

GigE Responder GIGR

User's Manual



 **WARNING**

Using the supplied equipment in a manner not specified by Sunrise Telecom may impair the protection provided by the equipment.

 **LASER CAUTIONS!**

- This is a class 1 laser product. Avoid looking directly at the transmitter source.
- Use of controls and procedures other than those specified in this manual may result in exposure to hazardous laser radiation.
- Unterminated optical connectors may emit laser radiation. Do not view with optical instruments.

End of Life Recycling and Disposal Information

DO NOT dispose of Waste Electrical and Electronic Equipment (WEEE) as unsorted municipal waste. For proper disposal return the product to Sunrise Telecom. Please contact our local offices or service centers for information on how to arrange the return and recycling of any of our products.

EC Directive on Waste Electrical and Electronic Equipment (WEEE)



The Waste Electrical and Electronic Equipment Directive aims to minimize the impact of the disposal of electrical and electronic equipment on the environment. It encourages and sets criteria for the collection, treatment, recycling, recovery, and disposal of waste electrical and electronic equipment.



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1 Introduction

1.1 Overview of Functions

The GigE Responder provides loopback functionality in a low-cost, handheld platform that is the perfect companion to the SunSet MTT Ethernet and Gigabit Ethernet modules as well as the STT Ethernet, STT Metro, and STT ONE modules. When Ethernet and IP traffic passes through a switch or router, the source and destination addresses are checked, logged, and used for directing the traffic. A simple hard loop like those used for TDM networks are insufficient for testing. Instead, a smart loop device must swap the source and destination addresses in the MAC and IP headers.

With a standard, full featured test set on one end of a circuit and the GigE Responder on the other, you can verify throughput, bit error rate, roundtrip delay, packet jitter (delay variation), and quality of service. The GigE Responder is compatible with RFC 2544 testing and is also well suited for Ethernet over SONET/SDH (EOS) testing. The ping function verifies Layer 3 connectivity for Internet access, Voice over IP (VoIP), IPTV, and other IP services.

Key Features

- 10/100/1000BASE-T, RJ-45 Port
- 1000BASE-X, SFP Port
- Loopback for Layer 1, 2, and 3
- IP Ping, Traceroute for Layer 3 connectivity test

1.2 Important Safeguards and Precautions

Utmost care has been taken in the manufacture of the GigE Responder. Please keep the following simple instructions in mind while using the GigE Responder.

- Please keep the GigE Responder away from fire, extremely hot areas, water or moisture of any kind.
- Do not service your GigE Responder by yourself.
- Opening the GigE Responder housing will void the warranty
- Always following the GigE Responder instructions.
- Always follow the state law or company regulations on the port scanning or IP address PING test.

1.3 GigE Responder Package Contents

The GigE Responder package includes the following:

- GigE Responder
- One Li-Ion rechargeable battery pack
- One AC/DC adaptor, input 100—240V, output 12V/2.0A.
- One CD with User's Manual and Firmware upgrade tools
- One protective bumper case with built-in stand
- One carry case

1.4 Specifications

Display	320 X 240 TFT LCD
Power	<ul style="list-style-type: none"> Li-Ion rechargeable battery, lasts up to 4 hours with link at full wire speed. Battery Pack with AC/DC adaptor (100–240 VAC, 2A, 50/60 Hz).
Interface	<ul style="list-style-type: none"> One 10/100/1000Mbps RJ45 port compliant with IEEE 802.3 for 10Mbps, 802.3u for 100Mbps, 802.3ab for 1000Mbps. One SFP fiber port for 850nm, 1310nm, or 1550nm transceiver, compliant with IEEE 802.3z. Auto switched between the 2 ports depends on connected interface. Fiber has higher priority when both ports are connected.
LEDs	4 LEDs: <ul style="list-style-type: none"> LINK/ACT (for 10/100/1000Mbps link) PAT SYNC: Pattern synchronization SIGNAL/ERR: Optical signal and error(s) POWER/BATTERY: Power and Battery status
Weight	Less than 500g with battery.
Audio	Audible tone to indicate key input.
Operating Temperature	0–40° C
Operating Humidity	10–85 % (non-condensing).

Table 1 GigE Responder Specifications

2 Physical Description

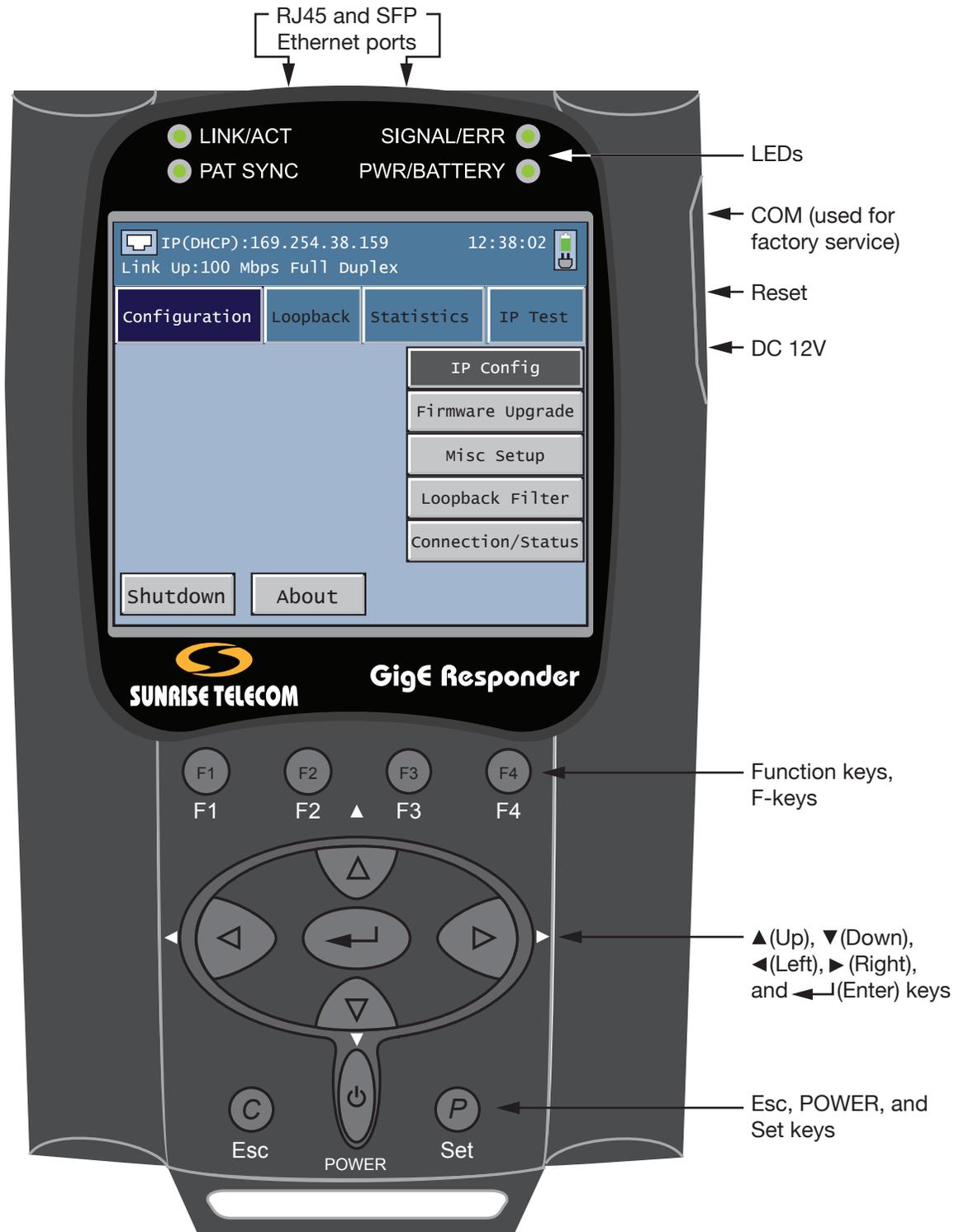


Figure 1 GigE Responder Screen View

2.1 Screen Side

2.1.1 Keypad Functions

POWER: Press and hold POWER until the GigE Responder LEDs light up. To power off, press Shutdown (F1) from the GigE Responder main menu. In the message window, select Shutdown using ◀, ▶ and press ↵. Another shut down option is to press and hold POWER longer than four seconds.

◀, ▲, ▼, ▶: Move the cursor to select an item. Use ◀, ▶ to increase or decrease a selected value by 1.

↵: After completing a setting or a data entry, press ↵ to activate the setting or confirm the data entry.

Set: Switch between pre-programmed values for a selected item. Look for Set in this User's Manual.

Esc: Exit a menu by going back one screen. Look for Esc in this User's Manual.

F1, F2, F3, F4: These Function keys are soft keys for selecting the corresponding item in each menu shown on the bottom of the screen. See Figure 2 for the screen relationships.

In this example, F1 is associated with Manual, F2 is associated with Respond, F3 is not used, and F4 is associated with Start.

In this manual, F-keys are indicated in text such as Manual (F1), Respond (F2) and so on.

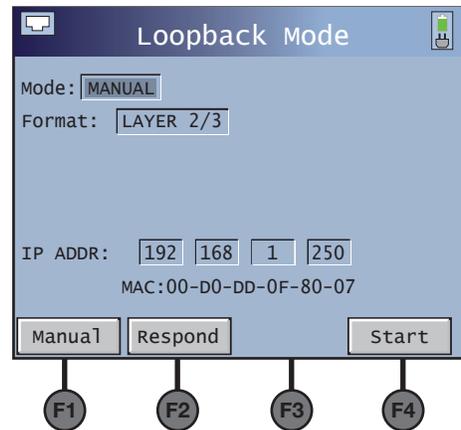


Figure 2 F-keys and Screen Relationships

2.1.2 LEDs

There are four LED at the top of the GigE Responder:

LINK/ACT: Flashing green indicates activity on the 10/100/1000Mbps link.

PAT SYNC: Indicates Pattern Synchronization.

SIGNAL/ERR: Indicates optical signal and error(s).

POWER/BATTERY: Indicates Power and battery status. Green indicates normal battery power. Red indicates low battery. Flashing red indicates connect the GigE Responder to the AC/DC adaptor as soon as possible.

2.2 Top Side

RJ45 Port: Electrical Copper interface port that supports 10/100/1000 Mbps link.

SFP Port: Fiber Optical interface for SFP transceivers, the port can support both the single mode gigabit transceiver and multi mode gigabit transceivers shown in Figure 3:

- The SA580-850 dual duplex type LC, 850 nm transceiver:



- The SA580-1310 dual duplex type LC, 1310 nm transceiver:



- The SA580-1550 dual duplex type LC, 1550 nm transceiver



Figure 3 Fiber Optic Transceivers

To insert a transceiver:

⚠ CAUTION: Use of non Sunrise Telecom transceivers will void the test set warranty.

1. Align the transceiver label side with the battery side of GigE Responder .
2. Insert the transceiver into the SFP port. There will be a clicking sound when the transceiver is properly seated.
3. When ready for use, remove any protective caps on the interface end of the transceiver.

To remove a transceiver:

1. Install the protective cap on the interface end of the transceiver.
2. Grip the outer edge of the transceiver and pull it away from the GigE Responder.

The recommended optical cables are shown in Table 2.

Sunrise P/N	Description
SA561	Standard 2 meter LCUPC to SCUPC duplex multimode patch cord.
SA562	Optional 2 meter LCUPC to SCUPC duplex single mode patch cord.

Table 2 Fiber Optic Cables

Note: The Electrical or Fiber interface is auto switched between the two. When both are connected, the fiber mode has higher priority than electrical mode.

2.3 Right Side

12 V DC: Connect the supplied AC/DC adaptor to this port.

Reset: Perform a hardware or power reset of the GigE Responder.

COM: This port is used only by the factory.

2.4 Battery Side

The battery is found under the panel on the back side of the GigE Responder.

2.4.1 Battery Replacement

When the battery does not hold a charge, it needs to be replaced. Use the following procedure:

1. Shutdown the GigE Responder.
2. Remove the one screw that retains the battery cover.
3. Pull the cover away from the chassis.
4. Pull the battery away from the chassis.
5. Unplug the battery from the GigE Responder.
6. Plug the new battery into the GigE Responder.
7. Position the new battery into the chassis.
8. Place the cover in position and secure with the screw.
9. Connect the supplied AC/DC adaptor.
10. Charge the battery before use.

2.4.2 Battery Care and Storage

Observe these basic battery care procedures to avoid possible damage to the battery and to maintain its performance.

WARNINGS

- Failure to observe the following procedures and precautions can result in electrolyte leaks, heat generation, bursting, fire, and serious personal injury.
- Battery electrolyte is a strong colorless alkaline solution, which is extremely corrosive and will burn skin.
 - If skin comes in contact with the electrolyte from the battery, thoroughly wash the area immediately with clean water.
 - If clothing comes in contact with the electrolyte from the battery, discard the clothing.
 - If any fluid from the battery comes in contact with eyes, immediately flush thoroughly with clean water and consult a doctor. The electrolyte can cause permanent loss of eyesight.
- Keep the battery out of reach of children.

CAUTIONS

- Never dispose the battery in a fire.
- Never heat the battery.
- Never strike or drop the battery.
- Do not apply water, or other oxidizing agents to the battery. This will cause corrosion and heat generation. If the battery becomes rusted, the gas release vent may no longer operate and cause the battery to burst.
- Do not charge the battery using an AC/DC adapter not specified by Sunrise Telecom. Charge the battery only with the Sunrise Telecom AC/DC adapter that came with the test set.

- If the battery is not fully charged after the battery charger's predetermined charging period has elapsed, stop the charging process. Prolonged charging may cause leakage of battery fluid, heat generation, and or bursting.
- Charge the battery within a temperature range of 0°C (+32°F) to +40°C (+104°F).
- Do not use the battery if it leaks fluid or changes shape; otherwise it may cause heat generation, bursting, and fire.
- Do not short circuit the battery by connecting the positive (+) and negative (-) terminals together with electrically conductive materials, such as lead wires, etc.
- Do not connect the battery directly to a power source or the cigarette lighter socket in a car. Use the optional specified cigarette lighter charger from Sunrise Telecom.
- Never disassemble the battery. Doing so may cause an internal or external short circuit, or result in exposed material of battery reacting chemically with the air. It may also cause heat generation, bursting, and/or fire.
- Never modify or reconstruct the battery pack. Protective devices are built into the battery pack. If damaged, excessive current flow may cause loss of control during charging or discharging of the battery, which can result in leakage of battery fluid, heat generation, bursting, and/or fire.
- When the battery operating time becomes much shorter than its initial operating time even after recharged, the battery has reached its end of life and should be replaced with a new one.

Extended Battery Storage

- Fully charge the battery before storing.
- Remove the battery from the test set as described in [Section 2.4.1](#).
- Do not store the battery in high temperatures, such as direct sunlight, in cars during hot weather, or near any other heat source. This will impair the performance and shorten the operating life of the battery, and may cause battery leakage.
 - For maximum battery life, store the battery between -20°C (-4°F) and +30°C (+86°F).
- During storage, the battery will need to be regularly recharged. The interval ranges from approximately 30 to 90 days at temperatures between -20°C (-4°F) and +30°C (+86°F). In general, the higher the storage temperature the shorter the recharge cycle.
 - To recharge, install the battery into the test set and use the supplied Sunrise Telecom battery charger to recharge the battery.
 - Charge the battery within a temperature range of 0°C (+32°F) to +40°C (+104°F).
- After long-term storage, there is a possibility that the battery will not fully recharge. To fully charge it, charge and discharge the battery for a few times. Use the test set to discharge the battery.

3 Operation and Menus

1. Make sure the battery is properly installed and it is fully charged before operation.
2. Plug in the cable into the RJ45 connector or insert in the desired SFP transceiver into the fiber slot for a fiber link.
3. Press and hold the Power key for 3 seconds to turn on the GigE Responder.
4. With power on, the booting process will begin:
 - The screen will be blank while the firmware is loaded.
 - The LINK/ACT LED will blink indicating that the system is booting.
 - The screen will display the Sunrise Telecom logo once the firmware has been loaded and the software is being loaded.
5. At the end of the process, the main menu screen is displayed, as in Figure 4:

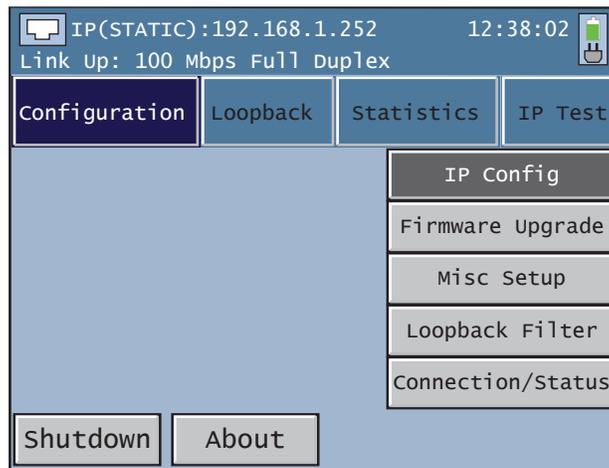


Figure 4 Main Menu Screen

The main menu screen allows you to make selections using ◀, ▲, ▼, ▶. Once you make a selection, press ↵.

Note: Menu paths are indicated throughout this manual using the following convention, i.e. Configuration / IP Config > means to:

Select Configuration by using ◀, ▲, ▼, ▶, then select IP Config. A selection is indicated by a darkened box with white text or just a darkened box.

>: Press ↵ after a selection is made.

The upper section of the main menu screen conveys valuable information:

- Current IP address mode (STATIC or DHCP) and the IP address that is assigned to the GigE Responder after start up. In Figure 4; IP(STATIC):192.168.1.252.
- Current time of day using a 24 hour format. In Figure 4; 12:38:02.
- Link media, copper (🟢), or fiber (🟦). Green fill indicates a connection, white fill indicates no connection.
- Link status, link speed, and link mode. In Figure 4 it is; Link up: 100 Mbps Full Duplex.
- Battery icon (🔋). When the AC/DC adaptor is connected to a mains, a plug icon within the battery icon indicates that the system is plugged in and charging. The battery part of the icon shows the batteries current charge level; all green is 100%.

The battery icon works with the GigE Responder's battery LED to indicate battery condition and when to connect the AC/DC adaptor for charging. When the LED flashes red, use of the AC/DC adaptor is required.

Main Menu Screen F-keys

Shutdown (F1): View a window with three shutdown choices:

- Shutdown: Safely shutdown the GigE Responder.
- Reboot: Restart the GigE Responder.
- Quit: Escape from this window and return to the previous screen.

Use ◀, ▶ to make a selection, and press ◀↵ to execute your choice.

About (F2): View the following basic information about the GigE Responder:

- Available memory
- Hardware version
- Firmware version
- FPGA version
- Serial Number (SN)
- MAC address

When finished viewing, press the Esc key.

The main menu screen has the following selections arranged in a row near the top of the screen:

- Configuration
- Loopback
- Statistics
- IP Test

The menus within these selections are discussed in the following sub-sections.

3.1 Configuration

As seen in Figure 4, the Configuration menu screen contains the following:

- IP Config
- Firmware Upgrade
- Misc Setup
- Loopback Filter
- Connection Status

3.1.1 IP Configuration

As seen in Figure 5, the GigE Responder supports both DHCP (Dynamic IP) or Static (fixed) modes.

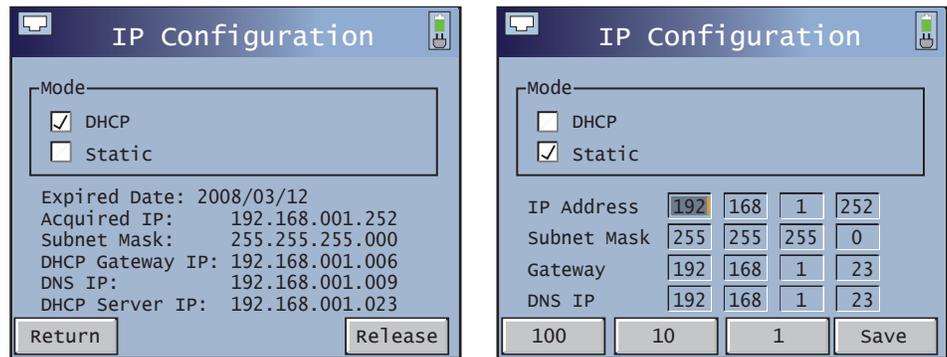


Figure 5 IP Configuration Screens

To change Modes, press the Set key and the Mode will toggle.

DHCP Mode

Dynamic IP mode automatically acquires the IP address from a DHCP server when the GigE Responder is started up. The screen shown on the left in Figure 4 reports the following information given out by the DHCP server:

- Expired Date
- Acquired IP address
- Subnet Mask address
- DHCP Gateway IP address
- DNS IP address
- DHCP Server IP address

DHCP Screen F-keys

Return (F1): Return to the previous screen.

Release/Acquire (F4): Release the IP address of GigE Responder from the DHCP server. Press again to acquire a new address from the DHCP server.

Static Mode

Use this mode when a DHCP server is not available on the network to be tested. When Static is selected, the screen shown on the right in Figure 4 is displayed. In it the addresses shown must be filled in by you.

To select a field to edit, use ◀, ▶. Then press 100 (F1), 10 (F2), or 1 (F3) to set the value to increase or decrease the field after pressing ▲ or ▼.

When finished, press Save (F4) and a message is displayed asking if you wish to reboot. Press ↵ to confirm, or press the Esc key to escape.

3.1.2 Firmware Upgrade

The GigE Responder firmware version and the FPGA code version is shown when About (F2) is pressed in the main menu.

Whenever there is a new firmware available for upgrading, use the Firmware Upgrade function to complete the process.

The transfer of the firmware is between a Windows PC (Windows 2000 minimum), running the SunriseUtility.exe utility program, and the GigE Responder, using a standard copper Ethernet cable.

When the firmware transfer from the PC to the GigE Responder is completed, select Firmware Upgrade from the GigE Responder main menu. In the message window, select yes and press **←**. If successful, you will see the following message; “Firmware and driver upgrade completed, please reboot”. Following the on screen prompt to reboot the GigE Responder, and the upgrade process is completed.

See [Section 4](#) for the complete procedure of the upgrade process.

3.1.3 Misc Setup

The Miscellaneous Setup screen is used to set basic operation parameters of the GigE Responder.

In this screen, press **←**, **→** to select a field. Use **▲**, **▼** to change the setting within the selected field.



Figure 6 Miscellaneous Setup Screen

Configure the following:

MM:DD:YY: Set the Month, Date, and Year of the GigE Responder calendar.

HH:MM:SS: Set the GigE Responder clock in Hours: Minutes: Seconds. The clock uses a 24 hour format.

Beeper Mode: Choose whether or not to have a beep sound at each keystroke. Press the Set key to select Yes or No.

Shutdown Time (Min): Set a shut down time from 1–999 minutes. Set to 0 to deactivate this timer.

Screen Saving (Min): Set a screen shut down time from 1–240 minutes. This feature is useful for prolonging battery life. Once the GigE Responder is in screen saving mode, press any key to activate the screen. Set to 0 to deactivate this timer.

When finished with your settings, press Save (F3) to save your changes. Press any key to continue. Press Return (F4) to display the main menu screen.

3.1.4 Loopback Filter

After power on, the GigE Responder receives all incoming packets from the network. In some applications when troubleshooting a network or analyzing the network traffic, it is sometimes useful to filter some specific packets.

The Loopback Filter screen displayed is dependent on the setting of Loopback Filter. DISABLE shown on the left in Figure 7, ENABLE shown on the right.

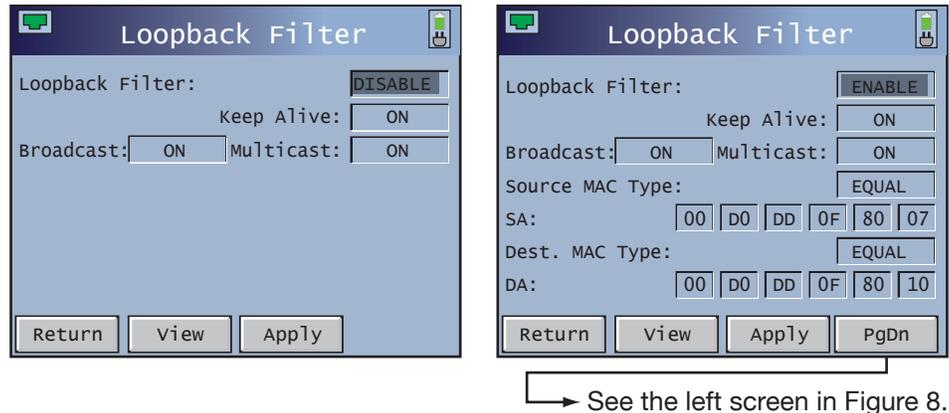


Figure 7 Loopback Filter Screens

Loopback Filter F-keys

Return (F1): Escape back to the main menu screen.

View (F2): View a listing of received statistics. See [Section 3.3.1](#).

Apply (F3): Apply the currently displayed settings.

PgDn (F4): If available, view the next screen.

To select settings, use ◀, ▶. To change it's state, press the Set key.

Configure the following:

Loopback Filter

Options: DISABLE or ENABLE

- **DISABLE**: No specific filters are used, and all packets are looped through. This is the default setting.
- **ENABLE**: Available filters can be configured.

Note: When disabled, Keep Alive, Broadcast and Multicast filters are still active. The default scenarios of Loopback suppose to drop all Keep Alive, Broadcast and Multicast packets. This applies to Layer 2/3 Loopback only. If the loopback Layer is set to Layer 1, all packets are loopbacked without filtering.

Keep Alive

Options: ON or OFF

- **ON**: Keep Alive packets are dropped and not counted.
- **OFF**: Keep Alive packets are passed through and counted.

Broadcast

Options: ON or OFF

- **ON**: Broadcast packets are dropped and not counted.
- **OFF**: Broadcast packets are passed through and counted.

Multicast

Options: ON or OFF

- **ON**: Multicast packets are dropped and not counted.
- **OFF**: Multicast packets are passed through and counted.

At this point, if Loopback Filter was set for DISABLE, press Apply (F3) to activate your choices and press Return (F1) to view the main menu screen.

If Loopback Filter was set for ENABLE, continue with the rest of the settings shown in the right screen of Figure 7.

Source MAC Type

Options: ANY, EQUAL, or NOT

If the SA (Source Address) line is available, enter an address using ◀, ▶ to select a field, and ▲, ▼ to change it's value.

- ANY: This field in the packets is not checked. This is the default setting. The SA line will not be displayed.
- EQUAL: This field in the packets is checked. If the value in the packet matches the value specified in the Loopback filter, the packet is looped. Otherwise the packet is dropped.
- NOT: This field in the packets are checked. If the value in the packet doesn't match the value specified in the Loopback filter, the packet is looped. Otherwise the packet is dropped.

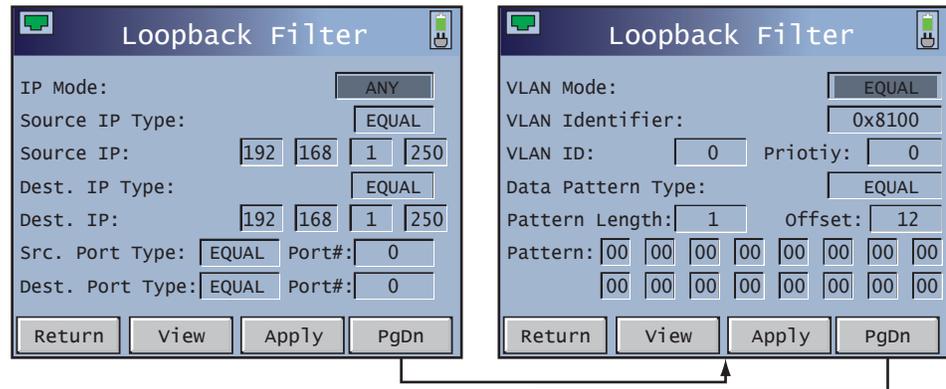
Dest. MAC Type

Options: ANY, EQUAL, or NOT

If the DA (Destination Address) line is available, enter an address using ▲, ▼ to select a field, and ▲, ▼ to change it's value.

- ANY: This field in the packets is not checked. This is the default setting. The SA line will not be displayed.
- EQUAL: This field in the packets is checked. If the value in the packet matches the value specified in the Loopback filter, the packet is the packet is looped. Otherwise the packet is dropped.
- NOT: This field in the packets are checked. If the value in the packet doesn't match the value specified in the Loopback filter, the packet is looped. Otherwise the packet is dropped.

Press PgDn (F4) to view the next screen:



▶ See the right screen in Figure 7.

Figure 8 Loopback Filter Screens, 2 and 3

In the left screen shown in Figure 8, choose the filtering rules used on the received IP header packets:

IP Mode

Options: ANY, IP Only, TCP/IP Only, or UDP/IP Only

Select a type of filtering.

- ANY: All headers are not checked. This is the default setting.
- IP Only: Only IP packets are looped back.
- TCP/IP Only: Only TCP packets are looped back.
- UDP/IP Only: Only UDP headers are looped back.

Source IP Type and Source IP

The criteria for these two fields are the same as in the Source MAC Type, but it applies to the source IP address of the IP header.

Dest. IP Type and Dest. IP

Criteria for these two fields are the same as in the Source MAC Type, but it applies to the destination IP address of the IP header.

Source Port Type and Source Port

The criteria for these two fields are the same as in the Source MAC Type, but it applies to the source port of the IP packet.

Dest Port Type and Dest Port

The criteria for these two fields are the same as in the Source MAC Type, but it applies to the destination port of the IP packet.

Press PgDn (F4) to configure items for VLAN Tag filtering and Data (Test) Pattern filtering, as shown in the right screen in Figure 8.

VLAN Mode

Options: ANY, EQUAL, or NOT

Set the filter rule on the receiving packet to the type as:

- ANY: The received packet is any type (either VLAN or not VLAN type).
- EQUAL: This field in the packets are checked. If the value in the packet matches the value specified in the Loopback filter, the packet is looped. Otherwise the packet is dropped.
- NOT: This field in the packets are checked. If the value in the packet doesn't match the value specified in the Loopback filter, the packet is looped. Otherwise the packet is dropped.

VLAN Identifier

Options: 0x8100, 0x9100, or 0x9200

If the VLAN Mode is set to EQUAL or NOT, then enter the VLAN identifier in this field for the match by pressing the Set key.

VLAN ID

Options: 0—4095

Enter a specific VLAN ID in the VLAN tag of the received packet for filtering.

VLAN Priority

Options: 0—7

Enter a specific VLAN priority in the VLAN tag of the received packet for filtering.

Data Pattern Type

Set the filter rule on the received packet to the type of data pattern as:

- ANY: Data patterns are not checked.
- EQUAL: The data pattern must match the entered one, to allow the received packet to be counted in the Statistics View screen.
- NOT: The data pattern must not match the entered pattern to allow the received packet to be counted in the Statistics View screen.

Data Pattern Length

Options: 1—16

Enter the number of bytes in the data pattern.

Data Pattern Offset

Options: 12—1498

Set the byte offset where the data pattern is located in the received packet. It must be after the source MAC address.

Data Pattern

Enter a data pattern as desired for the filter. The maximum pattern length is 16 bytes long, only the specified Data Pattern Length is valid for the filter matching.

3.1.5 Connection/Status

The Link Status screen, shown on the left in Figure 9, reports the current link status. The Link Control screen, shown on the right in Figure 9, lets you control the link parameters used to negotiate and activate the link status with a remote partner.

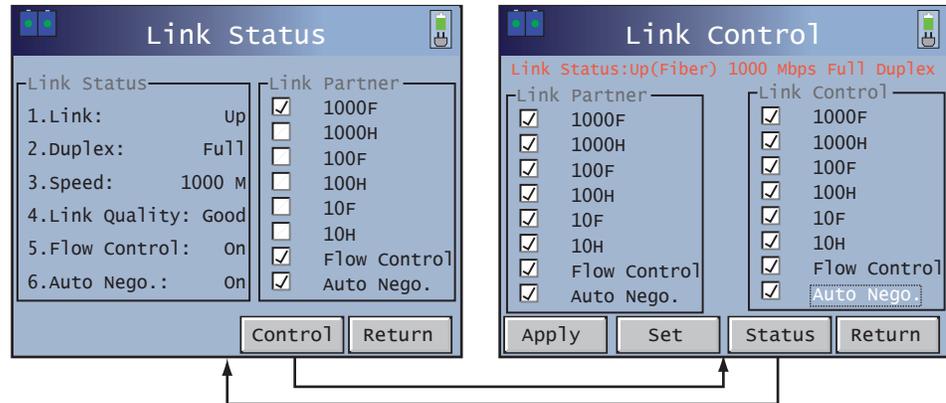


Figure 9 Link Screens

Link Status Screen

The left Link Status screen in Figure 9 reports the status of the GigE Responder side of the link, in the Link Status column:

Link: Current link status, Up or Down.

Duplex: Current link mode, Full or Half.

Speed: Current link speed, 10, 100, or 1000 Mbps.

Link Quality: Current link quality, it is Good if link is Up.

Flow Control: The flow control capability of the GigE Responder.

Auto Nego.: The auto negotiation capability of the GigE Responder.

The Link Partner column in the left screen of Figure 9 reports the following information for the remote device that the GigE Responder is connected to. A check mark indicates supported items.

1000F: Support for 1000Mbps Full Duplex.

1000H: Support for 1000Mbps Half Duplex.

100F: Support for 100Mbps Full Duplex.

100H: Support for 100Mbps Half Duplex.

10F: Support for 10Mbps Full Duplex.

10H: Support for 10Mbps Half Duplex.

Flow Control: Support for flow control capability.

Auto Negotiate: Support for Auto Negotiate capability.

Link Control Screen

Access the Link Control screen by pressing Control (F3) in the Link Status screen, as indicated in Figure 9. In this screen, you can activate (check mark) or deactivate (no check mark) the parameters in the Link Control (GigE Responder) column.

Use ◀, ▶ to select a parameter, then press Set (F2) to change its status. When finished, press Apply (F1) to activate the link with the selected parameters. The red status line of text under the Link Control header will update to reflect the new parameters if successfully implemented. If not a warning message, "Link Mode Fail!", will be displayed; press any key to return to the Link Control screen.

When finished, either press Return (F4) to display the main menu screen or Status (F3) to display the Link Status screen.

3.2 Loopback

This menu contains one item:

- Loopback Mode

3.2.1 Loopback Mode

Use loopback to send back the packets to the original source with source and destination addresses swapped. The GigE Responder will loopback the received packets from a test set with the following rules:

- All frames will be looped unchanged including invalid frames, unless filtered in Loopback Filter.
- MAC layer, source and destination MAC address are swapped.
- IP layer, source and destination IP and MAC address are swapped.
- If Layer 1 is selected, all packets are looped back unchanged.

Loopback mode allows you to perform a complete analysis of the traffic because the same generated traffic is returned to be analyzed.

This is required with RFC2544 or BERT measurements because the procedure typically demands that a single piece of test equipment is responsible for test pattern generation and analysis.

The GigE Responder provides an intelligent loopback at Layer 2 or Layer 3 (IP layer). The tester must provide an ARP (Address Resolution Protocol) for discovering the network route. It is also advantageous that filters are provided so that broadcast traffic, and any other IP address that is not relevant to the test procedure, does not undergo the loopback process. This will control the amount of traffic on the network, to prevent possible overload. The GigE Responder will automatically respond to the ARP packet from the source while in loopback mode, using the any enabled filtering. Also, ARP packets will be replied by the GigE Responder anytime regardless loopback mode is running or not.

Configure the following:

Mode

Options: Manual or Respond

The configuration screen presented is dependent on the selected Mode.

Manual: The Loopback mode screens for Manual Layer 1 are shown in Figure 10:

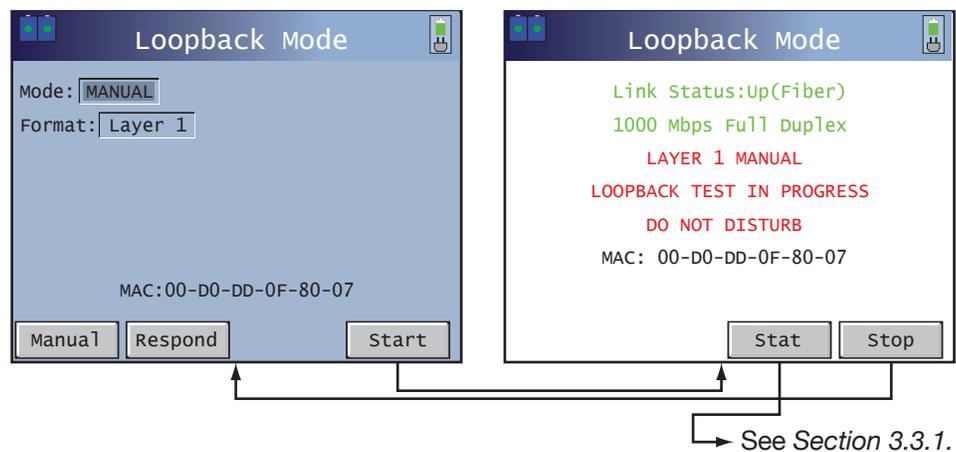


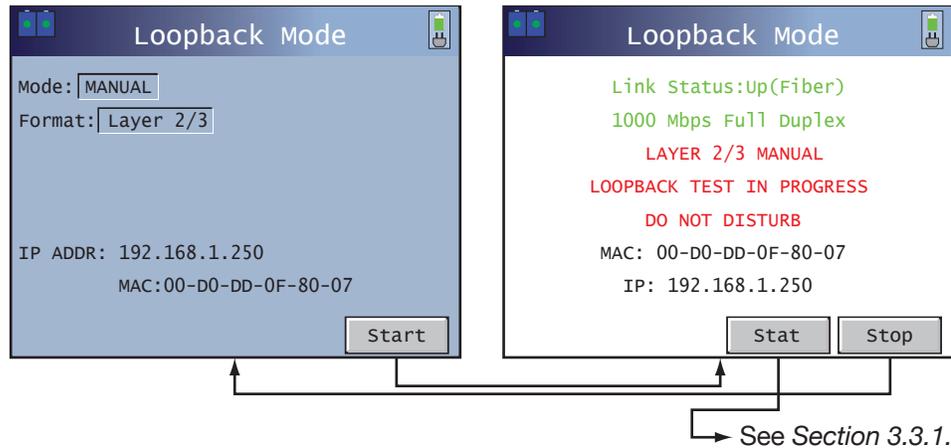
Figure 10 Manual Layer 1 Loopback Mode Screens

Configure the following for MANUAL mode:

Format

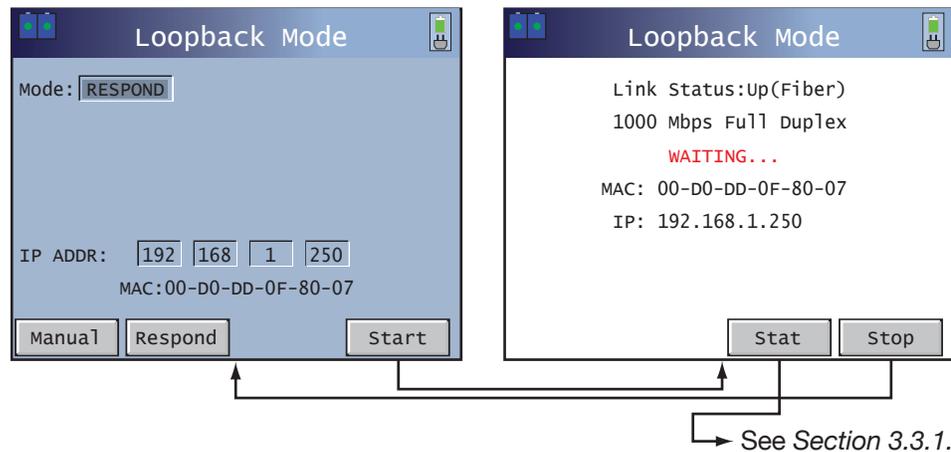
Options: Layer 1 or Layer 2/3

- Layer 1: If Layer 1 is selected, no further configuration is required. Press Start (F4) in the left screen shown in Figure 10 to begin the loopback. The right screen is then displayed. When finished, press Stop (F4).
- Layer 2/3: If Layer 2/3 is selected, no further configuration is required. Press Start (F4) to begin the loopback with the right screen shown in Figure 10. When finished, press Stop (F4).
- In the left screen of Figure 11, the GigE Responders current MAC and IP addresses are displayed so the remote traffic generator can specify the valid destination addresses in the packets to traverse through routed network to reach GigE Responder for loopback.



See Section 3.3.1.
Figure 11 Manual Layer 2/3 Loopback Mode Screens

Respond: The Loopback mode screens for RESPOND are shown in Figure 12:



See Section 3.3.1.
Figure 12 Respond Loopback Mode Screens

Configure the following for RESPOND mode:

IP ADDR

Enter an IP address that the GigE Responder will respond to using ◀, ▶ to select the field. Use ▲, ▼ along with 100 (F1), 10 (F2), and 1 (F3) to change the field value. When finished, press Start (F4) to begin with the right screen shown in Figure 12. When finished, press Stop (F4).

3.3 Statistics

This menu contains one item:

- Statistics View

3.3.1 Statistics View

Use these screens to view network statistics information, which will help determine network condition and analyze the possible causes of any network problems.

Statistics View F-keys

Return (F2): If available, press to return to the previous screen. If not available, press the Esc key to return to the main menu.

Clear (F3): Clear all accumulated statistics and SIGNAL/ERR LED status (if errors were detected) and restart their collection.

PgDn (F4): View the next available screen. Note that the scroll bar on the right of the screen indicates the displayed screen. You can also use ▲, ▼.

Figure 13 shows the Statistics View screens:

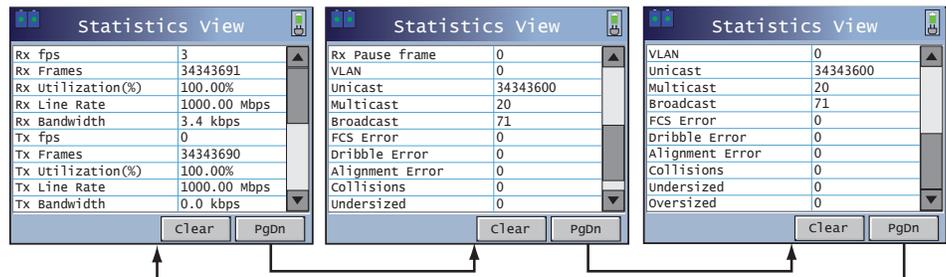


Figure 13 Statistics View Screens

The following is reported:

Rx fps: Received frames per second.

Rx Frames: Number of valid received frames.

Rx Utilization (%): Received utilization rate.

Rx Line Rate: Received line rate.

Rx Bandwidth: Received bandwidth in Kbps or Mbps.

Tx fps: Transmitted frames per second.

Tx Frames: Number of valid transmitted frames.

Tx Utilization (%): Transmitted utilization rate.

Tx Line Rate: Transmitted line rate.

Tx Bandwidth: Transmitted bandwidth in Kbps or Mbps.

Rx Pause frame: Number of received pause frames.

VLAN: Number of valid received VLAN frames. See Figure 14 for details of a VLAN tag.

Unicast: Number of valid received Unicast frames.

Multicast: Number of valid received Multicast frames.

Broadcast: Number of valid received Broadcast frames.

FCS Error: Number of received Frame Check Sequence errors.

Dribble Error: Number of received frames with dribble error.

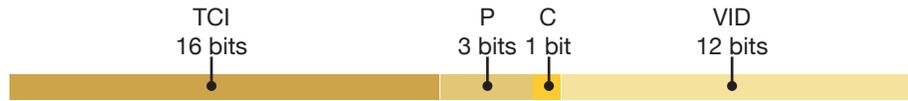
Alignment Error: Number of received frames with alignment error.

Collisions: Number of received frames with collisions.

Undersized: Number of received undersized frames.

Oversized: Number of received oversized frames.

VLAN Tag Conforming to IEEE 802.1Q and IEEE 802.1P



TCI: Tag Control Information set to 8100 (hex).
P: IEEE 802.1P Priority level, set between 0 and 7.
C: Canonical indicator set to 0.
VID: VLAN ID, set between 0 to 4095.

Figure 14 VLAN Tag

3.4 IP Test

This menu contains two items:

- Ping
- Trace Route

Use these two tests to confirm that the GigE Responder is connected to the network and that the configuration settings are correct.

3.4.1 Ping

Use Ping to test and analyze the remote Ethernet connection.

The GigE Responder's Ping function allows up to sixteen user definable profiles (files). You can setup Ping Test parameters and save them for later use. Each profile can be reviewed and edited by pressing PgDn (F4). Figure 15 shows the Ping Setup screen on the left, and Ping Result screen on the right.

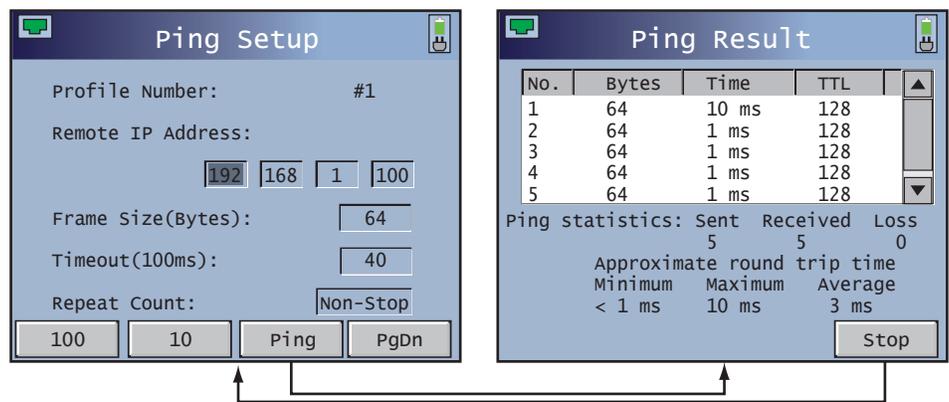


Figure 15 Ping Screens

Configure the following in the Ping Setup screen:

Profile Number: Use PgDn (F4) to select a profile (1–16).

Remote IP Address: Set the IP address to Ping using ◀, ▶ to select the field. Use ▲, ▼ along with 100 (F1) and 10 (F2) to change the fields value.

Frame Size (Bytes): Desired frame size of the sent ping frame. Use ▲, ▼ along with 100 (F1) and 10 (F2) to change the fields value.

Timeout (100 ms): Time in 100 ms units before the connection is timed out. This is the longest time allowed for the remote client to respond. Use ▲, ▼ to change the fields value.

Repeat Count: The number of loop counts that you wish to send ping test frames. Use ▲, ▼ to change the fields value or press NonStop (F1) to continuously ping the remote IP address.

If any item is changed, Save (F3) is available. It allows you to overwrite the selected Profile Number displayed above Remote IP Address with your new entries.

When ready, press Ping (F2 or F3) to start the test. The Ping Result screen is displayed if the link is up with the following ping statistics:

- **No.:** Count of the ping.
- **Bytes:** Frame size of the ping.
- **Time:** Round trip time of the ping.
- **TTL:** Time To Live of the ping.
- Maximum, Minimum, and Average round trip time for all pings.

View the entire window by moving the scroll bar cursor using ▲, ▼.

When finished, press Stop (F4) or Return (F4).

3.4.2 Traceroute

Use Traceroute to trace all the nodes in the route to that remote device. During the test, the system will display each node's IP address and its domain host name.

Figure 16 shows the Traceroute Setup screen on the left, and Traceroute Result screen on the right.

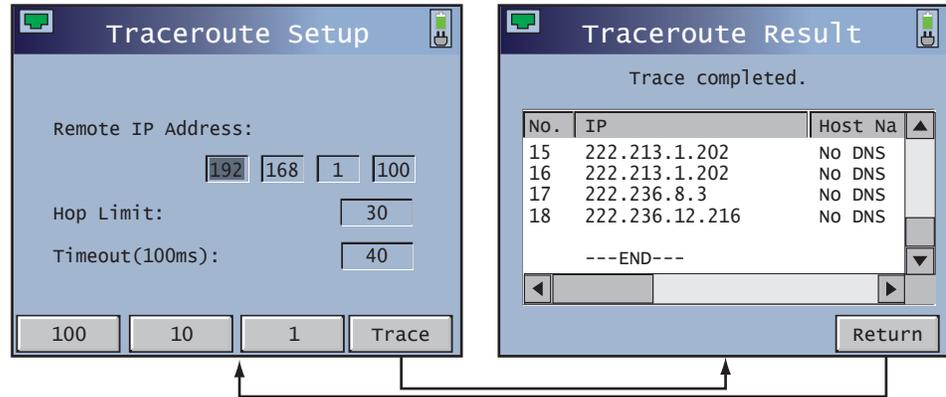


Figure 16 Traceroute Screens

Configure the following in the Traceroute Setup screen:

Remote IP Address: Set the IP address to trace, using ◀, ▶ to select the field. Use ▲, ▼ along with 100 (F1), 10 (F2), and 1 (F3) to change the fields value.

Hop Limit: Use ▲, ▼ along with 10 (F2) and 1 (F3) to set the maximum number of hops. The default value is 30.

Timeout (100 ms): Time, in 100 ms units, that is allowed for a packet to pass through a node. If the response time is longer than this reply timer, it will be treated as no response. Use ▲, ▼ to change the fields value. The maximum is six seconds.

When ready, press Trace (F4) to run the test. The Traceroute Result screen is displayed with the following results:

- **No.:** Number of the hop
- **IP** address of the node.
- **Host Name** if available

View the entire window by moving the scroll bar cursors using ◀, ▲, ▼, ▶.

When finished, press Return (F4).

4 Firmware Update

Use the information in this section to upgrade the GigE Responder's software. The upgrade utility is found on the CD-ROM that came with your GigE Responder. It must be installed on a Windows PC in order to upgrade the GigE Responder software.

4.1 Windows Setup and Performing an Upgrade

1. Locate the GigEResponder folder found on the CD-ROM that came with your GigE Responder and copy it to a Windows PC desktop.
2. In the GigEResponder folder, there are two folders:
 - Responder Software folder
 - fpgaeth.dll
 - sunrise.dll
 - sunrise.exe
 - Upgrade Utility folder
 - SunriseUtility.exe
3. Use a standard copper Ethernet cable, and connect the GigE Responder to the PC, using their respective copper Ethernet ports.
4. Configure the PC for a static connection. This example uses Windows 2000.
 - A. From the Start button, select Settings / Network and Dial-up connections / Local Area Connection Status.
 - B. In the Local Area Connection Status window, click Properties.
 - C. In the Local Area Connection Properties window, select the Internet Protocol (TCP/IP) line and click on Properties.
 - D. In the Internet Protocol (TCP/IP) Properties window select, "Use the following IP address" option and enter the following
IP Address: 192.168.1.100
Subnet mask: 255.255.255.0
Default gateway: 192.168.1.23
When finished click OK.
 - E. In the Local Area Connection Properties window, click OK.
 - F. In the Local Area Connection Status window, click OK. Note you may need to restart the PC to establish a connection.
5. From the GigE Responder main menu select, Configuration > IP Config.
6. Change the mode to Static, and enter the following settings:
IP Address: 192.168.1.250
Subnet Mask: 255.255.255.0
Gateway: 192.168.1.23
DNS IP: 192.168.1.23
When finished, press Save (F4). At the prompt, restart the GigE Responder.
7. To confirm that the PC and GigE are connected, ping the GigE Responder from the PC using this procedure:
 - A. On the PC from the Start button select, Run.
 - B. In the Run dialog window, type **cmd** and click OK.
 - C. In the DOS window at the flashing insertion point type:
ping 192.168.1.250
 - D. Press Enter on the PC.
 - E. If you have a connection, the DOS window on the PC will display the following line:

Reply from 192.168.1.250 bytes=32 time<10ms TTL=128

Followed by other information confirming a correct setup.

- If you do not have a connection, the DOS window on the PC will display: Request timed out.

If this occurs, either your settings are incorrect, or you may have a bad copper Ethernet cable.

F. When finished, close the DOS window.

8. On the PC, locate SunriseUtility.exe in the GigEResponder folder and double click it. The window in Figure 17 is displayed:

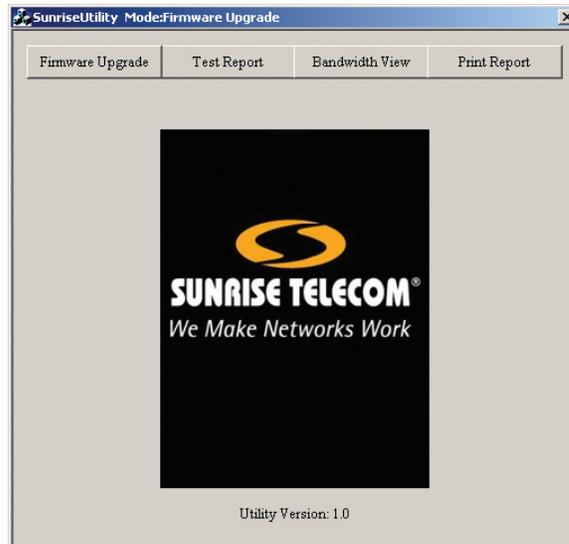


Figure 17 Sunrise Utility Window

9. Select Firmware Upgrade. The window in Figure 18 is displayed:

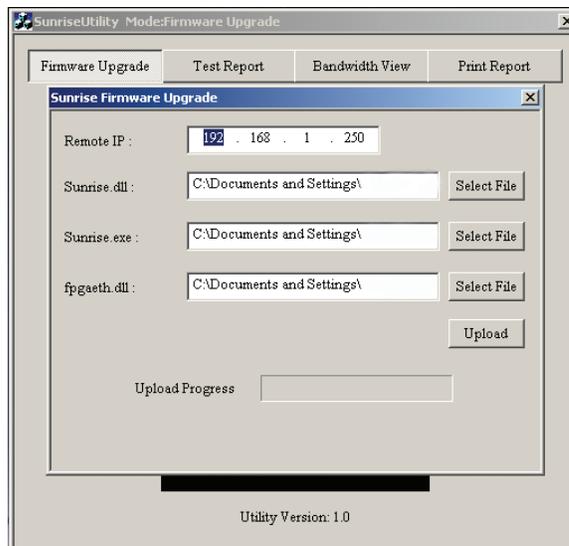


Figure 18 Firmware Upgrade Window

10. Confirm Remote IP is set for **192.168.1.250**.

11. Click Select File and confirm the location of “Sunrise.dll”, “Sunrise.exe”, and “fpgaeth.dll”.

12. Click Upload and the Upload Progress bar should indicate that the file transfer is occurring.
 - If a error occurs, a dialog box is displayed indicating the error. Correct the error and retry by clicking Upload.
13. When the file transfer is successfully finished, a window is displayed confirming a successful transfer.
14. From the GigE Responder select, Configuration > Firmware Upgrade.
15. In the message window, select Yes to proceed with the upgrade.
16. After the upgrade is completed, restart the GigE Responder.
17. When finished, disconnect the copper Ethernet cable and close the Sunrise Utility program on the PC.

Note: The other functions of the Sunrise Utility (Test Report, Bandwidth View, and Print Report) do not apply to the GigE Responder.
18. If needed, restore the PC's Internet Protocol (TCP/IP) Properties window settings back to "Obtain an IP address automatically" (see step 4 in this procedure).

5 Applications

5.1 Loopback

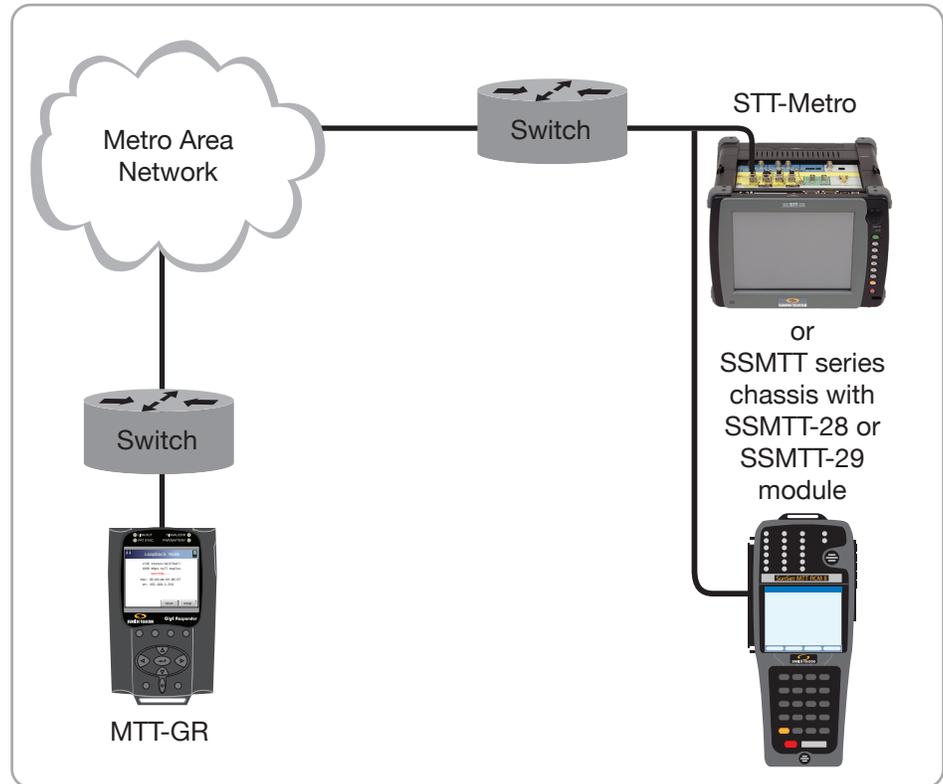


Figure 19 Loopback Mode Testing

Loopback mode allows the specified Ethernet port to send incoming Ethernet frames back to the sender for end-to-end testing. Performing loopback tests is a common means of verifying the round trip delay of the network. The Ethernet loopback functions have been designed to emulate those used in traditional T-carrier networks. Manual mode immediately sets the port into loopback, whereas Responder mode allows the far end unit to send loop up and loop down commands.

There are two possible configurations for the loopback feature:

- **Manual Mode:** In this mode the GigE Responder will loopback all incoming frames as soon as this mode is selected.
- **Responder Mode:** In this mode, a test set setup as a controller will send a loop up command to the GigE Responder, which will then start looping all incoming frames. The GigE Responder will continue doing this until a loop down frame is received from the controller.

For setup details, see [Section 3.2](#).

5.2 Ping Test

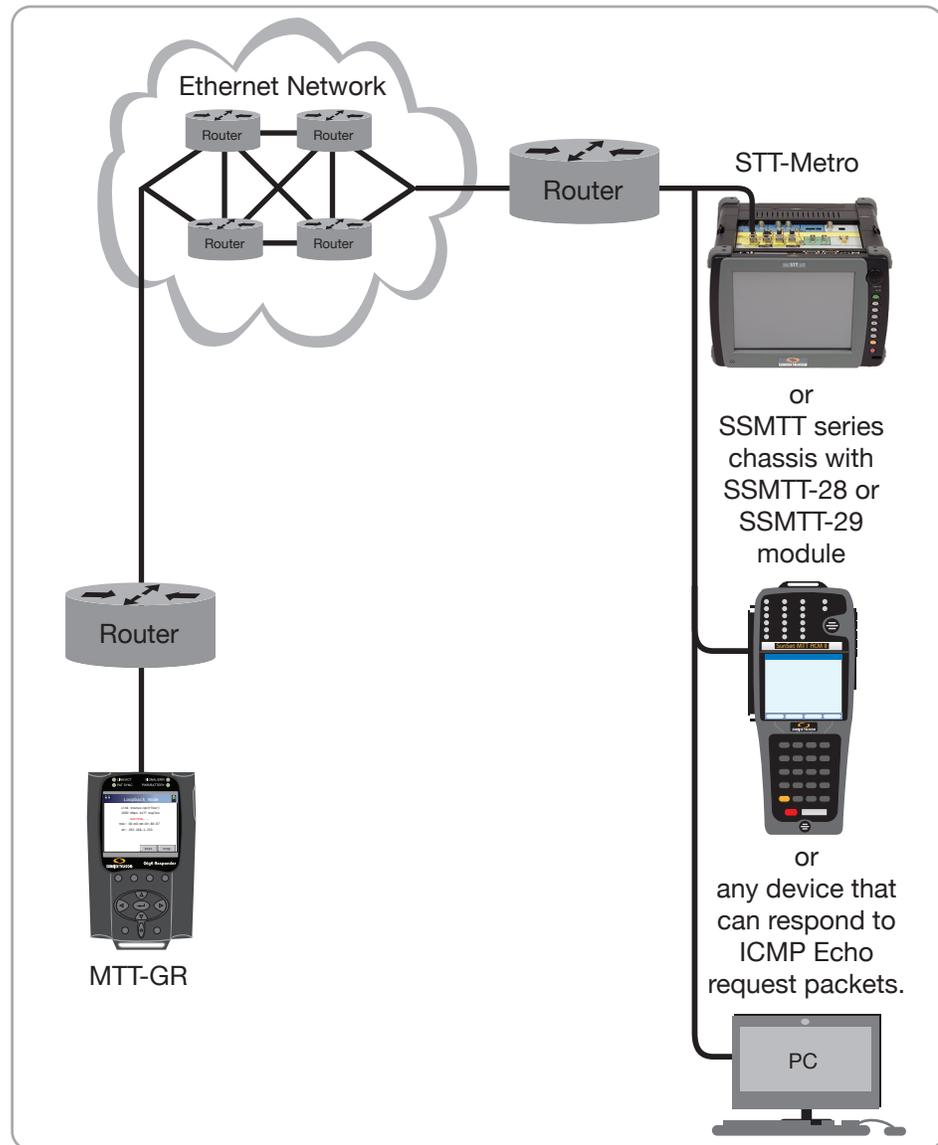


Figure 20 Ping Testing

The complexity of a routed IP network can make traditional throughput testing cumbersome and time consuming. The GigE Responder offers a simple ping test to verify Layer 3 connectivity. Ping testing also has the advantage that it works with any router or device that responds to ICMP Echo request packets, and does not require a second test set.

For setup details, see [Section 3.4.1](#).

6 General Information

6.1 Testing and Calibration Statement

Sunrise Telecom certifies that this product was manufactured, tested, and verified according to the applicable Sunrise Telecom Incorporated manufacturing and test procedure(s). These formal procedures are designed to assure that the product meets its required specifications.

This product has no user-adjustable settings. During normal usage, periodic calibration is not a requirement. However, if the product fails during the self-verification test, during power up, the product can be returned to the manufacturer for evaluation and repair.

6.2 Customer Service

General Sunrise Telecom Customer Service is available from 7:30 AM to 5:30 PM Pacific Standard Time (California, U.S.A.).

Customer Service performs the following functions:

- Answers customer questions over the phone on such topics as product operation and repair.
- Facilitates prompt repair of malfunctioning test sets.
- Provides information about product upgrades.

A Return Merchandise Authorization (RMA) Number is required before any product may be shipped to Sunrise Telecom for repair. Out-of-warranty repairs require both an RMA and a Purchase Order before the unit is returned. All repairs are warranted for 90 days.

Contact Customer Service at:

Sunrise Telecom Incorporated

302 Enzo Drive

San Jose, CA 95138

U.S.A.

Tel: 1-800-701-5208

Fax: 1-408-363-8313

Internet: <http://www.sunrisetelecom.com>

E-mail: support@sunrisetelecom.com

Or contact one our offices listed in [Section 6.3](#).

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Via Jacopo Peri, 41/c, 41100 Modena, ITALY

E-mail: info@sunrisetelecom.it
Tel: 39 059 403711 Fax: 39 059 403715

6.4 Express Limited Warranty

Hardware Coverage. COMPANY warrants hardware products against defects in materials and workmanship. During the warranty period COMPANY will, at its sole option, either (i) refund of CUSTOMER'S purchase price without interest, (ii) repair said products, or (iii) replace hardware products which prove to be defective; provided, however, that such products which COMPANY elects to replace must be returned to COMPANY by CUSTOMER, along with acceptable evidence of purchase, within twenty (20) days of request by COMPANY, freight prepaid.

Software and Firmware Coverage. COMPANY warrants software media and firmware materials against defects in materials and workmanship. During the warranty period COMPANY will, at its sole option, either (i) refund of CUSTOMER'S purchase price without interest, (ii) repair said products, or (iii) replace software or firmware products which prove to be defective; provided, however, that such products which COMPANY elects to replace must be returned to COMPANY by CUSTOMER, along with acceptable evidence of purchase, within twenty (20) days of request by COMPANY, freight prepaid. In addition, during the warranty period, COMPANY will provide, without charge to CUSTOMER, all fixes and patches to the original product specifications sold which COMPANY issues during the warranty period. COMPANY does not warrant or represent that all software defects will be corrected. In any case where COMPANY has licensed a software product "AS-IS," COMPANY'S obligation will be limited to replacing an inaccurate copy of the original material. This warranty does not cover upgrade or enhancements to product software and firmware.

Period. The warranty period for Hardware, Software and Firmware will be Three (3) Years from date of shipment to CUSTOMER. The COMPANY may also sell warranty extensions or provide a warranty term of three years with the original sale, which provide a longer coverage period for the test set chassis, software and firmware, in which case the terms of the express limited warranty will apply to said specified warranty term.

Only for CUSTOMER. COMPANY makes this warranty only for the benefit of CUSTOMER and not for the benefit of any subsequent purchaser or licensee of any merchandise.

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No Guaranty. Nonapplication of Warranty. COMPANY does not guaranty or warrant that the operation of hardware, software, or firmware will be uninterrupted or error-free. Further, the warranty shall not apply to defects resulting from:

- (1) Improper or inadequate maintenance by CUSTOMER;
- (2) CUSTOMER-supplied software or interfacing;
- (3) Unauthorized modification or misuse;
- (4) Operation outside of the environmental specifications for the product;
- (5) Improper site preparation or maintenance; or
- (6) Improper installation by CUSTOMER.

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