

FLUKE®

660 Series

Frame Relay Installation Assistant

Users Guide

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Chapter 1

Introduction

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Using This Guide

This *660 Series Frame Relay Installation Assistant Users Guide* describes how to operate the 660 Series Frame Relay Installation Assistant (also referred to as the “tester”). It provides instructions for setting up the tester and using it to verify the readiness of a frame relay link and test performance of a frame relay circuit.

Because the tester has many functions, we encourage you to first read this guide, which explains the most commonly used features of the tester. Then, refer to the *660 Series Frame Relay Installation Assistant Reference Manual*, the companion reference document, for descriptions of the tester's more advanced features and functions. The reference manual is available on the Fluke Web site at <http://www.fluke.com/manuals/660>.

This guide is intended for users who want to start using the tester immediately with minimal instruction. It describes the main features of the tester and explains how to set up, operate, and care for it. For your protection, it is important that you observe all warnings and important safety information in this guide and on the tester.

Introduction

The 660 Series Frame Relay Installation Assistant is a portable, battery-operated, handheld tester that is used to install frame relay services and perform basic throughput testing and troubleshooting of those services over Wide Area Network (WAN) links.

As an installation tool, the Frame Relay Installation Assistant gives you the option of emulating customer premise or network equipment. This feature enables you to test the function of each network component and determine whether a frame relay service is ready for use before any routers, Channel Service Units/Data Service Units (CSUs/DSUs), or Frame Relay Access Devices (FRADS) are deployed.

As a basic throughput and troubleshooting tool, you can use the tester to verify end-to-end connectivity and test performance of a frame relay network. You can obtain single-ended throughput diagnostics by configuring soft loopbacks in CPE or network switches. Additionally, you can perform end-to-end throughput testing by terminating each end of a permanent virtual circuit (PVC) with a 660 tester and conducting a two-way test.

The tester can also monitor in-service traffic to capture utilization, congestion, and error statistics over a specified period. The data can be stored in the tester's memory or exported to a personal computer for processing by a spreadsheet program or text editor.

The 660 Series Frame Relay Installation Assistant offers two models:

- Model 660T: connects to and tests frame relay service on Dataphone Digital Service (DDS), T1, and Serial circuits.
- Model 660TE: connects to and tests frame relay service on DDS, T1, E1, and Serial circuits.

Overview of Features

The 660 Series Frame Relay Installation Assistant provides the following features:

- Connects to and tests frame relay service for DDS, T1, E1, and Serial circuits (V.35, X.21, RS449, RS530, and RS232).
- Emulates customer premise or network equipment.
- Automatically recognizes the line type and automatically configures line parameters to match the received signal.
- Determines frame relay parameter types, such as emulation mode, Local Management Interface (LMI) protocol type, and multi-protocol encapsulation type. Automatically brings up the frame relay link, displaying all active Data Link Connection Identifiers (DLCIs).
- Runs all critical tests automatically and provides pass/fail results that indicate whether the circuit you are testing meets the test standards specified for the service.
- Runs the following out-of-service tests: Line test, Line BERT, Frame Relay, Frame Loss, IP PING, and IP Performance (optional).
- Monitors live frame relay circuits to check functionality, troubleshoot problems, and gather and report network statistics.

In addition, the tester offers the following features to help you simplify service turn-up and troubleshooting of frame relay service:

- Presents test options and results in a simple menu system.
- Provides quick information about the status of an incoming signal on LED indicators that are located on each of four interface modules.
- Provides specific test duration controls.
- Stores test results in nonvolatile memory for uploading to a printer or PC through the RS-232 port.
- Generates and stores fault information and provides time, date, and duration information for failure events.
- Operates for up to four hours on a rechargeable NiMH battery.
- Provides easy software upgrades through the RS-232 port into flash memory.
- Provides remote control operation through a dial-up modem connection.

For information on the tester's electrical and mechanical features, see Appendix A.

Safety Information

The 660 Series Frame Relay Installation Assistant is intended for use by qualified personnel inside a central office that is electrically isolated from the outside span or inside the customer premises only. The tester is designed for use with communication circuits carrying a maximum 35 volts dc or peak ac, wire to wire or wire to earth.

The following general safety precautions must be observed during all phases of operation, service, and repair of this tester. Failure to comply with these precautions or with specific warnings in this guide violates safety standards of design, manufacture, and intended use of this instrument. Fluke Corporation assumes no liability for the customer's failure to comply with these requirements.

⚠Warning

To ensure protection against lightning strikes, never connect the tester to a telephone line outside of primary protection.

Never connect the tester to a data circuit when lightning storms are nearby.

Do not remove the covers. There are no user-serviceable parts inside.

Should the LCD become damaged, the liquid crystal material can leak. Avoid all contact with this material, especially swallowing. Use soap and water to thoroughly wash all skin and clothing contaminated with the liquid crystal material.

When using an ac power source, use only the supplied ac adapter/charger to power or charge the tester.

Do not use the tester if it operates abnormally. Protection may be impaired.







Inspect the tester before using. Do not use it if it is damaged.

When servicing the tester, use only the specified replacement parts.

Always use the appropriate interface module when connecting the tester to a data circuit.

Table 1-1 describes the international electrical symbols used on the tester and in this guide.

Table 1-1. International Electrical Symbols

Symbol	Meaning
	Warning: Risk of electric shock.
	Important information. See specific explanations in this guide.
	Equipment is protected by double insulation or reinforced insulation to protect the user against electric shock.
	Battery should be recycled.
	Equipment is suitable for connection to the public telephone network.
	Equipment is not for connection to the public telephone network.

Care and Maintenance

Your 660 Series Frame Relay Installation Assistant is designed to be maintenance free. Treat it with care to ensure the best performance by observing the following:

- Avoid rough handling
 Avoid dropping the tester. After you use the Frame Relay Installation Assistant, disconnect the interface module from the main unit and return the tester and the module to the padded soft case. Use the original packaging if you must ship the tester.
- Clean carefully
 The plastic casing for your tester has a finish that should retain its durability for many years. To clean the tester, use a soft, slightly damp cloth. To remove any stains, use a mild soap. Never use detergents, solvents, or abrasive cleaners on the tester.

Service and Adjustment

Service and adjustment of the 660 Series Frame Relay Installation Assistant is to be performed only by trained Fluke Corporation service personnel.

If you experience a problem with the tester, visit Fluke's Web site at www.fluke.com or call one of the following numbers to report the problem

USA: 1-888-993-5853
Canada: 1-800-363-5853
Europe: +31 402-678-300
Japan: +81-3-3434-0181
Singapore: +65-737-2922
Anywhere in the world: +1-425-356-5500

In the event that the tester requires repair, service center personnel will provide you with shipping information and repair prices. If the tester is covered under warranty, it will be promptly repaired or replaced (at Fluke's option) and returned to you, postage paid, at no charge. See the registration card for warranty terms. If the warranty has lapsed, Fluke will repair the tester for a fixed fee and return it, postage paid, to you.

Checking Your Shipping Package

Remove the items from the shipping container and check that the package contains the items in the following list. Match each item with those shown in Figure 1-1. If any item is missing or damaged, contact your place of purchase.

- 660 Series Frame Relay Installation Assistant tester
- NiMH rechargeable battery pack (installed)
- RS-232 cable (PN 944806)
- Power line cord (not shown; contact Fluke Customer Service for the appropriate line cord)
- Power supply INTL (PN 944223)

- Soft case (PN 675501)
- Carrying strap (PN 946769)
- 660-Link Software 3.5-inch diskette (PN 1547059)
- This Users Guide (not shown; PN 804424)
- Warranty registration card (not shown; PN 688861)

For a list of replacement parts and optional accessories that you can order for your tester, see Appendix B.

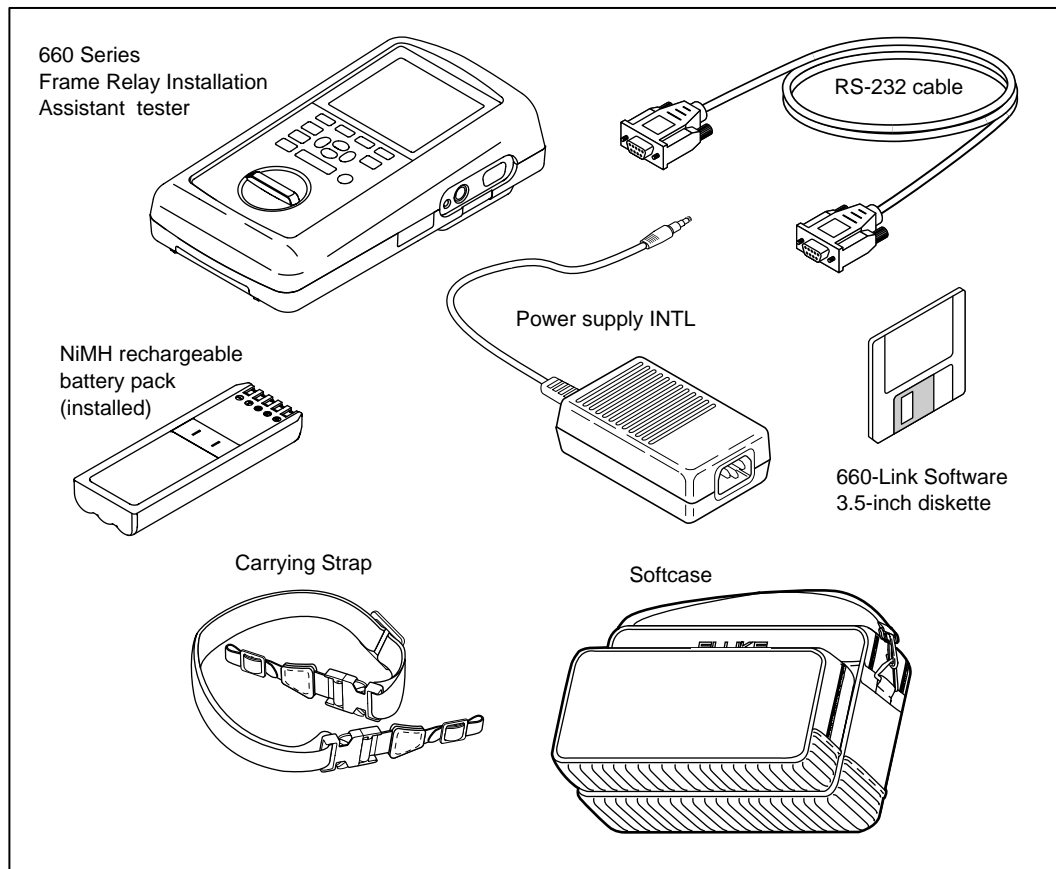


Figure 1-1. Standard Accessories

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Technical Support

Fluke Corporation offers a variety of support options to help you get the most from your 660 Series Frame Relay Installation Assistant. If you require technical support, please have the following information available:

- Your name and company
- Model number and serial number of the tester
- A description of the problem and any error messages that appear on the LCD.

For application or operation assistance, or for information about the tester, call the following numbers:

USA and Canada: 1-888-993-5853
Europe: +31 402-678-200
Japan: +81-3-3434-0181
Singapore: +65-738-5655
Anywhere in the world: +1-425-356-5500

Or, visit Fluke's Web site at www.fluke.com.

Chapter 2

Setting Up and Operating the Tester

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The Frame Relay Installation Assistant: at a Glance

Chapter 2 shows you how to set up and operate your 660 Series Frame Relay Installation Assistant.

The chapter begins with an overview of the physical layout of the tester so that you know where the various controls and connections are located and understand the functions of the rotary dial, keys, and LEDs.

You will then learn how to navigate through the menu system so that you can locate desired tests, functions, and configuration parameters.

The chapter also shows you how to attach interface modules to the tester. These modules enable you to adapt the tester to different types of WAN interfaces.

You will also learn how to connect the tester to the external power supply and to a printer or PC.

The chapter concludes by explaining the most commonly used features of the Frame Relay Installation Assistant. You learn how to turn on the tester and how to perform such fundamental tasks as setting the date and time, adjusting the brightness and contrast of the LCD, and restoring factory default settings.

The Front Panel

Figure 2-1 identifies the main elements of the Frame Relay Installation Assistant's front panel. Following the figure are descriptions of these elements.

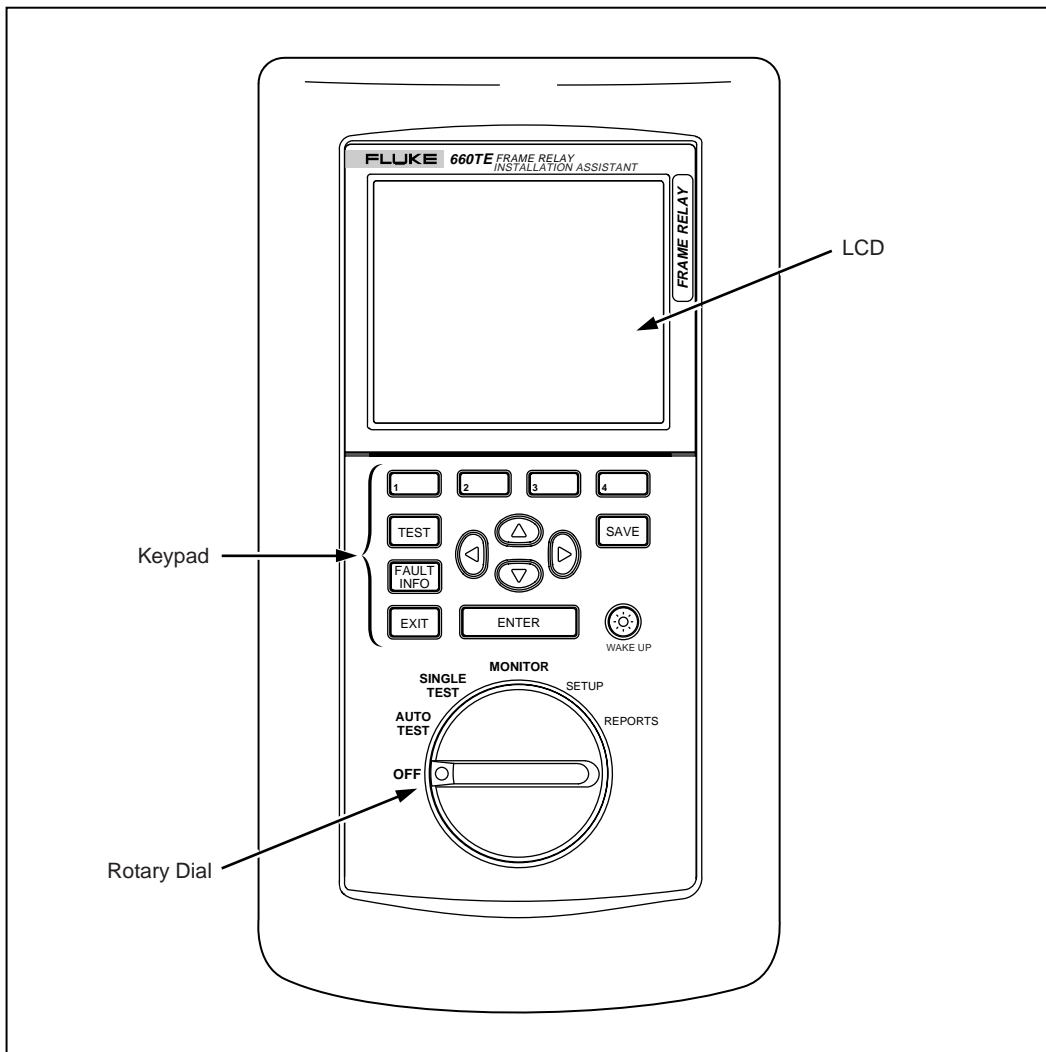


Figure 2-1. The Front Panel

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LCD

The Frame Relay Installation Assistant has a 15-line by 30-character, bit-mapped graphic LCD. The LCD has a backlight with adjustable contrast. The LCD displays the tester's menus as well as any error messages, test results, and setup parameters.

Rotary Dial

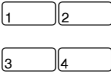






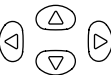
You use the rotary dial to select a mode of operation for the tester. This dial has six settings:

- **OFF**
Turns off the tester.
- **AUTO TEST**
Automatically runs three discrete single tests (LINE, FRAME RELAY, and AutoPING) consecutively. Use the Auto Test function to qualify the physical local loop and turn up and validate a new frame relay service.
- **SINGLE TEST**
Displays a menu of specialized tests that you can run one at a time to verify the performance of a link or troubleshoot a link that failed an Auto Test.
- **MONITOR**
Puts the tester in monitor mode so that you can unobtrusively monitor a link without interrupting service. Also provides a function that can assist you with determining the correct committed information rate (CIR) for any active PVC, based on measured traffic volumes.
- **SETUP**
Displays setup parameters that you can use to configure the tester. Also provides a means for you to set pass/fail thresholds for the Single Tests.
- **REPORTS**
Displays a list of test result reports that are saved in memory. You can print and delete these reports, and upload them to a PC. Also includes an Edit Report function that enables you to customize report headers with such information as a company name, user name, and location name.

Keypad

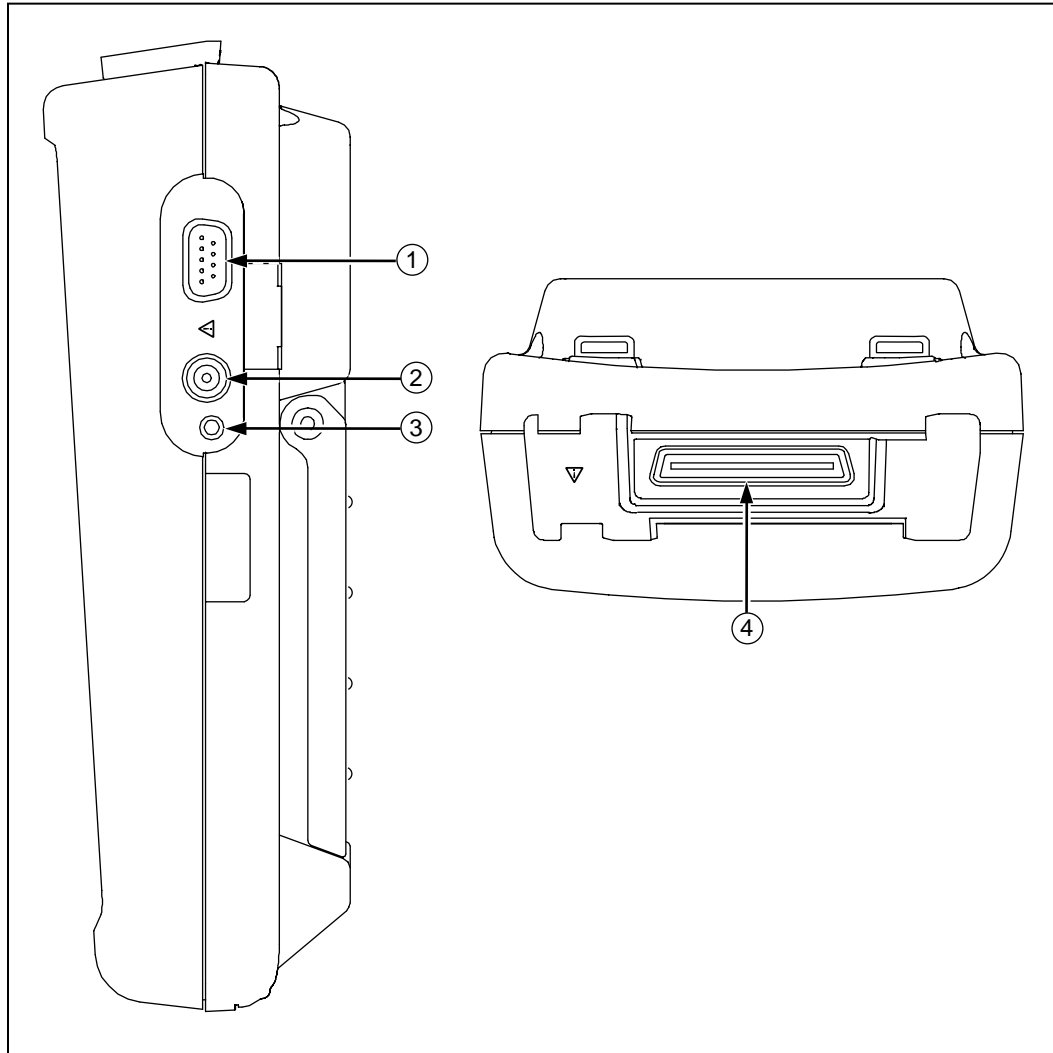
The keypad contains keys that are used to access the tester's functions and execute commands. The keypad also has directional arrow keys that are used to select items on the tester's menus. Table 2-1 lists the tester's keys and describes their functions.

Table 2-1. Key Functions

Key	Function
	Carry out commands that are related to the currently displayed screen. To locate a key's function, look on the LCD directly above the key.
	Starts the selected test or monitoring session.
	Displays the Fault Log, which contains records of any major errors or failures that occur during a test or monitoring session.
	Depending on the screen, has one of the following functions: <ul style="list-style-type: none"> • Exits the currently displayed screen and returns you to the previous level in the menu hierarchy. • Stops the currently running test.
	Displays a submenu or information that is related to the menu item that was selected.
	Has two functions: <ul style="list-style-type: none"> • Adjusts the backlight and contrast of the LCD. • Turns on the backlight, if the backlight timer automatically turned it off.
	Saves test results and parameter changes in memory.
	Move the on-screen cursor in the direction in which the arrow points (Left, Right, Up, and Down).

Connector Panels

The Frame Relay Installation Assistant has two connector panels. One panel is located on the top, and the other panel is located on the side of the tester (as shown in Figure 2-2). See Table 2-2 for descriptions of the components of the connector panels.



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Figure 2-2. Connector Panels

Table 2-2. Connector Panel Features

Item Number	Feature	Description
①	RS-232C serial port	A 9-pin connector that interfaces with a printer or host computer through a standard IBM-AT EIA RS-232C serial cable.
②	ac adapter/charger jack	Connector for the ac adapter/charger that is supplied with the tester.
③	ac power indicator	A multicolor LED that shows the status of ac power: <ul style="list-style-type: none"> • Off: ac adapter/charger is not connected. • Steady red: ac adapter/charger is fast charging the battery. • Blinking red: ac adapter/charger is trickle-charging the battery in preparation for fast charging. This state indicates that the battery voltage is extremely low, which can prevent the tester from operating. • Green: fast charging is completed. The ac adapter/charger is trickle charging to maintain the battery charge.
④	Interface module connector	Connector that attaches the tester to an interface module.

The Beeper

The Frame Relay Installation Assistant has a beeper that issues a tone or sequence of tones under the circumstances described in Table 2-3. You can turn the beeper on or off (see “Configuring the Frame Relay Installation Assistant” for details).

Table 2-3. Significance of the Beeper Tones

Tone	Occurrence
One short beep	Issued when you turn on the tester, change the position of the rotary dial, or press a valid key.
One long beep	Issued when a test ends or is manually interrupted and a <code>PASS</code> result is displayed.
Two short beeps	Issued when you press an invalid key.
Two long beeps	Issued when a fault log record is created during a test. Issued when an attention or warning message is displayed.
Three short beeps	Issued when a test ends or is manually interrupted and a <code>WARNING</code> or <code>FAIL</code> result is displayed.

The Menus




The Frame Relay Installation Assistant has a menu-based interface. The menus provide access to the tester's setup and testing functions as well as to test results and fault log event records. This section shows you how to access the menus and how to navigate through the menu system.

Accessing the Menus



To access the menus, turn the rotary dial to the name of the function or test that you want to perform.

The tester displays the startup screen followed by the top-level menu for your selection.


Selecting a Menu Item

To select a menu item, press  or  to move the cursor its name. Then, press .

Displaying the Next Page or the Previous Page of a Menu

Many menus have more than one page of entries. To display the next page of a menu, press  (Page Down). To display the previous page, press  (Page Up).

Exiting a Menu

To exit a menu, press .

You leave the currently displayed menu and return to the previous level in the menu hierarchy.

Connecting the Tester

This section shows you how to connect the Frame Relay Installation Assistant to the external power supply and to a printer or PC.

Connecting to the External Power Supply

When the tester is connected to an ac outlet, you can use the power supply as a continuous power source. In this way, you can test for long periods of time without concern for depleting the batteries.

To connect to the external power supply, follow these steps:

1. Plug the ac adapter/charger into an ac outlet.
2. Connect the power supply connector to the ac adapter/charger jack. This jack is located on the side panel of the tester (refer to Figure 2-2).
3. Turn on the Frame Relay Installation Assistant and begin usage.

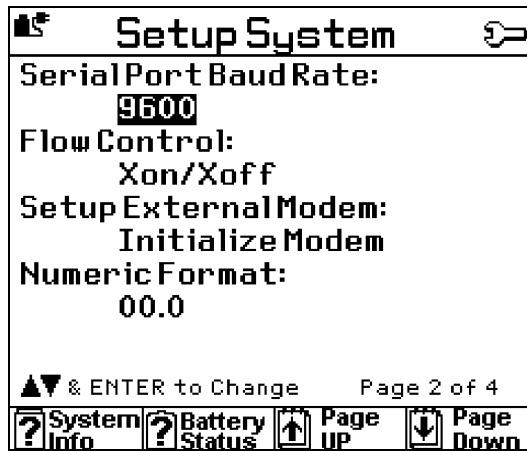
Connecting to a Printer or PC

The interface cable provided with the tester is configured for communication with a PC or serial printer.

To connect the tester to a PC or serial printer, refer to Figure 2-2 and proceed as follows:

1. Remove any cables that are connected to the tester.
2. Plug one DB-9 end of the serial cable into the RS-232C serial port, which is located on the side of the tester.

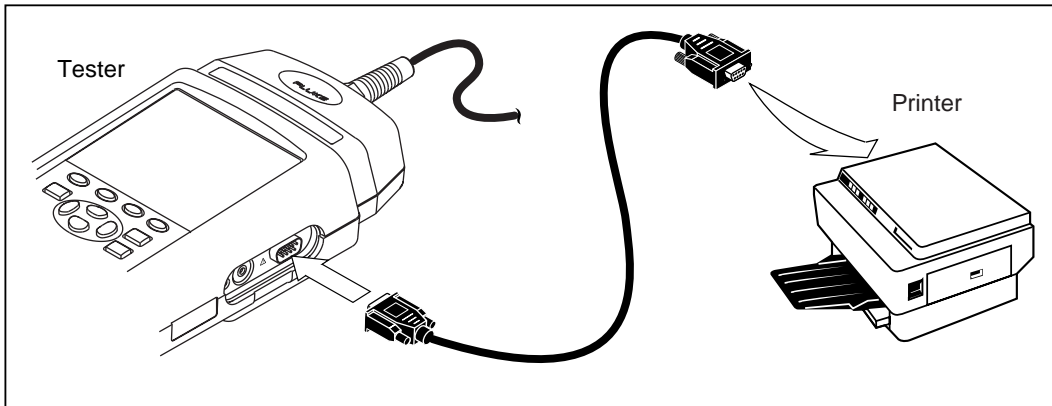
3. Plug the other DB-9 end of the serial cable into the serial port on the printer or PC.
4. Configure the tester's serial port settings and flow control. To do this, complete the following:
 - a. Turn the rotary dial to **SETUP** to display the **Setup** menu.
The cursor is positioned on the **System** option.
 - b. Press to display the **Setup System** menu. Then, press (Page Down) to display Page 2:



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The cursor is positioned on the setting for the **Serial Port Baud Rate** parameter.

- c. Press to display the list of available baud rate settings. Then, press to select the appropriate setting for the printer or PC. Finally, press to store your baud rate selection.
- d. Press to move the cursor to the **Flow Control** parameter. Then, press to display the list of available settings. Next, press to select the desired setting. Finally, press to store your flow control selection.



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Figure 2-3. Connecting the Tester to a Printer

Interface Modules

Optional interface modules are available for use with the Frame Relay Installation Assistant.

These modules provide the correct jacks and interface circuitry for testing different physical WAN interfaces.

The Frame Relay Installation Assistant offers four interface modules:

- 660M-DDS adapts the tester for connection to DDS transmission circuits.
- 660M-T1 adapts the tester for connection to T1 transmission circuits.
- 660M-E1 adapts the tester for connection to E1 transmission circuits.
- 660M-S adapts the tester to V.35, X.21, RS-449/V.36, RS-232/V.24, and RS-530 serial communication links.

Before operating the tester, you must attach it to the appropriate interface module.

This section shows you how to connect the tester to an interface module and describes the information displayed by the LED indicators found on the front of each of the four modules.

⚠Warning

Interface modules provide isolation and shock protection.

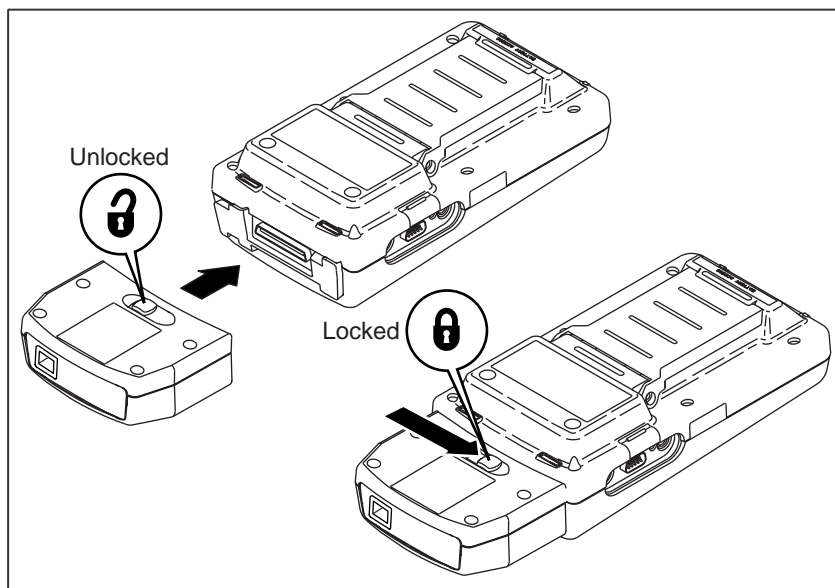
Do not operate the tester without the appropriate interface module connected.

Attaching an Interface Module to the Tester

Notes

Interface modules are purchased separately from your local Fluke dealer.

If you change modules, you do not have to calibrate the tester.



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Figure 2-4. Attaching an Interface Module to the Tester

To attach an interface module to the tester, complete the following (refer to Figure 2-4 for assistance):

1. Slide the latch on the back of the interface module to the right (unlocked position).
2. With the front of the tester and interface module facing away from you, position the interface module on top of the tester, making sure that the connector on the module and the connector on the tester are aligned.
3. Slide the latch on the interface module to the left to secure it to the tester.

The interface module is now connected to the tester.

Status LEDs

Each interface module has six LEDs. These LEDs provide quick, visual information on the status of the detected signal.

Figure 2-5 identifies the LEDs on the T1, E1, and DDS interface modules. Table 2-4 describes their function.

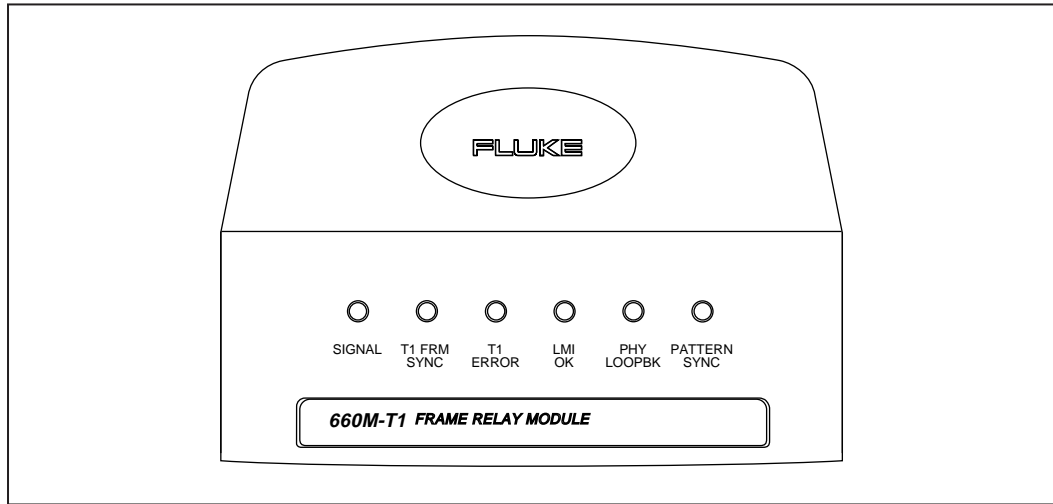


Figure 2-5. LEDs on the T1, E1, and DDS Interface Modules

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Table 2-4. T1, E1, and DDS Interface Module LEDs

LED	Meaning
SIGNAL	Steady green: the signal is present. Off: no signal is present or the signal is too weak.
FRM SYNC	Steady green: the framer is synchronized to the incoming signal. Off: no signal is present or the framer cannot synchronize to the incoming signal.
ERROR	Fast blinking red: the first T1/E1/DDS alarm or error has been detected. Steady red: the signal is in an active T1/E1/DDS alarm state or there are consecutive errored seconds. Slow blinking red: a T1/E1/DDS alarm or error occurred some time in the past. <p style="text-align: center;"><i>Note</i></p> <p style="text-align: center;"><i>When you start a new test or restart the currently running test, the tester clears the alarm and error history.</i></p> Off: no T1/E1/DDS alarms or errors have been detected since the test began.
LMI OK	Slow blinking green: the frame relay LMI link state is changing from down to up. Steady green: normal frame relay LMI keep-alive activity is present between the network and CPE. Fast blinking green: the frame relay LMI link state is changing from up to down. Off: the frame relay LMI link is down or there is no signal or framer synchronization.
PHY LOOPBK	Steady red: a physical loopback is present at the other end of the link (remote). Fast blinking red: the tester is currently set in self (local) loopback mode. Off: no local or remote loopback is in place.
PATTERN SYNC	Steady green: the tester is synchronized to the received BERT test pattern. Off: the tester is not synchronized to or is not receiving the expected BERT test pattern.

Figure 2-6 identifies the LEDs on the Serial interface module. Table 2-5 describes their function.

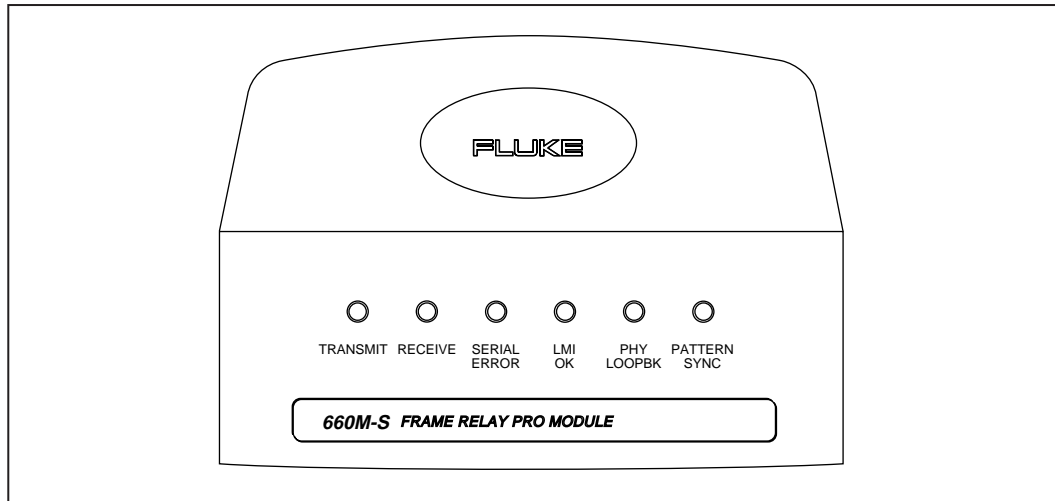


Figure 2-6. LEDs on the Serial Interface Module

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Table 2-5. Serial Interface Module LEDs

LED	Meaning
TRANSMIT	Steady green: the tester is transmitting serial data. Off: the tester is not transmitting data.
RECEIVE	Steady green: the tester is receiving serial data. Off: the tester is not receiving data.
SERIAL ERROR	<p>Fast blinking red: the first LOC alarm or the first Serial Lead error has been detected.</p> <p>Steady red: the signal is in an active LOC alarm state or there are consecutive Serial Lead errors.</p> <p>Slow blinking red: an alarm or error occurred some time in the past.</p> <p style="text-align: center;"><i>Note</i></p> <p style="text-align: center;"><i>When you start a new test or restart the currently running test, the tester clears the alarm and error history.</i></p> <p>Off: no LOC alarms or Serial Lead errors have been detected since the test began.</p>
LMI OK	<p>Slow blinking green: the frame relay LMI link state is changing from down to up.</p> <p>Steady green: normal frame relay LMI keep-alive activity is present between the network and CPE.</p> <p>Fast blinking green: the frame relay LMI link state is changing from up to down.</p> <p>Off: the frame relay LMI link is down or there is no signal or framer synchronization.</p>
PHY LBK	<p>Steady red: a physical loopback is present at the other end of the link (remote).</p> <p>Fast blinking red: the tester is currently set in self (local) loopback mode.</p> <p>Off: no local or remote loopback is in place.</p>
PATTERN SYNC	<p>Steady green: the tester is synchronized to the received BERT test pattern.</p> <p>Off: the tester is not synchronized to or is not receiving the expected BERT test pattern.</p>

Performing Basic Operations

This section gives you some basic information about how to operate the Frame Relay Installation Assistant. Read this section before you run any tests and obtain test results.

Turning on the Tester

To turn on the Frame Relay Installation Assistant, turn the rotary dial to any setting.

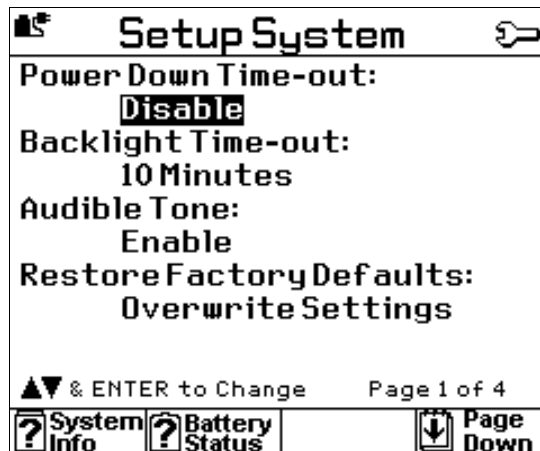
The startup screen is displayed followed by the top-level screen for the setting you selected.

Configuring the Tester

You can configure the tester so that it suits your particular work style and operating preferences.



To configure the tester, proceed as follows:

1. Turn the rotary dial to **SETUP**.
 The **Setup** menu is displayed. The **System** option is highlighted.
2. Press to display the **Setup System** menu:



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The **Setup** menu displays the setup parameters (see Table 2-6) that are used to configure the tester. The current setting for a parameter is located directly under its name.

3. To change the setting for a parameter, press  to move the cursor to the setting that you want to change. Then, press .

The tester displays the following:




- The alternative setting, if the parameter has only two settings.
- A list of settings, if the parameter has several settings. To select the desired setting, do the following:
 - a. Press the  move the cursor to the desired setting.
 - b. Press  to store your selection in memory.

Table 2-6. Setup Parameters for Configuring the Tester



Parameter	Description
Power Down Time-out	Sets the power-down timer to put the tester into low-power mode after the specified period of inactivity.
Backlight Time-out	Sets the backlight timer to dim the backlight of the LCD after the specified period of inactivity.
Audible Tone	Turns the tester's beeper on or off.
Restore Factory Defaults	Overwrites all setup parameters with their factory default settings.
Serial Port Baud Rate	Sets the communication speed for the RS-232 port.
Flow Control	Controls the flow control method used by the printer/PC RS-232 port.
Numeric Format	Specifies the numeric format for the display of decimal fractions.
Date	Sets the date.
Date Format	Specifies the format for the display of the date.
Time	Sets the time.
Time Format	Specifies the format for the display of the time.
Fault Log Memory Config	Determines whether the tester overwrites fault log records or stops storing records when the fault log exceeds its capacity.
Enable Software Options	Displays a screen on which you can enter key codes that enable various software options.
Setup External Modem	Displays a screen on which you can enter a custom character string that is sent to an external modem to cause it to automatically answer.

Adjusting the Contrast of the LCD

To adjust the contrast of the LCD, complete the following:

1. Press and hold  for one second or longer.

The **Contrast Adjust Screen** is displayed.

2. Press  or  until the desired level of contrast is obtained.

3. Then, press to store the setting.

The contrast setting is saved in memory even after you turn off the tester.

4. Press .

Restoring the Default Settings

You can restore all of the tester's setup parameters to their original values (as shipped by the factory).

Restoring the default settings is a useful task when you want to put the tester in a known state.

To restore the default settings, follow these steps:

Caution

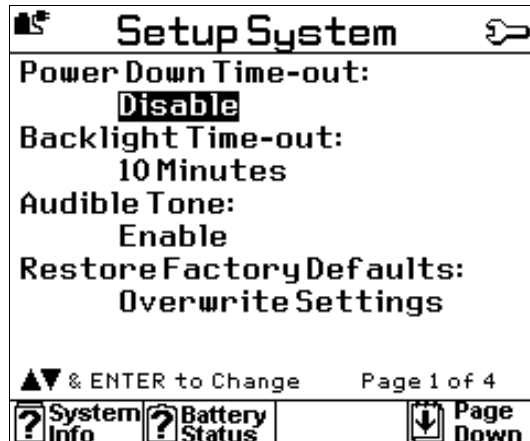
When you restore the factory default settings, any settings that you previously programmed for the tester are permanently erased.

1. Turn the rotary dial to **SETUP**.

The **Setup** menu is displayed. The **System** option is highlighted.

2. Press .

The **Setup System** menu is displayed:



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3. Press to move the cursor to the **Restore Factory Defaults** parameter. Then, press .

A warning message is displayed to advise you that all of your current setup values will be lost.

4. Do one of the following:
 - Press to change all of the current settings back to their factory-programmed values.
 - Press to cancel.

Responding to Low Battery Warnings

The tester displays a warning message when the battery voltage is low or too low for it to operate. If such a message is displayed, you will need to charge the battery.

To charge the battery, connect the ac adapter/charger to the tester and to ac line power. You can operate the tester on ac power while the battery is charging.

You can also charge the battery by using an optional 12-volt vehicle adapter or externally using an optional battery charger stand.

Charge the battery for approximately four hours before you run the tester on battery power. On a fully charged battery, the tester can operate for about four hours.

Updating the Tester with New Software

When a software update becomes available for the 660 Series Frame Relay Installation Assistant, you can download the latest version from the Fluke Web site (<http://www.fluke.com/nettools/software/660>) to your PC, then transfer the files to your tester. Using the Web site requires Internet access and a web browser.

To install new software, you need 660 Link, a Windows-based download utility program. This program is on the 3.5-inch diskette that was shipped with the tester or is available from the Web site. If you need help downloading new software, call Fluke Technical Support.

The 660-Link Program

The 660-Link program is on the 3.5-inch diskette that is included among the tester's standard accessories (see Figure 1-1).

Using this program, you can do the following:

- Configure a PC's serial port for communication with the tester
- Transfer software updates from a PC to the tester
- Upload saved test result reports from the tester to a PC
- Remotely operate the tester via a dial up modem connection.

The 660-Link program runs under Windows® 95, 98 or NT. For information on the minimum system requirements for running the program and for information on installing and using it with the tester, see the *660 Frame Relay Installation Assistant Reference Manual*. You can find the reference manual at the Fluke Web site <http://www.fluke.com/manuals/660>.

Chapter 3

Turning Up New Frame Relay Service

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Introduction

To turn up a new frame relay service, complete the following steps in the order given. Each step is explained in detail following this summarized procedure.

1. Select a cabling scheme for the tester.
2. Select an emulation mode for the tester.
3. Cable the tester.
4. Run tests and analyze the circuit.

Selecting a Cabling Scheme

The Frame Relay Installation Assistant can transmit and receive signals while acting as one of the following devices:

- Data Terminal Equipment (DTE)

When configured to operate as DTE, the tester uses the wiring scheme appropriate for a DTE connection to communicate with a device that is using a DCE wiring scheme. For T1/E1 circuits, the tester receives on pins 1 and 2 and transmits on pins 4 and 5. For DDS circuits, the tester receives on pins 7 and 8 and transmits on pins 1 and 2. For Serial circuits, the tester receives on DTE receive pins and transmits on DTE transmit pins.



DTE is usually the appropriate cabling scheme if the tester is emulating CPE (see "Selecting an Emulation Mode"). Figures 3-4 and 3-5 show sample cabling configurations in which the tester is emulating CPE. Select **DTE** as the cabling scheme if your connections look like those depicted either figure.

- Data Circuit Terminating Equipment (DCE)

When configured to operate as DCE, the tester uses the wiring scheme appropriate for a DCE connection to communicate with a device that is using a DTE wiring scheme. For T1/E1 circuits, the tester receives on pins 4 and 5 and transmits on pins 1 and 2. For DDS circuits, the tester receives on pins 1 and 2 and transmits on pins 7 and 8. For Serial circuits, the tester receives on DCE receive pins and transmits on DCE transmit pins.

DCE is usually the appropriate cabling scheme if the tester is emulating the frame relay network (see "Selecting an Emulation Mode"). Figures 3-6 and 3-7 show sample cabling configurations in which the tester is emulating a frame relay network. Select **DCE** as the cabling scheme if your connections look like those depicted in either figure.

To select a cabling scheme, follow these steps:




1. Turn the rotary dial to **SETUP**.
The **Setup** menu is displayed.
2. Press  to select **Line**, then press  to display the **Setup Line** menu.
The cursor is positioned on the **Line Cabling** parameter.

Notes

*If the tester is emulating customer premise equipment, **DTE** is usually the correct setting.*

*On the other hand, **DCE** is usually the correct setting when the tester is emulating central office equipment.*

*To have the tester automatically detect the received signal and set the appropriate **DTE** or **DCE** cabling, set the **Line Cabling** parameter to **Auto Detect** (the default).*

3. Press .
The list of settings for the **Line Cabling** parameter is displayed.
4. Press  to select the desired setting, then press .
Your selection is saved in memory.

Selecting an Emulation Mode

The Frame Relay Installation Assistant can emulate one of the following frame relay Link Management Interfaces (LMI):

- **User-to-Network Interface Customer Premise Equipment (UNI CPE)**
When the tester emulates UNI CPE (see Figure 3-1), it functions like a router or a router CSU/DSU combination. This type of emulation is appropriate when you want to qualify the network prior to installing customer premise equipment.
- **User-to-Network Interface Frame Relay Network (UNI NET)**
When the tester emulates UNI NET (see Figure 3-2), it functions like a frame relay network. This type of emulation is appropriate when you want to verify the operation and configuration of frame relay customer premise equipment.
- **Network-to-Network Interface (NNI)**
When the tester emulates NNI (see Figure 3-3), it maintains a two-way LMI polling session. This type of emulation is appropriate when you want to emulate network equipment that interfaces with other network equipment.

Figure 3-1 illustrates a UNI CPE configuration in which the tester emulates CPE.

Note

Figure 3-1 illustrates the most common connection scheme. If you had a Serial connection, the tester would be connected to the local loop through a CSU/DSU.

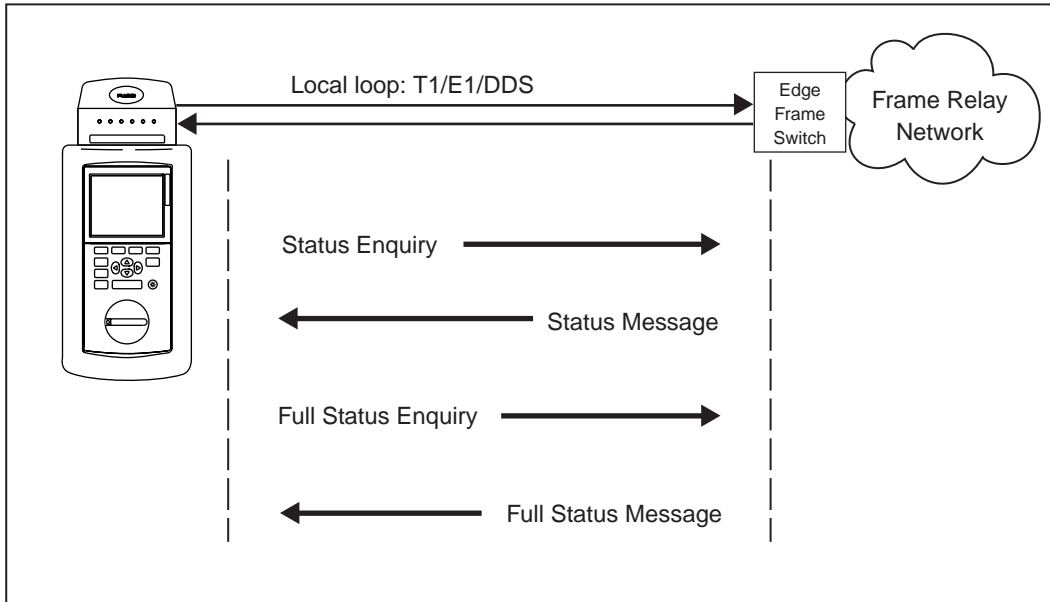


Figure 3-1. Frame Relay Installation Assistant Emulating UNI CPE

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Figure 3-2 illustrates a UNI Network configuration in which the tester emulates the frame relay network.

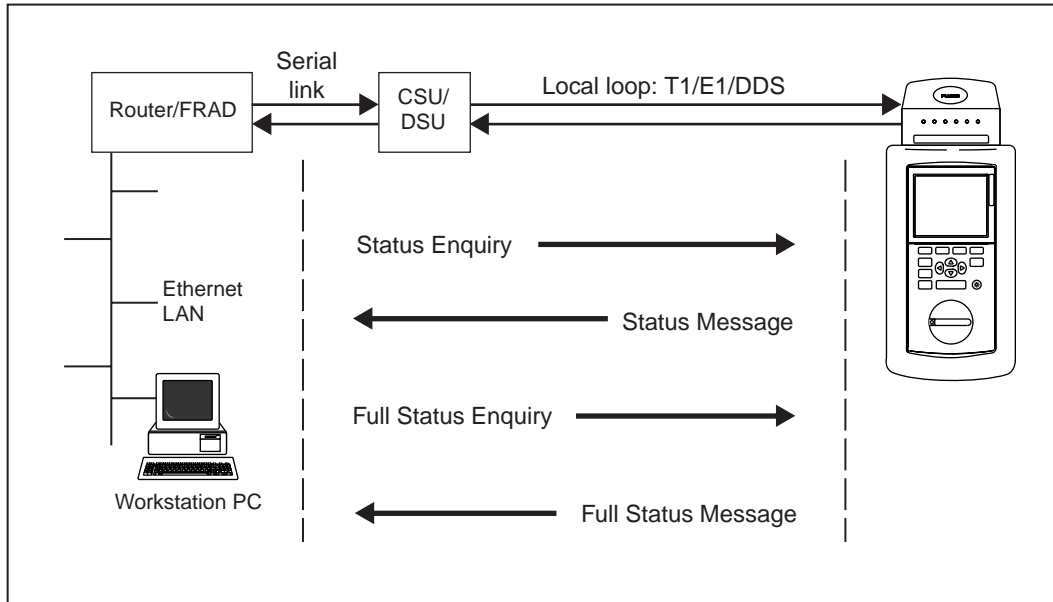


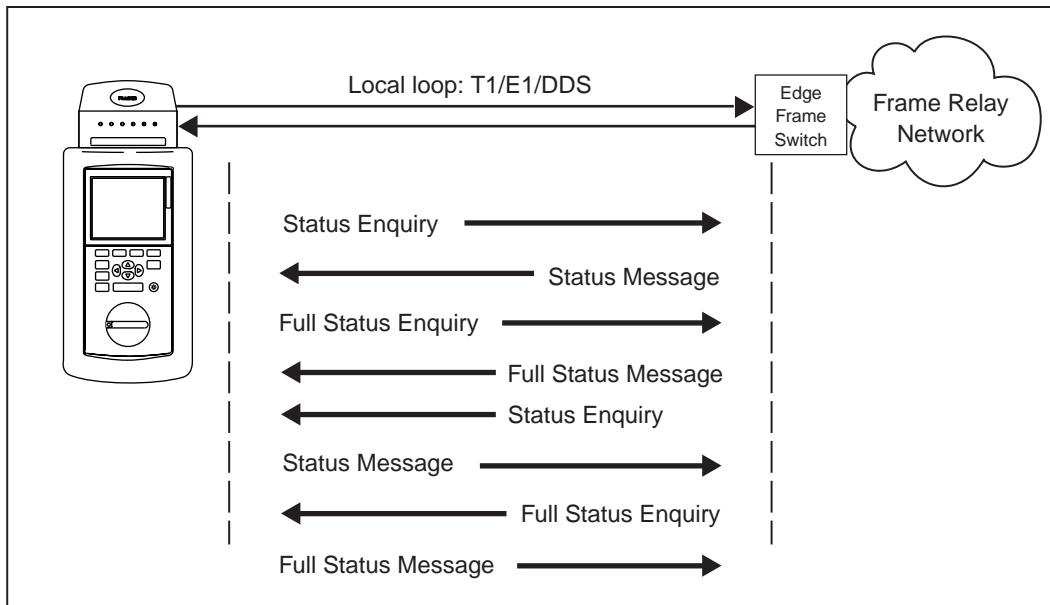
Figure 3-2. Frame Relay Installation Assistant Emulating the Frame Relay Network

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Figure 3-3 illustrates a Network-to-Network configuration in which the tester emulates network equipment that interfaces with other network equipment.

Note


Figure 3-3 illustrates the most common connection scheme. If you had a Serial connection, the tester would be connected to the local loop through a CSU/DSU.

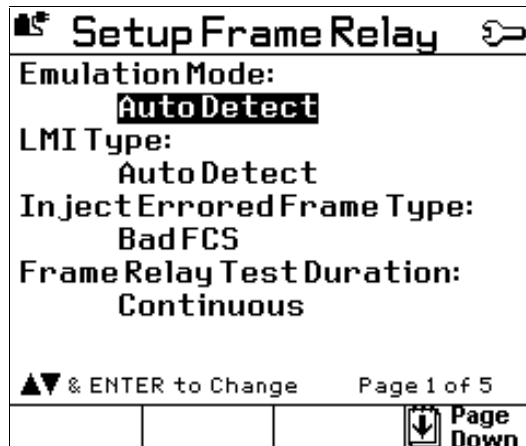


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Figure 3-3. Frame Relay Installation Assistant Emulating NNI

To select an emulation mode, complete the following:

1. Turn the rotary dial to **SETUP**.
The **Setup** menu is displayed.
2. Press  to select **Frame Relay**, then press to display the **Setup Frame Relay** menu:




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The setting for the **Emulation Mode** parameter is highlighted.

3. To change the current setting, press .
- The list of settings is displayed.

Note

*If you select **Auto Detect** (the default), the tester automatically detects the LMI type and sets the emulation mode.*

4. Press  to select the desired setting, then press .
- Your selection is saved in memory.

Cabling the Tester

The following sections show you various ways to cable the tester based on the choice of cabling schemes and emulation modes described in the previous sections. Refer to the cabling instructions that fit your particular application.

DTE Line Cabling for CPE Emulation

To cable the tester for CPE emulation, complete the following:

1. Make sure that the customer premise equipment that the tester is emulating is disconnected from the frame relay network.
2. Connect the tester to the frame relay network (refer to Figure 3-4 or 3-5 for assistance).

Note

If the interface is DB15 or Bantam, you must use the appropriate adapter cable.

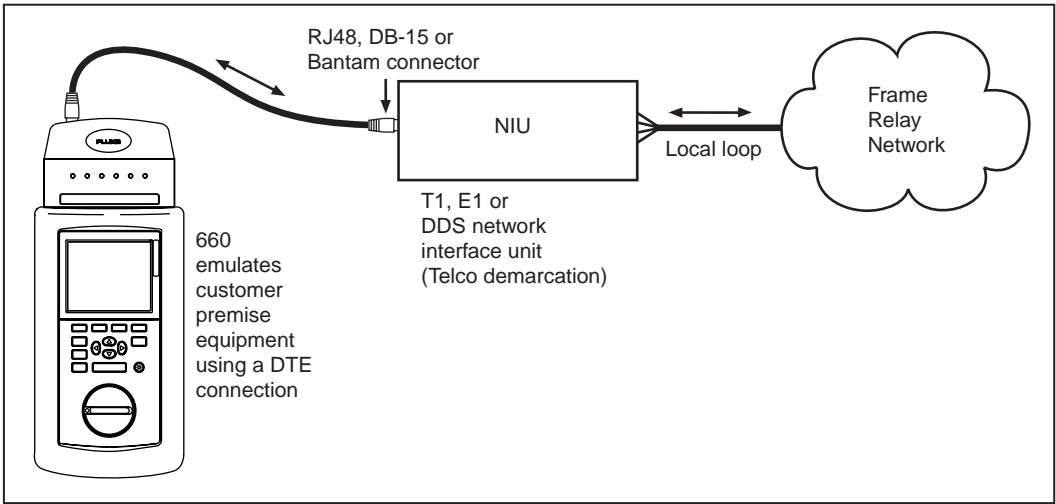
3. Turn on the tester.

Notes

*If the line cabling is set to **Auto Detect** (the default), the tester automatically detects the received signal pair and sets the appropriate DTE or DCE cabling.*

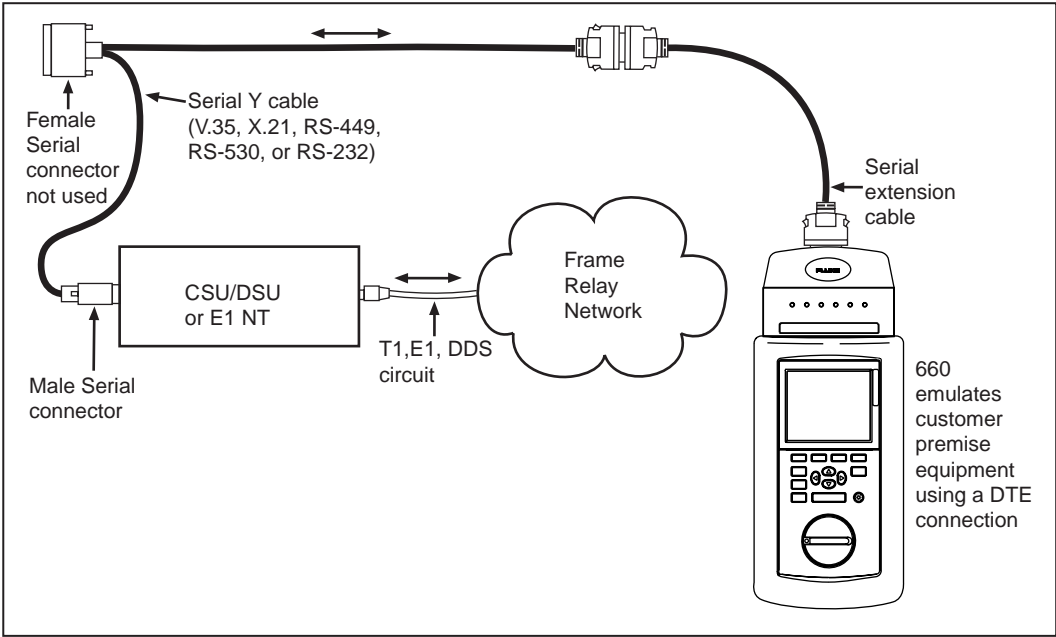
*If the emulation mode is set to **Auto Detect** (the default), the tester automatically detects the LMI type and sets the emulation mode.*

You are now ready to run an Auto Test. See “Running an Auto Test”, which follows, for instructions.



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Figure 3-4. Emulating CPE by Terminating the T1/E1/DDS Circuit



acb03f.eps

Figure 3-5. Emulating CPE by Terminating the Serial Circuit

DCE Line Cabling for Network Emulation

To cable the tester for UNI or NNI network emulation, complete the following:

1. Disconnect the CPE from the frame relay network.
2. Connect the tester to the CPE (refer to Figure 3-6 or 3-7 for assistance).
3. Turn on the tester.

Notes

*If the line cabling is set to **Auto Detect** (the default), the tester automatically detects the received signal pair and sets the appropriate DTE or DCE cabling.*

*If the emulation mode is set to **Auto Detect** (the default), the tester automatically detects the LMI type and sets the emulation mode.*

You are now ready to run Auto Test. See “Running an Auto Test” for instructions.

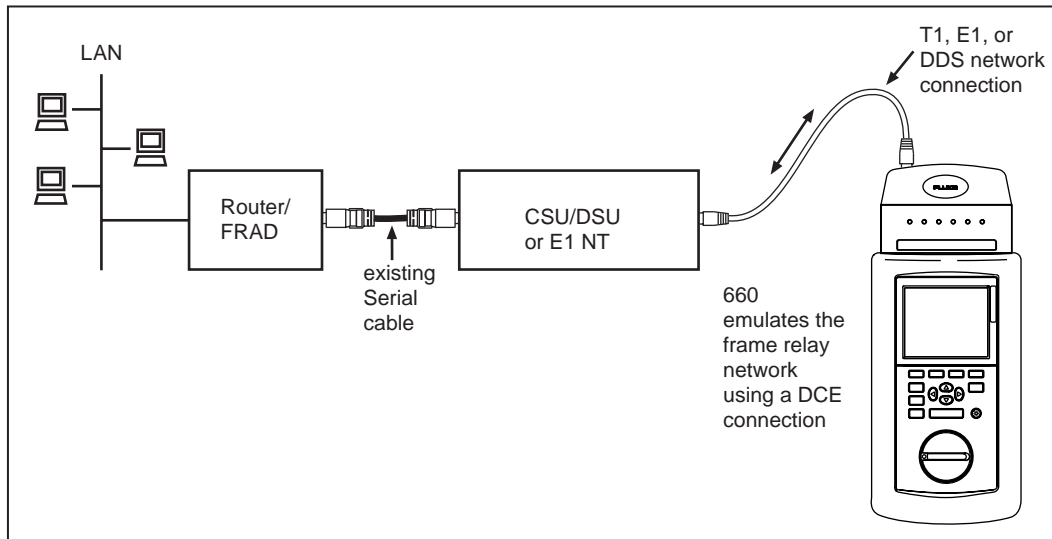


Figure 3-6. Emulating UNI or NNI Network by Terminating the T1/E1/DDS Circuit

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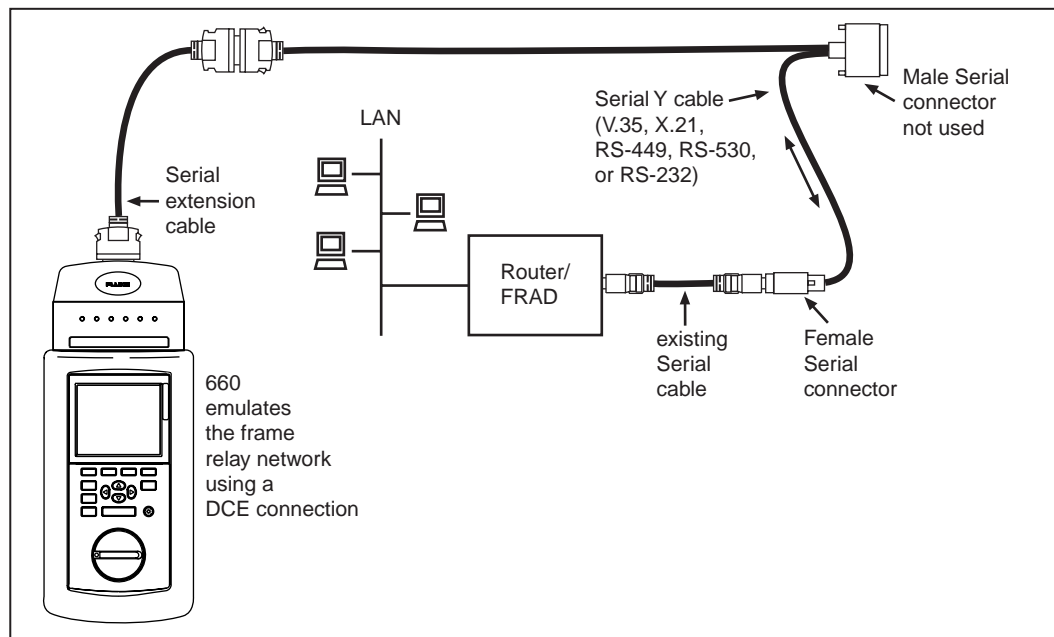


Figure 3-7. Emulating the UNI or NNI Network by Terminating the Serial Circuit

acb05f.eps

Running an Auto Test

Auto Test is a set of three diagnostic tests that the tester runs automatically with a single press of a button. When you turn up a frame relay service, an Auto Test can help you assess the basic condition of a frame relay network and enable you to determine whether it is ready for use before user or network equipment is installed. Specifically, the tests that comprise an Auto Test help you do the following:


- Ensure that the physical circuit is provisioned correctly and functions according to the requirements of your installation
- Verify that the physical circuit is connected to the frame relay network
- Verify end-to-end connectivity through the frame relay network.

The following tests comprise an Auto Test. A typical Auto Test takes approximately one minute to complete.

- **LINE**
Depending on the interface type, the LINE test is composed of between three to five subtests. These tests can help you determine whether the transmission circuit is physically able to support the frame relay service. Specifically, the tests provide physical circuit information, such as the configuration parameters detected, and indicate whether physical layer errors or alarms were discovered.
- **Frame Relay**
The Frame Relay test is composed of five subtests. This test verifies that the physical circuit is connected to the frame relay network and that the network or customer premise equipment can maintain an LMI keep-alive session. This test also provides DLCI statistics, reporting on the number of active DLCIs that are found, as well as frame relay traffic statistics and frame errors.
- **AutoPING**
This test verifies end-to-end connectivity by identifying the IP addresses of devices on the far end of each active PVC and sending an IP PING echo request to those devices to determine whether they are online and responding.

Setting Up an Auto Test

To set up an Auto Test, complete the following:

1. Turn the rotary dial to **SETUP**.
The **Setup** menu is displayed.
 2. Press  to select **Auto Test**, then press .
- The **Setup Auto Test** menu is displayed. The cursor is positioned on the setting for the **Emulation Mode** parameter.

Note

Descriptions of the Auto Test setup parameters can be found in the 660 Series Frame Relay Installation Assistant Reference Manual.

3. Press to display the list of settings for the **Emulation Mode** parameter.
4. Press to select the desired setting, then press to save your selection in memory.

Continue in this manner, selecting and saving a setting for each parameter on the **Setup Auto Test** menu.

Starting an Auto Test

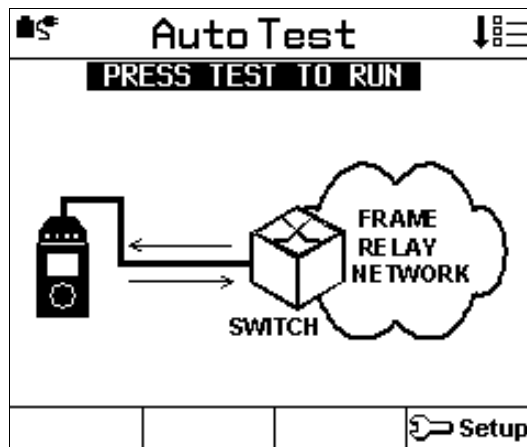
Note

Before you run this test, you may want to modify the header that appears on any test result reports that you may save (see "Creating a Header for Test Reports" in Chapter 5 for instructions). Note that you can change the header after a report is saved, but you will have to edit the text file to do so.

To start an Auto Test, complete the following:

1. Turn the rotary dial to **AUTO TEST**.

The **Auto Test** screen is displayed:



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2. Press .

The test begins. As the tester completes each subtest, it issues a PASS, WARN, or FAIL result, which is displayed on the **Auto Test** Summary Results screen.

After all of the subtests run, the tester displays the **TEST COMPLETE** screen. If all of the subtests successfully meet their performance criteria, the tester displays an overall **PASS** result on this screen. If performance criteria are not met for any test, the tester beeps and displays a **WARN** or **FAIL** result.

Note

*A **PASS**, **WARN**, or **FAIL** result is issued in accordance with the parameters selected under the setup for each subtest (see "Setting Up a Single Test" for details).*

You can now save the results of the test or view them. See "Saving Auto Test Results" or "Viewing Auto Test Results" for details.

Saving Auto Test Results

To save Auto Test results, follow the instructions under "Saving Test Results" in Chapter 5.

Viewing Auto Test Results

To view results from an Auto Test, follow these steps:

Note

*If you press **EXIT**, you can view Auto Test results, but you can no longer save them. After you exit the **TEST COMPLETE** screen, you cannot return to that screen to save results. Be aware that any fault log records associated with the results are also lost.*

1. On the **TEST COMPLETE** screen, press **EXIT**.
The **Auto Test Summary Results** screen is displayed. Overall results are displayed in the right column.
2. To view summary results for a specific subtest, press **▼** to select the name of the test, then press **ENTER**.
Summary results for the selected test are displayed.

Following is an example of the summary results provided for the Frame Relay subtest. Note that for each test parameter, the tester displays an overall result: PASS, WARN, or FAIL.

Frame Relay Test FR	
Summary Results:	PASS
Frame Relay Service:	PASS
LMI Test:	PASS
DLCI List:	PASS
Circuit Traffic:	PASS
Frame Errors:	PASS
▲▼ & ENTER to View Details ⌚ 00:01:53	
Restart	

acb19f.bmp

3. To view detailed results for a particular test parameter, press to select the parameter, then press .

Following is an example of the type of detailed results that the tester provides. This example shows the detail results generated for the AutoPING test's **Target Discovery** parameter:

AutoPING Test IP	
Target Discovery Details	
DLCI	Far End IP Address
16	198.246.178.000
17	198.178.246.000
18	198.178.246.000
19	198.178.246.000
20	198.178.246.000
21	198.178.246.000
22	198.178.246.000
Page 1 of 2	
Restart	Page Down

acb22f.bmp

Running Single Tests

The Single Tests are specialized tests that you can run to gather more detailed and focused results in a particular area of interest.

When you run any of the Single Tests, you must have the tester connected to the circuit under test in a terminated, out-of-service fashion (see “DTE Line Cabling for CPE Emulation” or “DCE Line Cabling for Network Emulation” in this chapter for instructions).


The Frame Relay Installation Assistant runs the following Single Tests:

- **LINE**
Determines transmission circuit parameters based on the received signal. Looks for the proper signal receive levels and checks for physical layer errors and alarms.
- **LINE BERT**
Transmits and receives standard BERT patterns for acceptance testing or for troubleshooting physical transmission circuits.
- **FRAME RELAY**
Verifies that the network or customer premise equipment can maintain an LMI keep-alive session. Test results include a list of the active DLCIs found as well as frame relay traffic statistics and frame errors.
- **FRAME LOSS**
Verifies end-to-end PVC performance over a designated DLCI using special frame relay test frames. Test results contain standard metrics for contractual service-level agreements (SLAs).

- **PING**
Tests end-station-to-end-station IP connectivity and round-trip delay through a network.
- **IP PERFORMANCE** (separately purchased option)
Verifies end-to-end PVC performance over a designated DLCI using IP packets within the payload of the generated test traffic. Inter-operates with a Fluke OneTouch LAN tester to provide a two-way WAN to LAN IP performance test. Features an automatic ramp-up function and separate upstream and downstream results.

Setting Up a Single Test

To set up a Single Test, complete the following:

1. Turn the rotary dial to **SETUP**.
The **Setup** menu is displayed.
2. Press  to select the name of the test that you want to set up. Press to display the setup menu for the test.
3. For each setup parameter on the menu, select the desired setting.

Refer to the *660 Series Frame Relay Installation Assistant Reference Manual* for descriptions of the setup parameters for the Single Tests.

Starting a Single Test

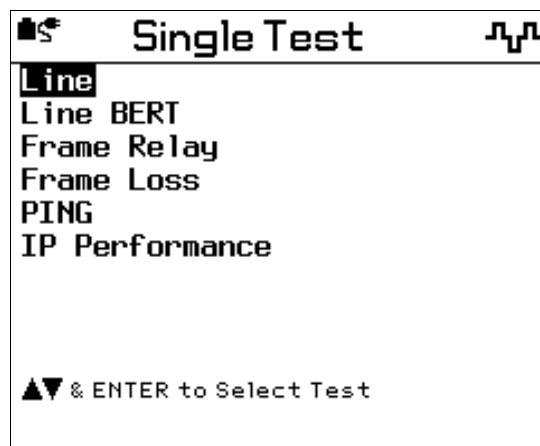
Note


Before you run a test, you may want to change the header that appears on any test result reports that you will save (see "Creating a Header for Test Reports" in Chapter 5 for instructions). Note that you can change the header after a report is saved, but you will have to edit the text file to do so.

To start a Single Test, follow these steps:

1. Turn the rotary dial to **SINGLE TEST**.

The **Single Test** menu is displayed:



2. Press  to select the test that you want to run. Then, press .

The top-level screen for the selected test is displayed. The current setup for the test is located at the bottom of the screen.

3. Do one of the following:
 - If the current setup is correct, press **TEST** to start the test.
When the test ends or is manually interrupted, an overall PASS, FAIL, or WARN result is displayed on the **TEST COMPLETE** screen.
 - If the current setup is not correct, complete the following:
 - a. Press **4**(Setup) to display the setup screen for the test.
 - b. Follow the instructions on the screen to change the settings of the test parameters.
 - c. Press **EXIT** to return to the test screen. Then, press **TEST** to start the test.
After the test ends or is manually interrupted, an overall result is displayed for the test on the **TEST COMPLETE** screen.

Saving Single Test Results

For instructions on saving the results of a Single Test, see "Saving a Test Result Report" in Chapter 5.

Viewing Single Test Results

To view results from a Single Test, follow these steps:

Note

*If you press **EXIT**, you can view test results, but you can no longer save them. After you exit the **TEST COMPLETE** screen, you cannot return to that screen to save results. Be aware that any fault log records associated with the results are also lost.*

1. On the **TEST COMPLETE** screen, press **EXIT**.
Summary results for the test are displayed. An overall result for each test parameter is displayed in the right column.
2. To view detailed results for a particular test parameter, press **▼** to select the parameter, then press **ENTER**.

Chapter 4

Monitoring an In-Service Network

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Introduction

Chapter 4 shows you how to use the 660 Series Frame Relay Installation Assistant to manage and troubleshoot an in-service frame relay network. First, you will learn how to connect the tester to a frame relay network so that you can monitor service at the customer site or at a central office. After you make the appropriate connections, you will learn how to use the tester to monitor circuits to check for physical layer problems and gather network traffic statistics.

Connecting the Tester for Monitoring Service at a Customer Site

The following sections describe the ways to connect the tester to a frame relay network that is in service at a customer site.

Connecting to a T1, E1, or DDS Circuit

There are two ways to connect the tester to a T1, E1, or DDS circuit: into a tap box or into the monitor jacks on a CSU/DSU or NT (for E1). Follow the procedure that suits your particular application.

Tap Box Connection

Note

To use this procedure, you need a tap box (NT907). The tap box, which comes with each interface module, contains a tap port that allows you to monitor both transmit pairs (network to CPE and CPE to network), one at a time.

To connect into a tap box, refer to Figure 4-1 and complete the following:

1. Using the supplied patch cable RJ48 to RJ48, connect the tester to the port labeled "TAP" on the tap box.

Note

The circuit must be opened briefly when you initially install the tap box. After it is installed, you can connect the tester to it at any time without disrupting service.

2. Connect the frame relay circuit-under-test to one of the ports labeled “LINE” on the tap box.
3. Connect the CSU/DSU to the other port labeled “LINE” on the tap box.

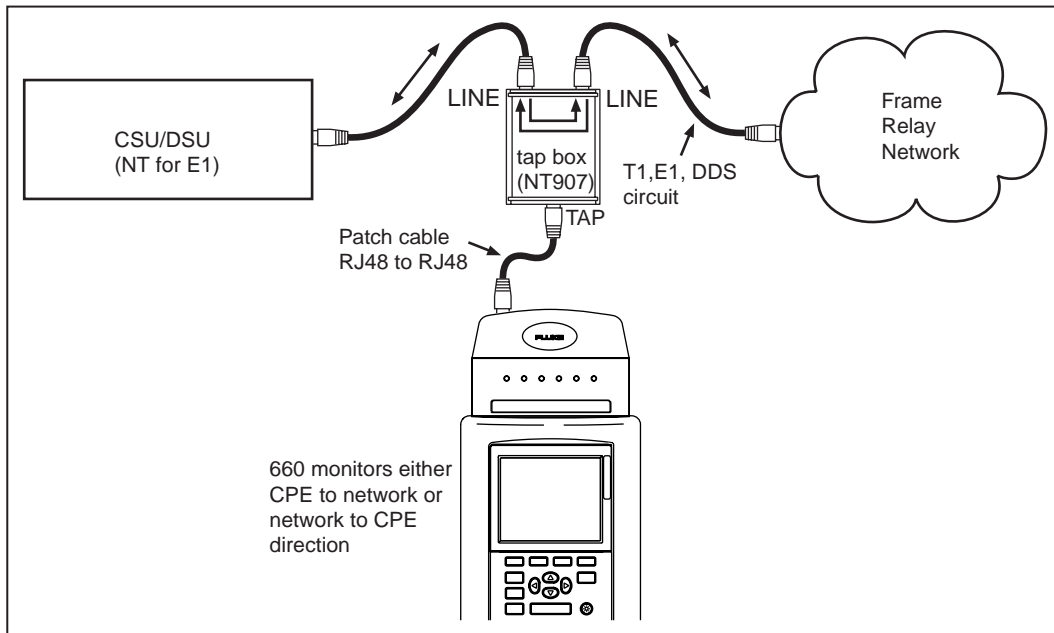


Figure 4-1. Connecting Tester for In-Service Monitoring of a T1, E1, or DDS Circuit

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T1/DDS CSU/DSU Monitor Jack Connection

To connect the tester to the monitor jacks on a CSU/DSU, refer to Figure 4-2 and complete the following:

1. Connect the RJ48 end of the adapter cable (PN 1546664 for T1; PN 1546673 for DDS) to the T1/DDS interface module.
2. Connect the adapter cable Bantam connector labeled “RECEIVE” to the CSU/DSU MON jack OUT.
3. Connect the adapter cable Bantam connector labeled “TRANSMIT” to the CSU/DSU MON jack IN.

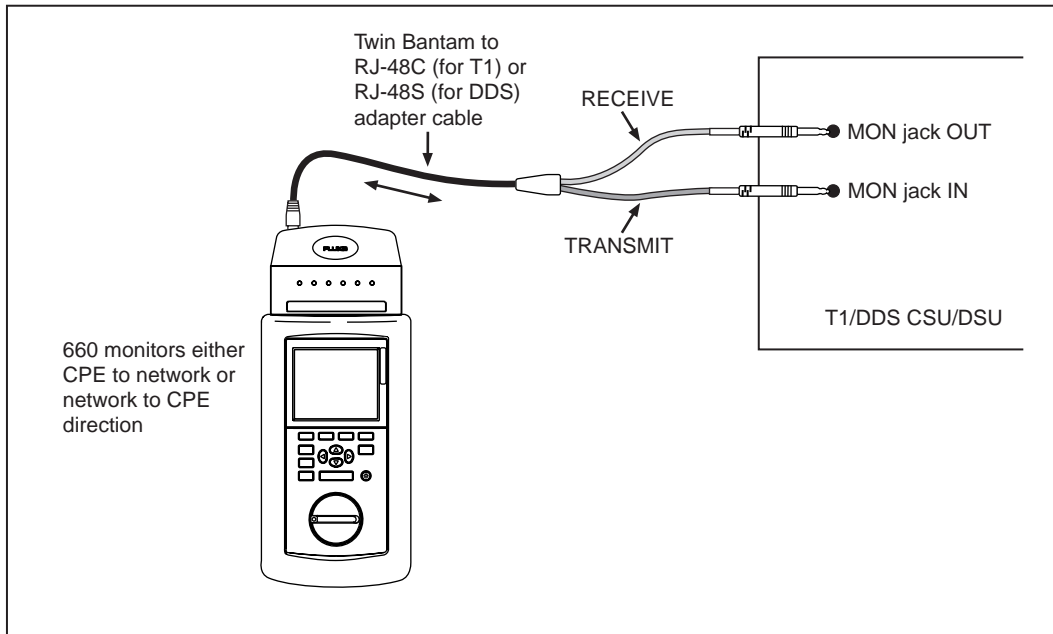


Figure 4-2. Connecting the Tester to Monitor Jacks on a T1 or DDS CSU/DSU

E1 Network Termination (NT) Equipment Monitor Jack Connection

To connect the tester to the monitor jacks on E1 NT equipment, refer to Figure 4-3 and complete the following:

1. Connect one end of the supplied RJ48 to RJ48 patch cable to the E1 interface module and the other end to the supplied E1 Balun.
2. Connect one end of a 75 Ω coaxial patch cable (PN 686623) to the E1 Balun BNC connector labeled "RX" and the other end to the NT equipment MON jack OUT.
3. Connect one end of a second 75 Ω coaxial patch cable (PN 686623) to the E1 Balun BNC connector labeled "TX" and the other end to the NT equipment MON jack IN.

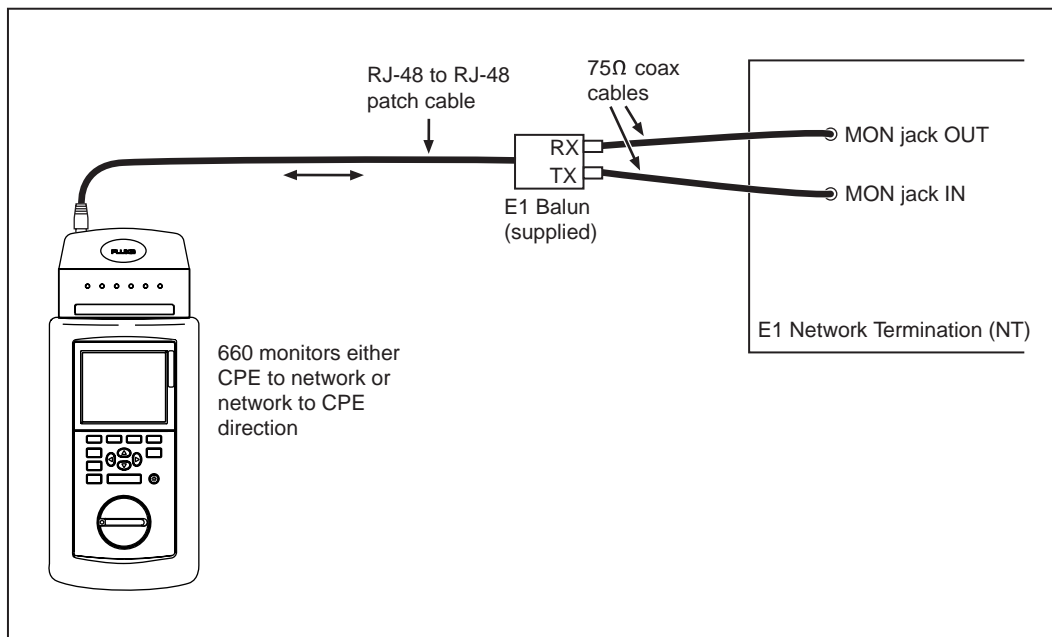


Figure 4-3. Connecting the Tester to Monitor Jacks on E1 NT Equipment

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Connecting to a Serial Circuit

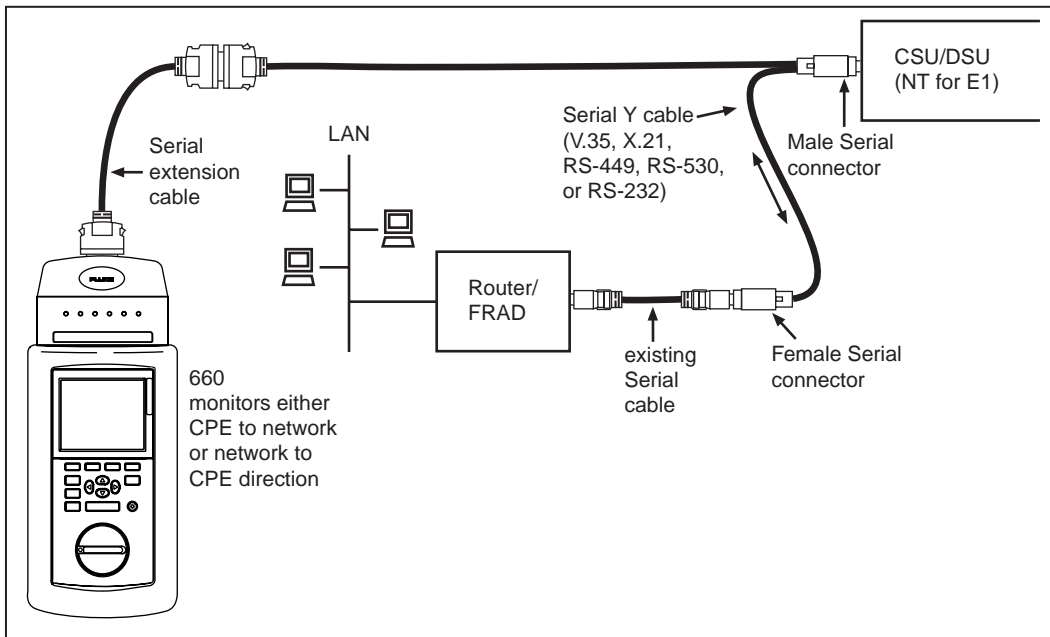
To connect the tester to a Serial circuit, refer to Figure 4-4 and complete the following:

Note

The circuit must be opened briefly when you connect the Serial Y cable.

After it is installed, you can connect the tester to it at any time without disrupting service.

1. Using the serial extension cable, connect the tester to one of the following accessory Y adapter cables:
 - NS102 X.21
 - NS103 V.35
 - NS104 V.35 (French)
 - NS105 RS-449/V.36
 - NS106 RS-530
 - NS107 RS-232/V.24
2. Connect the Female end of the Serial Y cable to the existing cable that typically connects the DTE (router or FRAD) to the CSU/DSU (NT for E1).
3. Connect the Male end of the Serial Y cable to the DCE (CSU/DSU or NT for E1).



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Figure 4-4. Connecting the Tester for In-Service Monitoring of a Serial Circuit

Connecting the Tester for Monitoring Service at a Central Office

The following sections describe the ways to connect the tester to a frame relay network that is in service at a central office.

T1/DDS Patch Panel or Channel Bank Connection

To connect the tester to a frame relay circuit at a central office, refer to Figure 4-5 and complete the following:

1. Connect the RJ48 end of the adapter cable (PN 1546664 for T1; PN 1546673 for DDS) to the T1/DDS interface module.
2. Connect the Bantam plug labeled "RECEIVE" to the Inbound monitor jack on the patch panel or channel bank.
3. Connect the Bantam plug labeled "TRANSMIT" to the Outbound monitor jack on the patch panel or channel bank.

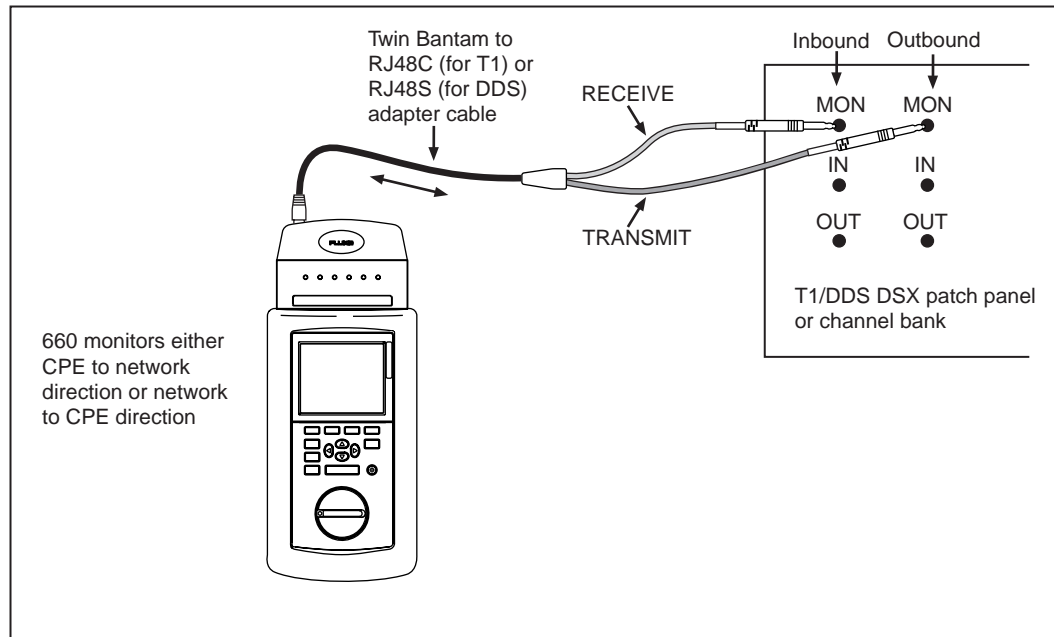


Figure 4-5. Connecting the Tester to a T1 or DDS Circuit at a Central Office Site

E1 Line Terminal Equipment (LTE) Connection

To connect the tester to the monitor jacks on E1 LTE, refer to Figure 4-6 and complete the following:

1. Connect the supplied RJ48 to RJ48 patch cable to the E1 interface module and the supplied E1 Balun.
2. Connect one end of a 75 Ω patch cable (PN 686623) to the supplied E1 Balun BNC connector labeled "RX" and the other end to the Inbound BNC monitor jack on the LTE.
3. Connect one end of a second 75 Ω patch cable (PN 686623) to the supplied E1 Balun BNC connector labeled "TX" and the other end to the Outbound BNC monitor jack on the LTE.

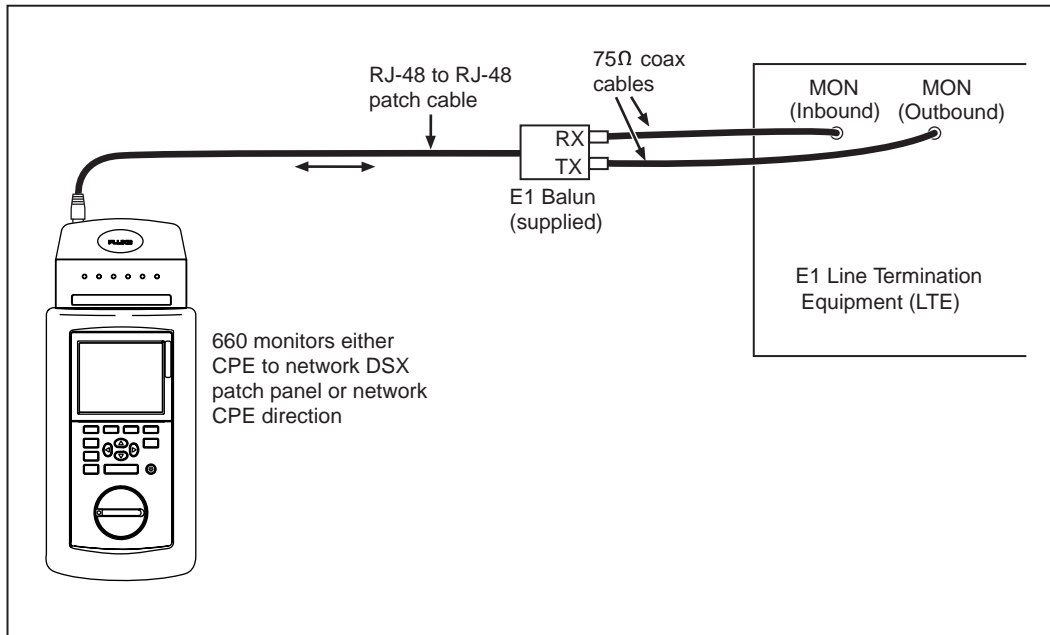


Figure 4-6. Connecting the Tester to an E1 Circuit at a Central Office (Exchange) Site

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Monitoring an In-Service Frame Relay Circuit

After you connect the tester as described in the previous sections, you are ready to put the tester in monitor mode. In this mode, the tester unobtrusively checks all frames sent over a frame relay network. The tester runs the following tests:

Note

The LINE and Frame Relay tests use the same pass/fail criteria that are configured in the setup for the respective single tests. If the criteria are exceeded, a WARN or FAIL message is displayed. The Top PVCs and CIR Advisor tests have no PASS/FAIL criteria associated with them.

- **LINE**
Verifies that the circuit-under-test has no physical layer errors or alarms present and that it can support the frame relay service.
- **FRAME RELAY**
Verifies that the network or user equipment can maintain an LMI keep-alive session. Reports the active DLCIs found and provides frame relay traffic statistics and frame errors.
- **Top PVCs**
Displays those PVCs on an in-service link that are consuming the most bandwidth or experiencing the most congestion.
- **CIR Advisor**
Monitors live traffic on a single target DLCI and compares the utilization measured to the Committed Information Rate (CIR) that is specified by the user.

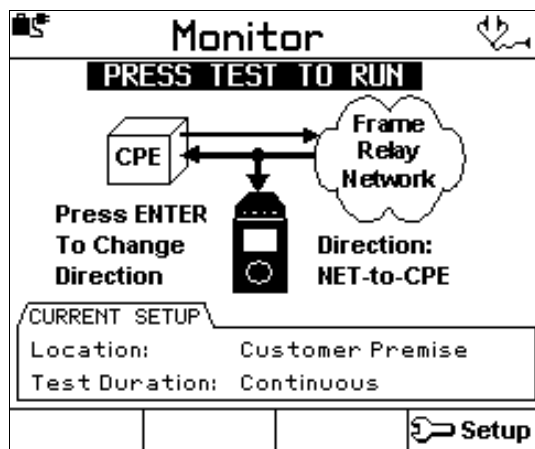
After you end the session, the tester provides both summary and detailed reports of its findings.

To monitor a circuit, complete the following:

Note

Before you begin monitoring, you may want to change the header that appears on any test result reports that you will save (see "Creating a Header for Test Reports" in Chapter 5 for instructions). Note that you can change the header after a report is saved, but you will have to edit the text file to do so

1. Turn the rotary dial to **MONITOR**.
2. The **Monitor** screen is displayed:



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On this screen, you can indicate in which direction you want the tester to monitor the circuit. Choose one the following directions:

- **CPE to NET**
From the customer premises to the network.
- **NET to CPE**
From the network to the customer premises.

3. Do *one* of the following:
 - If the displayed direction is correct, press .
 - If the displayed direction is not correct, press to change it. Then, press .The tester begins monitoring the frame relay circuit.
 4. To stop the session, press .
- The tester displays the **TEST COMPLETE** screen.
- From this screen, you can either view results (see "Viewing Monitoring Session Results") or save them (see "Saving Monitoring Session Results").

Viewing Monitoring Session Results

To view results from a monitoring session, complete the following:


Note

*If you press , you can view results from the session, but you can no longer save them. After you exit the **TEST COMPLETE** screen, you cannot return to that screen to save results. Be aware that any fault log records associated with the results are also lost.*

1. From the **TEST COMPLETE** screen, press .
- The **Monitoring Summary Results** screen is displayed. Overall results for each subtest are displayed in the right column.

Note

If the physical link is carrying unframed data (for example, BERT patterns), the Top PVCs and CIR Advisor result screens may display erroneous results.

2. To view summary results for a specific subtest, press  to select the name of the test, then press .
3. To view detailed results for any of the tests, position the cursor on the name of the test, then press .

For detailed descriptions of the monitoring session results, refer to the *660 Series Frame Relay Installation Assistant Reference Manual*.

Saving Monitoring Session Results

To save results from a monitoring session, follow the instructions under "Saving Test Results" in Chapter 5.

Chapter 5 Reports

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Introduction

The tester can save results in memory for later review. These results are stored in a report file, which is saved in memory even after the tester is turned off or reset.

Chapter 5 shows you how to manage test report files. You will learn how to create a header for your reports, how to save results in a report file, and how to print the file. You will also learn how to delete any report files you no longer need from the tester's memory.

This chapter also describes the tester's fault log. This log keeps track of major errors or failures that the tester detects during a test or monitoring session. You will learn how to display the log, how to save records to it, and how to print the information it contains.

Test Reports

This section shows you how to do the following:

- Create a report header
- Save test results
- Print test reports
- Delete test reports.

Creating a Header for Test Reports

You can create an identifying header for your test reports. This header specifies a company name, an operator name, and a test site name. When you print test results, this header appears at the top of the report.



Before you run any tests, you may want to modify the header that appears on any test result reports that you may save. Use this procedure to edit the header.

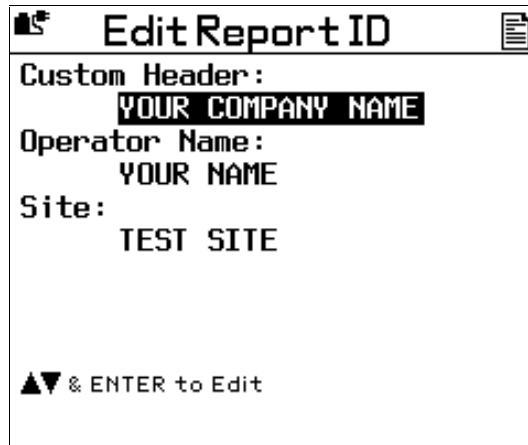
Note

You can change the header after a report is saved, but you will have to edit the text file to do so.

To create or modify a header, complete the following:



1. Turn the rotary dial to **REPORTS**.
The **Reports** menu is displayed.

2. Press  to select **Edit Report Identification**. Then, press .
3. The **Edit Report ID** screen is displayed:



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The cursor is positioned on the setting for the **Custom Header** parameter.

4. To change the **Custom Header**, do the following:
 - a. Position the cursor on the parameter's setting.
 - b. Press  to display an edit screen.
 - c. Press  until you erase the name that is currently in the **Custom Header** field. Then, follow the instructions to type a name.

Note

The name you type can be up to 20 characters long.

- d. When you finish, press  to store the name change.

5. To change the **Operator Name** or **Site**, do the following:
 - a. Position the cursor on the parameter's setting.
 - b. Press .
 - c. Press until you erase the name that is currently in the **Operator Name** or **Test Site** field. Then, follow the instructions to type a name.

Notes

The name you type can be up to 20 characters long.

You can create lists of operator and site names. You can choose names from these lists so that when you print a report, the desired operator or site name is in the header.

After the lists are created, you can add names to them and edit them. Press to add a name, and press to edit existing names.

Saving Test Results

Depending on the state that the tester is in, you can save Auto Test, Single Test, or Monitoring session results in a report file. The tester saves results only if the following conditions are satisfied:

- An Auto Test or Single Test must have run for the duration specified in their respective setups
- or
- An Auto Test, Single Test, or Monitoring session must have run for any duration then have been manually stopped by the user.

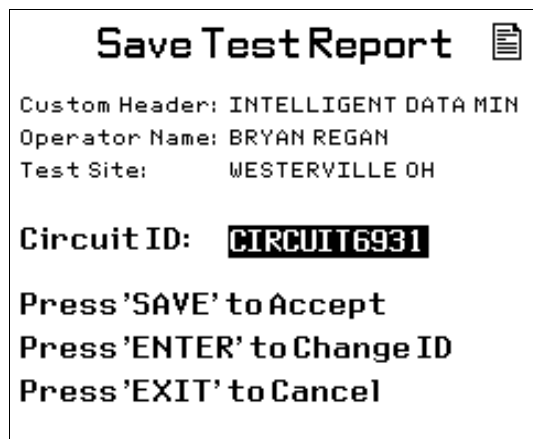
If either condition is not met, the tester beeps when you press .

To save test results, follow these steps:

1. Wait for the test to end or press to manually stop the running test.
 The **TEST COMPLETE** screen is displayed.

2. Press **SAVE**.

The **Save Test Report** screen is displayed:



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The tester prompts you to provide a name for the file in the **Circuit ID** field. You can accept the default name that is provided or you can type a different name for the file in this field.

3. Do one of the following:

- To use the default file name, press **SAVE**.

The results are saved in the report file. This file contains both summary and detailed results from the test or monitoring session. If any errors or failures were detected, corresponding fault log records are appended to the report (see "The Fault Log" for details).

- To type a different file name, press **ENTER**. Then, follow the instructions on the screen to type a name. The name you choose can be from 1 to 15 characters long.

After you type a name for the file, press **SAVE**.

The results are saved in the report file. This file contains both summary and detailed results from the test or Monitoring session. If any errors or failures were detected, corresponding fault log records are appended to the report (see "The Fault Log" for details).


- Press **EXIT** to cancel.



Printing a Test Report

Any results that are saved in a report file can be printed directly to a printer or terminal emulator.

This section shows you how to print test reports on a serial printer connected to the tester. Before you print, it is a good idea to check your printer connections and settings. See “Connecting to a Printer or PC” in Chapter 2 for instructions.

To print a test report, complete the following:

1. Turn the rotary dial to **REPORTS**.
The **Reports** menu is displayed.
2. Press  to select **Print Test Reports**. Then, press .
The **Print Test Reports** screen is displayed:

Print Test Reports			
Circuit ID	Type	Stat	Date
CIRCUIT6932	LINE	F	11/10/99
CIRCUIT6933	FRAME LOSS	F	11/10/99
CIRCUIT6934	FRAME LOSS	P	11/10/99
CIRCUIT6931	PING	P	11/10/99
▲▼ & ENTER to Print		Page 1 of 1	
			


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This screen lists the names of the reports that are saved in the tester's memory. For each report, the following information is given:

- Type of test
- Overall status (P for PASS, F for FAIL, W for WARN, or N for Not Completed)
- File creation date.

Note


Each page can display up to eight report names. If there are additional pages, press (Page Down) to display them.

3. Do one of the following:
 - To print a single report, press  to select the name of the report. Then, press . The selected report is printed.
 - To print all of the reports, press (Print All). The tester prints all of the reports that are saved in the tester's memory.
 - Press (Cancel Print) to cancel printing.

Deleting a Test Report

You can delete test reports individually or all at one time. To delete a report, complete the following:

1. Turn the rotary dial to **REPORTS**.
The **Reports** menu is displayed. The **Delete Test Reports** option is highlighted.
 2. Press .
- The tester displays the **Delete Test Reports** screen:

Delete Test Reports 			
Circuit ID	Type	Stat	Date
CIRCUIT6932	LINE	F	11/10/99
CIRCUIT6933	FRAME LOSS	F	11/10/99
CIRCUIT6934	FRAME LOSS	P	11/10/99
CIRCUIT6931	PING	P	11/10/99

▲▼ to Select a Report Page 1 of 1

<input checked="" type="checkbox"/> Delete Report	<input checked="" type="checkbox"/> Delete All		
---	--	--	--

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This screen lists the names of the reports that are saved in the tester's memory. For each report, the following information is given:

- Type of test
- Overall status (P for PASS, F for FAIL, W for WARN, or N for Not Completed)
- File creation date.

Note

Each page can list up to eight report names. If there are additional pages, press (Page Down) to display them.

3. Do one of the following:
 - If you want to delete one report, press to select its name. Then, press (Delete Report).
The selected report is deleted from memory.
 - If you want to delete all of the reports, press (Delete All).
The tester deletes all reports from memory.

The Fault Log

The Frame Relay Installation Assistant has a fault log. This log enables you to save historical information regarding errors or failures that may occur while you are monitoring or conducting a test. This information can be particularly helpful to you when you are troubleshooting circuits and attempting to catch intermittent faults.

The specific types of failures or errors that cause the tester to report a fault and create a fault log record depend on which interface module is being used. Consult the *660 Series Frame Relay Installation Assistant Reference Manual* for the types of fault events that pertain to the interface you are testing.

The tester detects errors and creates fault log records only while a test or monitoring session is in progress. If the beeper is enabled, the tester issues an audible sound every time it adds a new fault record to the log. The tester also displays an alarm bell icon (under the battery icon) to alert you that one or more fault records were added to the log.

The fault log can contain up to 100 individual records (numbered 1 to 100). When the log fills to capacity, the tester either begins writing over the oldest record (in a circular fashion) or stops storing records. The choice depends on the parameter selected when the tester was configured (see “Configuring the Frame Relay Assistant” and note the description in Table 2-6 for the **Fault Log Memory Config** parameter).

The following sections show you how to view fault log records and how to save those records in a report file.

Viewing Fault Log Records

While a test or monitoring session is in progress, the tester automatically detects any major errors or failures that occur and records those events in the fault log.

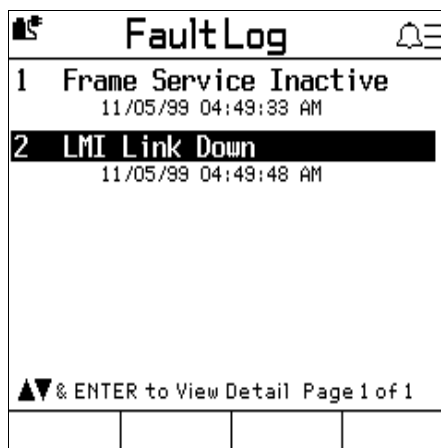
You can view the contents of the fault log at any time during or after a test or monitoring session. To view fault log records, complete the following:

Note

If the tester detects a fault while you are viewing the fault log, you will see a record automatically added to the log.

1. Press **FAULT INFO**.

The first page of the **Fault Log** menu is displayed, for example:



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Each detailed report in the fault log contains the following information:

- Fault record number (#2)
 - Type of fault event (LMI Link Down)
 - Start date and time of the fault event (11/05/99; 04:49:48 AM)
 - Stop date and time of the fault event (11/05/99; 04:50:32 AM)
 - Duration of the fault event (44 seconds)
 - Detailed description of the event
4. To exit the detailed results screen, press **EXIT**.

Saving Fault Log Records

Note

Fault log records are considered to be part of the test results. Therefore, to save any records created during a test, you must save the test results. If you start a new test without saving results from the previous test, the fault log records created during that test are erased and can not be recovered.

To save fault log records, follow these steps:

1. Wait until the currently running test ends or press **EXIT** to manually stop the test or monitoring session.

The **TEST COMPLETE** screen is displayed.

2. Press **SAVE**.
3. Follow the instructions on the screen to name and save the results in a test report file. When you finish, press **SAVE**.

The tester saves the test results and any fault log records created during the test to the report file. The fault log records are now part of the test report. If you print, delete, or upload the report, the associated fault log records are also printed, deleted, or uploaded, respectively.

Deleting Fault Log Records

When you save results in a report file, the fault log records, if they exist, are automatically appended to the results in the file. Therefore, to delete the fault log records, you must delete the file (see "Deleting a Test Report" for instructions).

Printing Fault Log Records

When you save results in a report file, the fault log records, if they exist, are automatically appended to file. Therefore, to print the records, you must print the file (see "Printing a Test Report" for instructions).

Appendices

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Appendix A Features and Specifications

Introduction

Appendix A describes the physical and operational characteristics of your 660 Series Frame Relay Installation Assistant.

Physical

Size: (L x W x H): approximately 23.5 cm x 12.7 cm x 7.6 cm (9.25" x 5.0" x 3.0") without attached interface module

Weight: 1.5 kg (3.25 lb.) without interface module

Display:

- 15-line by 30 character LCD with backlight and adjustable contrast
- Resolution is 240 x 200 bits

LED indicators: six software controlled LED indicators on each interface module and one charging status LED on the main tester

Communication Port: RS-232 PC/Printer port (DB-9)

Interface Modules:

- 660M-DDS adapts the 660T or 660TE models for DDS wiring on 135-ohm UTP cable using an RJ48S connector.
- 660M-T1 adapts the 660T or 660TE models for T1 wiring on 100-ohm UTP cable using an RJ48C connector.
- 660M-E1 adapts the 660TE models for E1 wiring on balanced 120-ohm UTP cable using an RJ48C connector. Includes an adapter for 75-ohm coaxial cable.
- 660M-Serial adapts 660T and 660TE models to V.35, X.21, RS-449/V.36, RS-232/V.24, and RS-530 serial interface wiring.

Power

AC operation: operates from an external ac adapter/charger

Battery type: operates from an internal removable NiMH rechargeable battery pack (installed)

Battery life: a fully charged battery provides approximately four hours of continuous use

Battery recharge time: four hours in the tester and two hours in the optional charger stand BC7217

Environmental

Operating temperature: 0 °C to 45 °C

Storage temperature: -20 °C to 60 °C

Humidity tolerance (operation without condensation):

- 95 % (10 °C to 35 °C)
- 75 % (30 °C to 40 °C)
- 45 % (40 °C to 45 °C)
- Uncontrolled <10 °C

Vibration: Random, 2g, 5-500 Hz

Shock: 1 Meter Drop Test

Altitude: 3000 m

Standards Compliance

Physical: T1.403, T1.410, T1.510, T1.231, G.703, G.704, G.821, M.2100

LMI: T1.617 and T1.617a, original LMI, Q.933, X.36

Frame Relay Forum: FRF.1.1, FRF.2.1, FRF.3.1, FRF.13, FRF.14

Regulatory Compliance

EMC: EN61326: 1998

Safety: CSA C22.2 No.950-95

CE:

- EN 60950, Low Voltage Directive
- EN 61326, EMC Directive
- TBR12, TBR13: TTE Directive (for E1interface only)

Appendix B ***Replacement Parts and Accessories***

Introduction

Appendix B lists the replacement parts and accessories that you can obtain from your local Fluke dealer for the 660 Frame Relay Installation Assistant.

Replacement Parts

Table B-1 lists replacement parts that you can purchase for the tester. When you place an order, you will need to supply the order number for the item. Refer to Figure B-1 for an illustration of the replacement parts listed in this table. Use the Item Number to locate the part.

Table B-1. Replacement Parts for the 660 Series Frame Relay Installation Assistant

Item Number	Description	Order Number
①	Top case	PN 673480
②	Bottom case	PN 673491
③	Bottom case decal	PN 1277064
④	Framer assembly	PN 668316
⑤	Processor assembly	PN 668357
⑥	Keyboard assembly	PN 1551469
⑦	Keypad	PN 621323
⑧	Display	PN 602430
⑨	Lens	PN 673571 (660T) PN 675477 (660TE)
⑩	Soft case	PN 675501
⑪	<i>660 Series Frame Relay Installation Assistant Users Guide (English)</i>	PN 804424
Not shown	<i>660 Series Frame Relay Installation Assistant Reference Manual</i>	December 1999. Available from the Fluke Website (http://www.fluke.com/manuals/660).
⑫	Power supply INTL	PN 944223
⑬	Battery pack	PN 665083
⑭	Battery door	PN 938357
Not shown	Power cord	Contact Fluke Customer Service for the appropriate power cord.
⑮	Strap	PN 946769
⑯	RS-232 cable	PN 944806

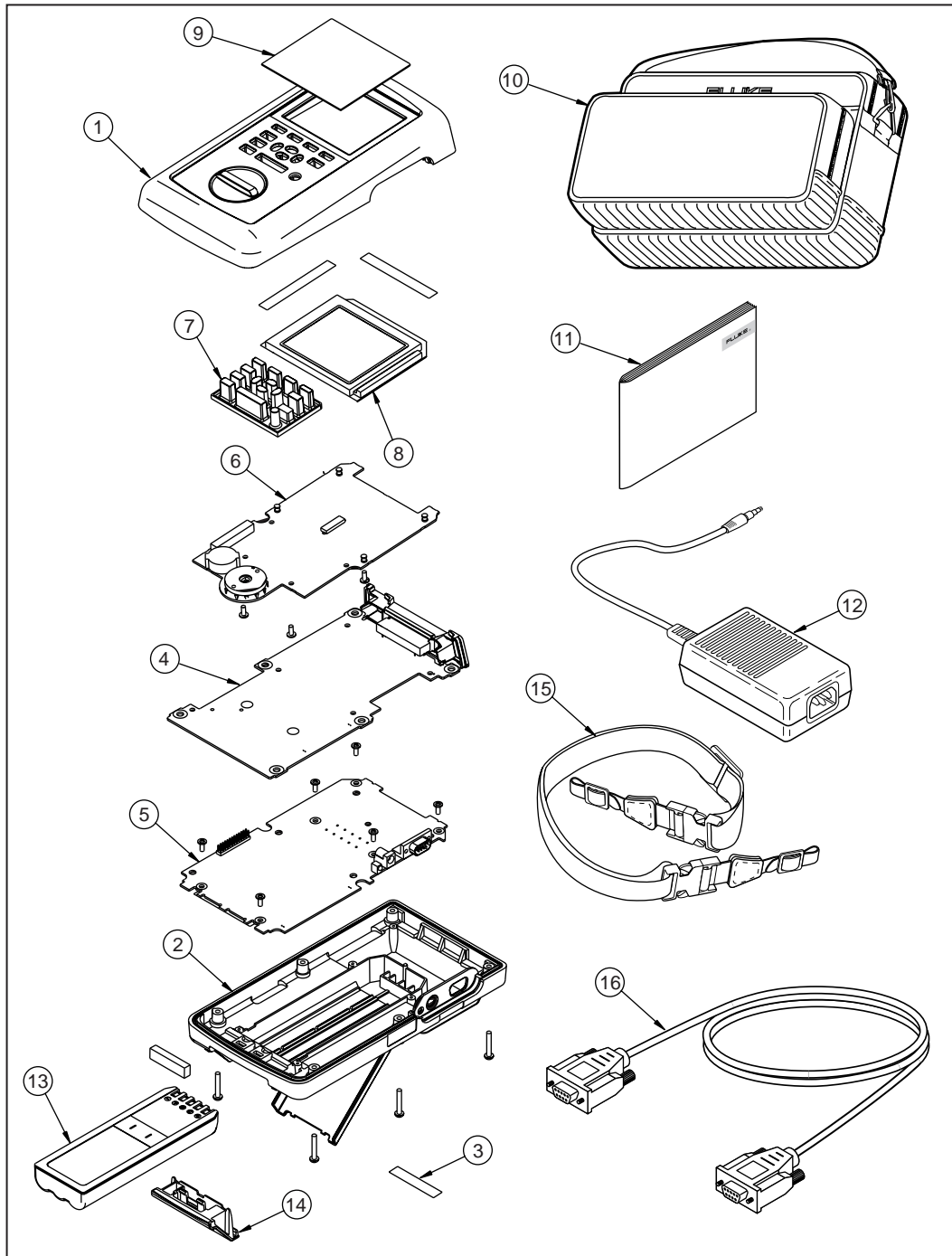


Figure B-1. Replacement Parts

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Accessories

Table B-2 lists the accessories that are available for purchase for the tester. When you place an order, you will need to supply the order number for the item. Use the Item Number in the table to locate the accessories, which are shown in Figure B-2.

Table B-2. Accessories for the 660 Series Frame Relay Installation Assistant

Item Number	Description	Order Number
①	T1/FT1 Interface Module	660M-T1
②	E1/FE1 Interface Module	660M-E1
③	DDS 4-wire Interface Module	660M-DDS
④	Serial Interface Module	660M-S
⑤	Deluxe soft case (flight carry-on style)	C791
⑥	NiMH extra battery pack	BP7235
⑦	External battery charger NiMH INTL with power supply	BC7217 INTL
⑧	External battery charger NiMH 120 V with power supply	BC7217 120
⑨	Male RSV to female RSV extension cable	NS101
⑩	Male RSV to X.21 Y cable	NS102
⑪	Male RSV to V.35 Y cable	NS103
⑫	Male RSV to French V.35 Y cable	NS104
⑬	Male RSV to RS-449/V.36 Y cable	NS105

Table B-2. Accessories for the 660 Series Frame Relay Installation Assistant (cont.)

Item Number	Description	Order Number
⑭	Male RSV to RS-530 Y cable	NS106
⑮	Male RSV to RS-232/V.24 Y cable	NS107
⑯	Male RJ-48C to twin male Bantam cable adapter for T1	PN 1546664
⑰	Male RJ-48S to twin male Bantam cable adapter for DDS	PN 1546673
⑱	Male RJ-48C to male Siemens 3-prong cable adapter	PN 1275978
⑲	Female RJ-45 to male 15 pin D-sub adapter	PN 1541170
⑳	D-sub 15-pin socket to D-sub 15-pin socket	PN 1544228
㉑	4 Tap Boxes – Three female RJ-45 connectors	NT907
㉒	Female RJ-45 to female RJ-45 coupler	PN 927884
㉓	Male RJ-45 to male RJ-45 Cat 5 patch cable	PN 107109
㉔	Male RJ-45 to alligator clips cable	PN 938394
㉕	Male BNC to male BNC cable-single, 2m, 75 Ω	PN 686623
㉖	Female BNC to Female BNC couplers-single, 75 Ω	PN 1278707
㉗	110 punchdown block to female RJ-45 adapter	PN 928379
㉘	66 punchdown block to female RJ-45 adapter	PN 928374
Not shown	Software Option IP Performance	660-TP
㉙	12V Vehicle Battery Charger/Adapter	PN 800695
㉚	Female RJ-48 to twin female BNC adapter	PN 1272912

Table B-2. Accessories for the 660 Series Frame Relay Installation Assistant (cont.)

Item Number	Description	Order Number
Not shown	<p>T1/DDS Cable Kit</p> <ul style="list-style-type: none"> • Male RJ-45 to male RJ-45 Cat 5 patch cable (PN107109) • Female RJ-48 to female RJ-48 coupler (PN 927884) • Male RJ-45 to alligator clips cable (PN 938394) • 110 punchdown block to female RJ-45 adapter (PN 928379) • 66 punchdown block to female RJ-45 adapter (PN 928374) • Male RJ-48C to twin male Bantam cable adapter for T1 (PN 1546664) • Female RJ-45 to male 15 pin D-sub adapter (PN 1541170) • Male RJ-48S to twin male Bantam cable adapter for DDS (PN 1546673) • D-sub 15-pin socket to D-sub 15-pin socket (PN 1544228) 	NT801
Not shown	<p>E1 Cable Kit</p> <ul style="list-style-type: none"> • Male RJ-45 to male RJ-45 Cat 5 patch cable (PN 107109) • Female RJ-45 to female RJ-45 coupler (PN 927884) • Male RJ-45 to alligator clips cable (PN 938394) • Male RJ-48C to male Siemens 3-prong cable adapter (PN 1275978) • 2 Male BNC to male BNC cables-single, 2m, 75 Ω (PN 686623) • 2 Female BNC to Female BNC couplers-single, 75 Ω (PN 1278707) 	NT802

Table B-2. Accessories for the 660 Series Frame Relay Installation Assistant (cont.)

Item Number	Description	Order Number
Not shown	660T-Pack <ul style="list-style-type: none"> • 660T main tester • 660M-T1, 660M-DDS, 660M-S interface modules • Male RSV to V.35 Y cable (NS103) • External battery charger NiMH 120 V with power supply (BC7217 120) • Soft case (PN 675501) • 12V Vehicle Battery Charger/Adapter (PN 800695) • NiMH extra battery pack (BP7235) 	660T-Pack
Not shown	660E-Pack <ul style="list-style-type: none"> • 660TE main tester • 660M-E1, 660M-S interface modules • Male RSV to X.21 Y cable (NS102) • Male RSV to V.35 Y cable (NS103) • 2 Male BNC to male BNC cables-single, 2m, 75 Ω (NC101) • 2 Female BNC to Female BNC couplers-single, 75 Ω (NC901) • External battery charger NiMH INTL with power supply (BC7217 INTL) • Soft case (PN 675501) • 12V Vehicle Battery Charger/Adapter (PN 800695) • NiMH extra battery pack (BP7235) 	660E-Pack

Table B-2. Accessories for the 660 Series Frame Relay Installation Assistant (cont.)

Item Number	Description	Order Number
Not shown	660TE-Pack <ul style="list-style-type: none"> • 660TE main tester • 660M-T1, 660M-E1, 660M-S interface modules • Male RSV to X.21 Y cable (NS102) • Male RSV to V.35 Y cable (NS103) • 2 Male BNC to male BNC cables-single, 2m, 75 Ω (NC101) • 2 Female BNC to Female BNC couplers-single, 75 Ω (NC901) • External battery charger NiMH INTL with power supply (BC7217 INTL) • Soft case (PN 675501) • 12V Vehicle Battery Charger/Adapter (PN 800695) • NiMH extra battery pack (BP7235) 	660TE-Pack

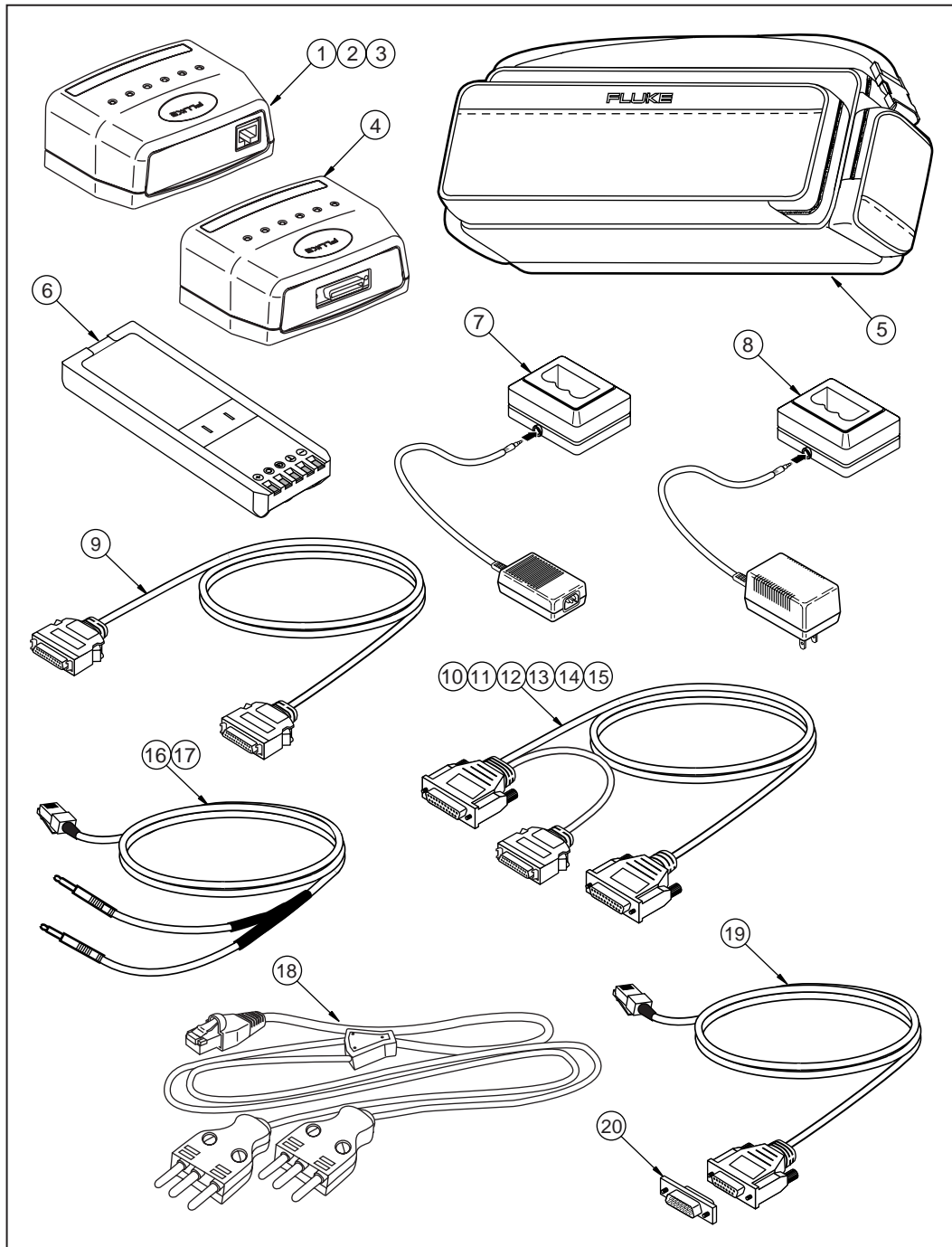
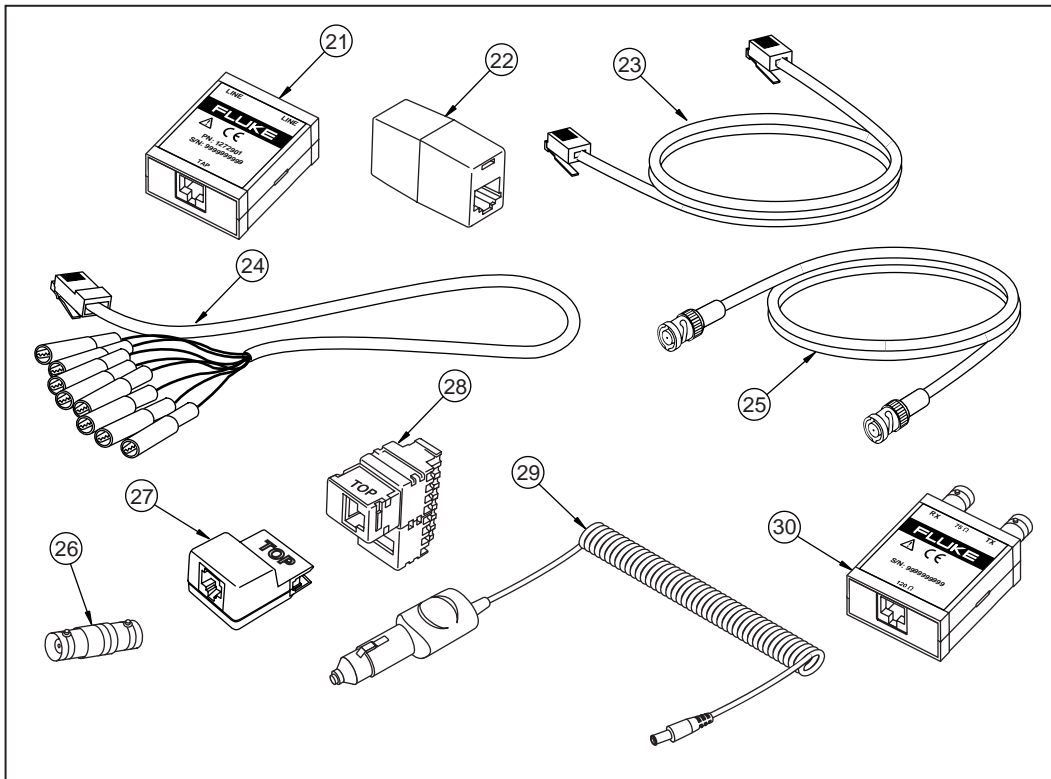


Figure B-2. Accessories

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Figure B-2. Accessories (cont.)

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