure the Ethernet port for a dynamic IP address using DHCP:

1. From the **System** tab, select **I/O Settings**.
2. Select **Ethernet**.
3. From **Ethernet Configuration**, select **Obtain an IP address from a DHCP server**. The unit will use the network's DHCP server to dynamically assign it an IP address.
4. Reboot the unit for changes to take affect.

To view the Ethernet port assignment:

The Ethernet port assignment is automatically enabled for SCPI. When licensed for TL1, it also appears on the Port Assignment line.

1. From the **System** tab, select **I/O Settings**.
2. Select **Ethernet**.
3. The **Port Assignment** line displays what has been assigned, by way of default or license. SCPI is automatically listed. If the unit is licensed for TL1, then TL1 is also displayed on the assignment line.

Ethernet Configuration


If Ethernet port parameters are changed, the unit must be rebooted for the changes to take affect.

The following configures the Ethernet port's parameters:

- **Obtain an IP address from a DHCP server:** The unit will uses the network's Dynamic Host Connection Protocol (DHCP) server to dynamically assign it an IP address. ***When selected, the IP Address, Subnet Address, Router, Host Name, and Domain Name functions are disabled, but will be populated by the DHCP server.***
- **Specify an IP address:** Allows a static IP address to be entered using the IP Address, Subnet Address, Router, Host Name, and Domain Name functions.
- **IP Address:** Enter the unit's IP address using dotted decimal notation. For example, **nnn.nnn.nnn.nnn**, where **nnn** is a value from 0 to 255.

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> **WARNING:** IP addresses **192.168.138.000 through 192.168.138.255** are reserved and should not be used. A serious system conflict can occur if these IP addresses are entered.
>
> If you must use an IP address in the range of **192.168.x.y** (where x is not equal to 138), then you must set the Subnet Address to **255.255.255.0**.

- **Subnet Address:** Enter the subnet address using dotted decimal notation.
- **Router:** Enter the Router address using dotted decimal notation.
- **Host Name:** Enter the unit's host name (for example, NICPLUS). This is an optional parameter.
- **Domain Name:** Enter the unit's domain name (for example, lightwave.com). This is an optional parameter.
- **Port Assignment:** Sets the Ethernet port to one of the following interfaces – None, SCPI, TL1, or SNMP.

> The **Host Name** and **Domain Name** parameters defined for Ethernet Configuration screen also apply to the Wireless Configuration screen. Any changes made to these parameters on one screen will also be made on the other screen.

Configure the GPIB Port

The unit can be controlled using SCPI commands through the unit's GPIB port. The Port Assignment line of the GPIB screen automatically displays SCPI as its assignment

To configure the GPIB port:

1. From the **System** tab, select **I/O Settings**.
2. Select **GPIB**.
3. Select **GPIB Port** and enter the primary address for the GPIB interface. Address values are from 0 to 30. The primary address must match the GPIB host or communications cannot be established.
4. Select **OK**.

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Configure and Assign the Serial Port

The unit's serial port is a physical interface that can be used to:

- Transfer SCPI or TL1 commands to and from the unit.
- Connect a serial printer to the unit.

To configure and assign the serial port:

1. From the **System** tab, select **I/O Settings**.
2. Select **Serial**.
3. If necessary, select the **Baud Rate**, **Parity**, **Data Bits**, and **Stop Bits** serial configuration parameters and make the appropriate changes.
4. Select **Port Assignment**. The Select Serial Port Assignment dialog box appears.

> The Printer option only displays when configuring from the NIC touch screen. The TL1 option only displays if the unit is licensed for TL1

5. Select the desired port assignment.

Serial Configuration

> Before changing serial port parameters, you must first disable the serial port by setting its assignment to **None**. After changing parameters, you can reset the serial port to its previous assignment. Refer to Port Assignment for a list of serial port interfaces.

The following configures the Serial port's parameters:

- **Baud Rate:** Set to 19200, 14400, 9600, 4800, 2400, or 1200.
- **Parity:** Set to None, Odd, Even, Mark, or Space.
- **Data Bits:** Set to 7 or 8.
- **Stop Bits:** Set to 1 or 2.

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- **Port Assignment:** Set the serial port to one of the following interfaces – None, SCPI, TL1 (when licensed), SNMP, or Printer (available when working from the NIC touch screen).

Configuring TCM for Receive Mode

When transmitting or monitoring errors and alarms the unit must be configured for TCM operation.

To configure the unit for TCM monitor operation:

1. Select an SDH or SONET protocol processor.
2. Select **Receive**.
3. Select **SET 2**.
4. Select the **TC Error/Alarm Processing** function and select **Enable**.
5. The unit is configured to monitor for incoming TCM errors, alarms, and traces.
   Select **Monitoring the TC Trace** for more information about incoming trace patterns.

To monitor for TC-TIM alarms:

1. Select **Receive**.
2. Select **SET 2**.
3. Select the **TIM Alarm Reporting** function and select Enable.

Related Topics:

Monitoring TCM Results

Monitoring the TC Trace

Monitoring the TC Trace

Before monitoring TC trace:

- Make sure the unit is configured for TCM receive mode.

To view the TC trace:

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1. Select an SDH or SONET protocol processor.
2. Select **Receive**.
3. Select **POH** to view the incoming TC trace, which appears at the bottom of the screen.


A TC-TIM alarm occurs if the incoming TC trace does not match the expected TC Trace. The alarm's duration appears on the Results' Alarm screen.

Monitoring TCM Errors and Alarms

Incoming TCM errors and alarms are available in a number of TCM The Results function

Before monitoring TCM traffic:

- Make sure the unit is configured for TCM receive mode.
- Check to see if the TC Summary LED is red. If so, the unit is receiving (or has received) TCM activity. Use the following procedures to view TCM error and alarm activity in more detail.

To view TCM results:

1. Select an SDH or SONET protocol processor.
2. Select **Results**. Various Results functions appear on the screen.
3. Select **Scan** to view a summary count of current TCM error and alarm activity.
4. Select **Errors** to view the following details about incoming TCM errors (TC-IEC, TC-REI, TC-OEI):
    - Error count using an 11-digit format.
    - Average error rate over the total error duration using an N.NNe-N format.
    - Current error rate using an N.NNe-N format.
5. Select **Alarms** to view TCM alarm's duration in seconds. TCM alarms include TC-RDI, TC-ODI, TC-AIS, TC-UNEQ, TC-TIM, and TC-LOF).
6. Select **Event** to view a time-stamp of the TCM event.

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7. Select **Graph** to view a graph of TCM alarms or error counts:
    - Once the graph appears, select **Change Upper** or **Change Lower**.
    - Select **Alarm 3** to display TCM alarms.
    - Select **TC-IEC Counts**, **TC-REI Counts**, or **TC-OEI Counts** to display TCM error counts.

TCM LEDs

The **TC Summary** LED indicates if a TCM error or alarm has been detected.

- If the LED is red,



The TC LEDs appear in the center of the screen. The following describes the TC LEDs.

LED	Description
TC-AIS	Tandem Connection-Alarm Indication Signal. Indicates if IEC bits 1110 are being received from upstream TCM equipment. (Bits 1-4 of the N1 byte are the IEC bits.) This is an alarm LED.
TC-IEC	Tandem Connection-Incoming Error Count. Indicates a B3 error count is being received from downstream TCM equipment. Bits 1-4 of the N1 byte are used for this indicator. This is an error LED.
TC-LOF	Tandem Connection-Loss of Frame. Indicates the loss of a valid multiframe frame alignment signal (FAS) pattern from upstream TCM equipment. This is an alarm LED.
TC-ODI	Tandem Connection-Outgoing

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	Defect Indicator. Indicates that the unit is sending an ODI alarm to upstream TCM equipment. Bit 7 in multiframe 74 of the N1 byte is used for this indicator. This is an alarm LED.
TC-OEI	Tandem Connection-Outgoing Error Indication. Indicates that the unit is sending an OEI error to upstream TCM equipment. Bit 6 of the N1 byte is used for this indicator. This is an error LED.
TC-RDI	Tandem Connection-Remote Defect Indication. Indicates that a defect has occurred at the downstream TCM equipment. The unit is receiving an alarm. Bit 8 in multiframe 73 of the N1 byte is used for this indicator. This is an alarm LED.
TC-REI	Tandem Connection-Remote Error Indication. Indicates that an error has occurred at the downstream TCM equipment. The unit is receiving an error. Bit 5 of the N1 byte is used for this indicator. This is an error LED.
TC-TIM	Tandem Connection-Trace Identifier Mismatch. Indicates that the incoming TC trace does not match the expected TC trace. This appears as an alarm count on the Results' Alarm screen.
TC-UNEQ	Tandem Connection-Unequipped. Indicates that a 00h pattern has been detected in the N1 byte of a Tandem Connection. This is an alarm LED.

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Configuring TCM for Transmit Mode

When transmitting or monitoring errors and alarms the unit must be configured for TCM operation.

To configure the unit for TCM transmit operation:

1. Select an SDH or SONET protocol processor.
2. Select **Transmit**.
3. Select **SET 1**.
4. Select the **TC Overhead Processing** function and select **Enable**.
5. The unit is configured for transmit TCM mode, which now permits the transmission of TCM errors, alarms, and traces.

Related Topics:

Transmitting TCM errors

Transmitting TCM alarms

Transmitting a TC trace

Transmitting TCM Errors

Once in TCM mode, you can create and send TCM failures and errors on your network.

Before generating TCM traffic:

- Make sure the unit is configured for TCM operation.

To insert errors in TCM mode:

1. Select an SDH or SONET protocol processor.
2. Select **Transmit**.
3. Select **Error Alarm**.
4. Select **Error to Insert**. The **Select Error to Insert** window appears.
5. Select one of the following TCM errors:
    - TC-IEC

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- TC-REI
- TC-OEI

6. Select **Error Insert Rate**. The **Select Error Insert Rate** window appears.
7. Select an error rate. The system starts transmitting errors.

To stop TCM error transmission:

1. Select **Error to Insert**. The Select Error to Insert window appears.
2. Select **None**. Error transmission stops.

Transmitting TCM Alarms

The unit can transmit alarms to simulate various TCM alarm conditions. This can help determine if receiving Tandem Connection equipment can detect an alarm in the incoming signal.

Before generating TCM traffic:

- Make sure the unit is configured for TCM operation.

To insert alarms in TCM mode:

1. Select an SDH or SONET protocol processor.
2. Select **Transmit**.
3. Select **Error Alarm**.
4. Select **Alarm Generated**. The **Select Alarm to Insert** window appears.
5. Select one of the following TCM alarms:
    - TC-RDI
    - TC-ODI
    - TC-AIS
    - TC-UNEQ
    - TC-LOF
6. The unit starts transmitting alarms.

To stop alarm transmission:

1. Select **Alarm Generated**. The **Select Alarm to Insert** window appears.

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2. Select **Off**. Alarm transmission stops.

Transmitting a TC trace

A Tandem Connection (TC) trace can be generated to verify the connection between TCM equipment. The TC Trace is a 16-byte, ASCII-character pattern that can be continuously transmitted.

Before generating a TC trace:

- Make sure the unit is configured for TCM operation.

To create a TC trace:

1. Select an SDH or SONET protocol processor.
2. Select **Transmit**.
3. Select **POH**.
4. Select **TC Trace**.
5. Select:
    - **Default:** selects the 16-byte Digital Lightwave ASCII message as the TC trace pattern.
    - **All Ones (16 byte):** selects a 16-byte All Ones pattern as the TC trace pattern.
    - **All Zeros (16 byte)**: selects a 16-byte All Zeros pattern as the TC trace pattern.
    - **User Defined:** creates a 16-byte user-defined ASCII message as the TC trace pattern.
6. The unit uses this pattern as the TC trace.

Configure the Wireless Port


The unit only supports the HP 11-Mbps Wireless LAN PC Card. This card is inserted into the unit's PCMCIA slot.

The unit can connect to a wireless network using an 802.11 compliant wireless LAN PC card. The unit supports static IP addressing and dynamic IP addressing, using Dynamic Host Connection Protocol (DHCP). For information about the wireless parameters listed below, select Wireless Configuration.

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Initial wireless configuration:

1. Insert the wireless LAN PC card into the unit's PCMCIA slot. An audible tone indicates that the LAN card and PCMCIA drivers are initialized.
2. Select **System**.
3. Select **I/O Settings**.
4. Select **Wireless**. The wireless configuration parameters appear.
5. Select **Access Point ID** and enter the wireless LAN's name/ID.

To configure the wireless port for a **static** IP address:

1. Select **Specify an IP address**.
2. Enter the unit's:
    - **IP Address**
    - **Subnet Address**
    - **Router Address**
    - **Host Name** (optional)
    - **Domain Name** (optional)

> Important: IP addresses **192.168.138.000 through 192.168.138.255** are reserved and should not be used. A serious system conflict can occur if these IP addresses are entered.
>
> If you must use an IP address in the range of **192.168.x.y** (where x is not equal to 138), then you must set the Subnet Address to **255.255.255.0**.

To configure the wireless port for a **dynamic** IP address using DHCP:

▶ Select **Obtain an IP address** from a DHCP server. The unit will use the network's DHCP server to dynamically assign it an IP address.

The remaining wireless parameters that appear on the screen are disabled.

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Wireless Configuration

The unit only supports the HP 11-Mbps Wireless LAN PC Card. This card is inserted into the unit's PCMCIA slot.

The unit can connect to a wireless network using an 802.11 compliant wireless LAN PC card. The following describes the wireless configuration parameters:

- **Access Point ID:** Enter the wireless LAN's name/ID. The Access Point ID can be up to 32-characters in length.
- **Obtain an IP address from a DHCP server:** The unit will uses the network's Dynamic Host Connection Protocol (DHCP) server to dynamically assign it an IP address. ***When selected, the IP Address, Subnet Address, Router, Host Name, and Domain Name functions are disabled, but will be populated by the DHCP server.***
- **Specify an IP address:** Allows a static IP address to be entered using the IP Address, Subnet Address, Router, Host Name, and Domain Name functions.
- **IP Address:** Enter the unit's IP address using dotted decimal notation. For example, **nnn.nnn.nnn.nnn**, where **nnn** is a value from 0 to 255.

  WARNING: IP addresses **192.168.138.000 through 192.168.138.255** are reserved and should not be used. A serious system conflict can occur if these IP addresses are entered.

  If you must use an IP address in the range of **192.168.x.y** (where x is not equal to 138), then you must set the Subnet Address to **255.255.255.0**.

- **Subnet Address:** Enter the subnet address using dotted decimal notation.
- **Router:** Enter the Router address using dotted decimal notation.
- **Host Name:** Enter the unit's host name (for example, NICPLUS). This is an optional parameter.
- **Domain Name:** Enter the unit's domain name (for example, lightwave.com). This is an optional parameter.

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The **Host Name** and **Domain Name** parameters defined for Wireless Configuration screen also apply to the Ethernet Configuration screen. Any changes made to these parameters on one screen will also be made on the other screen.

Configuring a Protocol Mode

The unit can be configured to operate in SONET, SDH, PDH, or DS3/DS1 networks.

The options that appear on this screen are determined by your hardware configuration.

1. Select the **System** tab and choose **Misc**.
2. Select the **Protocols** button.
3. The following options appear:
    - **SONET, SDH:** These options appear if your unit contains one or more SONET/SDH boards, but no PDH board.
    - **DS1/DS3, E1/DS3, E1/E3:** These options appear if your unit contains a PDH board, but no SONET/SDH boards.
    - **SONET/DS1/DS3, SONET/E1/DS3, SDH/E1/E3, SDH/E1/DS3, SDH/DS1/DS3:** These options appear if your unit contains a PDH board and one or more SONET/SDH boards.
4. Select a protocol mode. The screen is updated to reflect the mode selected.

Configuring and Transmitting OC-1/3/12 and STM-0/1/4 APS Commands

For OC-1/3/12 and STM-0/1/4 mode, the APS function appears on a multifunctional screen that displays both Transmit and Receive APS commands.

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To configure K1 and K2 byte values:

1. Select **STM-0/1/4** or **OC-1/3/12**.
2. Select **Transmit**.
3. Select **APS**. The initial APS screen appears containing a table of the K1 and K2 byte sequences that can be transmitted.

   The three columns (User Setup, Transmit, and Receive) on the screen display the current bit value for the K1 and K2 bytes. Any changes made to the K1 and K2 bytes are automatically updated in the User Setup column.

   The Transmit column displays the bit values transmitted when you select either **Transmit User**, **Transmit Default**, or **Transmit Illegal**. The Receive Column displays the bit values received for the K1 and K2 bytes.

4. Select **APS Mode** to configure APS commands for Linear protection switching mode or Ring APS signaling mode.
5. Edit the K1 byte. The K1 byte is a request for switch action. There are three functions that allow you to edit the K1 byte:

   - **K1 Full Byte** - Sets all eight bits of the K1 byte at once.
   - **K1 Bits 1-4** - Sets the first four bits of the K1 byte.
   - **K1 Bits 5-8** - Sets the last four bits of the K1 byte.

6. Edit the K2 byte. The K2 byte provides additional information about SONET or SDH network architecture and alarm conditions. There are four functions that allow you to edit the K2 byte:

   - **K2 Full Byte** - Sets all eight bits of the K2 byte at once.
   - **K2 Bits 1-4** - Sets the first four bits of the K2 byte.
   - **K2 Bit 5 (provisioned)** - Sets the fifth bit of the K2 byte.
   - **K2 Bits 6-8** - Sets the last three bits of the K2 byte.

7. Use the following options to transmit bit values:

   - Use the **Transmit User** button to transmit the bit values that appear in the User Setup column. When pressed, the User Setup values are transmitted and appear in the Transmit column. You can edit

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the transmitted K1 and K2 bytes directly from the SOH function screen.

- Use the **Transmit Default** button to transmit the default bit values (10101010) for the K1 and K2 bytes. When pressed, the default bit values appear in the Transmit column.
- Use the **Transmit Illegal** button to transmit the illegal bit values (11111111) for the K1 and K2 bytes. When pressed, the illegal bit values appear in the Transmit column.

Configuring and Transmitting OC-192/STM-64 and OC-48/STM-16 APS Commands


The following only applies to OC-192/STM-64 and OC-48/STM-16 protocol processors.

Automatic Protection Switching (APS) is a function that allows an LTE to switch to a backup (or protection) channel in case errors or failures occur on the working channel. APS commands can be configured for either Linear- or Ring-based SONET and SDH networks and are transmitted using the K1 and K2 bytes of the Line Overhead.

You can test your network's APS response by generating a condition that is likely to cause APS switching. You also have the capability to generate specific APS messages and monitor the response by configuring the K1 and K2 bytes.

You can create up to 16 different K1 and K2 byte configurations (known as byte sequences) to measure and stress your equipment's APS switching capabilities.

To configure K1 and K2 byte values:

1. Select a OC-192/STM-64 or OC-48/STM-16 protocol processor.
2. Select the **Transmit** button.
3. Select the **APS** button. The initial APS screen appears containing a table of the K1 and K2 byte sequences that can be transmitted. A total of 16 K1 and K2 byte sequences can appear in the table.
4. To make a new entry:
   - Select **New Item**

   To edit an item:

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- Select **Item <#>**, for example, Item 12.

The Apply Maintenance to Entry screen appears, which contains functions used to configure and set the measurement criteria of the K1 and K2 bytes.

5. Select **APS Mode**. The APS Mode dialog box appears.
6. Choose **Linear** protection switching mode or **Ring** APS signaling mode.
7. Select a **K1** byte/bit. A value dialog box associated with the K1 selection appears

   The K1 byte is a request for switch action. There are three functions that allow you to edit the K1 byte:

   - Use the **K1 Full Byte** function to set all eight bits of the K1 byte at once.
   - Use the **K1 Bits 1-4** function to set the first four bits of the K1 byte.
   - Use the **K1 Bits 5-8** function to set the last four bits of the K1 byte.

8. Select a K2 byte/bit. A value dialog box associated with the K2 selection appears.

   The K2 byte provides additional information about SONET network architecture and alarm conditions. There are four functions that allow you to edit the K2 byte:

   - Use the **K2 Full Byte** function to set all eight bits of the K2 byte at once.
   - Use the **K2 Bits 1-4** function to set the first four bits of the K2 byte.
   - Use the **K2 Bit 5 (provisioned)** function to set the fifth bit of the K2 byte.
   - Use the **K2 Bits 6-8** function to set the last three bits of the K2 byte.

9. Select the desired K1 and/or K2 byte/bit value.
10. From the Apply Maintenance to Entry dialog box, select **Duration in Frames** to set up the number of frames that will be transmitted containing the newly configured K1 and K2 bytes.
11. Select **Update**. The initial APS screen appears on the touch screen.

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12. To configure additional K1 and K2 bytes, repeat steps 3-11 as described above. Otherwise, proceed to the next section to transmit K1 and K2 bytes.

To transmit K1 and K2 bytes:

1. Make sure that K1 and K2 byte sequences are configured as described above.
2. Select **Start** to transmit the K1 and K2 bytes.

To stop transmitting K1 and K2 bytes:

1. Select a protocol processor mode.
2. Select the **Transmit** button.
3. Select the **APS** button. The initial APS screen appears.
4. Select **Stop**.

Create a New Directory

1. From the **System** tab, select **File Services**.
2. Select **New Dir**. A keypad appears.
3. Enter a directory name (do not use spaces in directory or file names) and select **Enter**. The new directory appears at the bottom of the File List box.

Delete a User

If the System Lock function is enabled, only one user with Read and Write permissions (this includes Calibration and Admin users) can be logged in at a time. If a user with Read and Write permissions is already logged in, a window will appear giving you the option of logging in with Read permissions only.

1. From the **System** tab, select **Security**. The Security screen appears.
2. From the User List, select the **User Name** to be deleted.
3. With the user ID highlighted, select **Delete**. The user is removed from the User List.

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Deleting a File

1. Select **System**.
2. Select **File Services**. The File Services screen appears.
3. Select a file from the File List box.
4. Select **Delete**. A confirmation message appears.
5. Select **Yes**. The file is deleted.

If you do not have authorization to delete files, the **Access Denied** message appears.

Download a File

A file can be transferred to the NIC unit from a remote device (e.g., a PC), or from a local device such as a PCMCIA or Flash storage card or a USB storage device. (Note that System Controller 2 with embedded Windows XP supports USB plug and play functionality.) If using the PCMCIA or USB function, make sure that the PC card or USB storage device is plugged into the NIC unit before selecting the File Services button. When the PC card or USB device is inserted, an audible tone indicates that the proper drivers are qualified. If using the FTP function, make sure you have the IP address of the receiving device.

See also Upload a File

1. From the System tab, select **File Services**.
2. From the right File List box, select the download method by clicking on the Drive — FTP button.

   If using *FTP*, click on that button, then enter the IP Address of the device that will send the file to the NIC unit (unless you are using the Remote Control Software; then enter the test set address). If this device is secured with a User ID and Password, then enter this information. Enter an FTP session on the connecting device.

   If using a PCMCIA card, Flash card, or USB device such as a thumb drive, plug the card or device into the appropriate slot. After a few seconds the system will recognize the device and update the drive selection window. New drive letters will appear

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in the File List box. Note that it is possible to have both a PCMCIA card and a USB device connected to the NIC at the same time. From one of the drives in the File List box, select the directory containing the file to transfer. Note that it is usually best to plug in the storage media before clicking the File Services button

From the left File List box, select the destination directory.

From the right File List box, select the desired file to be transferred.

Select the download button.  The file will be transferred to the NIC unit.

Warning: When the unit is powered off, the FTP directory is automatically purged.

Sending Email Alerts

Before using the email alert feature, check with your Network Administrator to verify that your email account is set up to accept and forward SMTP mail.

IMPORTANT: After the email alert settings are completed the protocol tab for which the error/alarms have been configured must be selected or you must be in All Tests mode. Email alert messages will not be generated if these conditions are not met.

To set up email alerts:

1. Select the **System** tab and then **User Preference**. The User Preference screen appears.

2. Select the **Mail From** button in the Mail Notification section.

3. Using the keypad that appears, enter the sender's email address and press **Enter**.

4. Select the **Mail Server** button.

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5. Using the keypad that appears, enter the email server address (for example, Lightwave.com) and press **Enter**.

6. Select the **Mail To** button.

7. Using the keypad that appears, enter the recipient's email address and press **Enter**.

8. Select the **Mail Interval** button. The Select Duration of Test dialog box appears.

9. Select the desired test duration period. The test duration determines when the system checks for an error or alarm.

   For example, you set up a mail interval of 15 minutes on OC-1/3/12 for all errors/alarms and then select the OC-1/3/12 tab. At the first live error/alarm incident an email message is sent to the recipient. After 15 minutes has elapsed the system looks for the next live error/alarm incident and sends an email message. This 15-minute loop continues until you reset the email notification configuration.

This process is not active unless the configured protocol tab or All Tests is selected.

10. In the Processor / Mail Notify section, select the protocol processor that you want monitored. The Select Error/Alarm Mail Notification window appears.

Configure multiple protocols for email notification by selecting another protocol processor after the error/alarm notification step, as described in Step 11. To activate the email notification function for multiple protocols you must select **All Tests** after the configurations are completed.

11. Select the desired error/alarm type. You can select a specific error/alarm type or all errors and alarms. When monitoring multiple protocols, each protocol can be configured for its own error/alarm type.

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IMPORTANT: These configuration settings DO NOT persist after the unit has been restarted.

To terminate email alerts:

1. Select the **System** tab and then **User Preference**. The User Preference screen appears.
2. Select the **Mail Interval** button. The Select Duration of Test dialog box appears.
3. Select **OFF**.

Setting the External Clock

This function allows you to set the external clock to Bits or SETS.

To set the external clock:

1. Select **System**.
2. Select **Misc**.
3. Select **External Clock**.
4. Select **Bits** or **SETS**.

FTP

File Transfer Protocol can be used to copy files to and from the unit.

- If using the Remote Control Application or DLI Software Upgrade program, make sure that FTP service is enabled.
- To upload files using FTP, select Upload a File
- To download files using FTP, select Download a File.

Remote Control Application

The Remote Control Application software is a graphical user interface that allows you to remotely connect to and control portable and rackmount products from a PC.

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Before using the Remote Control Application:

- Verify the minimum software and hardware requirements.
- Verify that the Ethernet parameters have been entered into your unit.
- Verify that you have security access to the unit.
- Verify that FTP service is enabled on the unit.
- Install the Remote Control Application on to your PC.
- If the remote unit uses a PCMCIA modem for dial-up connectivity, configure the Remote Control Application for PCMCIA operation.

To start the Remote Control Application:

1. Select the Remote Control Application shortcut icon that appears on your PC's desktop.
2. Enter the remote unit's IP address, and your user ID and password.
3. Select **OK**.
4. Once the connection is made, the remote unit's GUI appears. The title bar contains the product name and connection method. Use your mouse to select functions.

   To automate the log on process, select Automating the Remote Control Icon for more information.

IMPORTANT: Files that are created when using the Remote Control Application are saved on your PC in the Remote Control's compatibility directory. This directory can be overwritten when connecting to other remote units that have the same compatibility level, but are different models (for example, a NIC Plus, a NIC 10G, and so on).

If you want to keep these files, copy and save the following to a backup directory on your PC that is not in the compatibility directory's path:

- Any file with the .set, .stat, .evt, .aps, .perf, or .rep extension.
- The client.prop file. Changes to this file are only needed if the remote unit uses a PCMCIA modem for its dial-up connection.

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Remote Control Application Requirements

The minimum software requirements are:

- Windows NT 4.0, Windows XP, Windows 2000, or Windows 98 operating systems.
- Microsoft Internet Explorer 4.0 or greater.
- Host domain and IP address information for LAN access.
  Make sure that this information is entered into your unit. Refer to Ethernet Port Configuration for more information.
- TCP/IP Network Protocol

The minimum hardware requirements are:

- A personal computer with a 300-MHz Pentium processor or faster.
- 128 MB RAM (256 MB RAM recommended for optimum performance)
- 60 MB of free disk space
- An SVGA monitor with a minimum screen resolution of 800 by 600 pixels and 256 colors (1025 by 768 recommended for optimum viewing).
- A CD-ROM drive (if installing from a CD-ROM) or web browser (if installing from the DLI web site) for software installation.
- A standard 10BaseT Ethernet cable for connectivity between the unit and the network.


If you connect the unit directly to your PC, you will need the following:

- A network interface card installed in your PC.
- A crossover 10BaseT Ethernet cable for connectivity between the unit and the PC's network interface card.

Ethernet Port Configuration

To configure the unit's Ethernet port:


If Ethernet port parameters are changed, the unit must be rebooted for

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the changes to take affect.

1. Select **System**.
2. Select **I/O Settings**.
3. Enter the unit's **IP Address**, **Subnet Address**, and **Router Address** from the Ethernet Configuration functions.

WARNING: IP addresses **192.168.138.000 through 192.168.138.255** are reserved and should not be used. A system conflict can occur if these IP addresses are entered.

Security Settings

Security is an administrative function and only appears if you are logged on as an Administrator. This screen is divided into the following main sections: User Security Information, System Services/FTP Administrator, and Reset System.

User Security Information

This function allows you to view the following security information on system users:

- User Name
- Permissions: Read Only, Read/Write, Calibrate, or Admin
- Active User: Displays the user's current status.
- Current Permissions: If Security System Lock is enabled, shows users that may temporarily have read only privileges.
- Default User

The Security function also enables a user with administrator privileges to perform the following tasks:

- Add a User
- Delete a User
- Update a User Profile
- Enable/Disable Security System Lock
- Establish a Default Login

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- Establish a Required Login

If the Security System Lock function is enabled, only one user with Read and Write permissions (this includes Calibration and Admin users) can be logged in at a time. If a user with Read and Write permissions is already logged in, a window will appear giving you the option of logging in with Read- Only permissions only. When the user logs on with Read-Only permissions, all functionality will be disabled with the exception of the online help and the About this product function.

System Services and FTP Administrator

- **System Services:** Allows an administrator to disable specific network services to meet their network's security policies. To enable a system service, select its checkbox. To disable a system service, remove the check so that the checkbox is blank.
- **FTP Administrator:** Assigns a user ID and password so that a user can log in to a remote computer and transfer files using the file transfer protocol service.

Reset System

- Restores default Security settings.

Add a New User

If the System Lock function is enabled, only one user with Read and Write permissions (this includes Calibration and Admin users) can be logged in at a time. If a user with Read and Write permissions is already logged in, a window will appear giving you the option of logging in with Read permissions only.

1. Select **System**.
2. Select **Security**. The Security screen appears.
3. From the User Name column, select **NEW USER**.
4. Under Account Information, select , which is next to the User ID field. A keypad appears.
5. Enter the user ID.

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6. Select , which is next to the Password field. A keypad appears.
7. Enter a password.
8. Select , which is next to the Permissions field. The Select User Permissions window appears with the following options:
    - **Read:** Allows the user read-only privileges.
    - **Read/Write:** Allows the user to read and update information.
    - **Calibrate:** Allows the user read and write privileges and the ability to perform calibration procedures on the unit.
    - **Admin:** Allows the user to perform network administrator tasks such as calibrating, adding, deleting, and updating user profiles.
9. Select a user permission option.
10. Select **Update**. The new user profile is added and appears on the User List.

Establishing a Default User Login

This function allows an administrator to establish a default login, which results in users not having to enter a user ID and password each time they use the unit.

Important: The default login function is only applicable for the NIC unit. When connecting to a NIC via the Remote NIC application, a user ID and password are required. Establishing a default login user can only be done from the NIC touch screen.

To establish a default login user:

1. From the **System** tab, select **Security**.
2. From the User Name list box, select the **User Name** that you wish to make the default upon login.
3. Select **Set as Default**. Under the Default User column, a "Yes" appears, indicating that the user has been established as default user.

The Set as Default button is only available from the NIC touch screen.

To disable a default login:

1. From the **System** tab, select **Misc**.

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2. From **Local Settings**, clear the **User Login Required** check box. A cleared check box, indicates that User Login Required is disabled.

> The User Login Required check box is only available from the NIC touch screen.

3. Reboot the unit for changes to take affect. When the unit restarts, a login box appears.

   If you do not wish to reset a Default Login user, there is no need to continue to the next step.

4. If you wish to set another default user, log in as an Admin user and repeat the steps above under, *To establish a default login*.

Enable/Disable Security System Lock

This function allows an administrator to enable a Security System Lock that only allows one user with Read and Write permissions (this includes Calibration and Admin users) to be logged in at a time. If a user with Read and Write permissions is already logged in, a window will appear giving you the option of logging in with Read Only permissions only. When the user logs on with Read Only permissions, all functionality will be disabled with the exception of the online help and the About this product function.

To enable Security System Lock:

1. From the **System** tab, select **Security**.
2. Under the **Default Entry**, select the **Security System Lock** check box. A checked box indicates that the Security System Lock function is enabled.

To disable Security System Lock:

1. From the **System** tab, select **Security**.
2. From **Default Entry**, clear the **Security System Lock** check box. A cleared check box indicates that the Security System Lock function is disabled.

Enter a License Key

The License Key function allows you to enable functionality that you may not have initially purchased. If you wish to obtain more functionality for your NIC unit, contact your Digital Lightwave sales representative for a PO number. Then

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contact Digital Lightwave Customer Service for a License Key that will activate the requested features.

To enter a new license key:

1. From the **System** tab, select **Misc**.
2. Select **License Key**. A keypad appears.
3. Enter the new license key into the text box.
4. Select **Enter** when done.
5. Restart the unit for the new functions to take effect.

Establish User Login Parameters

This function allows an administrator to establish the user login parameters. The login parameters allow for the following:

- A **default login**, which means when the test set is booted up a default user name already appears in the User Name of the login dialog box. However, the user must enter a password.
- A **required login**, which means when the test set is booted up the user is required to enter a user name and password.

Important: The login function is only applicable for the NIC unit. When connecting to a NIC via the Remote NIC application, the NIC IP Address, User ID, and Password are required.

Delete a User

If the System Lock function is enabled, only one user with Read and Write permissions (this includes Calibration and Admin users) can be logged in at a time. If a user with Read and Write permissions is already logged in, a window will appear giving you the option of logging in with Read permissions only.

1. From the **System** tab, select **Security**. The Security screen appears.
2. From the User List, select the **User Name** to be deleted.
3. With the user ID highlighted, select **Delete**. The user is removed from the User List.

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Update a User Profile

If the System Lock function is enabled, only one user with Read and Write permissions (this includes Calibration and Admin users) can be logged in at a time. If a user with Read and Write permissions is already logged in, a window will appear giving you the option of logging in with Read permissions only.

1. From the **System** tab, select **Security**.
2. From the User List, select the user profile to be updated. The user ID, password, and permissions appears in the Account Information portion of the screen.
3. Select , which is next to the field to be updated.
    - If the *User ID* or *Password* was selected, a keypad appears, allowing you to modify the current information. Press **Enter** when you are done.
    - If *Permissions* was selected, the Select User Permissions window appears. Select the updated permissions that you wish to apply.
4. When you are done updating the user's profile, select **Update**. The updated information appears on the User List.

Display Serial Numbers and Software Revision

This function displays the following information:

- Copyright Information
- Feature set number
- Graphical User Interface Version
- Customer Service Information
- Circuit Pack Information
    - Product Serial Number
    - Kit Number
    - System Control Version
    - SCPI Version

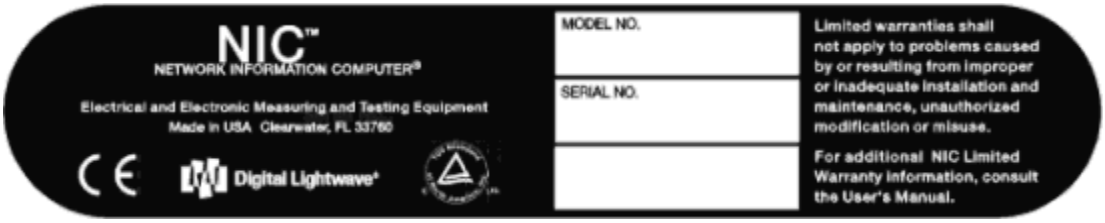
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- TL1 Version
- SNMP Version
- OmniOrb Version
- UPX Version
- zlib Version
- Kit Numbers and Versions

To view this information:

1. Select **System**.
2. Select **About this product**. The software revision number and hardware serial numbers appear.
3. To close the **About this product** box, select **OK**.

You may also obtain some of the product information by viewing the product label located on the unit. For example:



Establish a Required User Login

This function allows an administrator to establish a required login, which results in user having to enter a user ID and password each time they use the unit.

Important: Establishing a required user login can only be done from the NIC touch screen.

To establish a required login:

1. From the **System** tab, choose **Misc**.
2. From **Local Setting**, select the **User Login Required** check box. When this box is checked, a required login has been established.

   To disable the required login, clear the **User Login Required** check box.

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The User Login Required check box is only available from the NIC touch screen.

System Services

The following system services can be enabled or disabled by an Administrator.

A unit reboot is required if any changes are made to system services.

- **Internet Information.** The IIS (Internet Information Server) service provides the ability to host a simple web server, which uses port 80 (http). This function can be disabled (deselect the checkbox) to prevent unauthorized access to the port.
- **File Transfer Protocol.** The FTP service allows a user to remotely log in to the unit and transfer files. Disabling this function can prevent unauthorized access to ports 20 and 21.

  FTP service must be enabled if you use the Remote Control Application or the DLI Software Upgrade software. You can not connect to the unit using these applications if FTP service is disabled.

- **Remote Procedure Call.** This protocol allows an application on one PC to request a service from another application located on a different PC within in a LAN. Disabling this function can prevent unauthorized users from using the unit to access other equipment in a customer's network.
- **Telnet.** The Telnet service allows a user to log in to a remote system. Disabling this function can prevent unauthorized users from using the unit to access a customer's network.
- **NetBIOS.** The NetBIOS (Network Basic Input/Output System) program allows applications to use port 139 to communicate to different PCs within a LAN. This function can be disabled to prevent unauthorized access to the port.
- **SCPI.** The SCPI (Standard Commands for Programmable Instruments) service uses port 8090 to send and receive SCPI commands to the unit. Disabling this function will prevent unauthorized access to the port.

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- **TL1.** The TL1 (Transaction Language 1) service uses port 8080 to send and receive TL1 commands to the unit. Disabling this function will prevent unauthorized access to the port.
- **SNMP.** The SNMP (Simple Network Management Protocol) service uses ports 161 and 162 to transfer commands and traps to and from the unit. Disabling this function will prevent unauthorized access to these ports.

Automating the Remote Control Application Icon

The Remote Control Application software is a graphical user interface that allows you to remotely control portable and rackmount products from a PC. An icon for the Remote Control Application software is created and placed on your desktop when the software is installed.

You can add IP address, user ID, and password parameters to the icon to automate the log on process.

1. From the desktop, right click on the Remote Control Application icon.
2. Select **Properties** and choose the **Shortcut** tab.
3. Place the cursor at the end of the **Target** text box.
4. Press the space bar and type:

   ip=*x.x.x.x*,uid=*y*,pw=*z*

   where, *x.x.x.x* is the system's IP address
   y is the system's user ID (case sensitive)
   z is the system's password (case sensitive)
5. Click **OK**.
6. When you double click the Remote Control Application's icon, a connection is made and the remote system's GUI appears.


If an invalid parameter is entered, the automatic log on will fail, and you must enter the appropriate data.

Upload a File


A file can be transferred from the unit to a remote device (e.g., a PC), or to a local device, such as a PCMCIA or Flash storage card or a USB storage device. (Note that System Controller 2 with embedded Windows XP

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supports USB plug and play functionality.) If using the PCMCIA or USB function, make sure that the PC card or USB storage device is plugged into the NIC unit before selecting the File Services button. When the PC card or USB device is inserted, an audible tone indicates that the proper drivers are qualified. If using the FTP function, make sure you have the IP address of the receiving device.

See also Download a File

1. From the System tab, select **File Services**.
2. From the right File List box, select the upload method by clicking on the Drive — FTP button.

   If using *FTP*, click on that button, then enter the IP Address of the device that will receive the file (unless you are using the Remote Control Software; then enter the test set address). If this device is secured with a User ID and Password, then enter this information. Enter an FTP session on the connecting device.

   If using a PCMCIA card, Flash card, or USB device such as a thumb drive, plug the card or device into the appropriate slot. After a few seconds the system will recognize the device and update the drive selection window. New drive letters will appear in the File List box. Note that it is possible to have both a PCMCIA card and a USB device connected to the NIC at the same time. From one of the drives in the File List box, select a target directory to receive the file. Note that it is usually best to plug in the storage media before clicking the File Services button

   From the left File List box, select the current directory location of the file you want to transfer.

   Select the desired file to be transferred.

   Select the upload button.  The file will be transferred from the NIC unit.

Warning: When the unit is powered off, the FTP directory is automatically purged.

Download a File

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A file can be transferred to the NIC unit from a remote device (e.g., a PC), or from a local device such as a PCMCIA or Flash storage card or a USB storage device. (Note that System Controller 2 with embedded Windows XP supports USB plug and play functionality.) If using the PCMCIA or USB function, make sure that the PC card or USB storage device is plugged into the NIC unit before selecting the File Services button. When the PC card or USB device is inserted, an audible tone indicates that the proper drivers are qualified. If using the FTP function, make sure you have the IP address of the receiving device.

See also Upload a File

1. From the System tab, select **File Services**.
2. From the right File List box, select the download method by clicking on the Drive — FTP button.

   If using *FTP*, click on that button, then enter the IP Address of the device that will send the file to the NIC unit (unless you are using the Remote Control Software; then enter the test set address). If this device is secured with a User ID and Password, then enter this information. Enter an FTP session on the connecting device.

   If using a PCMCIA card, Flash card, or USB device such as a thumb drive, plug the card or device into the appropriate slot. After a few seconds the system will recognize the device and update the drive selection window. New drive letters will appear in the File List box. Note that it is possible to have both a PCMCIA card and a USB device connected to the NIC at the same time. From one of the drives in the File List box, select the directory containing the file to transfer. Note that it is usually best to plug in the storage media before clicking the File Services button

   From the left File List box, select the destination directory.

   From the right File List box, select the desired file to be transferred.

   Select the download button.  The file will be transferred to the NIC unit.

Warning: When the unit is powered off, the FTP directory is automatically purged.

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Dropping and Inserting an STM-64/16/4

This procedure is applicable to systems configured with STM-64/16/4 or OC-192/48/12 protocol processors.

This function allows you to drop an STM-16 signal from an STM-64 signal, and then an STM-4 signal from an STM-16 signal. Conversely, this procedure can also be performed in SONET mode (i.e., drop an OC-48 signal from an OC-192, and an OC-12 from an OC-48). Dropping signals does not need to be performed in any particular protocol processor order.

1. Select **Presets**. The Apply Presets window appears.
2. Select **Interface**. All line interfaces available for your unit appear.
3. Select **STM-64** as the interface starting point.
4. Select **Configuration**. The protocols available for the selected interface appear.
5. Select **STM-4 A/D.**
6. Select **Apply**. The unit takes a few moments to apply the new protocol connections. Use the Switch Matrix to view the new connections.

If you make a mistake while creating connections, simply select **Interface** and reenter the interface value. This action erases any previously entered interface or configuration values.

To disengage the configured protocol connections:

- Select **All to Tx/Rx.** This globally disconnects any internal connections between multiple protocol processors. All protocol processors will now expect to receive a signal using its line interface.

Sending Email Alerts

Before using the email alert feature, check with your Network Administrator to verify that your email account is set up to accept and forward SMTP mail.

IMPORTANT: After the email alert settings are completed the protocol tab for which the error/alarms have been configured must be selected or you

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must be in All Tests mode. Email alert messages will not be generated if these conditions are not met.

To set up email alerts:

1. Select the **System** tab and then **User Preference**. The User Preference screen appears.

2. Select the **Mail From** button in the Mail Notification section.

3. Using the keypad that appears, enter the sender's email address and press **Enter**.

4. Select the **Mail Server** button.

5. Using the keypad that appears, enter the email server address (for example, Lightwave.com) and press **Enter**.

6. Select the **Mail To** button.

7. Using the keypad that appears, enter the recipient's email address and press **Enter**.

8. Select the **Mail Interval** button. The Select Duration of Test dialog box appears.

9. Select the desired test duration period. The test duration determines when the system checks for an error or alarm.

   For example, you set up a mail interval of 15 minutes on OC-1/3/12 for all errors/alarms and then select the OC-1/3/12 tab. At the first live error/alarm incident an email message is sent to the recipient. After 15 minutes has elapsed the system looks for the next live error/alarm incident and sends an email message. This 15-minute loop continues until you reset the email notification configuration.

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This process is not active unless the configured protocol tab or All Tests is selected.

10. In the Processor / Mail Notify section, select the protocol processor that you want monitored. The Select Error/Alarm Mail Notification window appears.

Configure multiple protocols for email notification by selecting another protocol processor after the error/alarm notification step, as described in Step 11. To activate the email notification function for multiple protocols you must select **All Tests** after the configurations are completed.

11. Select the desired error/alarm type. You can select a specific error/alarm type or all errors and alarms. When monitoring multiple protocols, each protocol can be configured for its own error/alarm type.

IMPORTANT: These configuration settings DO NOT persist after the unit has been restarted.

To terminate email alerts:

1. Select the **System** tab and then **User Preference**. The User Preference screen appears.

2. Select the **Mail Interval** button. The Select Duration of Test dialog box appears.

3. Select **OFF**.

Setting the External Clock

This function allows you to set the external clock to Bits or SETS.

To set the external clock:

1. Select **System**.

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2. Select **Misc**.
3. Select **External Clock**.
4. Select **Bits** or **SETS**.

Use Graphs

Use the **Graph** button to view error and alarm results for the selected protocol processor. Graphs show the test history for either the current test or a previously saved test.

To use graphs function:

1. Select a protocol processor that has been configured for Error Alarm testing.
2. From **Results**, select **Graph**. The Graph screen appears. It contains two graphs which allow you to display incoming alarms and errors.
3. Use the following buttons to control graphing parameters:

    - **Sample Rate** - Sets the timing for graph results at increments of 1 Second, 1 Minute, or 15 Minutes.
    - **Change Scale** - Compresses or expands the displayed time scale for the graphed errors and alarms at time intervals of 30 minutes, 90 minutes, 3 hours, 6 hours, 12 hours, 24 hours, or 72 hours.
    - **Change Upper** - Sets the type of errors or alarms that appear in the upper graph.
    - **Change Lower** - Sets the type of errors or alarms that appear in the lower graph.
    - **Shift Left and Shift Right** - Adjusts the graph's time scale to an earlier or later time.
    - **Print Report** - Prints a graph report to printer or file.
    - **Save Graphs** - Saves a graph to file as a .grp file that can be replayed at a later time.

> Important: This is not a text file; when replayed, it appears as the original graph plot. Choose *Print a Graph to Report* if you desire graph information that can be printed out.)

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- **Replay Graphs/Stop Replay** - Replays or stops saved graphs (.grp).

Display History

The system maintains a log of errors and alarms detected on the incoming protocol processor's signal. This history of past and current events can be viewed using the **LEDs** or **Results** button.

The LEDs provide a visual indicator of current and past activity, and are used to quickly narrow the focus of what is received and possible problem areas of the network.

The **Results** button provides broad details of error and alarm activity.

To display history using the Results button:

1. Select a protocol processor mode.
2. Select the **Results** button. The **Scan** button functions appear.
3. To view other events, select the **Errors**, **Alarms**, **PTR**, or **Graphs** buttons.

The **Scan** button displays a list of received alarms and errors, along with the number of seconds that the event occurred. This summary identifies a general area to investigate when an error or alarm is detected.

The **Errors** button provides the following details about received errors:

- Error count using an 11-digit format
- Average error rate over the error duration using an N.NNe-N format
- Current error rate using an N.NNe-N format
- Error free seconds using an 8-digit format
- Errored seconds using an 8-digit format
- Severely errored seconds
- Unavailable errored seconds

The **Alarm** button displays the number of seconds that an alarm was present.

The **PTR** button provides the following details about received Pointer adjustments:

- Positive Justification: Indicates the number of positive Pointer adjustments

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- Negative Justification: Indicates the number of negative Pointer adjustments
- Pointer Justification Seconds: Indicates the duration of a Pointer adjustment in seconds
- NDF Count: Indicates the number of New Data Flags received
- Receive Pointer Value: Indicates the Pointer value

The **Graphs** button provides an additional view of error and alarm results for the selected protocol processor. Graphs show the test history for either the current test or a previously saved test.

Inserting Payload Patterns

The system supports a number of PRBS patterns for transmission in the signal's payload.

To insert a payload pattern:

1. Select a protocol processor mode.
2. Select **Transmit**.
3. For *SONET*, *SDH* and *E1*, select **SET 1**. For *E3* and *E4*, select **SET 2.**
4. Select **Payload Pattern**. The **Select Payload Pattern** window appears.
5. Select a pattern. The system will transmit this pattern as the payload.

To insert a user-defined pattern:

1. Select a protocol processor mode.
2. Select **Transmit**.
3. For *SONET*, *SDH,* and *E1*, select **SET 1**. For *E3* and *E4*, select **SET 2.**
4. Select **Payload Pattern**.
5. Select **User Defined**. A touch screen keypad appears. Use the keypad to enter a pattern up to 32-bits in length.
6. Select **OK**. The system will transmit this pattern as the payload.

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Inserting Alarms

The system can transmit alarms to simulate various alarm conditions. One reason for transmitting alarms is to determine if the receiving equipment can detect an alarm in the incoming signal.

To insert alarms:

1. Select a protocol processor**.**
2. Select **Transmit** and choose **Error Alarm**.
3. Select **Alarm Generated**. The Select Alarm to Insert window appears.
4. Select an alarm. The system starts transmitting alarms.

To stop alarm transmission:

1. Select the protocol processor mode.
2. Select **Transmit** and choose **Error Alarm**.
3. Select **Alarm Generated**. The Select Alarm to Insert window appears.
4. Select **Off**. Alarm transmission stops.

Inserting Multiple Errors

Various errors can be transmitted by the system. One reason for transmitting errors is to determine if the receiving equipment can detect an error in the incoming signal. Inserting multiple errors not only allows you to initiate a continuous test, but it also allows you to set up a specific test duration and action to take when the duration ends. For example, you could set the test duration to run for five minutes, the action after test to repeat the test, and print the statistics to a file or printer.

To insert multiple errors:

1. Select a protocol processor mode.
2. Select **Transmit** and choose **Error Alarm**.
3. Select **Error to Insert**. The Select Error to Insert window appears.
4. Select an error.
5. Select **Error Insert Rate**. The Select Error Insert Rate window appears.

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6. Select an error rate. The system starts transmitting errors.

Selecting **None** will stop the error transmission.

To set up duration and after test actions:

1. Choose **Test**. The Test window appears, which provides the Duration and Action After Test options.
2. Select **Duration** and choose how long you want to run the test for.
3. Select **Action After Duration** button and choose the desired actions.

Inserting Single Errors

Various errors can be transmitted by the system. One reason for transmitting errors is to determine if the receiving equipment can detect an error in the incoming signal. After defining the error parameters, the Error Insert button injects single errors into the transmitted protocol processor's signal.

To insert single errors:

1. Select a protocol processor and choose **Transmit**.
2. Select **Error Alarm**.
3. Select **Error to Insert**. The Select Error to Insert window appears.
4. Select an error.

Important: DO NOT set Error Insert Rate when inserting a single error.

Important: Select **Restart** from the Common Function buttons to clear any previously collected data.

5. Select **Error Insert** from the Common Function buttons to inject the error.
6. To view the event statistics, choose the protocol's **Results** button.

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7. To print or record the statistics, see the topic Print Report.

Displaying Large LEDs

1. Select a protocol processor tab.
2. Select the **Results** button.
3. Select **Large LEDs**.

License Key

The License Key function allows you to enable functionality that you may not have initially purchased. If you wish to obtain more functionality for your unit, contact Customer Service to request new features, and you will be provided a License Key that will activate the requested features.

To enter a new license key:

1. Select **System**.
2. Select **MISC**.
3. Select **License Key**. A keypad appears.
4. Enter the new license key into the text box.
5. Select **Enter** when done.
6. Reboot the unit for the new functions to take effect.

   Select **Re-Boot Unit** and select **Yes**.

Locking and Unlocking a Test Set

To prevent users from interfering with each other, an individual user can "lock" and take control of a test set. This is done using the Lock icon that appears on the GUI. Permission levels determine the user's ability to lock and unlock a test set. When you lock the test set, you can configure protocol processors, start tests, and perform general product functions without the worry of contending for resources with another user.

When a test set is locked by someone else, the  icon is displayed.

To unlock a test set locked by someone else:

1. Select the icon. The Lock/Unlock dialog box appears.

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2. Select **Force Unlock**. The command buttons change to "Lock and Exit" and "Lock".

> You must have **Admin** privileges to be able to force the unlock.

3. Selecting one of the following causes the command buttons to change to "Unlock and Exit" and "Unlock", and the information boxes become available.
    - **Lock and Exit** - Locks the unit and automatically closes the dialog box. To enter notes after the dialog box closes, select the locked icon to reopen the dialog box.
    - **Lock** - Allows you to enter note information in the Circuit Info: and Contact Info: boxes before closing the dialog box. The notes carry over to all protocol processors in the test set. When a different test set is locked the user can enter notes pertinent to it.
4. To enter note information, select **Circuit Info:** and/or **Contact Info:**. The Enter User String keyboard opens.
5. Type notes and select **Enter**. The notes appear in their associated information box.
6. Select **Exit** to close the Lock/Unlock dialog box.

When you have the test set locked, the  icon is displayed.

To unlock a test set that you have locked:

1. Select the icon. The Lock/Unlock dialog box appears.
2. Selecting one of the following causes the command buttons to change to "Lock and Exit" and "Lock":
    - **Unlock and Exit** - Unlocks the unit and automatically closes the dialog box.
    - **Unlock** - Unlocks the unit without closing the dialog box. Select **Exit** to close the Lock/Unlock dialog box.

When the test set is unlocked, the  icon is displayed.

To lock a test set:

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1. Select the icon. The Lock/Unlock dialog box appears.
2. Selecting one of the following causes the command buttons to change to "Unlock and Exit" and "Unlock", and the information boxes become available.
    - **Lock and Exit** - Locks the unit and automatically closes the dialog box.
    - **Lock** - Allows you to enter note information in the **Circuit Info:** and **Contact Info:** boxes before closing the dialog box. The notes carry over to all protocol processors in the test set. When a different test set is locked the user can enter notes pertinent to it. Select **Exit** to close the dialog box.

Locking/Unlocking Screen Access

The test set screen can be disabled to prevent user access by others. This function requires a user ID and password to lock and unlock the screen. When unlocking the screen, the unit will only accept the last user ID and password entered, or the unit's original user ID and password.

To lock the screen:

1. Select **Off/Lock** from the common function buttons. The Unlock Login dialog box appears.
2. Enter your **User ID**.
   On a portable unit, press  to open a keyboard to enter the user ID.
3. Enter your **Password**.
   On a portable unit, press  to open a keyboard to enter the password.
4. Select **OK**. The Locked Unit dialog box appears. This dialog box remains on the screen until the screen is unlocked.

If the unit is locked because critical testing is in progress, select the **Unlock** button and enter the **User ID** and **Password** again. Select **OK**.

The unit will only accept the last User ID and Password entered or the unit's original User ID and Password. An error message appears if an invalid ID or Password in entered.

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To unlock the screen:

1. Select the **Unlock** button from the **Locked Unit** dialog box. The Unlock Login dialog box appears.
2. Enter your **User ID.**
   On a portable unit, press  to open a keyboard to enter the user ID.
3. Enter your **Password**.
   On a portable unit, press  to open a keyboard to enter the password.

The unit will only accept the last User ID and Password entered or the unit's original User ID and Password. An error message appears if an invalid ID or Password in entered.

4. Select **OK**.

Establish User Login Parameters

This function allows an administrator to establish the user login parameters. The login parameters allow for the following:

- A **default login**, which means when the test set is booted up a default user name already appears in the User Name of the login dialog box. However, the user must enter a password.
- A **required login**, which means when the test set is booted up the user is required to enter a user name and password.

Important: The login function is only applicable for the NIC unit. When connecting to a NIC via the Remote NIC application, the NIC IP Address, User ID, and Password are required.

Establishing a Default User Login

This function allows an administrator to establish a default login, which results in users not having to enter a user ID and password each time they use the unit.

Important: The default login function is only applicable for the NIC unit. When connecting to a NIC via the Remote NIC application, a user ID and password are required. Establishing a default login user can only be done from the NIC touch screen.

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To establish a default login user:

1. From the **System** tab, select **Security**.
2. From the User Name list box, select the **User Name** that you wish to make the default upon login.
3. Select **Set as Default**. Under the Default User column, a "Yes" appears, indicating that the user has been established as default user.

The Set as Default button is only available from the NIC touch screen.

To disable a default login:

1. From the **System** tab, select **Misc**.
2. From **Local Settings**, clear the **User Login Required** check box. A cleared check box, indicates that User Login Required is disabled.

   The User Login Required check box is only available from the NIC touch screen.

3. Reboot the unit for changes to take affect. When the unit restarts, a login box appears.

   If you do not wish to reset a Default Login user, there is no need to continue to the next step.

4. If you wish to set another default user, log in as an Admin user and repeat the steps above under, *To establish a default login*.

Establish a Required User Login

This function allows an administrator to establish a required login, which results in user having to enter a user ID and password each time they use the unit.

Important: Establishing a required user login can only be done from the NIC touch screen.

To establish a required login:

1. From the **System** tab, choose **Misc**.
2. From **Local Setting**, select the **User Login Required** check box. When this box is checked, a required login has been established.

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To disable the required login, clear the **User Login Required** check box.

The User Login Required check box is only available from the NIC touch screen.

Measuring Service Disruption Activity

The following only applies to SDH and SONET protocol processors.

The NIC unit can measure service disruption switching intervals in your network and can be configured to monitor for a specific event that will cause a service disruption switch. When this event occurs, the duration in both seconds and frames is logged. These statistics can be used to determine how long it takes for your network equipment to react to an service disruption event and switch to a backup path.

The SDH/SONET/OTN service disruption measurement has an accuracy of 1 µs (microsecond). GigE service disruption tests show an accuracy of 0.1 ms (millisecond).

To measure Service Disruption activity:

1. Select an SDH or SONET protocol processor.
2. Select the **Test** button.
3. Select the **Service Disrptn** button. The Service Disruption measurement screen appears.
4. Select **Protection Switch Criteria**. The alarms, errors, and patterns that can be used to trigger an APS event appear.
5. Select one or multiple measurement criteria in the Protection Switch Criteria field. The measurement criteria is the alarms, errors, and patterns that can be used to trigger a service disruption event.
6. Select **Consecutive Good Time Required** or **Consecutive Good Frames Required** (these parameters are coupled). A key pad appears.

    - If *Consecutive Good Time Required* was selected, enter the duration (in milliseconds) of valid frames to occur before Protection Switching is confirmed to be activated. The range is 0.125 to 2047.875 milliseconds.

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- If *Consecutive Good Frames Required* was selected, enter the number of valid frames to occur before Protection Switching is confirmed to be activated. The range is 1 to 16383 frames.

7. Select **Action State.** The APS options appear.
8. Select **Single APS** or **Continuous APS** to begin measuring. The unit will begin monitoring the incoming signal for this event. If it occurs, the protection switch state and time will appear in both seconds and frames present. The results will not include the number of good frames, but the number of frames that elapsed before the first good frame, meeting the entered criteria, occurred.

A history of event is recorded in the History Recent Milli Seconds and History Recent Frames fields. The complete summary of event can be viewed on the Service Disruption Summary screen.

To stop monitoring Service Disruption measurement activity:

1. Select **Action State**.
2. Select **Stop APS**.

To view the Service Disruption Summary:

1. Select the **System** tab.
2. Select the **Service Disruption** button. The Service Disruption Summary screen appears.

Service Disruption

The unit can measure service disruption intervals in your network. The unit can be configured to monitor for a specific event that will cause a service disruption. When this event occurs, the duration in both seconds and frames is logged. These statistics can be used to determine how long it takes for your network equipment to react to a service disruption event and switch to a backup path.

The SDH/SONET/OTN service disruption measurement has an accuracy of 1 µs (microsecond). GigE service disruption tests show an accuracy of 0.1 ms (millisecond).

Test Service Disruption functions include:

- **Consecutive Good Time Required**: This function allows you to enter the time-duration (in milliseconds) of consecutive error-free frames to elapse

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before Protection Switch measurements stop accumulating. The range is 0.1 to 409.0 milliseconds and is entered using a keypad.

- **Consecutive Bad Time Required**: This function allows you to enter the time-duration (in milliseconds) of consecutive errored frames to elapse before Protection Switch measurements begin to accumulate. The range is 0.1 to 409.0 milliseconds and is entered using a keypad.
- **State**: Starts and stops Service Disruption mode. If an event occurs, the protection switch time will appear in both seconds and frames present. The results will not include the number of good frames, but the number of errored frames that occur before the first good frame. This is based on the previously selected criteria for the consecutive time and frame requirements. The unit begins monitoring the incoming signal for a service disruption measurement event as soon as one of the following State options is selected:

  Single APS: Monitors for a single service disruption event. Seconds and frames are reported and the State returns to Inactive.

  Continuous APS: Constantly monitors for service disruption events, and updates the seconds and frames reported.

  Stop APS: Stops service disruption monitoring. The State returns to Inactive.

- **Protection Switch Time (MilliSecs)**: Indicates the duration in seconds that it took for the service disruption event (errored frames) to occur.

For more information about monitoring service disruption activity, select *Measuring Service Disruption Activity* in the Common Tasks section of the online help.

Monitoring the Incoming J0, J1, or J2 Trace

Select Monitoring the TC Trace for information about the TC Trace.

1. Select an SDH or SONET protocol processor mode.
2. Select **Receive**.
3. Select **SOH** to view the incoming J0 Trace, which appears at the bottom of the screen.

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4. Select **POH** to view the incoming J1 Trace or J2 Trace, which appears at the bottom of the screen.

   (The J2 Trace only applies to the STM-4 and OC-12 protocol processors.)

Monitoring the TC Trace

Before monitoring TC trace:

- Make sure the unit is configured for TCM receive mode.

To view the TC trace:

1. Select an SDH or SONET protocol processor.
2. Select **Receive**.
3. Select **POH** to view the incoming TC trace, which appears at the bottom of the screen.


A TC-TIM alarm occurs if the incoming TC trace does not match the expected TC Trace. The alarm's duration appears on the Results' Alarm screen.

Monitoring Incoming Errors, Alarms, or Pointer Activity

1. Select a protocol processor mode.
2. Select **Results**.
3. Select the following Results tabs to monitor events:

   - The **Scan** button functions appear on the touch screen. A summary count of current error, alarm, and event activity is reported. If no activity is reported, the message "No Errors or Alarms" appears.
   - Select **Err** to view more details about incoming errors. This function reports the following:

     - Error count using an 11-digit format
     - Average error rate over the total error duration using an N.NNe-N format
     - Current error rate using an N.NNe-N format

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- Errored seconds using an 8-digit format
- The percentage of seconds in which the error was present
- The total number of error-free seconds using an 8-digit format
- The percentage of seconds that the error was not present

- Select **Alarm** to view more details about incoming alarms. This function reports the number of seconds that an alarm is present.
- Select **PTR** to view more details about incoming Pointer events (this function is only applicable to SONET/SDH protocol processors). This function reports the following:
  - The number of positive Pointer adjustments
  - The number of negative Pointer adjustments
  - The duration of a Pointer adjustment (in seconds)
  - The number of New Data Flags (NDF)
  - The number of invalid NDFs
- Select **Event** to view a summary of events (alarms, errors, and Pointer activity) recorded by the unit. For more information, refer to the Recording in the Event Log section.
- Select **APS** to display the incoming bit values of the K1 and K2 bytes. For more information, refer to the Monitoring SONET/SDH APS Commands section.
- Select **Large LEDs** displays LED error and alarm indicators in a large, easy-to-read format, which covers the entire touch screen area. This is useful for viewing errors or alarms from a long distance, such as across the room from a test bay.
- Select **Graph** displays incoming errors and alarms in the form of a line or bar graph.

Monitoring Signal Status

1. Select **Receive**.

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2. Select **SIG**. The Receive Signal Status window appears.

    - In *PDH* mode, Peak Positive and Negative Pulse voltage, power in dBm and dBdsx, line frequency, and line frequency offset information appears.
    - In *SDH* and *SONET* mode, frequency, optical power, and line frequency offset received information appears.

Monitoring SCPI or TL1 Commands

The Monitor screen is a command window that allows you to view SCPI or TL1 commands issued to the unit. The monitor also shows the command response (for valid commands entered) or the error code (if an invalid command is entered).

To use the Monitor feature, the communications port must be configured. The Ethernet and GPIB ports are always enabled for SCPI commands and, when licensed, they are automatically enabled for TL1. However, the port assignment (TL1 [when licensed] or SCPI) for the Serial port must be selected. Configure these ports before using the Monitor function.

To open the monitor:

1. Select the **System** tab and choose **Monitor**.
2. Choose **Select Command Processor** and point to **SCPI** or **TL1**.

To issue SCPI commands to the unit:

- Refer to the *SCPI Command Reference Guide* for procedures. The guide can be found in the Technical Documentation Library at http://www.lightwave.com.

To issue TL1 commands to the unit

- Refer to the *TL1 Command Reference Guide* for procedures. The guide can be found in the Technical Documentation Library at http://www.lightwave.com.

Monitoring the TC Trace

Before monitoring TC trace:

- Make sure the unit is configured for TCM receive mode.

To view the TC trace:

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1. Select an SDH or SONET protocol processor.
2. Select **Receive**.
3. Select **POH** to view the incoming TC trace, which appears at the bottom of the screen.

A TC-TIM alarm occurs if the incoming TC trace does not match the expected TC Trace. The alarm's duration appears on the Results' Alarm screen.

Configuring TCM for Receive Mode

When transmitting or monitoring errors and alarms the unit must be configured for TCM operation.

To configure the unit for TCM monitor operation:

1. Select an SDH or SONET protocol processor.
2. Select **Receive**.
3. Select **SET 2**.
4. Select the **TC Error/Alarm Processing** function and select **Enable**.
5. The unit is configured to monitor for incoming TCM errors, alarms, and traces.
   Select **Monitoring the TC Trace** for more information about incoming trace patterns.

To monitor for TC-TIM alarms:

1. Select **Receive**.
2. Select **SET 2**.
3. Select the **TIM Alarm Reporting** function and select Enable.

Related Topics:

Monitoring TCM Results

Monitoring the TC Trace

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Setting Oscillator Value

1. Select **System**.
2. Select **Misc**.
3. Select **Oscillator Value**.
4. Using the touch screen key pad, enter a value between 1 and 255.
5. Click **Ok** to accept the value.

Pausing/Resuming a Test

To pause a test:

1. Select **Test.**
2. Select **Pause Test**. When Pause is selected, the system stops collecting data, but the Elapsed Time counter continues. Additionally, when Pause is selected, a red **Test Paused** LED appears in the LEDs/Quick Status area.

To resume a test:

- Select **Resume Test**.
  The Test Paused LED turns white with red text, indicating that the test was paused earlier. A restart or new test will clear the LED's history.
- The events occurring while in pause mode will be recorded in the Event Log.

Making Pointer Adjustments

The beginning of a SONET or SDH payload is identified by a **Pointer**. It consists of the H1 and H2 Pointer bytes. You can stress a network by manually adjusting the Pointer using the Increment and Decrement Pointer buttons. By performing this task, you can stress your SONET or SDH equipment to verify if it can tolerate Pointer adjustments, and how your equipment will react and report these adjustments.

There are several Pointer parameters that must be configured before making a positive or negative Pointer adjustment.

To make Pointer adjustments:

1. Select a protocol processor mode.
2. Select **Transmit** and choose **PTR**.

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3. Configure the Pointer Adjustment parameters. For example,

    - Select **NDF Flag** to allow a New Data Flag to be set when a new Pointer value has been transmitted.
    - Select **Pointer Value** to change the Pointer value from 0 to 782.
    - Select **Frequency Offset** to increase or decrease the speed of the Pointer adjustments.
    - Select **Pointer Action** to select the type of Pointer activity that occurs when the Increment Pointer or Decrement Pointer buttons are selected.
    - Use **Burst Count** to set the number of repetitions for Pointer adjustments.

4. Select **INC Pointer** to make a positive pointer adjustment, or select **DEC Pointer** to make a negative pointer adjustment.

These buttons generate and control Pointer movements within the transmitted signal. You can stress test a network by changing pointers or introducing an offset that continuously adjusts the STS or AU Pointer.

Presets Function

The Presets function provides a quick and convenient way to set up the system for operation. Using Presets involves selecting a starting protocol and its interface, and then making an internal connection to another protocol. See Adding/Dropping SDH/PDH Signals for more information.

To set up a connection using the Presets function:

1. Select **Presets** from the Common Function Buttons row.
2. Select **Interface**. All line interfaces available for your unit appear.
3. Select an interface as a starting point.
4. Select **Configuration**. The protocols available for the selected interface appear.
5. Select a protocol to connect to the interface. If required, select the **Configuration** button again to create additional connections.


If you make a mistake while creating connections, simply select **Interface** and reenter the interface value. This action erases any previously entered interface or configuration values.

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6. Select **Apply**. The unit takes a few moments to apply the new protocol connections. Use the Switch Matrix to view the new connections.

To disengage the configured protocol connections:

- Select **All to Tx/Rx**. This globally disconnects any internal connections between multiple protocol processors. A protocol processor will now expect to receive a signal using its line interface.

Adding/Dropping SDH and PDH Signals

The NIC allows you to set up single, or multiple test sets, and provides multiplexing and demultiplexing functionality for signal levels. Using the NIC's Preset mode, you can add or drop a signal from optical/electrical SDH and SONET, or electrical PDH into another protocol processor's signal levels in order to monitor for error and alarm conditions. For additional information on test units see Understanding Test Units.

Important: When the NIC/NAA has multiple test units you must first select the desired **test unit** protocol tab before selecting the Presets button. The configuration options available through the Preset Selection screen are dependent on the test set that is selected.

1. Select the protocol processor.
2. Select **Presets**. The Apply Presets dialog box appears. Several examples are provided below.

- **To add an STM-4 signal into an STM-16 signal:**

a. Select the **Interface** button and choose **STM-16**.

b. Select the **Configuration** button and choose **STM-4 A/D**.

Multiple signals can be added to the interface by selecting the Configuration button again and choosing another signal before selecting Apply.

c. Select **Apply**.

- **To add an E1 into an E3 signal:**

c. Select the **Interface** button and choose **E3**.

d. Select the **Configuration** button and choose **E1 #1 A/D** or **E1 #2 A/D**.

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Multiple signals can be added to the interface by selecting the Configuration button again and choosing another signal before selecting Apply.

c. Select **Apply**.

- **To add a E1 #2 A/D LI into an E3 signal:**

c. Select the **Interface** button and choose **E3**.

d. Select the **Configuration** button and choose **E1 #2 A/D LI.**

Multiple signals can be added to the interface by selecting the Configuration button again and choosing another signal before selecting Apply.

c. Select **Apply**.

3. The unit is configured for Add/Drop mode. Go to the next section to specify different frames and patterns for the added signal.

If you make a mistake while creating connections, simply select **Interface** and reenter the interface value. This action erases any previously entered interface or configuration values.

Specify Frames and Patterns for the Added Signal

If you have added an STM-4 signal into an STM-16 signal:

1. Select **STM-4**.
2. Select **Transmit**.
3. Select **SET 2**. The Mapping options appears.
4. Select the options on the screen to specify the **Foreground** and **Background** AU and TUG patterns and HP and LP signal labels to be added to the signal.

If you have added an E3 signal to an E4 signal:

1. Select **E3**.
2. Select **Transmit**.
3. Select **SET 2**. The E3 Transmit Mapping screen appears.

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4. Select **E1#1 Channel Inserted** and select from channels 1 through 16 for E1 #1.
5. Select **E1#2 Channel Inserted** and select from channels 1 through 16 for E1 #2.
6. Select **E1 Background Frame** and select the background frame (Unframed, PCM30, PCM30CRC, PCM31, PCM31CRC) for the specified channel.
7. Select **E1 Background Pattern** and select up to a 32-bit background pattern for the specified channel.

Printer Port Configuration

The unit supports both parallel and serial printers.

For Parallel Printing:

- Attach a parallel printer cable (with a 25-pin male connector on one end) to the unit's **Parallel Port** connector. This is a DB-25 female connector.

For Serial Printing:

Important: The following steps must be performed from the NIC unit touch screen. "Printer" is not an available Serial port assignment from the Remote Control Application.

1. Attach a serial printer cable (with a 9-pin female connector on one end) to the unit's **RS-232** port connector. This is a DB-9 male connector.
2. From the **System** tab, select **I/O Settings**.
3. Select the **Serial** button.
4. Select the **Port Assignment** button and choose **Printer**.

Printing a Graph Report

To print a graph report:

1. From the **Results** tab, select **Graph**.
2. Select **Print Report**. The Report Setup menu appears.
3. Choose one of the following:

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- From **Destination Printer**, select **Graphs** to print reports to a printer.

  If printing a report from the NIC unit, make sure that a printer is attached to the unit's parallel or serial port.

- From **Destination File**, select **Graphs to File** to print reports to a file. The File Browser dialog box appears.

  Enter a filename and select **OK**. The file extension for a graph is .rep.

  Files saved when working with the Remote Control Application will not be accessible from the NIC unit touch-screen and visa-versa. The remote application saves the files to the Remote Control (GalaxyNIC) directory on the PC. The NIC unit saves the files to its default D:\DLI... drive on the test unit.

4. Select **OK**.

For information on retrieving a graph saved to file, see Print or View Saved Files.

Destination Printer

The Destination Printer functions print a report directly to a printer.

For local printing (which means that you are using the touch screen), you must have a printer attached to the unit's parallel port or serial port.

For remote printing (which means that you are using the Remote Control software to operate a unit from a PC), the report is sent to your PC's default printer. The standard Windows Print dialog appears when using the Remote Control software.

Printing a Real-Time Test

Important: Real-time test reporting is only available locally (from the touch screen) on portable units.

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A real-time test records and generates a report of any events (alarms, errors, or power interruptions) that occur while the unit is monitoring a customer's circuit. The reports, generated in real time, can be sent to an attached printer, a file, or both.

The report contains the following information:

- A user-defined header
- A brief list of product settings
- Test start time and date
- Event activity as it occurs during the test
- A "print alive" message, which can be configured at a specified time to ensure the user that the real-time test is still active
- A statistical report, produced at the conclusion of the test, providing a summary of reported events. If no events occur during the test duration, a completion message, indicating that no problems were found, is printed.

Real-time test settings and accumulated results are not discarded if a power interruption occurs. The results are saved in 15-minute increments. When power is restored to the unit, the real-time test continues from where it was prior to the power interruption. The power interruption event will appear in the real-time report.

To set up and start a real-time test:

1. Select **Test**.
2. Select **SET 1**. The Duration and Action After Duration functions appear.
3. Select **Action After Duration**, and then select **Realtime Actions**. The Select Realtime Actions after Test dialog box appears.
4. Select one of the following real-time test options:
    - Print Events and Repeat Test
    - Record Events and Repeat Test
    - Print and Record Events and Repeat Test
    - Print Events
    - Record Events
    - Print and Record Events

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5. The Realtime Setup Parameters dialog box appears. Select **User Header**. The Enter User String keyboard appears.
6. Type a header name using the keypad that appears and select **Enter**. The header, which can be up to 64-bytes in length, serves as a brief description of the test.
7. Select **Print Alive** message. The Enter Duration window appears.
8. Set the time parameter, which determines if and when a Print Alive message is generated. A value of 0 disables the messaging function. Select **OK**. The header name and duration setting appear on the Realtime Setup Parameters window.
9. Select **OK**. The Realtime Setup Parameters window closes.
10. Select **Duration** and enter how long the test will run.
11. Select the **Restart** button to start the real-time test. The Elapsed Time counter, located in the top right corner, resets to 0.

Important: When a real-time test begins, the unit is locked as indicated by the screen lock message. Other users cannot access the unit and change settings. However, if the Unlock button is selected during a test, anyone can then access the touch screen and change product settings. This action can disrupt real-time test results.

Printing a Report

Selecting the Print Report Common Function Button while on the allows you to print statistic and event reports to a printer or file.

1. Select **Print Report**. The Report Setup menu appears.
2. Choose one of the following:
   - From **Destination Printer**, select one or multiple reports to print directly to a printer. If printing a report from the NIC unit, make sure that a printer is attached to the unit's parallel or serial port. The following reports are available:

     Settings - (.set extension) Reports current values for all Transmit and Receive Set functions.

     Statistics - (.stat extension) Reports results for the Scan, Errors, Alarms, and PTR.

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- **Events** - (.evt extension) Reports a detailed summary of events, such as alarms, errors, and pointer activity. This report includes the event, the number of events logged, the start and stop time of the event, and the duration of the event.

- **APS** - (.aps extension) Reports the results of the K1 and K2 byte sequences received by the unit.

- **Performance** - (.perf extension) Reports Performance Monitor results.

- From **Destination File**, choose one or multiple reports to print to a file. The File Browser dialog box appears.

The **Comma Delimiter** option can be applied to the Settings To File and Statistics To File reports.

- Enter a filename and select **OK**.

Important: Files saved when working with the Remote Control Application will not be accessible from the NIC unit touch-screen and visa-versa. The remote application saves the files to the Remote Control (GalaxyNIC) directory on the PC. The NIC unit saves the files to its default D:\DLI... drive on the test unit.

3. In the **User Comment** box, select the **Input** button to enter notes that will display in the report. A keyboard opens.
4. Enter comment text using the keyboard. When working from NIC test set use the touch screen keyboard. Select **Enter**.

To clear comment text, select the **Clear** button.

5. Select **OK**.

For information on retrieving saved files, see Print or View Saved Files.

Important: Files that are created when using the Remote Control Application are saved on your PC in the Remote Control directory. This

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directory can be overwritten when connecting to other remote units that have the same compatibility level, but are different models (for example, a NIC Plus, a NIC 10G, and so on).

If you want to keep these files, copy and save the following to a backup directory on your PC that is not in the Remote Control Application directory's path:

- Any file with the .set, .stat, .evt, .aps, .perf, or .rep extension.
- The client.prop file. Changes to this file are only needed if the remote unit uses a PCMCIA modem for its dial-up connection.

Screen Capture

This function allows you to print the currently displayed screen and converts it to a bitmap (.bmp) image, which is saved to your test set or PC's hard drive in the GalaxyNIC folder.

Important: You cannot print or view a saved .bmp from the System File Services list box. You must locate the .bmp in the GalaxyNIC directory on your PC. To locate the .bmp:

a. Open the Remote NIC (**GalaxyNIC**) directory. For example, the default directory is C:\Program Files\GalaxyNIC.

b. Locate the **Compat** folder from which the Remote NIC is running. The folder name represents the Feature Set operating on the NIC unit. For example, the Compat folder for Feature Set 4.1.28 appears in the GalaxyNIC directory as Compat400010028.

c. Open the .bmp file and print to a local printer.

To capture a screen:

1. Select the **Print Report** common function button.
2. Select **Screen Capture**. The image is saved as Screen.bmp.

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A screen capture image will automatically overwrite an existing Screen.bmp file. To save previous screen capture images, use the File Services' Rename function.

3. If you are capturing screens using a portable unit, you must transfer the file from the unit to your PC to print the bitmap image. Refer to Uploading a File for file transfer procedures. After the file is copied to your PC, it can be opened and printed.

Printing or Viewing Saved Files

While running tests, you have the option to save the information to a file. The instructions below tell you where and how to print or view a saved file.

Important: Files saved when working with the Remote Control Application will not be accessible from the NIC unit touch-screen and visa-versa. The remote application saves the files to the Remote Control (GalaxyNIC) directory on the PC. The NIC unit saves the files to its default D:\DLI... drive on the test unit.

To print or view a saved file:

1. From the **System** tab, select **File Services**.
2. Select a file from the **Disk** directory box. The desired report may display in the main Disk directory, or it may be stored in one of the folders in the directory. Folder names are enclosed in brackets **[foldername]**. To return to the main Disk directory after opening a folder, select **[. .]** or the **Disk** button.

Important: Real-time reports generated from the NIC unit touch-screen, using the Action after Duration function, are automatically stored in the [APP] folder. Select the folder to display those reports.

The following is a list of file extension used for files generated from the Print Report, Graph, or Action after Duration functions:

- **.aps** - APS Report
- **.rep** - Graph Report, BERT Analysis, RFC Thru Put Analysis

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- **.evt** - Event Report
- **.perf** - Performance Report
- **.real** - Real-time Test Report (Stored in [APP} folder on NIC unit.)
- **.set** - Settings Report
- **.stat** - Results Report
- **.statE** - Event Report
- **.grp** - Graph (This is not a text file. It can only be viewed as a graph by selecting **Results,** pointing to **Graph** and choosing the **Replay Graphs** button.)

3. Choose one of the following

To **Print** the file:

a. Select **Print**. A standard Print dialog box appears.

> If you want to print a report directly from the NIC unit, make sure that a printer is attached to the unit's parallel or serial port.

b. Select the printer **Name** and choose **OK**.

To **View** the file:

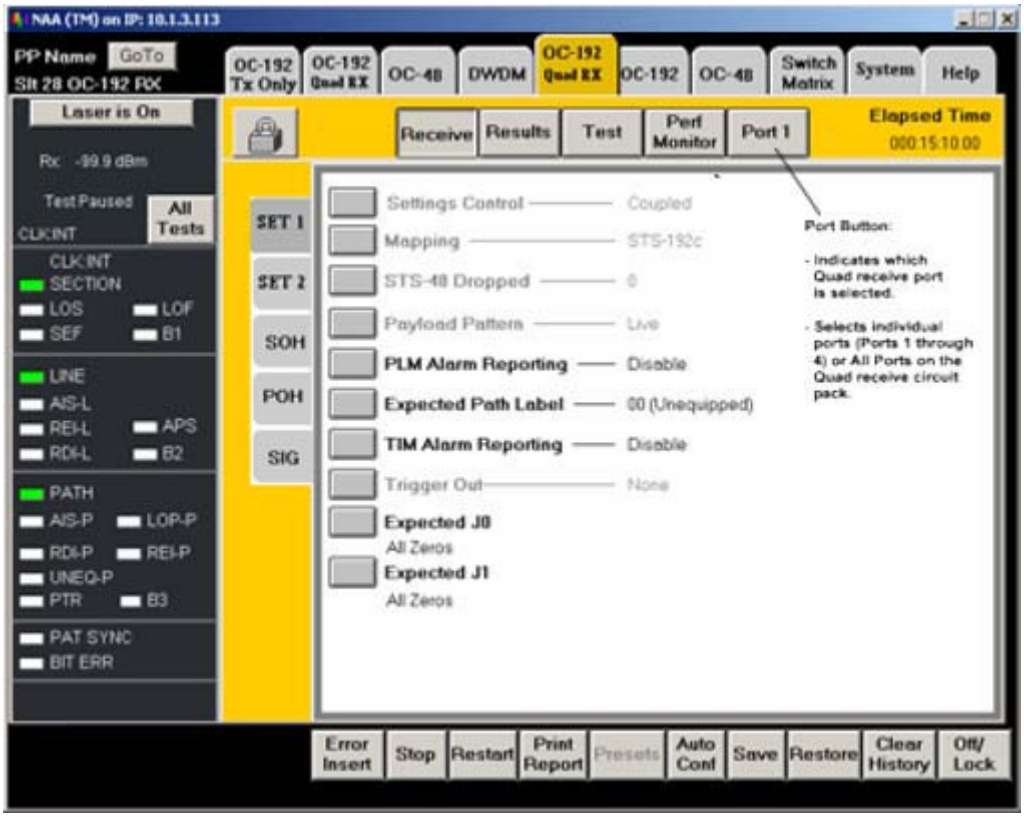
a. Select **View**. The View File window appears.
b. Select **Exit** to close the window.

Quad Port Selection

> This procedure is only valid for units that have a Quad receive circuit pack installed.

A Quad receive circuit pack can accept up to four separate incoming optical channels. The following example illustrates a Quad receive circuit pack configured for SONET.

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To select one of four Quad receive ports:

1. Select the **Quad RX** tab. The protocol processor's receive functions appear.
2. Use the **Port** button to select one of the four ports on the Quad receive circuit pack. (The receive functions associated with that port appear.)

   The **All Ports** option allows changes to be made simultaneously to all ports on a Quad receive circuit pack; however, all of the ports must be locked.

   To lock the ports before using the All Ports option:

   a. Select the **Port <#>** button and choose a port from the Select Port dialog box.

   b. Select the **Lock** icon. See Locking and Unlocking a Test Set for information about using the Lock/Unlock dialog box.

   c. Repeat Steps a and b until all ports are locked.

   d. Select the **Port <#>** button and choose **All Ports**.

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Important: When in All Ports mode, the results that appear when the **Results** button is selected only apply to the current port. The current port appears on the Port button, for example, All (Port 1).

When a Quad receive circuit pack is selected, the **Transmit** button and **APS** functions are not available.

Port Selection

The GigE contains four connection ports that operate independently.

- Two Gigabit Ethernet optical ports
- Two 10/100 Mbps ports

To select a port to configure or monitor:

1. From the Ethernet tab, select the **Port <#>** button.
2. The following port options appear:
    - **Port 1** (optical port) selects Port 1. Any subsequent changes made to the GigE unit apply to Port 1.
    - **Port 2** (optical port) selects Port 2. Any subsequent changes made to the GigE unit apply to Port 2.
    - **Port 3** (10/100 Mbps port) selects Port 3. Any subsequent changes made to the GigE unit apply to Port 3.
    - **Port 4** (10/100 Mbps port) selects Port 4. Any subsequent changes made to the GigE unit apply to Port 4.

Locking and Unlocking a Test Set

To prevent users from interfering with each other, an individual user can "lock" and take control of a test set. This is done using the Lock icon that appears on the GUI. Permission levels determine the user's ability to lock and unlock a test set. When you lock the test set, you can configure protocol processors, start tests, and perform general product functions without the worry of contending for resources with another user.

When a test set is locked by someone else, the  icon is displayed.

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To unlock a test set locked by someone else:

1. Select the icon. The Lock/Unlock dialog box appears.
2. Select **Force Unlock**. The command buttons change to "Lock and Exit" and "Lock".

> You must have **Admin** privileges to be able to force the unlock.

3. Selecting one of the following causes the command buttons to change to "Unlock and Exit" and "Unlock", and the information boxes become available.
    - **Lock and Exit** - Locks the unit and automatically closes the dialog box. To enter notes after the dialog box closes, select the locked icon to reopen the dialog box.
    - **Lock** - Allows you to enter note information in the Circuit Info: and Contact Info: boxes before closing the dialog box. The notes carry over to all protocol processors in the test set. When a different test set is locked the user can enter notes pertinent to it.
4. To enter note information, select **Circuit Info:** and/or **Contact Info:**. The Enter User String keyboard opens.
5. Type notes and select **Enter**. The notes appear in their associated information box.
6. Select **Exit** to close the Lock/Unlock dialog box.

When you have the test set locked, the  icon is displayed.

To unlock a test set that you have locked:

1. Select the icon. The Lock/Unlock dialog box appears.
2. Selecting one of the following causes the command buttons to change to "Lock and Exit" and "Lock":
    - **Unlock and Exit** - Unlocks the unit and automatically closes the dialog box.
    - **Unlock** - Unlocks the unit without closing the dialog box. Select **Exit** to close the Lock/Unlock dialog box.

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When the test set is unlocked, the  icon is displayed.

To lock a test set:

1. Select the icon. The Lock/Unlock dialog box appears.
2. Selecting one of the following causes the command buttons to change to "Unlock and Exit" and "Unlock", and the information boxes become available.
    - **Lock and Exit** - Locks the unit and automatically closes the dialog box.
    - **Lock** - Allows you to enter note information in the **Circuit Info:** and **Contact Info:** boxes before closing the dialog box. The notes carry over to all protocol processors in the test set. When a different test set is locked the user can enter notes pertinent to it. Select **Exit** to close the dialog box.

Rebooting the Unit

This function allows the system to write unsaved data to the disk before you reboot the unit. You can perform this task from the System I/O window or by selecting the Off/Lock button on a protocol processor.

Important: Rebooting the test set must be done from the NIC touch screen.

To reboot the unit from the System, I/O Settings window:

1. Select the **System** tab and choose **I/O Settings**.
2. Select **Ethernet** and choose **Reboot**. The Reboot dialog box appears.
3. Select **OK** to continue with the reboot process, or Cancel to keep the unit on. The Shutdown in Progress message box appears.
4. After all unsaved data is written to the disk, the unit restarts.

    Important: If the unit does not successfully reboot turn it off manually by toggling the On/Off switch to **Off**.

To reboot the unit from a protocol processor tab or Switch Matrix:

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1. Select the **Off/Lock** common function button. The Unlock Login dialog box appears.

> Important: Do not enter the User ID or Password.

2. Select **Reboot**. The Reboot dialog box appears.
3. Select **OK** to continue with the reboot process, or Cancel to keep the unit on. The Shutdown in Progress message box appears.
4. After all unsaved data is written to the disk, the unit restarts.

> Important: If the unit does not successfully reboot turn it off manually by toggling the On/Off switch to **Off**.

Replaying Graphs

Use the **Replay Graphs** button to open any previously saved graph (.GRP) that is stored on the system.

Use the **Stop Replay** button to close the graph file.

Recording in the Event Log

The Event Log is a table that displays events recorded by the unit. A scroll bar is available, allowing you to scroll up and down to view an extended history.

To use the Event Log:

1. Select a protocol processor tab.
2. Select the **Results** button.
3. Select **Event**. As events occur (such as alarms, errors, or Pointer activity) they appear and continuously scroll in the table.

   Events display in a ascending order from the most recent event to the oldest event. The Descending button indicates that events appear in descending order. (This button switches between descending event order appearance and ascending event order appearance. The current label of the button indicates the event order.)

4. Select **Pause** to stop the scrolling action and then use the scroll bar to view events. Select **Resume** to restart the event log.

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5. To display events in an ascending order, select **Descending**. The button changes to Ascending and the events appear from the oldest event to the most recent event.
6. Select **Resume** to continue Event Log reporting.

Remote Control Application

The Remote Control Application software is a graphical user interface that allows you to remotely connect to and control portable and rackmount products from a PC.

Before using the Remote Control Application:

- Verify the minimum software and hardware requirements.
- Verify that the Ethernet parameters have been entered into your unit.
- Verify that you have security access to the unit.
- Verify that FTP service is enabled on the unit.
- Install the Remote Control Application on to your PC.
- If the remote unit uses a PCMCIA modem for dial-up connectivity, configure the Remote Control Application for PCMCIA operation.

To start the Remote Control Application:

1. Select the Remote Control Application shortcut icon that appears on your PC's desktop.
2. Enter the remote unit's IP address, and your user ID and password.
3. Select **OK**.
4. Once the connection is made, the remote unit's GUI appears. The title bar contains the product name and connection method. Use your mouse to select functions.

   To automate the log on process, select Automating the Remote Control Icon for more information.

IMPORTANT: Files that are created when using the Remote Control Application are saved on your PC in the Remote Control's compatibility directory. This directory can be overwritten when connecting to other remote units that have the same compatibility level, but are different models (for

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example, a NIC Plus, a NIC 10G, and so on).

If you want to keep these files, copy and save the following to a backup directory on your PC that is not in the compatibility directory's path:

- Any file with the .set, .stat, .evt, .aps, .perf, or .rep extension.
- The client.prop file. Changes to this file are only needed if the remote unit uses a PCMCIA modem for its dial-up connection.

Remote Control Application Requirements

The minimum software requirements are:

- Windows NT 4.0, Windows XP, Windows 2000, or Windows 98 operating systems.
- Microsoft Internet Explorer 4.0 or greater.
- Host domain and IP address information for LAN access.
  Make sure that this information is entered into your unit. Refer to Ethernet Port Configuration for more information.
- TCP/IP Network Protocol

The minimum hardware requirements are:

- A personal computer with a 300-MHz Pentium processor or faster.
- 128 MB RAM (256 MB RAM recommended for optimum performance)
- 60 MB of free disk space
- An SVGA monitor with a minimum screen resolution of 800 by 600 pixels and 256 colors (1025 by 768 recommended for optimum viewing).
- A CD-ROM drive (if installing from a CD-ROM) or web browser (if installing from the DLI web site) for software installation.
- A standard 10BaseT Ethernet cable for connectivity between the unit and the network.

If you connect the unit directly to your PC, you will need the following:

- A network interface card installed in your PC.

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- A crossover 10BaseT Ethernet cable for connectivity between the unit and the PC's network interface card.

Ethernet Port Configuration

To configure the unit's Ethernet port:

If Ethernet port parameters are changed, the unit must be rebooted for the changes to take affect.

1. Select **System**.
2. Select **I/O Settings**.
3. Enter the unit's **IP Address**, **Subnet Address**, and **Router Address** from the Ethernet Configuration functions.

WARNING: IP addresses **192.168.138.000 through 192.168.138.255** are reserved and should not be used. A system conflict can occur if these IP addresses are entered.

Security Settings

Security is an administrative function and only appears if you are logged on as an Administrator. This screen is divided into the following main sections: User Security Information, System Services/FTP Administrator, and Reset System.

User Security Information

This function allows you to view the following security information on system users:

- User Name
- Permissions: Read Only, Read/Write, Calibrate, or Admin
- Active User: Displays the user's current status.
- Current Permissions: If Security System Lock is enabled, shows users that may temporarily have read only privileges.
- Default User

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The Security function also enables a user with administrator privileges to perform the following tasks:

- Add a User
- Delete a User
- Update a User Profile
- Enable/Disable Security System Lock
- Establish a Default Login
- Establish a Required Login

If the Security System Lock function is enabled, only one user with Read and Write permissions (this includes Calibration and Admin users) can be logged in at a time. If a user with Read and Write permissions is already logged in, a window will appear giving you the option of logging in with Read- Only permissions only. When the user logs on with Read-Only permissions, all functionality will be disabled with the exception of the online help and the About this product function.

System Services and FTP Administrator

- **System Services:** Allows an administrator to disable specific network services to meet their network's security policies. To enable a system service, select its checkbox. To disable a system service, remove the check so that the checkbox is blank.
- **FTP Administrator:** Assigns a user ID and password so that a user can log in to a remote computer and transfer files using the file transfer protocol service.

Reset System

- Restores default Security settings.

System Services

The following system services can be enabled or disabled by an Administrator.

A unit reboot is required if any changes are made to system services.

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- **Internet Information.** The IIS (Internet Information Server) service provides the ability to host a simple web server, which uses port 80 (http). This function can be disabled (deselect the checkbox) to prevent unauthorized access to the port.
- **File Transfer Protocol.** The FTP service allows a user to remotely log in to the unit and transfer files. Disabling this function can prevent unauthorized access to ports 20 and 21.

> FTP service must be enabled if you use the Remote Control Application or the DLI Software Upgrade software. You can not connect to the unit using these applications if FTP service is disabled.

- **Remote Procedure Call.** This protocol allows an application on one PC to request a service from another application located on a different PC within in a LAN. Disabling this function can prevent unauthorized users from using the unit to access other equipment in a customer's network.
- **Telnet.** The Telnet service allows a user to log in to a remote system. Disabling this function can prevent unauthorized users from using the unit to access a customer's network.
- **NetBIOS.** The NetBIOS (Network Basic Input/Output System) program allows applications to use port 139 to communicate to different PCs within a LAN. This function can be disabled to prevent unauthorized access to the port.
- **SCPI.** The SCPI (Standard Commands for Programmable Instruments) service uses port 8090 to send and receive SCPI commands to the unit. Disabling this function will prevent unauthorized access to the port.
- **TL1.** The TL1 (Transaction Language 1) service uses port 8080 to send and receive TL1 commands to the unit. Disabling this function will prevent unauthorized access to the port.
- **SNMP.** The SNMP (Simple Network Management Protocol) service uses ports 161 and 162 to transfer commands and traps to and from the unit. Disabling this function will prevent unauthorized access to these ports.

Remote Control Application Installation

The Remote Control Application is supplied on a CD-ROM.

To install from a CD-ROM:

1. Close any applications running on your PC before installing the software.

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2. Insert the CD into the PC's CD-ROM drive.
3. The auto-run function starts and displays the Welcome screen.
4. Select **Remote Control Application** from the **Software** tab and click **Install**.
5. Follow the on-screen instructions to install the software into a directory and create a program folder.
6. You must restart your PC before using the Remote Control Application. Determine if Windows will start now **(Yes)** or later **(No)**, and then select **Finish** to complete installation. A shortcut icon and program item are created for the Remote Control Application.

Ethernet Configuration

If Ethernet port parameters are changed, the unit must be rebooted for the changes to take affect.

The following configures the Ethernet port's parameters:

- **Obtain an IP address from a DHCP server:** The unit will uses the network's Dynamic Host Connection Protocol (DHCP) server to dynamically assign it an IP address. ***When selected, the IP Address, Subnet Address, Router, Host Name, and Domain Name functions are disabled, but will be populated by the DHCP server.***
- **Specify an IP address:** Allows a static IP address to be entered using the IP Address, Subnet Address, Router, Host Name, and Domain Name functions.
- **IP Address:** Enter the unit's IP address using dotted decimal notation. For example, **nnn.nnn.nnn.nnn**, where **nnn** is a value from 0 to 255.

WARNING: IP addresses **192.168.138.000 through 192.168.138.255** are reserved and should not be used. A serious system conflict can occur if these IP addresses are entered.

If you must use an IP address in the range of **192.168.x.y** (where x is not equal to 138), then you must set the Subnet Address to **255.255.255.0**.

- **Subnet Address:** Enter the subnet address using dotted decimal notation.

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- **Router:** Enter the Router address using dotted decimal notation.
- **Host Name:** Enter the unit's host name (for example, NICPLUS). This is an optional parameter.
- **Domain Name:** Enter the unit's domain name (for example, lightwave.com). This is an optional parameter.
- **Port Assignment:** Sets the Ethernet port to one of the following interfaces – None, SCPI, TL1, or SNMP.

The **Host Name** and **Domain Name** parameters defined for Ethernet Configuration screen also apply to the Wireless Configuration screen. Any changes made to these parameters on one screen will also be made on the other screen.

Add a New User

If the System Lock function is enabled, only one user with Read and Write permissions (this includes Calibration and Admin users) can be logged in at a time. If a user with Read and Write permissions is already logged in, a window will appear giving you the option of logging in with Read permissions only.

1. Select **System**.
2. Select **Security**. The Security screen appears.
3. From the User Name column, select **NEW USER**.
4. Under Account Information, select , which is next to the User ID field. A keypad appears.
5. Enter the user ID.
6. Select , which is next to the Password field. A keypad appears.
7. Enter a password.
8. Select , which is next to the Permissions field. The Select User Permissions window appears with the following options:
    - **Read:** Allows the user read-only privileges.
    - **Read/Write:** Allows the user to read and update information.

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- **Calibrate:** Allows the user read and write privileges and the ability to perform calibration procedures on the unit.
- **Admin:** Allows the user to perform network administrator tasks such as calibrating, adding, deleting, and updating user profiles.

9. Select a user permission option.
10. Select **Update**. The new user profile is added and appears on the User List.

Automating the Remote Control Application Icon

The Remote Control Application software is a graphical user interface that allows you to remotely control portable and rackmount products from a PC. An icon for the Remote Control Application software is created and placed on your desktop when the software is installed.

You can add IP address, user ID, and password parameters to the icon to automate the log on process.

1. From the desktop, right click on the Remote Control Application icon.
2. Select **Properties** and choose the **Shortcut** tab.
3. Place the cursor at the end of the **Target** text box.
4. Press the space bar and type:

   ip=*x.x.x.x*,uid=*y*,pw=*z*

   where, *x.x.x.x* is the system's IP address
   y is the system's user ID (case sensitive)
   z is the system's password (case sensitive)
5. Click **OK**.
6. When you double click the Remote Control Application's icon, a connection is made and the remote system's GUI appears.


If an invalid parameter is entered, the automatic log on will fail, and you must enter the appropriate data.

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Remote Control Application Removal

Important: Reports that were saved to the Compat4030 folder, located in the Remote Control Application directory (for example, C:\Program Files\GalaxyNIC\Compat4030) will be deleted during the uninstall process. To save historical reports, copy the data files to a folder located outside of the Remote Control Application directory before proceeding with the uninstall process.

To remove the Remote Control Application

1. Close the Remote Control Application.
2. Click the **Windows Start** button and choose **Settings**.
3. Select **Control Panel** and choose **Add/Remove Programs**.
4. Select **Remote NIC** and click the **Add/Remove** button.
5. Follow the on-screen instructions.
6. Open Windows Explorer and locate the Remote Control Application (GalaxyNIC) directory. For example, C:\Program Files\GalaxyNIC.
7. Delete the **GalaxyNIC** folder.
8. Install the new Remote Control Application.

Rename a File

1. From the **System** tab, select **Files Services**.
2. Select a file from the File List box.
3. Select **Rename**. A keyboard appears. Enter the new file name with extension. (Do not use spaces in file names.)
    - SET is the default extension for a Settings report.
    - STAT is the default extension for a Statistics report. (This includes tests produced using the Act/Duration button.)
    - EVT is the default extension for an Event report.
    - APS is the default extension for an APS report.
    - GRP is the default extension for a Graph report.
    - BMP is the default extension for a Print Screen image.

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- PERF is the default extension for a Performance Monitor report.

4. Select **Enter** from the keyboard. The file is renamed.

The extensions above are default file extensions. You are able change these to .txt (text) files using the **Rename** function.

Resetting the System

This Administrator function clears and restores default settings to the following:

- User Accounts - deletes all user accounts and restores the default Admin account.
- FTP Administrator - deletes the FTP account and restores the default FTP user ID and password.
- System Services - restores all default system service settings.

User files, such as the protocol processor's transmit and receive settings, report statistics, graphs, and test results, are not deleted. These files are managed using File Services.

To reset the system:

1. Select **System**.
2. Select **Security**. The Security screen appears.
3. Select the **Reset System** button.
4. A message confirming that you want to reset the system appears. Select **Yes**.
5. A message stating that the system must be restarted for changes to take affect appears. Select **OK**.
6. Restart the system.

Security Settings

Security is an administrative function and only appears if you are logged on as an Administrator. This screen is divided into the following main sections: User Security Information, System Services/FTP Administrator, and Reset System.

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User Security Information

This function allows you to view the following security information on system users:

- User Name
- Permissions: Read Only, Read/Write, Calibrate, or Admin
- Active User: Displays the user's current status.
- Current Permissions: If Security System Lock is enabled, shows users that may temporarily have read only privileges.
- Default User

The Security function also enables a user with administrator privileges to perform the following tasks:

- Add a User
- Delete a User
- Update a User Profile
- Enable/Disable Security System Lock
- Establish a Default Login
- Establish a Required Login


If the Security System Lock function is enabled, only one user with Read and Write permissions (this includes Calibration and Admin users) can be logged in at a time. If a user with Read and Write permissions is already logged in, a window will appear giving you the option of logging in with Read- Only permissions only. When the user logs on with Read-Only permissions, all functionality will be disabled with the exception of the online help and the About this product function.

System Services and FTP Administrator

- **System Services:** Allows an administrator to disable specific network services to meet their network's security policies. To enable a system service, select its checkbox. To disable a system service, remove the check so that the checkbox is blank.

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- **FTP Administrator:** Assigns a user ID and password so that a user can log in to a remote computer and transfer files using the file transfer protocol service.

Reset System

- Restores default Security settings.

System Services

The following system services can be enabled or disabled by an Administrator.


A unit reboot is required if any changes are made to system services.

- **Internet Information.** The IIS (Internet Information Server) service provides the ability to host a simple web server, which uses port 80 (http). This function can be disabled (deselect the checkbox) to prevent unauthorized access to the port.
- **File Transfer Protocol.** The FTP service allows a user to remotely log in to the unit and transfer files. Disabling this function can prevent unauthorized access to ports 20 and 21.


FTP service must be enabled if you use the Remote Control Application or the DLI Software Upgrade software. You can not connect to the unit using these applications if FTP service is disabled.

- **Remote Procedure Call.** This protocol allows an application on one PC to request a service from another application located on a different PC within in a LAN. Disabling this function can prevent unauthorized users from using the unit to access other equipment in a customer's network.
- **Telnet.** The Telnet service allows a user to log in to a remote system. Disabling this function can prevent unauthorized users from using the unit to access a customer's network.
- **NetBIOS.** The NetBIOS (Network Basic Input/Output System) program allows applications to use port 139 to communicate to different PCs within a LAN. This function can be disabled to prevent unauthorized access to the port.

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- **SCPI.** The SCPI (Standard Commands for Programmable Instruments) service uses port 8090 to send and receive SCPI commands to the unit. Disabling this function will prevent unauthorized access to the port.
- **TL1.** The TL1 (Transaction Language 1) service uses port 8080 to send and receive TL1 commands to the unit. Disabling this function will prevent unauthorized access to the port.
- **SNMP.** The SNMP (Simple Network Management Protocol) service uses ports 161 and 162 to transfer commands and traps to and from the unit. Disabling this function will prevent unauthorized access to these ports.

File Services

This function provides file management of saved reports. It allows you to:

- Print any saved report file
- Upload report files from the unit
- Download report files to the unit
- View any report printed to file
- Rename report files
- Delete report files
- View file details (size and modification date)
- Create a new directory for file storage

Restart an Error, Alarm, or Event

The Restart common function button performs the following activities:

- **Starts** error, alarm, or event activity that was stopped using the Stop button.
- **Clears and resets** error, alarm, and event activity counters, statistics, and LEDs for the current protocol processor.

To restart a test or reset statistics:

- Select the **Restart** button located at the bottom of the touch screen. Configured testing on the current protocol processor is restarted.

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Restoring a Settings Configuration or Factory Defaults

This function allows you to perform the following actions:

- Restore the unit's factory default settings.
- Restores or recalls any saved configurations for all protocol processors' Receive or Transmit settings.

To restore a settings configuration:

1. Select **Restore** from the common function buttons. The Select Type of Restore window appears with the following options:
    - **Factory Defaults:** Restores the unit's default settings. If this option is selected, the default settings are immediately restored. (See Factory Default Mode to set the unit's default Protocol Processor mode.)
    - **User File:** Recalls any saved configurations for a protocol processor's Receive or Transmit settings. If this option is selected, go to step 2.
2. If User File is selected, the File Browser window appears. From the File list, select the name of the settings configuration to be restored.
3. Click **OK**. The User File settings configuration selected is restored.

Round-Trip Delay Testing

The round-trip delay function allows you to transmit a known frame into your network and measure how long it takes for the frame to return to the unit.

To generate and measure round-trip delay:

1. Select an SDH or SONET protocol processor.
2. Select **Test**.
3. Select **RTD**. The Round-Trip Delay screen appears.
4. To fine-tune the measurement, select **Consecutive Good Time Required** or **Consecutive Good Frames Required** (these parameters are coupled). Otherwise, continue to step 5.

    If one of the following is selected, a keypad appears.

    - If *Consecutive Good Time Required* is selected, enter the duration (in milliseconds) of valid frames to occur before the round-trip delay

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function is confirmed to be activated. The range is 0.125 to 2047.875 milliseconds.

- If *Consecutive Good Frames Required* is selected, enter the number of valid frames to occur before the round-trip delay function is confirmed to be activated. The range is 1 to 16383 frames.

5. Select **Action State**. The round-trip delay options appear.
6. Select **Single Round-Trip Delay** or **Continuous Round-Trip Delay** to start the round-trip delay function.

    - If *Single Round-Trip Delay* is selected, an AIS alarm is inserted into a frame and transmitted once through your network. The frame's transmission through the network is measured in frame counts and milliseconds. Frame counts indicates the number of frames received before the AIS frame is received by the unit. Milliseconds indicates how long it took for the AIS frame to travel out and return to the unit.
    - If *Continuous Round-Trip Delay* is selected, an AIS alarm is inserted into a frame and continuously transmitted through your network. The current frame count and duration appear in the **Current** column. The fastest round trip appears in the **Minimum** column and the slowest round trip appears in the **Maximum** column.

To stop the round-trip delay function:

1. Select **Action State**.
2. Select **Stop Round-Trip Delay**.

Save a Customized Settings Configuration

Saves a customized configuration for all protocol processors' Transmit or Receive settings. For example, when a customized settings configuration is saved while in a particular protocol processor mode (for example, STM-4), the settings currently configured for other protocol processors (for example, E1, E3, STM-16, etc.) will also be saved with that setting configuration.

To save a configuration:

1. Create a test configuration using the Transmit and Receive Settings screens.
2. Once you are done, select **Save** from the common function buttons. The File Browser window appears.

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3. Select **File Name**.
4. Enter the name of the setting configuration to be saved, and select **Enter** when done. The file is saved with an automatic file extension of .set.

Saving Graphs for Replay

Select the Save Graphs button to save the graphed results to a file for replay at a later time. The graph is saved with a .grp extension. To view the graph select the **Replay Graphs** button and choose the desired .grp file from the Browser dialog box.

WARNING: Files saved when working with the Remote Control Application will not be accessible from the NIC unit touch-screen and visa-versa. The remote application saves the files to the Remote Control (GalaxyNIC) directory on the PC. The NIC unit saves the files to its default D:\DLI... drive on the test unit.

For instructions on accessing a saved file see Print or View Saved Files.

Configuring the Screen Saver

The screen saver can be turned off or configured to activate after a set period of time. When the screen saver is operating, you can clear it by touching anywhere on the touch screen.

1. From the **System** tab, select **Misc**.
2. Select **Start Screen Saver**. The Select Screen Saver Delay dialog box appears.
3. Select the desired delay period.

To disable the screen saver:

1. From the **System** tab, select **Misc**.
2. Select **Start Screen Saver** and choose **Off**.

Changing SONET/SDH Overhead Bytes

The following only applies to SONET and SDH protocol processors.

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The SOH and POH functions allow you to stress a SONET or SDH network by directly editing overhead (OH) bytes to simulate errors, alarms, and other stress conditions.

A specific slot can be selected, and its OH bytes can be changed for transmission out of the system. **SONET overhead** includes Section, Line and Path overhead bytes. **SDH overhead** includes Regenerator Section (RS), Multiplex Section (MS), and Higher-Order Path (HP) overhead bytes. By altering the OH bytes, this allows other equipment to detect, and if necessary, react to these changes.

To change overhead bytes:

1. Select an SDH or SONET protocol processor mode.
2. Select the **Transmit** button.
3. Select the **SOH** or **POH** button to display OH bytes.
4. In *SDH* mode, select a slot using the **SOH Slot** function.

   In *SONET* mode, select a slot using the **STS-1 Slot** function.
5. Select an OH byte.

   A keypad appears allowing the byte's 8-bit pattern to be edited. The byte appears in binary notation by default. Use the keypad's 1 and 0 buttons to change the bit value. Bit values are changed from the least significant bit to the most significant bit (from right to left).

   The byte can also appear in HEX or decimal notation by select the **HEX** or **DEC** button on the keypad.


The bit value can also be erased from the keypad using the **Clear** button.

6. When editing is complete, select **OK** to save the new value. (**Cancel** discards any changes made to the byte and restores the previous value.)

Displaying SDH/SONET Overhead Bytes


The following only applies to SDH and SONET protocol processors.

The system allows you to view Overhead bytes that are transmitted and received on the SDH or SONET signal.

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To view transmitted Overhead bytes:

1. Select a SONET or SDH protocol processor.
2. Select the **Transmit** button.
3. Select the **SOH** or **POH** button to display OH bytes.

   The Overhead bytes for the current SOH slot or STS-1 slot appear.

   From this screen, the Overhead bytes can be edited as described in **Changing SONET and SDH Overhead Bytes**.

4. To view Overhead bytes for other slots, select the **Showing** or **STS** button and enter a slot (1 to 192 for OC-192 or STM-64; 1 to 48 for OC-48 or STM-16; 1 to 12 for OC-12 or STM-4, and so on). Select **OK**, and the bytes for that specific slot appear.

To monitor incoming Overhead bytes:

1. Select an SDH or SONET protocol processor mode.
2. Select the **Receive** button.
3. Select the **SOH** or **POH** button to display OH bytes.

   The Overhead bytes for the selected slot (of the incoming SONET or SDH signal) appear.

   Use the **Showing** or **STS** button to view Overhead bytes for other slots.


Overhead bytes and trace bytes cannot be edited from this screen.

Changing SDH/SONET Overhead Bytes in Passthru Mode


The following only applies to SONET and SDH protocol processors.

Passthru mode allows an incoming signal to pass through the unit without altering the data in the signal. However, the overhead bytes (A1/A2, K1/K2, D1-D3, D4-D12, E1, F1, M1, and E2) can be changed to simulate errors, alarms, and other stress conditions such as Pointer Adjustments. This lets you verify if equipment in the SONET or SDH network can detect changed overhead bytes.

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To configure the unit for Passthru mode:

1. Select a SONET or SDH protocol processor.
2. Select the **Transmit** and choose **SET 1**.
3. Select the **Passthru Mode**. The Select Passthru Mode dialog box appears.
4. For STM-64/16 or OC-192/48, select **On** to enable Passthru mode.

   For STM-4 or OC-12, select **Intrusive** or **Intrusive Add/Drop** to enable Passthru mode.

To change Overhead bytes in Passthru mode:

1. Select the SOH or **POH** button.

   When Passthru mode is enabled:

   - The OH bytes are passed-through (looped) the system without being altered. (These bytes are disabled on the touch screen.)
   - The **Intrusive Overhead** buttons appear. These buttons allow you to select a specific OH byte and change its value.

2. Select an **Intrusive Overhead** button. For example, select F1 Pass.

   The selected Intrusive Overhead button changes to indicate that a specific byte has been selected. For example, F1 Pass now appears as F1 Intrude. In addition, the OH byte is now enabled and displays its value.

3. Select the same OH byte (from the left side of the touch screen) that you selected for Passthru mode (on the right side of the touch screen). For example, select the F1 byte.

   A touch screen keypad appears allowing the byte's 8-bit pattern to be edited. The byte appears in binary notation by default. Use the keypad's 1 and 0 buttons to change the bit value. Bit values are changed from the least significant bit to the most significant bit (from right to left).

   The byte can also appear in HEX or decimal notation by selecting the **HEX** or **DEC** button on the keypad.

4. When editing is complete, select **OK** to save the new value which will be transmitted out of the unit.
5. Repeat steps 2-4 to reconfigure other OH bytes.

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SDH/SONET Signal Notification

The following only applies to SDH and SONET protocol processors.

The unit can use SS bits to determine if it is receiving an SDH or SONET signal. If the received signal does not match the expected signal, the SS Bits Mismatch LED turns red. The SS bits are bits 5 and 6 of the H1 Pointer byte. These bits determine if the H1 byte is configured for SDH or SONET operation.

To configure the unit for SDH/SONET signal detection:

1. Select an SDH or SONET protocol processor.
2. Select **Receive**.
3. Select **SET 2**.
4. Select the **Expected SS Bits** function. The Select Expected SS Bit window appears.
5. Select an SS bits option.
6. Select the **SS Bits Alarm Reporting** function and select **Enable**.

   An alarm is reported if the incoming SS bits on the received signal do not match the expected SS bits.

Security Settings

Security is an administrative function and only appears if you are logged on as an Administrator. This screen is divided into the following main sections: User Security Information, System Services/FTP Administrator, and Reset System.

User Security Information

This function allows you to view the following security information on system users:

- User Name
- Permissions: Read Only, Read/Write, Calibrate, or Admin
- Active User: Displays the user's current status.
- Current Permissions: If Security System Lock is enabled, shows users that may temporarily have read only privileges.

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- Default User

The Security function also enables a user with administrator privileges to perform the following tasks:

- Add a User
- Delete a User
- Update a User Profile
- Enable/Disable Security System Lock
- Establish a Default Login
- Establish a Required Login


If the Security System Lock function is enabled, only one user with Read and Write permissions (this includes Calibration and Admin users) can be logged in at a time. If a user with Read and Write permissions is already logged in, a window will appear giving you the option of logging in with Read- Only permissions only. When the user logs on with Read-Only permissions, all functionality will be disabled with the exception of the online help and the About this product function.

System Services and FTP Administrator

- **System Services:** Allows an administrator to disable specific network services to meet their network's security policies. To enable a system service, select its checkbox. To disable a system service, remove the check so that the checkbox is blank.
- **FTP Administrator:** Assigns a user ID and password so that a user can log in to a remote computer and transfer files using the file transfer protocol service.

Reset System

- Restores default Security settings.

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Display Serial Numbers and Software Revision

This function displays the following information:

- Copyright Information
- Feature set number
- Graphical User Interface Version
- Customer Service Information
- Circuit Pack Information
    - Product Serial Number
    - Kit Number
    - System Control Version
    - SCPI Version
    - TL1 Version
    - SNMP Version
    - OmniOrb Version
    - UPX Version
    - zlib Version
    - Kit Numbers and Versions

To view this information:

1. Select **System**.
2. Select **About this product**. The software revision number and hardware serial numbers appear.
3. To close the **About this product** box, select **OK**.

You may also obtain some of the product information by viewing the product label located on the unit. For example:



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Increase or Decrease Speaker Volume

This function allows you to increase or decrease the speaker volume in order to hear the touch screen beep.

To increase or decrease speaker volume:

1. From the **System** tab, select **Misc**.
2. From **Speaker Volume**, select the **Low** arrow to decrease the volume, or **High** arrow to increase the volume.

Starting a Test

The Duration and Action After Duration functions determine how long a test runs and what activities occur at the end of the test.

To start a test:

1. Select the protocol processor that is running the test.
2. Select **Test**. The Duration and Action After Duration functions appear under **SET 1**.
3. Select **Duration**. The Select Duration of a Test dialog box appears.
4. Select how long you want the test to run.
5. Select **Action After Duration**. The Select Action After Test dialog box appears.
6. Choose the desired action that will occur at the end of the test. When you select **Repeat Actions**, the Select Repeat Action after Test dialog box appears. When you select **Realtime Actions**, the Select Realtime Actions after Test dialog box appears.

Real-time test reporting is only available locally (from the touch screen) on portable test sets.

To stop a test before the test duration expires:

- Select the **Stop** common function button. All statistics and events logged and reported by the Performance Monitoring and Results functions stop. In addition, the Elapsed Time and Duration counts stop.

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To restart a test:

- Select the **Restart** common function button. The test and statistics clear and the Elapsed Time counter restarts at zero.

To pause a test:

- Select **Pause Test**. When Pause is selected, the system will stop collecting data, but the elapsed time counter will continue.

To resume a paused test:

- Select **Resume Test**.

Duration

This function configures how long a timed test runs. The following options are available:

Options	Description
Continuous	Test is untimed, and unit is always collecting data.
5 Minutes	Test runs for 5 minutes.
15 Minutes	Test runs for 15 minutes.
1 Hour	Test runs for 1 hour.
2 Hours	Test runs for 2 hours.
24 Hours	Test runs for 24 hours.

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72 Hours	Test runs for 72 hours.
1 Week	Test runs for 1 week.
2 Weeks	Test runs for 2 weeks.
User Defined	Allows a specific test duration to be entered using a touch screen keypad. The minimum duration is 1 minute. The maximum duration is 99 days, 23 hours, and 59 minutes.

Action After Duration

Action after Duration defines what activities occur at the conclusion of a timed test. It allows several different options, including printing results to a printer or recording them to a file; repeating a test or just processing one test. Test results appear in a columned report format; however, there is one option available to record the statistics using a delimiter.

To determine how long a test will run, refer to Duration.

Print Options

When a print option is chosen, the report prints directly to a printer. If you are using the NIC touch-screen, a printer must be attached to the NIC's parallel or serial port. (See Printer Port Configuration.)

Record Options

When a record option is chosen, the results are saved to a file with one of the following extensions:

- **.evt** - Event Report. A detailed summary of alarms, errors, and pointer activity.
- **.statE** - Event Report. Used when the *Record Statistics/Events and Repeat Test* option is selected.
- **.stat** - Results Report. A statistics report of the Scan, Errors, Alarms, and PTR functions.

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- **.real** - Real-time Test Report. Real-time reports generated only from the NIC touch screen.

The file naming convention is: **xxhhmmss.<extension>** (where **xx** is the protocol processor, **hh** is hours, **mm** is minutes, **ss** is seconds). For example, a file named "OC163035.evt" represents an OC-192/48/12 test event that was recorded at 16:30:35.

To learn how to print or view a saved file, see the topic Print or View Saved Files.

The table below describes the Action after Duration options.

Options	**Description**
None	No action occurs at the end of the test duration.
Print Current Statistics	Test statistics are printed to a printer at the end of a timed test. The test does not repeat.
Record Current Statistics	Test statistics are printed to a file (.stat) at the end of a timed test. The test does not repeat.
Record Current Statistics using a delimiter	Test statistics are printed to a file (.stat) at the end of a timed test. The results appear in a quote/comma-report format, meaning that error and/or alarm values are enclosed in quotes (") and separated by commas (,). The test does not repeat.
Print Statistics and Repeat Test This option appears when **Repeat Actions** is selected.	Test statistics are printed to a printer at the end of the timed test and the test restarts. This cycle continues until the test is stopped by selecting **Stop** from the Common Function Buttons, or by changing the Action After Duration value.
Record Statistics and Repeat Test This option appears when **Repeat Actions** is selected.	Test statistics are printed to a file (.stat) at the end of a timed test and the test restarts. This cycle continues until the test is stopped by

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	selecting **Stop** from the Common Function Buttons, or by changing the Action After Duration value.
Print Events and Repeat Test This option appears when **Repeat Actions** is selected.	Test events are printed to a printer at the end of the timed test and the test restarts. This cycle continues until the test is stopped by selecting **Stop** from the Common Function Buttons, or by changing the Action After Duration value.
Record Events and Repeat Test This option appears when **Repeat Actions** is selected.	Test events are printed to a file (.evt) at the end of a timed test and the test restarts. This cycle continues until the test is stopped by selecting **Stop** from the Common Function Buttons, or by changing the Action After Duration value.
Print Statistics/Events and Repeat Test This option appears when **Repeat Actions** is selected.	Both test statistics and events are automatically printed to a printer at the end of the timed test and the test restarts. This cycle continues until the test is stopped by selecting **Stop** from the Common Function Buttons, or by changing the Action After Duration value.
Record Statistics/Events and Repeat Test This option appears when **Repeat Actions** is selected.	Both test statistics (.stat) and events (.statE) are printed to a file at the end of a timed test and the test repeats. This cycle continues until the test is stopped by selecting **Stop** from the Common Function Buttons, or by changing the Action After Duration value. Both **.statE** and **.stat** files are recorded.
Print Events and Repeat Test This option only appears on the NIC unit's touch screen when	Enables real-time reporting. Any event that occurs during a real-time test automatically prints to a printer that is attached to the NIC unit. When the test duration expires, the

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Realtime Actions is selected.	test restarts.
Record Events and Repeat Test This option only appears on the NIC unit's touch screen when **Realtime Actions** is selected.	Enables real-time reporting. Any event that occurs during a real-time test automatically prints to a file (.evt). When the test duration expires, the test restarts.
Print and Record Events and Repeat Test This option only appears on the NIC unit's touch screen when **Realtime Actions** is selected.	Enables real-time reporting. Any event that occurs during a real-time test automatically prints to a printer that is attached to the NIC unit and prints to a file (.evt). When the test duration expires, the test restarts.
Print Events This option only appears on the NIC unit's touch screen when **Realtime Actions** is selected.	Enables real-time reporting. Any event that occurs during a real-time test automatically prints to a printer that is attached to the NIC unit. The test does not repeat.
Record Events This option only appears on the NIC unit's touch screen when **Realtime Actions** is selected.	Enables real-time reporting. Any event that occurs during a real-time test automatically prints to a file (.evt). The test does not repeat.
Print and Record Events This option only appears on the NIC unit's touch screen when **Realtime Actions** is selected.	Enables real-time reporting. Any event that occurs during a real-time test automatically prints to a printer that is attached to the NIC unit and prints to a file (.evt). The test does not repeat.

Printer Port Configuration

The unit supports both parallel and serial printers.

For Parallel Printing:

- Attach a parallel printer cable (with a 25-pin male connector on one end) to the unit's **Parallel Port** connector. This is a DB-25 female connector.

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For Serial Printing:

> Important: The following steps must be performed from the NIC unit touch screen. "Printer" is not an available Serial port assignment from the Remote Control Application.

1. Attach a serial printer cable (with a 9-pin female connector on one end) to the unit's **RS-232** port connector. This is a DB-9 male connector.
2. From the **System** tab, select **I/O Settings**.
3. Select the **Serial** button.
4. Select the **Port Assignment** button and choose **Printer**.

Printing or Viewing Saved Files

While running tests, you have the option to save the information to a file. The instructions below tell you where and how to print or view a saved file.

> Important: Files saved when working with the Remote Control Application will not be accessible from the NIC unit touch-screen and visa-versa. The remote application saves the files to the Remote Control (GalaxyNIC) directory on the PC. The NIC unit saves the files to its default D:\DLI... drive on the test unit.

To print or view a saved file:

1. From the **System** tab, select **File Services**.
2. Select a file from the **Disk** directory box. The desired report may display in the main Disk directory, or it may be stored in one of the folders in the directory. Folder names are enclosed in brackets **[foldername]**. To return to the main Disk directory after opening a folder, select **[. .]** or the **Disk** button.

   > Important: Real-time reports generated from the NIC unit touch-screen, using the Action after Duration function, are automatically stored in the [APP] folder. Select the folder to display those reports.

   The following is a list of file extension used for files generated from the Print Report, Graph, or Action after Duration functions:

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- **.aps** - APS Report
- **.evt** - Event Report
- **.perf** - Performance Report
- **.real** - Real-time Test Report (Stored in [APP} folder on NIC unit.)
- **.rep** - Graph Report, BERT Analysis, RFC Thru Put Analysis
- **.set** - Settings Report
- **.stat** - Results Report
- **.statE** - Event Report
- **.grp** - Graph (This is not a text file. It can only be viewed as a graph by selecting **Results,** pointing to **Graph** and choosing the **Replay Graphs** button.)

3. Choose one of the following

To **Print** the file:

a. Select **Print**. A standard Print dialog box appears.


If you want to print a report directly from the NIC unit, make sure that a printer is attached to the unit's parallel or serial port.

b. Select the printer **Name** and choose **OK**.

To **View** the file:

a. Select **View**. The View File window appears.
b. Select **Exit** to close the window.

Using the Switch Matrix

The **Switch Matrix** is a graphical display of the unit's current interface and mapping connections. It allows you to configure the unit from a single screen using the following methods:

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- Switch Matrix components
- Presets button

To configure the unit using the Switch Matrix components:

1. Select the **Switch Matrix** tab.
2. Starting from the left, select an **Interface** button. After selecting an interface, the appropriate Mapping, Container, and Payload buttons are enabled on the Switch Matrix. This will help you create a valid configuration.
3. From the **Mapping** and **Payload** columns, select the desired, and available, Mapping and Payload buttons.
4. Select **Apply**. The unit applies the new configuration. Signal lines appear to illustrate the new data flow.

To disengage the configured protocol connections:

- Select **All to Tx/Rx**. This globally disconnects any internal connections between multiple protocol processors. A protocol processor will now expect to receive a signal using its line interface.

To configure the unit using the Presets button:

1. Select the **Switch Matrix** tab.
2. Select the **Presets** button located below the Switch Matrix. The Presets window appears.
3. Select the **Interface** button and choose an interface as a starting point.
4. Select the **Configuration** button and choose a protocol to connect to the selected interface. If necessary, select the Configuration button again to create additional connections.
5. Select the **Apply** button. The unit takes a few moments to apply the new protocol connections. When complete, the mappings and configurations associated with the selected Preset are automatically made. Signal lines appear to illustrate the new data flow.

   For more information, see Presets.

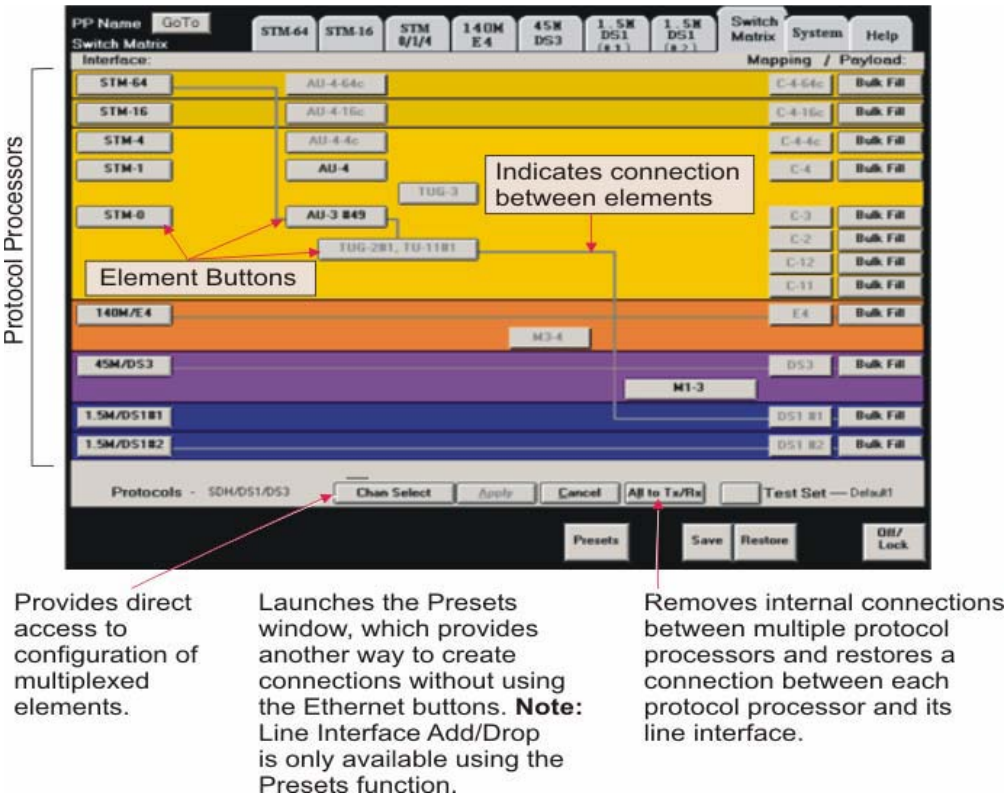
Switch Matrix

The Switch Matrix allows you to display and define a protocol processor's multiplexing structure from a single screen. This fast and convenient

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configuration method lets you select a protocol processor interface, route the signal through available mappings, drop the signal to other protocol processors, and select a payload to use within the signal. (See Switch Matrix Guidelines.)

The following is an example of the Switch Matrix in SDH mode.



Switch Matrix Guidelines

When using the Switch Matrix:

- ALWAYS start from left to right by first selecting an **Interface** button.
- NEXT, after selecting an interface, its available Container, Mapping, and Payload buttons are enabled to help you create a valid signal configuration.
- LAST, after making the connections between elements, select the **Apply** button for the new configuration and connections to take affect.

Enable/Disable Security System Lock

This function allows an administrator to enable a Security System Lock that only allows one user with Read and Write permissions (this includes Calibration and Admin users) to be logged in at a time. If a user with Read and Write permissions

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is already logged in, a window will appear giving you the option of logging in with Read Only permissions only. When the user logs on with Read Only permissions, all functionality will be disabled with the exception of the online help and the About this product function.

To enable Security System Lock:

1. From the **System** tab, select **Security**.
2. Under the **Default Entry**, select the **Security System Lock** check box. A checked box indicates that the Security System Lock function is enabled.

To disable Security System Lock:

1. From the **System** tab, select **Security**.
2. From **Default Entry**, clear the **Security System Lock** check box. A cleared check box indicates that the Security System Lock function is disabled.

Change Tab Name for the Go To Label

1. From the **System** tab, select **User Preference**.
2. Under **Label Preferences**, select **Local** or **Global**.
    - Local – Only changes the tab label for your session. Other users will not see the tab name that you enter.
    - Global – Changes the tab label on the unit so that all users see the same tab name that you enter.
3. Select a tab name from the **Assigned Name** column of the list box.
4. Under **PP Label Information**, enter a name in the **Assigned Name** text field. (When using the touch screen, select  to open a keypad.)
5. Select **Update List Entry**, to add the name to the User Defined Name column of the list box.
6. Repeat steps 3 through 5 to continue adding user-defined names, as desired.
7. Select **Save All List Entries**. The new tab names appear in the PP Name/Go To area of the screen when the protocol processor tab is selected.

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8. Select **PP Name / Go To**, located in the top-left corner of the touch screen. The Select Protocol Processor Entry dialog box appears displaying the new name.

When the protocol is selected the new name appears below the PP Name text on the touch screen; however, the name on the tab remains the same.

To restore tab names, select Restoring Default Tab Name for the Go To Label.

Restore Default Tab Names for the Go To Label

1. From the **System** tab, select **User Preferences**.
2. Under Label Preferences, select **Default**.
3. Select **Save All List Entries**. The default tab names are restored.

To change tab names, select Changing a Tab Name for the Go To Label.

TC Summary

The **TC Summary** LED indicates if a TCM error or alarm has been detected.

- If the LED is red, select the **TC Summary** text to display the TC LEDs



The TC LEDs appear in the center of the screen. The following describes the TC LEDs.

LED	Description
TC-AIS	Tandem Connection-Alarm Indication Signal. Indicates if IEC bits 1110 are being received from upstream TCM equipment. (Bits 1-4 of the N1 byte are the IEC bits.) This is an alarm LED.
TC-IEC	Tandem Connection-Incoming Error

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	Count. Indicates a B3 error count is being received from downstream TCM equipment. Bits 1-4 of the N1 byte are used for this indicator. This is an error LED.
TC-LOF	Tandem Connection-Loss of Frame. Indicates the loss of a valid multiframe frame alignment signal (FAS) pattern from upstream TCM equipment. This is an alarm LED.
TC-ODI	Tandem Connection-Outgoing Defect Indicator. Indicates that the unit is sending an ODI alarm to upstream TCM equipment. Bit 7 in multiframe 74 of the N1 byte is used for this indicator. This is an alarm LED.
TC-OEI	Tandem Connection-Outgoing Error Indication. Indicates that the unit is sending an OEI error to upstream TCM equipment. Bit 6 of the N1 byte is used for this indicator. This is an error LED.
TC-RDI	Tandem Connection-Remote Defect Indication. Indicates that a defect has occurred at the downstream TCM equipment. The unit is receiving an alarm. Bit 8 in multiframe 73 of the N1 byte is used for this indicator. This is an alarm LED.
TC-REI	Tandem Connection-Remote Error Indication. Indicates that an error has occurred at the downstream TCM equipment. The unit is receiving an error. Bit 5 of the N1 byte is used for this indicator. This is an error LED.
TC-TIM	Tandem Connection-Trace Identifier Mismatch. Indicates that the incoming TC trace does not

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	match the expected TC trace. This appears as an alarm count on the Results' Alarm screen.
TC-UNEQ	Tandem Connection-Unequipped. Indicates that a 00h pattern has been detected in the N1 byte of a Tandem Connection. This is an alarm LED.

TCM

The unit supports Tandem Connection Monitoring (TCM) mode for SDH and SONET protocol processors. When configured for TCM mode, the unit can transmit and monitor errors, alarms, and trace pattern activity between your network's TC equipment.

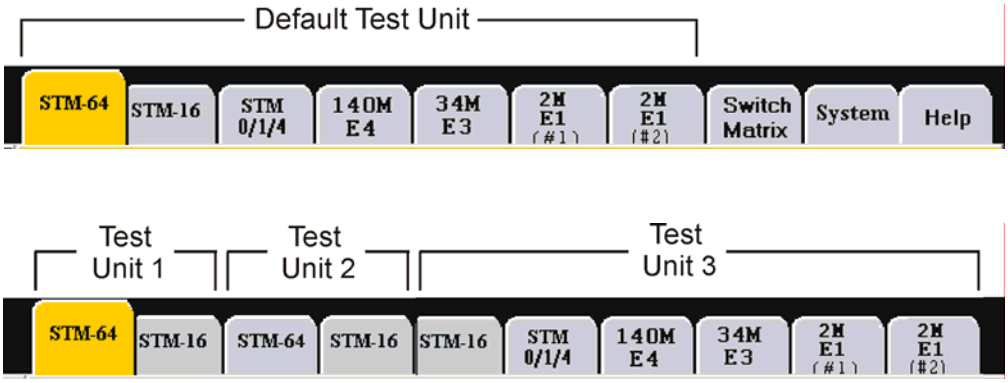
For more information about TCM transmit and receive procedures:

- Select **Configuring TCM Transmit Mode** for transmit preparation procedures and links to error, alarm, and trace generation.
- Select **Configuring TCM Receive Mode** for receive preparation procedures and links to error, alarm, trace, and overhead monitoring.
- Select **TC Summary LED** for information about the TCM LEDs,

Understanding Test Units

A test unit is a series of adjacent circuit packs that are installed in a NIC/NAA (test set). The test unit is based on a circuit pack's internal addressing and starts from the highest to the lowest speed.

However, when the second instance of a higher speed circuit pack is encoun¬tered, it is consid¬ered the beginning of the second test unit. The image displayed to the right shows a NIC that has eight protocol tabs, representing four test units.



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Preset configuration options that appear will be those available for the specified test unit. When the NIC/NAA has multiple test units you must first select the desired test unit protocol tab before selecting the Presets button.

Setting Time and Date

The system uses touch screen keypads for time and date configuration. Time is entered in a **HH/MM/SS** format. Date is entered in a **DD/MM/YYYY** format.

To set the time:

1. From the **System** tab, select **Set Unit's Date and Time**. The Set Date and Time window appear.
2. Select the **Time** button.
3. Select **Hour** and enter the hour using 2-digit, 24-hour, military time format.
4. Select **Minutes** and enter the minutes using a 2-digit format.
5. Select **Seconds** and enter the seconds using a 2-digit format.
6. Select **Set**. The time change appears in the LED/Quick Status area.

To set the date:

1. From the **System** tab, select **Set Unit's Date and Time**. The Set Date and Time window appear.
2. Select the **Date** button.
3. Select **Month** and enter the month using a 2-digit format.
4. Select **Day** and enter the day using a 2-digit format.
5. Select **Year** and enter the year using a 4-digit format.
6. Select **Set**. The date change appears next to the Set Unit's Date and Time field.

Adjust Touch Screen Brightness

To adjust a portable unit's touch screen intensity:

1. Select **System.**
2. Select **MISC**.
3. Select **Backlight Intensity**. A keypad appears. It accepts values ranging from **0** (brightest setting) to **255** (dimmest setting).

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4. Using the keypad, enter a value, and select **OK** when you are done.

Configuring the Screen Saver

The screen saver can be turned off or configured to activate after a set period of time. When the screen saver is operating, you can clear it by touching anywhere on the touch screen.

1. From the **System** tab, select **Misc**.
2. Select **Start Screen Saver**. The Select Screen Saver Delay dialog box appears.
3. Select the desired delay period.

To disable the screen saver:

1. From the **System** tab, select **Misc**.
2. Select **Start Screen Saver** and choose **Off**.

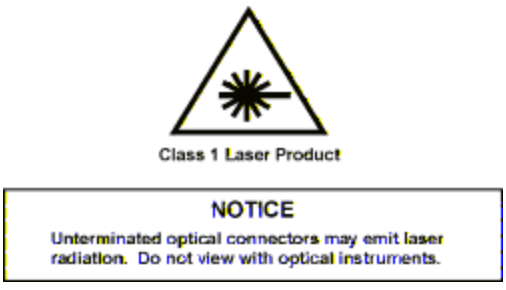
Turn Laser On or Off

Warning: The optical Transmit output is produced by a laser device. You should never, under any circumstances, look into an unterminated fiber.

Laser operation is controlled from the **Quick Status LEDs** area. The **Laser** button indicates if the laser is on or off. When the unit is powered on, the laser is off by default.

Laser Safety

The unit contains Class 1 laser devices. Never look into an unterminated fiber. Always place dustcaps on the optical ports when fiber is not attached to the optical ports. CDRH Accession numbers are listed in Agency Approvals.



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To turn the laser on:

- Select the **Laser** button in the **Quick Status LEDs** area. The laser status indicates **ON**.

To turn the laser off:

- Select the **Laser** button. The laser status indicates **OFF**.

SDH and SONET laser operation can be defined using the Initial Laser Setting function which controls whether the laser is on or off when the unit is turned on.

From the **Transmit** screen, select **Initial Laser Setting** and choose one of the following:

- **Off** – The unit's laser will be off when the unit is turned on.
- **On** – The unit's laser will be on when the unit is turned on.
- **Restore Previous State** – When the unit is turned on, the laser will be on or off based on its previous setting before the unit was turned off.

Configuring and Transmitting OC-1/3/12 and STM-0/1/4 APS Commands

For OC-1/3/12 and STM-0/1/4 mode, the APS function appears on a multifunctional screen that displays both Transmit and Receive APS commands.

To configure K1 and K2 byte values:

1. Select **STM-0/1/4** or **OC-1/3/12**.
2. Select **Transmit**.
3. Select **APS**. The initial APS screen appears containing a table of the K1 and K2 byte sequences that can be transmitted.

   The three columns (User Setup, Transmit, and Receive) on the screen display the current bit value for the K1 and K2 bytes. Any changes made to the K1 and K2 bytes are automatically updated in the User Setup column.

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The Transmit column displays the bit values transmitted when you select either **Transmit User**, **Transmit Default**, or **Transmit Illegal**. The Receive Column displays the bit values received for the K1 and K2 bytes.

4. Select **APS Mode** to configure APS commands for Linear protection switching mode or Ring APS signaling mode.
5. Edit the K1 byte. The K1 byte is a request for switch action. There are three functions that allow you to edit the K1 byte:
    - **K1 Full Byte** - Sets all eight bits of the K1 byte at once.
    - **K1 Bits 1-4** - Sets the first four bits of the K1 byte.
    - **K1 Bits 5-8** - Sets the last four bits of the K1 byte.
6. Edit the K2 byte. The K2 byte provides additional information about SONET or SDH network architecture and alarm conditions. There are four functions that allow you to edit the K2 byte:
    - **K2 Full Byte** - Sets all eight bits of the K2 byte at once.
    - **K2 Bits 1-4** - Sets the first four bits of the K2 byte.
    - **K2 Bit 5 (provisioned)** - Sets the fifth bit of the K2 byte.
    - **K2 Bits 6-8** - Sets the last three bits of the K2 byte.
7. Use the following options to transmit bit values:
    - Use the **Transmit User** button to transmit the bit values that appear in the User Setup column. When pressed, the User Setup values are transmitted and appear in the Transmit column. You can edit the transmitted K1 and K2 bytes directly from the SOH function screen.
        - Use the **Transmit Default** button to transmit the default bit values (10101010) for the K1 and K2 bytes. When pressed, the default bit values appear in the Transmit column.
        - Use the **Transmit Illegal** button to transmit the illegal bit values (11111111) for the K1 and K2 bytes. When pressed, the illegal bit values appear in the Transmit column.

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Configuring and Transmitting OC-192/STM-64 and OC-48/STM-16 APS Commands

The following only applies to OC-192/STM-64 and OC-48/STM-16 protocol processors.

Automatic Protection Switching (APS) is a function that allows an LTE to switch to a backup (or protection) channel in case errors or failures occur on the working channel. APS commands can be configured for either Linear- or Ring-based SONET and SDH networks and are transmitted using the K1 and K2 bytes of the Line Overhead.

You can test your network's APS response by generating a condition that is likely to cause APS switching. You also have the capability to generate specific APS messages and monitor the response by configuring the K1 and K2 bytes.

You can create up to 16 different K1 and K2 byte configurations (known as byte sequences) to measure and stress your equipment's APS switching capabilities.

To configure K1 and K2 byte values:

1. Select a OC-192/STM-64 or OC-48/STM-16 protocol processor.
2. Select the **Transmit** button.
3. Select the **APS** button. The initial APS screen appears containing a table of the K1 and K2 byte sequences that can be transmitted. A total of 16 K1 and K2 byte sequences can appear in the table.
4. To make a new entry:
   - Select **New Item**

   To edit an item:

   - Select **Item <#>**, for example, Item 12.

   The Apply Maintenance to Entry screen appears, which contains functions used to configure and set the measurement criteria of the K1 and K2 bytes.
5. Select **APS Mode**. The APS Mode dialog box appears.
6. Choose **Linear** protection switching mode or **Ring** APS signaling mode.

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7. Select a **K1** byte/bit. A value dialog box associated with the K1 selection appears

   The K1 byte is a request for switch action. There are three functions that allow you to edit the K1 byte:

   - Use the **K1 Full Byte** function to set all eight bits of the K1 byte at once.
   - Use the **K1 Bits 1-4** function to set the first four bits of the K1 byte.
   - Use the **K1 Bits 5-8** function to set the last four bits of the K1 byte.

8. Select a K2 byte/bit. A value dialog box associated with the K2 selection appears.

   The K2 byte provides additional information about SONET network architecture and alarm conditions. There are four functions that allow you to edit the K2 byte:

   - Use the **K2 Full Byte** function to set all eight bits of the K2 byte at once.
   - Use the **K2 Bits 1-4** function to set the first four bits of the K2 byte.
   - Use the **K2 Bit 5 (provisioned)** function to set the fifth bit of the K2 byte.
   - Use the **K2 Bits 6-8** function to set the last three bits of the K2 byte.

9. Select the desired K1 and/or K2 byte/bit value.
10. From the Apply Maintenance to Entry dialog box, select **Duration in Frames** to set up the number of frames that will be transmitted containing the newly configured K1 and K2 bytes.
11. Select **Update**. The initial APS screen appears on the touch screen.
12. To configure additional K1 and K2 bytes, repeat steps 3-11 as described above. Otherwise, proceed to the next section to transmit K1 and K2 bytes.

To transmit K1 and K2 bytes:

1. Make sure that K1 and K2 byte sequences are configured as described above.
2. Select **Start** to transmit the K1 and K2 bytes.

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To stop transmitting K1 and K2 bytes:

1. Select a protocol processor mode.
2. Select the **Transmit** button.
3. Select the **APS** button. The initial APS screen appears.
4. Select **Stop**.

Upgrade Test Set Software from CD

The instructions outlined below provide a quick set of steps for upgrading your NIC/NAA test set and troubleshooting a cancelled upgrade. For more in-depth information, see the NIC/NAA Software Upgrade Online Help.

Warning: You must have the **Java® Runtime Environment (JRE)** installed on your PC before proceeding with the upgrade.

To upgrade the test set software from the CD:

1. Turn the NIC test set **On**.
2. From the **System** tab, select **I/O Settings**.

   If the NIC test set is not on the network, use a cross-over cable to connect it to the PC.

3. Insert the **Software and Remote CD**, which you received with your NIC test set, into your computer's CD-ROM drive. The CD should automatically open the Remote NIC Software window.
4. From the **Software** tab, select **Upgrade NIC Software**.
5. Select **Install**. A DOS prompt window displays and then the Digital Lightwave's Software Upgrade dialog box appears. No action is required for the DOS prompt window.
6. From the Software Upgrade dialog box, select **Device Logon**. The Device Logon dialog box appears.
7. In the **New IP Address** box, type the IP Address for the NIC test set that is being upgraded. You can find the IP Address on the NIC test set's I/O screen.
8. Select **Add IP to List**. The address appears in the IP Address List box.

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Up to 32 device IP Addresses can be stored in the IP Address List box.

9. Select the **IP Address** and click the > button. The IP Address moves to the IP Addresses Selected box.

Warning: Do not attempt to upgrade more than one test unit (device) at a time. Devices moved into the IP Addresses Selected box are scheduled for upgrade. Therefore, select only one device from the IP Address List box before proceeding to the next step.

10. Select **OK**. The upgrade software connects to the NIC test set and then the Scheduled Upgrades Notice dialog box appears.
11. Select **OK**. The notice box closes and you are returned to the Software Upgrade dialog box.
12. Select **Upgrade**. The Upgrade Activity Status dialog box appears and then the Upgrade Alert! dialog box.

This automatically upgrades all circuit packs in the NIC test set. The upgrade process may take several minutes.

13. Select **OK**.
14. Toggle the test set's On/Off switch to **Off**.

Warning: Leave the test set off for a minimum of 10 seconds before rebooting it.

15. Turn the test set **On**.
16. From the NIC Common Function buttons, select **Restore**. The Select Type of Restore dialog box appears.
17. Select **Factory Defaults**.
18. This completes the software upgrade.

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Update a User Profile

If the System Lock function is enabled, only one user with Read and Write permissions (this includes Calibration and Admin users) can be logged in at a time. If a user with Read and Write permissions is already logged in, a window will appear giving you the option of logging in with Read permissions only.

1. From the **System** tab, select **Security**.
2. From the User List, select the user profile to be updated. The user ID, password, and permissions appears in the Account Information portion of the screen.
3. Select , which is next to the field to be updated.
    - If the *User ID* or *Password* was selected, a keypad appears, allowing you to modify the current information. Press **Enter** when you are done.
    - If *Permissions* was selected, the Select User Permissions window appears. Select the updated permissions that you wish to apply.
4. When you are done updating the user's profile, select **Update**. The updated information appears on the User List.

Upgrade Test Set Software from CD

The instructions outlined below provide a quick set of steps for upgrading your NIC/NAA test set and troubleshooting a cancelled upgrade. For more in-depth information, see the NIC/NAA Software Upgrade Online Help.

Warning: You must have the **Java® Runtime Environment (JRE)** installed on your PC before proceeding with the upgrade.

To upgrade the test set software from the CD:

1. Turn the NIC test set **On**.
2. From the **System** tab, select **I/O Settings**.

    If the NIC test set is not on the network, use a cross-over cable to connect it to the PC.

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3. Insert the **Software and Remote CD**, which you received with your NIC test set, into your computer's CD-ROM drive. The CD should automatically open the Remote NIC Software window.
4. From the **Software** tab, select **Upgrade NIC Software**.
5. Select **Install**. A DOS prompt window displays and then the Digital Lightwave's Software Upgrade dialog box appears. No action is required for the DOS prompt window.
6. From the Software Upgrade dialog box, select **Device Logon**. The Device Logon dialog box appears.
7. In the **New IP Address** box, type the IP Address for the NIC test set that is being upgraded. You can find the IP Address on the NIC test set's I/O screen.
8. Select **Add IP to List**. The address appears in the IP Address List box.

> Up to 32 device IP Addresses can be stored in the IP Address List box.

9. Select the **IP Address** and click the > button. The IP Address moves to the IP Addresses Selected box.

> Warning: Do not attempt to upgrade more than one test unit (device) at a time. Devices moved into the IP Addresses Selected box are scheduled for upgrade. Therefore, select only one device from the IP Address List box before proceeding to the next step.

10. Select **OK**. The upgrade software connects to the NIC test set and then the Scheduled Upgrades Notice dialog box appears.
11. Select **OK**. The notice box closes and you are returned to the Software Upgrade dialog box.
12. Select **Upgrade**. The Upgrade Activity Status dialog box appears and then the Upgrade Alert! dialog box.

> This automatically upgrades all circuit packs in the NIC test set. The upgrade process may take several minutes.

13. Select **OK**.

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14. Toggle the test set's On/Off switch to **Off**.

> Warning: Leave the test set off for a minimum of 10 seconds before rebooting it.

15. Turn the test set **On**.
16. From the NIC Common Function buttons, select **Restore**. The Select Type of Restore dialog box appears.
17. Select **Factory Defaults**.
18. This completes the software upgrade.

Upload a File

A file can be transferred from the unit to a remote device (e.g., a PC), or to a local device, such as a PCMCIA or Flash storage card or a USB storage device. (Note that System Controller 2 with embedded Windows XP supports USB plug and play functionality.) If using the PCMCIA or USB function, make sure that the PC card or USB storage device is plugged into the NIC unit before selecting the File Services button. When the PC card or USB device is inserted, an audible tone indicates that the proper drivers are qualified. If using the FTP function, make sure you have the IP address of the receiving device.

See also Download a File

1. From the System tab, select **File Services**.
2. From the right File List box, select the upload method by clicking on the Drive — FTP button.

   If using *FTP*, click on that button, then enter the IP Address of the device that will receive the file (unless you are using the Remote Control Software; then enter the test set address). If this device is secured with a User ID and Password, then enter this information. Enter an FTP session on the connecting device.

   If using a PCMCIA card, Flash card, or USB device such as a thumb drive, plug the card or device into the appropriate slot. After a few seconds the system will recognize the device and update the drive selection window. New drive letters will appear in the File List box. Note that it is possible to have both a PCMCIA card and a USB device connected to the NIC at the same time. From one of the drives in the File List box, select a

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target directory to receive the file. Note that it is usually best to plug in the storage media before clicking the File Services button

From the left File List box, select the current directory location of the file you want to transfer.

Select the desired file to be transferred.

Select the upload button.  The file will be transferred from the NIC.

Warning: When the unit is powered off, the FTP directory is automatically purged.

Updating a User Profile

If the System Lock function is enabled, only one user with Read and Write permissions (this includes Calibration and Admin users) can be logged in at a time. If a user with Read and Write permissions is already logged in, a window will appear giving you the option of logging in with Read permissions only.

1. From the **System** tab, select **Security**.
2. From the User Name list box, select the user profile to be updated. The user name, password, and permission appears in the Account Information box.
3. Select , next to the field to be updated.
   - If *Password* was selected, a keypad appears, allowing you to modify the current information. Press **Enter** when you are done.
   - If *Permissions* was selected, the Select User Permissions window appears. Select the updated permissions that you wish to apply.
4. When you are done updating the user's profile, select **Update**. The updated information appears on the User List.

Printing or Viewing Saved Files

While running tests, you have the option to save the information to a file. The instructions below tell you where and how to print or view a saved file.

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Important: Files saved when working with the Remote Control Application will not be accessible from the NIC unit touch-screen and visa-versa. The remote application saves the files to the Remote Control (GalaxyNIC) directory on the PC. The NIC unit saves the files to its default D:\DLI... drive on the test unit.

To print or view a saved file:

1. From the **System** tab, select **File Services**.
2. Select a file from the **Disk** directory box. The desired report may display in the main Disk directory, or it may be stored in one of the folders in the directory. Folder names are enclosed in brackets **[foldername]**. To return to the main Disk directory after opening a folder, select **[. .]** or the **Disk** button.

   Important: Real-time reports generated from the NIC unit touch-screen, using the Action after Duration function, are automatically stored in the [APP] folder. Select the folder to display those reports.

   The following is a list of file extension used for files generated from the Print Report, Graph, or Action after Duration functions:

   - **.aps** - APS Report
   - **.evt** - Event Report
   - **.perf** - Performance Report
   - **.real** - Real-time Test Report (Stored in [APP} folder on NIC unit.)
   - **.rep** - Graph Report, BERT Analysis, RFC Thru Put Analysis
   - **.set** - Settings Report
   - **.stat** - Results Report
   - **.statE** - Event Report

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- **.grp** - Graph (This is not a text file. It can only be viewed as a graph by selecting **Results,** pointing to **Graph** and choosing the **Replay Graphs** button.)

3. Choose one of the following

To **Print** the file:

a. Select **Print**. A standard Print dialog box appears.

> If you want to print a report directly from the NIC unit, make sure that a printer is attached to the unit's parallel or serial port.

b. Select the printer **Name** and choose **OK**.

To **View** the file:

a. Select **View**. The View File window appears.
b. Select **Exit** to close the window.

Viewing Added/Dropped Signal Activity

1. Select **Results**.
2. Select the following Results tabs to monitor events:

- The **Scan** button functions appear on the touch screen. A summary count of current error, alarm, and event activity is reported. If no activity is reported, the message "No Errors or Alarms" appears.
- Select **Err** to view more details about incoming errors. This function reports the following:

  - Error count using an 11-digit format
  - Average error rate over the total error duration using an N.NNe-N format
  - Current error rate using an N.NNe-N format
  - Errored seconds using an 8-digit format
  - The percentage of seconds in which the error was present

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- The total number of error-free seconds using an 8-digit format
- The percentage of seconds that the error was not present

- Select **Alarm** to view more details about incoming alarms. This function reports the number of seconds that an alarm is present.
- Select **PTR** to view more details about incoming Pointer events (this function is only applicable to SONET/SDH protocol processors). This function reports the following:
  - The number of positive Pointer adjustments
  - The number of negative Pointer adjustments
  - The duration of a Pointer adjustment (in seconds)
  - The number of New Data Flags (NDF)
  - The number of invalid NDFs
- Select **Event** to view a summary of events (alarms, errors, and Pointer activity) recorded by the unit. For more information, refer to the Recording in the Event Log section.
- Select **APS** to display the incoming bit values of the K1 and K2 bytes. For more information, refer to the Monitoring SONET/SDH APS Commands section.
- Select **Large LEDs** displays LED error and alarm indicators in a large, easy-to-read format, which covers the entire touch screen area. This is useful for viewing errors or alarms from a long distance, such as across the room from a test bay.
- Select **Graph** displays incoming errors and alarms in the form of a line or bar graph.

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Troubleshooting

This topic is intended to aid in resolving common user interface problems. For additional assistance, please contact Customer Service.

Interface	Symptom	Resolution
Power	No power (fans silent)	• Check input power cord seating on both ends. • Ensure input voltage and frequency is correct (100-120 VAC and 200-240 VAC, 50-60Hz). • Check the fuse. If fuse is blown, contact Customer Service.
Touch Screen	Will not respond	Remove anything resting against the screen (cables, etc.) and restart the unit if it is still not responding.

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Touch Screen	Too much or too little sensitivity.	Adjusting the touch screen sensitivity must be done by a trained Digital Lightwave representative. Contact Customer Support for assistance.
Speaker	Volume too loud or too soft	Adjust desired volume in the System, Misc screen
Optical	SONET B1, B2 errors appearing when locally looped.	• Inspect and clean fiber-optic surfaces. • Check the Receive signal status and ensure that the optical power is -2dBm to -14dBm for OC-192/STM-64 and -2dBm to -26dBm for OC-48/STM-16. Also that the frequency is within +/- 100ppm. **Note:** Attenuation is required for local loopback of OC-48/STM-16.

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Optical	Loss of signal or power level low	Check for optical connector tightness and eliminate any fiber kinks or knots.
Ethernet	Device not communicating	• Ensure cable is the correct type (*Direct* if connected to a LAN, and *Crossover* connected to a computer. • Set up a valid IP address in the System, I/O, Settings screen. • IP addresses 192.168.138.000 through 192.168.138.255 are reserved and should not be used. A system conflict can occur if these IP addresses are entered.

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Serial RS232	Device not communicating	• Ensure the connecting cable is a null modem cable. • Ensure communication settings of baud, bit, stop, and parity are set up correctly in the System, I/O, Settings screen.
Printer	Printing device will not print	• Verify that the printer is in "standard text" print mode. • Check that the cable is a "standard printer" cable.
PCMCIA	Card will not function in slot	Contact Customer Support to ensure the PCMCIA is properly licensed and enabled.

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USB	Storage device will not function when inserted	• Check device for proper seating. • Remove the device, reboot the NIC, and attempt to insert the USB device again. • Contact Customer Support if the above measures fail to work.
BITS	Unit not synchronizing up to timing source	• Check that the cables are connected correctly (IN/OUT). • Ensure the clock source is set to "BITS" on the System, Misc screen and enabled in the Transmit Clock reference screen • Verify that the input clock source is a clean signal with a frequency of 1.544 MHz into a 100-ohm termination.

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Clock out	Not triggering properly	• Ensure that "trigger out" options are properly enabled. • Ensure that the clock signal is terminated into a 50-ohm load.
SETS	Unit not synchronizing up to timing source	• Check that the cables are connected correctly (IN/OUT). • Ensure the clock source is set to "SETS" in the System, Misc screen and enabled in the Transmit Clock reference screen. • Verify that the input clock source is a clean signal with a frequency of 2.048 MHz into a 120-ohm termination.

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