860 DSP & 860 DSPi Multifunction Interactive Cable Analyzer

Section V: Utility Functions
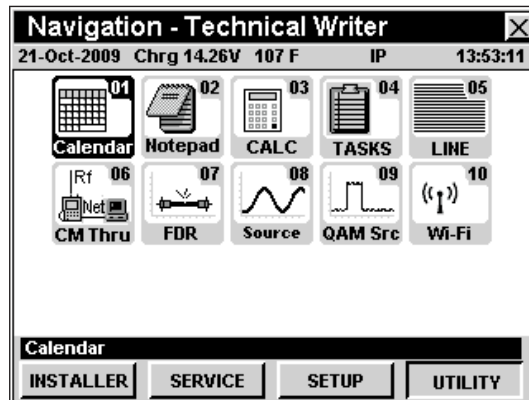
TRILITHIC

Utility Functions Overview

Introduction

The instrument enables you to select from several Utility Functions. The instruments features several Utility Functions which come with the instruments and may have one or more optional functions.

This section will provide you with instructions on how to utilize the functions available in the **Utility** menu of the instrument.

> **Note:** The labels and the arrangement of the icons in this section are the default settings of the instrument. The user's display appearance may be customized and therefore may differ from the **Utility** menu shown in this section. WorkBench software is required for customizing. See the WorkBench Operation Manual for more details.

Mode	Description	860 DSP Option	860 DSPi Option
Calendar	Displays the month and day of the current year.	Standard	Standard
Notepad	Enables the user to reference technical notes or text documents that have been created on a PC using the WorkBench Software or a text editor application, and loaded from a PC using the WorkBench Software.	Standard	Standard

Mode	Description	860 DSP Option	860 DSPi Option
Calculator	Provides basic math functions.	Standard	Standard
Tasks	Allows the user to display open and closed work order tasks. These work orders can be created using Trilithic Data Manager (TDM), CSG Workforce Express, or other third party workforce management systems.	Standard	Standard
Line Viewer	Allows the user to look at any line on an Analog (NTSC) Cable TV Channel. This is useful for checking your line blanker or test signal line inserter device for proper operation.	Standard	PP-1
Cable Modem Thru	Provides a method of using the internal cable modem as a desktop modem by allowing a customers PC to connect to the external RJ-45 port and gain Internet access through the internal cable modem. **NOT AVAILABLE FOR 860 DSP, SEE NOTE 1**	N/A	Standard
FDR	Provides a simple, convenient and accurate tool for determining the distance to cable faults. The option works by sending a sweep into the cable and analyzing the complex reflected wave to determine the distance to various sources of reflection (opens, shorts, splitters, etc.).	FDR and Return Transmitter Board	PP-1, FDR and Return Transmitter Board
Source Generator	An operating function that is bundled with the SSR Mode and RSVP Mode that configures the 860 DSPi to function as a return frequency signal source with settable signal frequency, amplitude, and modulation.	SR-1 or VP-1 or FDR/RSA	PP-1 and SR-1 or VP-1 or FDR/RSA

Mode	Description	860 DSP Option	860 DSPi Option
Upstream QAM Source	Generates a QPSK signal or a 16 or 64 QAM signal (5 to 42 MHz) at a test point that can be analyzed in the headend displayed using a bar graph. **NOT AVAILABLE FOR 860 DSP, SEE NOTE 1**	N/A	Standard
Wi-Fi	Provides the ability to survey available access points, or to access a network to perform tests such as ping, trace route, throughput, VoIP, and verification of browser functionality. **NOT AVAILABLE FOR 860 DSP, SEE NOTE 1**	N/A	PP-1 and Wi-Fi

Note 1: Although this icon will appear on the 860 DSP, this mode is not available for the 860 DSP. The 860 DSP must be upgraded to an 860 DSPi by installing an internal DOCSIS 2.0 or DOCSIS 3.0 modem to access this mode.

Each mode of the instrument can be accessed by selecting the corresponding icon as shown in the previous table. Some modes may be inaccessible based on the options that have been installed on the instrument. Optional modes for the 860 DSP and 860 DSPi are indicated by an option code that is described in detail in **Section I: The Basics**, Chapter 7: Optional Software and Hardware.

This section assumes you are at least familiar with the basic operation of the navigational tools used in the 860 DSPi, so be sure to review **Section I: The Basics,** Chapter 4: Basic Navigation before proceeding through this section.

To use some Utility Functions, you may have to set up some basic parameters, be sure you have completed **Section I: The Basics**, Chapter 5: Initial Setup before proceeding through this section.

To use some Utility Functions you will need to connect your instrument to your cable system.

Introduction

The **Calendar** Mode displays the current month and day (indicated with parentheses) by default.

The basic 860 DSP and 860 DSPi come equipped with the **Calendar** Mode as a standard feature.

This section will provide you with a basic understanding of how to use **Calendar** Mode including:

- Required Setup
- Changing Months

Calendar : October-2006						☒
SUN	MON	TUE	WED	THUR	FRI	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	(24)	25	26	27	28
29	30	31				

Note: If your instrument does not include all of the features shown in this chapter, go on-line to *www.trilithic.com* to update your firmware for free. This will allow you to use all of the newest features that are included in this mode.

Required Setup

To use **Calendar** Mode, you will need to set the current date, see **Section IV: Setup Functions, Chapter 2: Instrument Setup Mode**, *Global Settings*.

Changing Months

To change the month that is displayed, press the ▲ ▼ buttons to cycle through the months in the current year.

Notepad Mode ⬣ 3

Introduction

The **Notepad** Mode enables you to reference technical notes or text messages which have been created on a PC using the WorkBench software or a text editor application, and loaded from a PC using the WorkBench software.

The basic 860 DSP and 860 DSPi come equipped with the **Notepad** Mode as a standard feature. The **Notepad** Mode can be configured to run as a legacy version of the application, or can be configured to run through the instrument's web browser. The legacy **Notepad** Mode is discussed in the following sections; the web browser **Notepad** Mode is discussed in the final section of this chapter.

This section will provide you with a basic understanding of how to use **Notepad** Mode including:

- Required Setup
- Opening Text Files
- Changing Display Font Sizes
- Function Menu Options
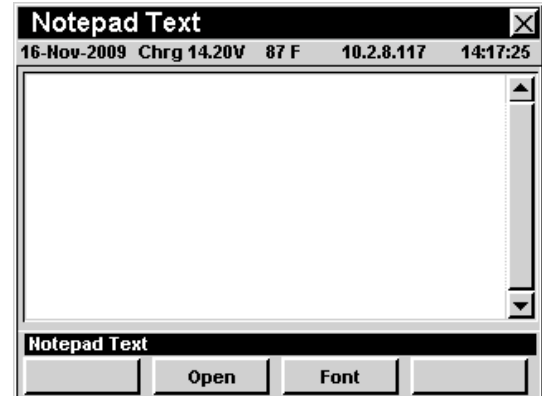
> **Note:** If your instrument does not include all of the features shown in this chapter, go on-line to *www.trilithic.com* to update your firmware for free. This will allow you to use all of the newest features that are included in this mode.
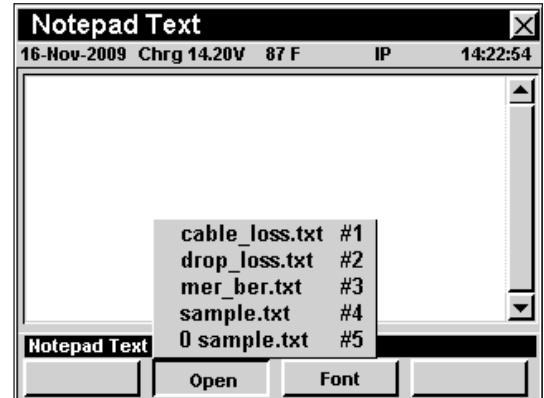
Required Setup

To use **Notepad** Mode, you are not required to perform any setup procedures.

Opening Text Files

To open a text file you have downloaded from a PC, press the [Open] softkey, use the ▲ ▼ buttons to highlight the file you want to view, and then press the (Ent) button to open the highlighted text file.
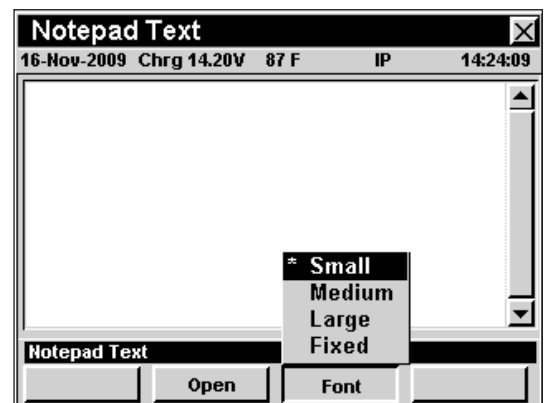
Use the ▲ ▼ buttons to scroll through the text file.

Notepad Text

16-Nov-2009 Chrg 14.20V 87 F   IP   14:22:54

cable_loss.txt #1
drop_loss.txt #2
mer_ber.txt #3
sample.txt #4
0 sample.txt #5

Notepad Text

Open   Font

Note: You will need the companion software, WorkBench to download any text files into your instrument. For instructions using WorkBench software, please see the WorkBench operation manual.

Changing Display Font Size

To change the size of the font that is displayed on your instrument in the Notepad Mode, press the [Font] softkey, use the ▲ ▼ buttons to highlight the desired font size and then press the (Ent) button.

Notepad Text

16-Nov-2009 Chrg 14.20V 87 F   IP   14:24:09

* Small
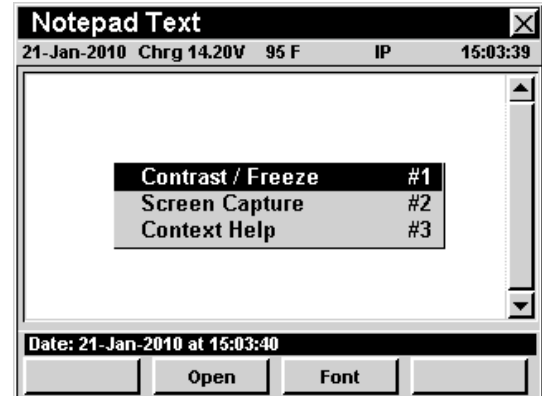 Medium
  Large
  Fixed

Notepad Text

Open   Font

Function Menu Options

The **Function** Menu can be accessed by pressing the (Fn) button while in the **Notepad** Mode.

The following **Function** Menu options can be accessed while in **Notepad** Mode and are described in **Section I: The Basics**, Chapter 6: Basic Function Menu Options:

- Contrast / Freeze
- Screen Capture
- Context Help

Web Browser Notepad

The **Legacy Notepad** Mode can only open text files, whereas the **Web Browser Notepad** can open text files, HTML files, and image files. To change configuration settings, refer to the **Section IV: Setup Functions**, Chapter 2: Instrument Setup Mode, *Global Settings, Notepad Utility* section of this manual.

The **Legacy Notepad** Mode functions the same as the instrument's web browser, which is detailed in **Section II: Installer Functions**, Chapter 14: Web Browser Mode.
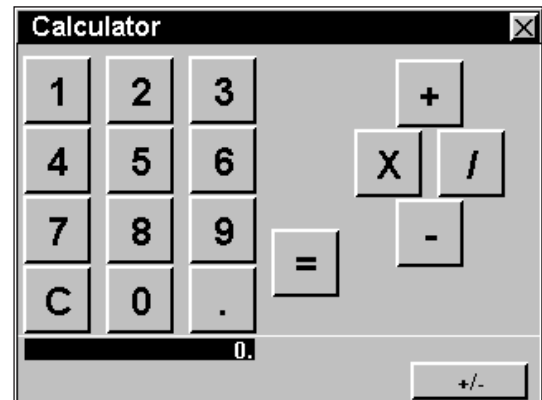
TRILITHIC
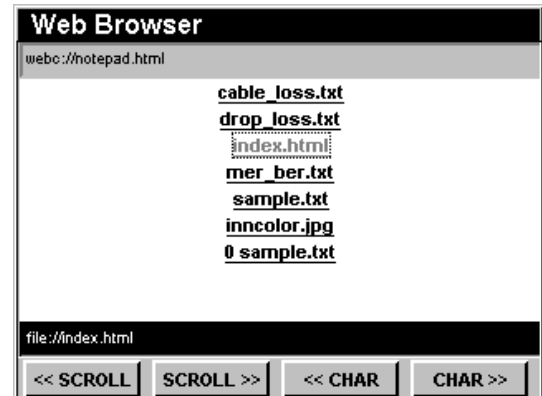
Overview

To use the calculator. Enter the desired number and mathematical function using the alphanumeric keypad, and then press the (Ent) button to compute the solution.

The basic 860 DSP and 860 DSPi come equipped with the **Calculator** Mode as a standard feature.

This section will provide you with a basic understanding of how to use **Calculator** Mode including:

- Required Setup
- Performing Calculations

> 📌 **Note:** If your instrument does not include all of the features shown in this chapter, go on-line to *www.trilithic.com* to update your firmware for free. This will allow you to use all of the newest features that are included in this mode.
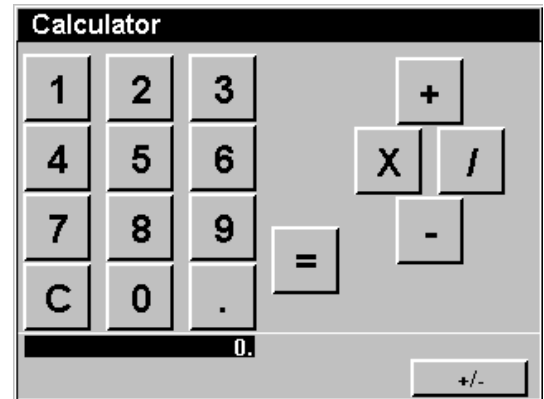
Required Setup

To use **Calculator** Mode, you are not required to perform any setup procedures.

CALC

Performing Calculations

The following buttons represent the functions shown on the calculator screen.

- The (0)...(9) number buttons correspond to the alphanumeric buttons.

- The (Bk) button is used to clear computations.

- The (Fn) button is used as the decimal point.

> **Note:** To enter decimals such as .5, .25, .73, etc., you will need to press the (0) button before you enter the decimal.

- The (Ent) button is used to equal (=) computations.

- The ◄ ► ▲ ▼ arrow buttons correspond to the calculator symbols for multiplication (x), and division (/), addition (+), subtraction (-).

- The ⬚ +/- ⬚ softkey is used to change a calculated number to a negative or positive.

Introduction

The **Tasks** Mode allows the user to display open and closed work order tasks. These work orders can be created using Trilithic Data Manager (TDM), CSG Workforce Express, or other third party workforce management systems.

The basic 860 DSP and 860 DSPi come equipped with the **Tasks** Mode as a standard feature.

This section will provide you with a basic understanding of how to use **Tasks** Mode including:

- Required Setup

- View Task Details

- New Task

- Close Task

- ReOpen Task

- Delete Task

- Function Menu Options
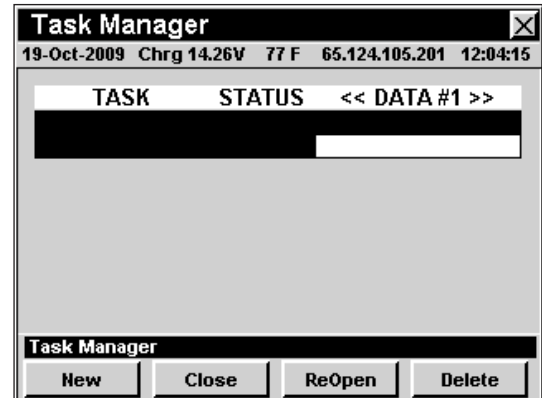
> **Note:** If your instrument does not include all of the features shown in this chapter, go on-line to *www.trilithic.com* to update your firmware for free. This will allow you to use all of the newest features that are included in this mode.

Required Setup

To use **Tasks** Mode, you will need to set the current date, see **Section IV: Setup Functions, Chapter 2: Instrument Setup Mode,** *Global Settings*. You will also need to enable **Tasks** Mode in the instrument setup; see **Section IV: Setup Functions**, Chapter 2: Instrument Setup Mode, *Measurement Settings, Data Log Attachments*. The value must be set to **Tasks** or **Locations + Tasks**.

In order to use the **Tasks** Mode, you will need to install Trilithic Data Manager (TDM), SG Workforce Express, or some other third party workforce management system.

Viewing Task Details

To view details of a specific task, use the ▲ ▼ buttons to highlight the task you want to view, and then press the (Ent) button. The **Task** window will open. When done viewing test details, press the (Ent) button.
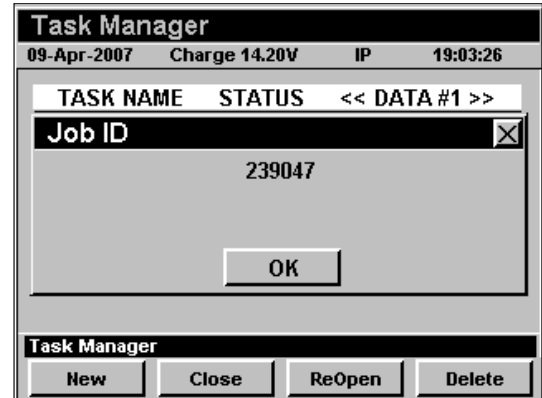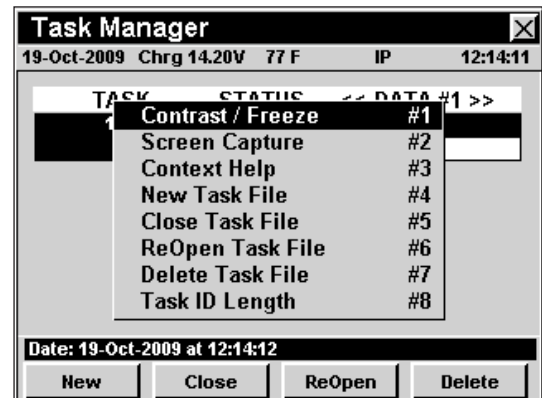
Function Menu Options

The **Function** Menu can be accessed by pressing the (Fn) button while in the **Tasks** Mode.

The following **Function** Menu options can be accessed while in **Tasks** Mode;

- Contrast / Freeze
- Screen Capture
- Context Help
- Close Task File
- ReOpen Task File
- Delete Task File
- Task ID Length

Basic Function Menu Options

The following functions are described in **Section I: The Basics**, Chapter 6: Basic Function Menu Options;

- Contrast / Freeze
- Screen Capture
- Context Help

TASKS

New Task File

This option is used to create a new task.

To use this option highlight the **New Task File** option, press the (Fn) button.

The **Function** Menu will close and the **Create New Task** window will open. Use the (1)...(0) buttons to enter a task ID number, and select the (Ent) button. The instrument will return to the **Task Manager** window.
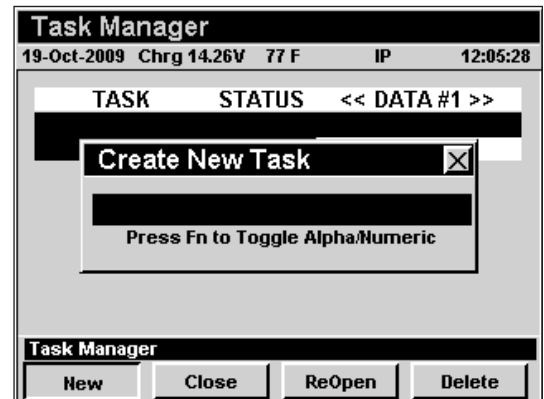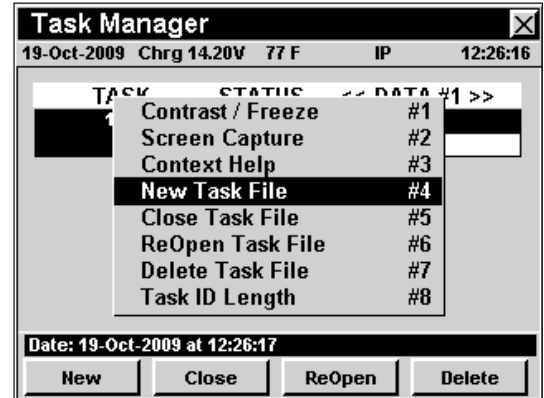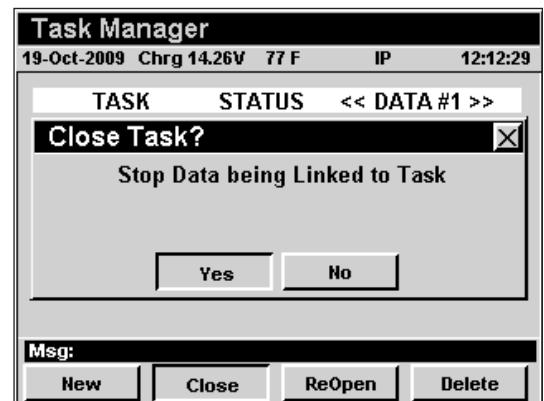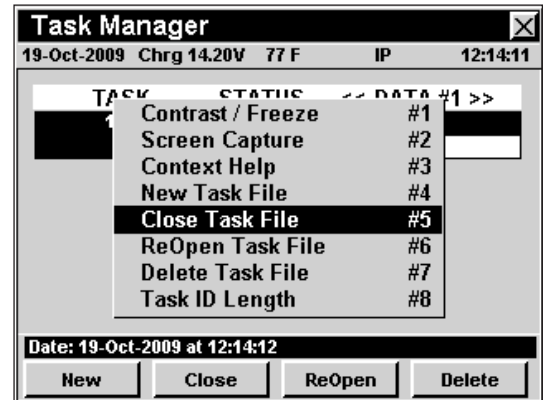
Close Task File

This option is used to close an open task.

To use this option, use the ▲ ▼ buttons to highlight the open task you want to close, press the **Fn** button, use the ▲ ▼ buttons to highlight **Close Task File**, and then press the **Ent** button. You may also select **Close Task File** by pressing ⑤.

The **Function** Menu will close and the **Close Task?** window will open. Use the ◄ ► buttons to select **Yes** to close the task or **No** to exit without closing the task, and select the **Ent** button. The instrument will return to the **Task Manager** window.
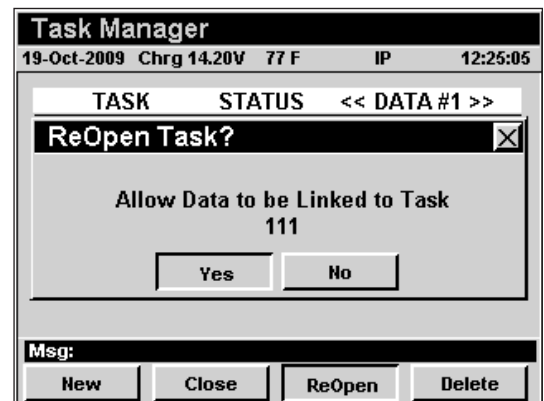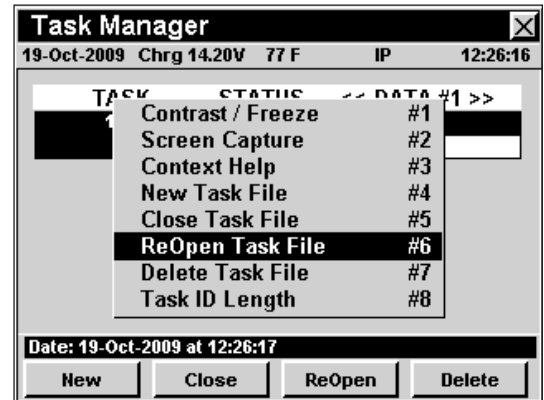
TASKS

ReOpen Task File

This option is used to reopen a closed task.

To use this option, use the ▲ ▼ buttons to highlight the closed task you want to reopen, press the **Fn** button, use the ▲ ▼ buttons to highlight **ReOpen Task File**, and then press the **Ent** button. You may also select **ReOpen Task File** by pressing **6**.

The **Function** Menu will close and the **ReOpen TASK?** window will open. Use the ◄ ► buttons to select **Yes** to open the closed task or **No** to exit without reopening the task, and select the **Ent** button. The instrument will return to the **Task Manager** window.

Task Manager
19-Oct-2009 Chrg 14.20V   77 F   IP   12:26:16

TASK   STATUS   << DATA #1 >>

Contrast / Freeze	#1
Screen Capture	#2
Context Help	#3
New Task File	#4
Close Task File	#5
ReOpen Task File	#6
Delete Task File	#7
Task ID Length	#8

Date: 19-Oct-2009 at 12:26:17

New   Close   ReOpen   Delete

Task Manager
19-Oct-2009 Chrg 14.20V   77 F   IP   12:25:05

TASK   STATUS   << DATA #1 >>

ReOpen Task?   ⊠

Allow Data to be Linked to Task
111

Yes   No

Msg:

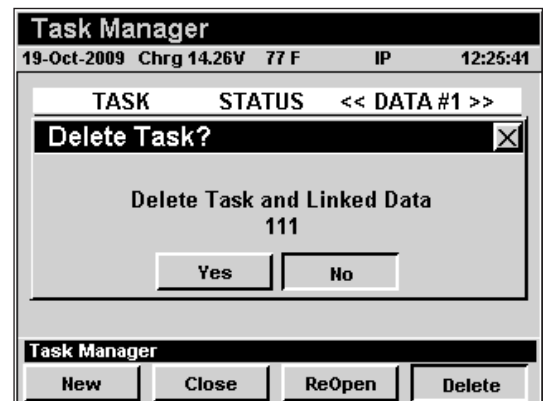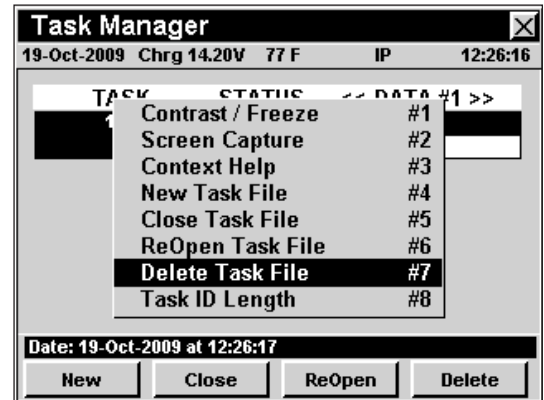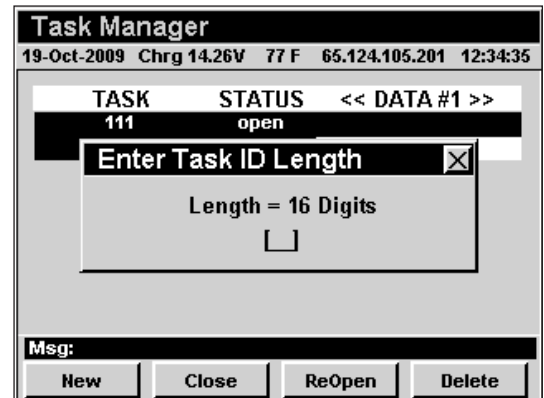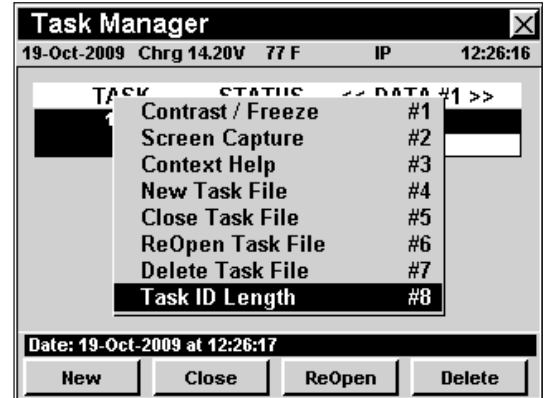New   Close   ReOpen   Delete

Delete Task File

This option is used to delete a task.

To use this option, use the ⓐ ⓥ buttons to highlight the task you want to delete, press the (Fn) button, use the ⓐ ⓥ buttons to highlight **Delete Task File**, and then press the (Ent) button. You may also select **Delete Task File** by pressing (7).

The Function Menu will close and the **Delete Task?** window will open. Use the ◄ ► buttons to select **Yes** to delete the task or **No** to exit without deleting the task, and select the (Ent) button. The instrument will return to the **Task Manager** window.

Task ID Length

This option is used to set the length of characters that may be used to identify a task.

To use this option, use the (▲) (▼) buttons to highlight the task you want to delete, press the (Fn) button, use the (▲) (▼) buttons to highlight **Task ID Length**, and then press the (Ent) button. You may also select **Task ID Length** by pressing (8).

The **Function** Menu will close and the **Enter Task ID Length?** window will open. Use the (1)...(0) buttons to enter the number of digits (16 max) allowed for the Task ID. If the number of digits is less than 10, press the (Ent) button and the instrument will return to the **Task Manager** window.. If the number of digits is greater than 9, the instrument will return to the **Task Manager** window.

Task Manager

19-Oct-2009 Chrg 14.20V 77 F		IP	12:26:16

TASK	STATUS	<< DATA #1 >>	
Contrast / Freeze			#1
Screen Capture			#2
Context Help			#3
New Task File			#4
Close Task File			#5
ReOpen Task File			#6
Delete Task File			#7
Task ID Length			#8

Date: 19-Oct-2009 at 12:26:17

New	Close	ReOpen	Delete

Task Manager

19-Oct-2009 Chrg 14.26V 77 F 65.124.105.201 12:34:35

TASK	STATUS	<< DATA #1 >>
111	open	

Enter Task ID Length ☒

Length = 16 Digits
⊔

Msg:

New	Close	ReOpen	Delete

Note: The **Task ID Length** must be set to the same value as the corresponding value that was set in Trilithic Data Manager.

TRILITHIC

Introduction

The **Line** Mode allows the user to look at any line on an analog (NTSC) cable TV channel. This is useful for checking your line blanker or test signal line inserter device for proper operation.

The basic 860 DSP comes equipped with the **Line** Mode as a standard feature. In order to use the **Line** Mode on your 860 DSPi, the instrument must be equipped with Power Pack Option (PP-1).

This section will provide you with a basic understanding of how to use **Line** Mode including:

- Required Setup
- Adjusting Channels and Frequencies
- Setting Line Number
- Setting Even/Odd Lines
- Setting Channel Plan
- Viewing Blank Lines
- Function Menu Options
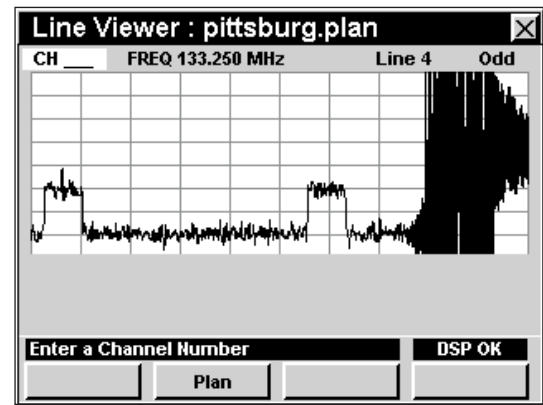
> **Note:** If your instrument does not include all of the features shown in this chapter, go on-line to *www.trilithic.com* to update your firmware for free. This will allow you to use all of the newest features that are included in this mode.

Required Setup

To use **Line** Mode, you are not required to perform any setup procedures.

Adjusting Channels and Frequencies

To change the channel or frequency, use the ◀ ▶ buttons to highlight the channel number or frequency, use the ▲ ▼ buttons to increment the value up and down or enter the desired channel number or frequency using the alphanumeric keypad, and then press the (Ent) button.
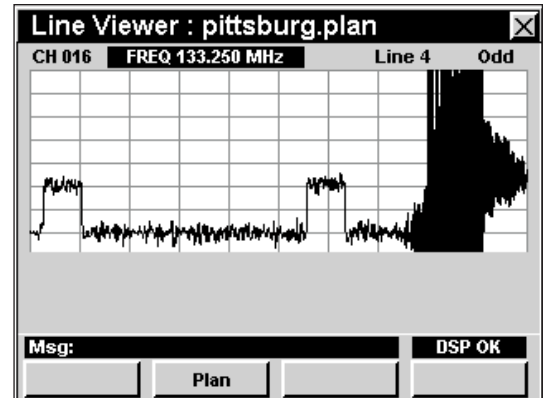
Setting Line Number

To change the line number, use the ◀ ▶ buttons to highlight the line number, use the ▲ ▼ buttons to increment the value up and down or enter the desired channel line number using the alphanumeric keypad, and then press the (Ent) button.
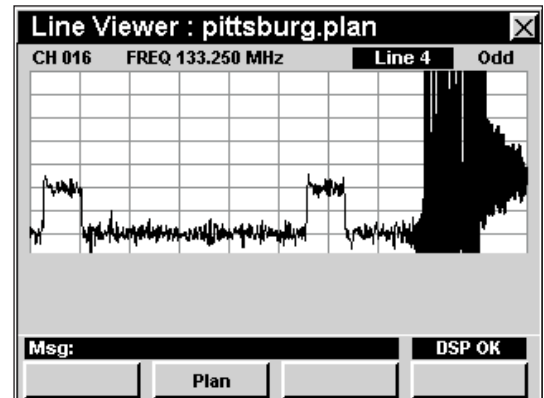
Setting Even/Odd Fields

To change the between even and odd fields, use the ◄ ► buttons to highlight the **Even/Odd**, use the ▲ ▼ buttons to increment change the value between **Even** and **Odd**.
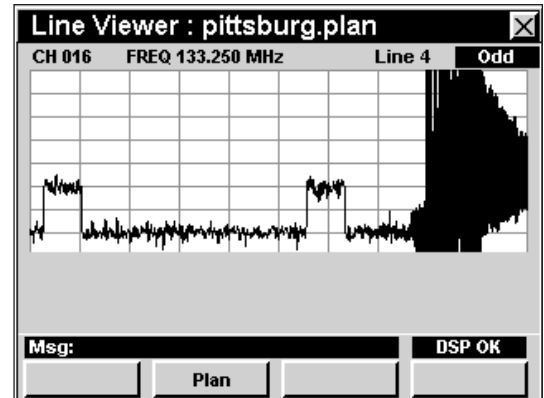
Setting Channel Plan

The instrument tunes channels according to a predefined channel plan. The currently selected plan is displayed in the Title Bar. To change the channel plan press the ⬚Plan⬚ softkey, the **Open File** window will open. Use the ◄ ► ▲ ▼ buttons to select the channel plan you want from the list of channel plans available, and then press the Ent button.
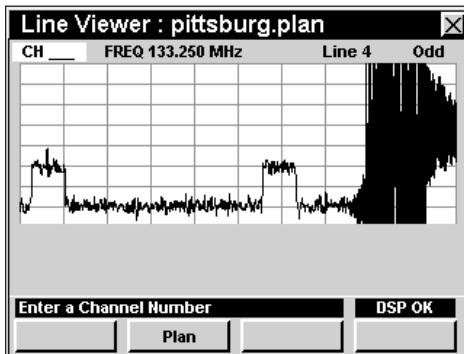
You must have a system channel plan that is up to date in order to view the channels in your system.
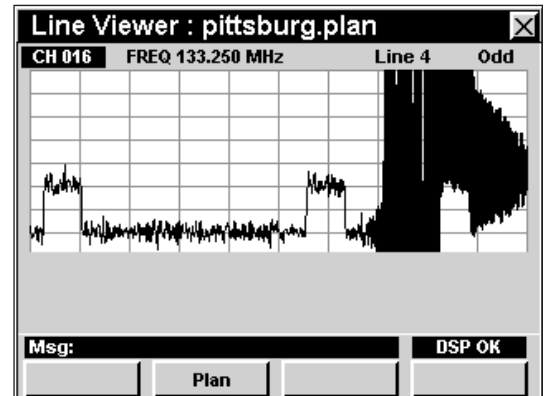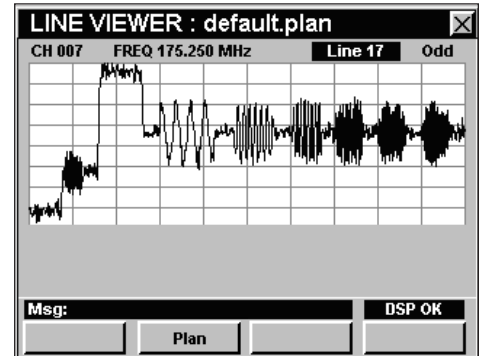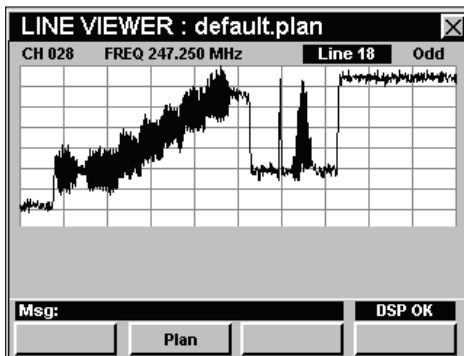
Viewing Blank Lines

The accompanying graphics demonstrate the typical types of signal lines.
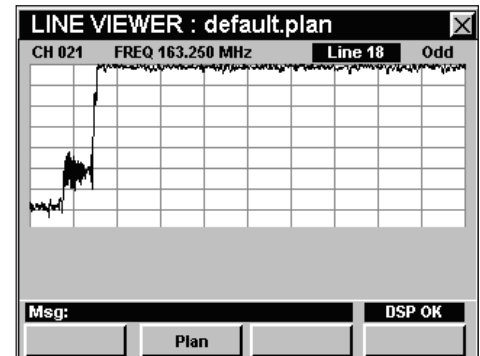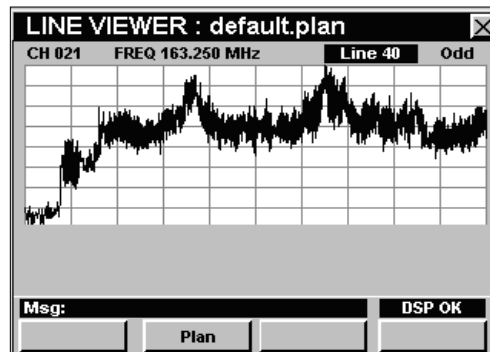

NTC Composite Signal

Multiburst Signal

FCC Composite Signal

Blank Line Signal
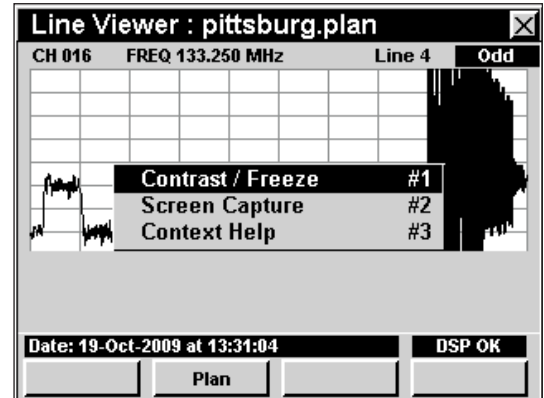

Regular NTSC Video Signal

Function Menu Options

The **Function** Menu can be accessed by pressing the **Fn** button while in the **Line** Mode.

The following **Function** Menu options can be accessed while in **Line** Mode and are described in **Section I: The Basics**, Chapter 6: Basic Function Menu Options:

- Contrast / Freeze

- Screen Capture

- Context Help

CM Thru Mode 7

Introduction

The **CM Thru** Mode provides a method of using the internal cable modem as a desktop modem by allowing a customers PC to connect to the external RJ45 port and gain Internet access through the internal cable modem.

The basic 860 DSPi comes equipped with the **CM Thru** Mode as a standard feature. This mode is not available for the 860 DSP in any configuration.

This section will provide you with a basic understanding of how to use **CM Thru** Mode including:

- Required Setup

- Logging on to the Network

- Measurement Data

Note: If your instrument does not include all of the features shown in this chapter, go on-line to *www.trilithic.com* to update your firmware for free. This will allow you to use all of the newest features that are included in this mode.

Required Setup

To use **CM Thru** Mode, you will need to set up some basic parameters, be sure you have completed **Section I: The Basics**, Chapter 5: Initial Setup before proceeding through this chapter.

If your instrument is equipped with an internal modem, you will need to setup the internal cable modem; see **Section IV: Setup Functions**, Chapter 2: Instrument Setup Mode, *CM/CPE Settings*.

Logging on to The Network

Verify in the status bar, that the field to the left of the time says **RDY**. This indicates that the instrument is ready to connect to the cable modem network.

> **Note:** If the instrument does not indicate **RDY** within 10 seconds after the instrument is turned on, power the unit off and back on. If the **RDY** message never shows up, you may not have Ethernet Option (CI-1, CI-2, CI-3, CI-4, or CI-5) installed on your 860 DSP.

Internal Cable Modem

Connect the cable drop to the instrument's

SLM/Forward input, then select the [icon] icon from the **Utility** menu. The **Logging On To Network** window will show the progress of the logon process.

When logon is complete, the **CM Thru** Mode will be displayed.
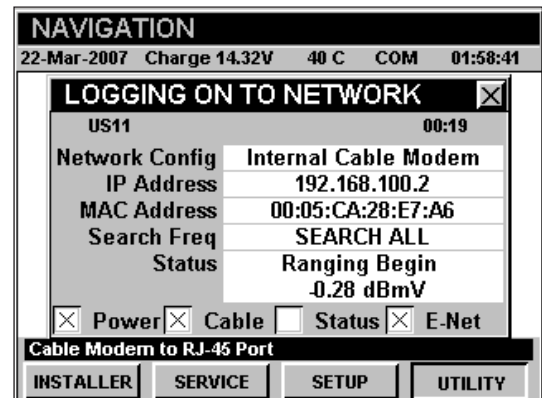
> **Note:** If you have not set the default downstream data carrier frequency or it is incorrect in may take several minutes for the modem to find the downstream data carrier.

Measurement Data

The **CM Thru** Mode displays connections statistics for the internal cable modem. The instrument will display the downstream and upstream frequency, transfer rate, and power level as well as the downstream modulation type, signal-to-noise ratio, corrected bits, and uncorrected bits.

Introduction

The **Frequency Domain Reflectometer (FDR)** Mode provides a tool for determining the distance to fault (DTF) of cable systems. The mode works by sending a sweep into the cable and analyzing the complex reflected wave to determine the distance to various sources of reflection (opens, shorts, splitters, etc.). The reflecting events are indicated on an amplitude versus distance display, and markers are used to identify the distance to the source of the reflection, and the return loss at that point.

This section will provide you with a basic understanding of how to use **FDR** Mode including:

- Required Setup

- Determine if **FDR** Mode is Available

- Using the **FDR** Mode

- Function Menu Options
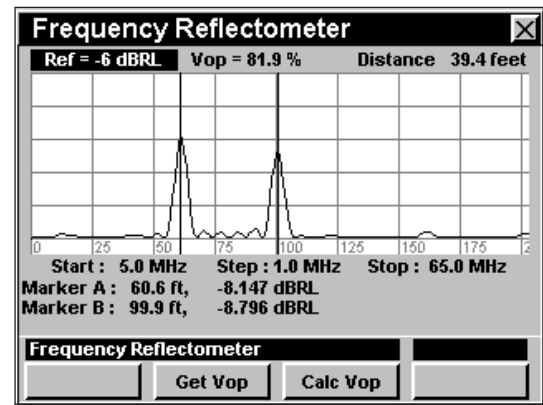
Required Setup

To use **FDR** Mode, you will need to set up some basic parameters, be sure you have completed **Section I: The Basics**, Chapter 5: Initial Setup before proceeding through this chapter.

Determine if FDR Mode is Available

To determine if the **FDR** Mode option is available on this instrument, press the ⟦Setup⟧ softkey, use the ◄ ► buttons to select the ⟦ⓘ Info⟧ icon and press the (Ent) button.

You may also press the (4) to display the Instrument Information screen.

Use the ▲ ▼ buttons to select the **RF Option Info** field. If the FDR Option is installed, the widow will display the text *FDR : YES*.
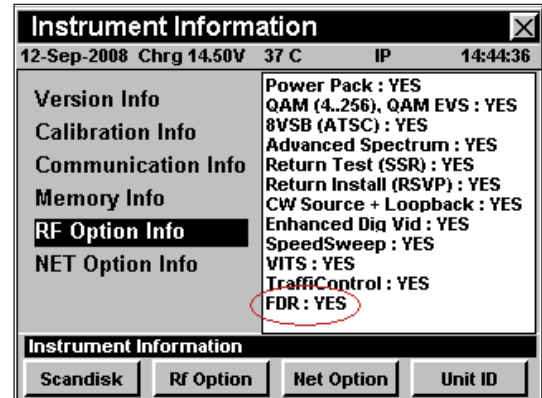
The **Calibration Info** field will display the date the **FDR** Mode was last calibrated.
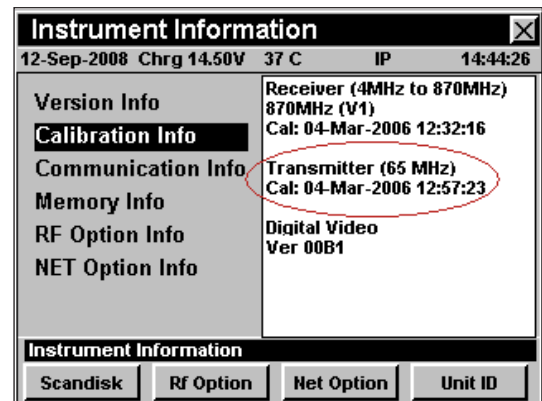
Using the FDR Mode

The **FDR** Mode allows the user to find reflection points in a cable network. The following procedures detail the use of the **FDR** Mode.

Reference Level

The reference level may be adjusted in 3 dB increments.

To change the reference level, use the ◄ ► buttons to highlight the **Ref** control and use the ▲ ▼ buttons to change the reference level.
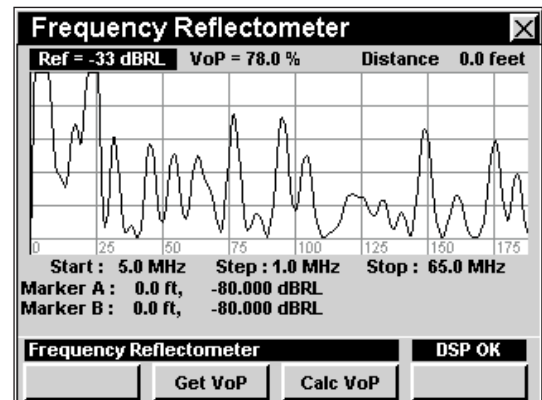
Velocity of Propagation (VoP)

To adjust the VoP use the ◄ ► buttons to highlight the **VoP** control and use the ▲ ▼ buttons to change the VoP percentage value.

Step Size

To change the frequency of the step size press the
◀ ▶ buttons to highlight the **Step** control, press the
▲ ▼ buttons to select **0.5 MHz** or **1.0 MHz** step
size.
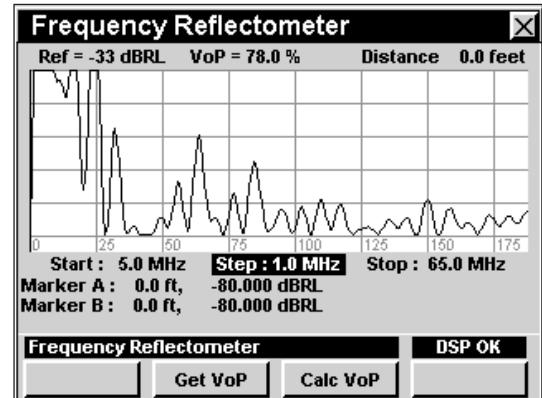
Marker Settings

The instrument displays two frequency-settable
markers as dark vertical lines on the scale. These
markers can be used to make amplitude
measurements of carriers at user-selected
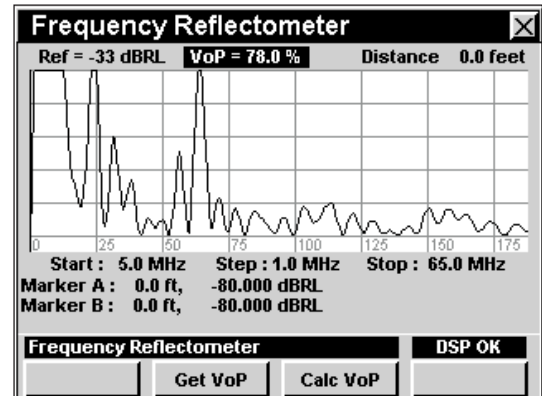frequencies, or to determine the difference (**Delta**) in
amplitude between two selected carriers.
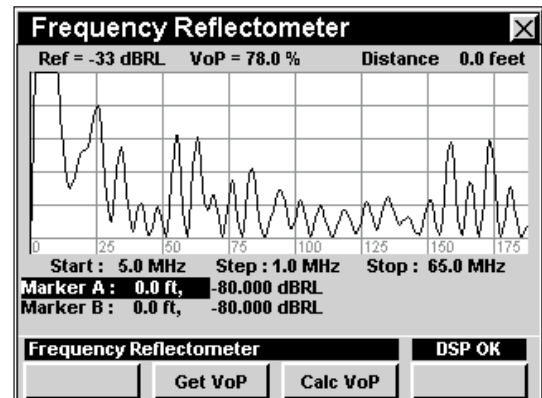
To set a marker to a frequency, use the ◀ ▶ buttons
to highlight **Marker A** or **Marker B**, then increment the
marker to higher or lower frequencies using the ▲ ▼
buttons. You can also enter a frequency directly using
the alphanumeric keypad and pressing the (Ent) button.

TRILITHIC
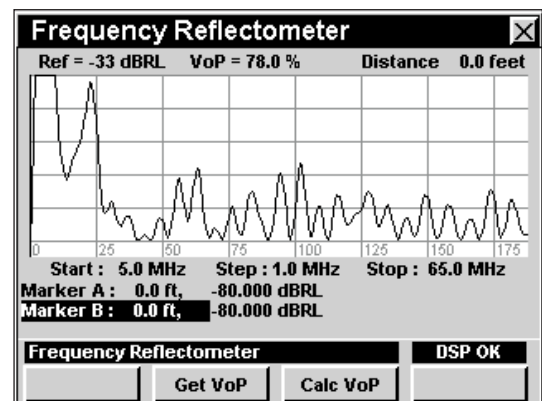
Calc VoP

To calculate distance, press the `Calc VoP` softkey, use the ⬆ ⬇ buttons to highlight **Marker A** or **Marker B**, and press the **Ent** button. The distance relative to the specific marker is displayed next to the **Distance** readout in the upper right corner of the **FDR** Mode window.
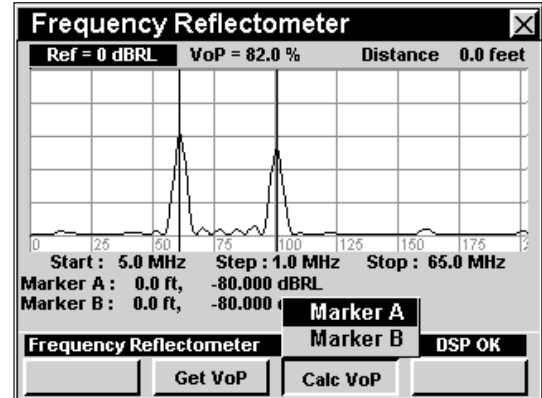
Get VoP

The user may select **RG-59, RG-6, RG-11, Simi-Rigid**, or **Hardline** cable type by pressing the `Get VoP` softkey, use the ⬆ ⬇ buttons to highlight the cable type desired and press the **Ent** button or you may also select the numeric key that matches the desired cable type.
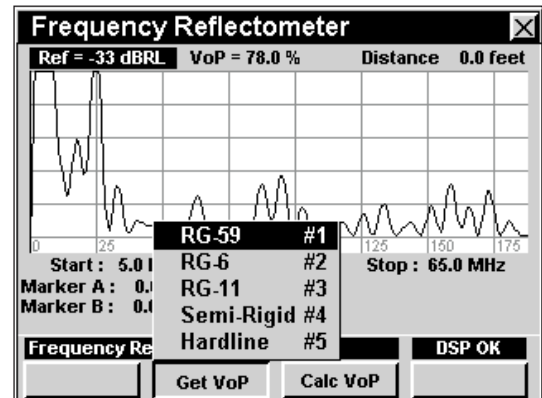
Function Menu Options

The **Function** Menu can be accessed by pressing the (Fn) button while in the **FDR** Mode.

The following **Function** Menu Options can be accessed while in **FDR** Mode and are described in **Section I: The Basics**, Chapter 6: Basic Function Menu Options:

- Contrast / Freeze
- Screen Capture
- Context Help
- Save Data Log

Introduction

The **Source** Mode configures the 860 DSP or 860 DSPi to function as a return frequency signal source with settable signal frequency, amplitude and modulation.

You can use **Source** Mode to "ring out" home and MDU (Multiple Dwelling Unit) cabling, using a signal level meter or Legacy Guardian Isometer Reverse Leakage Detector to trace cabling. You can also inject the test signal into the house wiring and use the Isometer to find breaks and loose connections that would admit ingress.
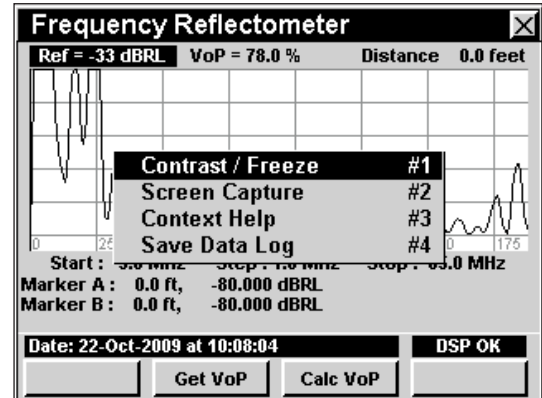
In order to use the **Source** Mode on your 860 DSP, the instrument must be equipped with Return Sweep Receiver Option (SR-1) or Return Tester Option (VP-1). In order to use the **Source** Mode on your 860 DSPi, the instrument must be equipped with Power Pack Option (PP-1) and Return Sweep Receiver Option (SR-1) or Return Tester Option (VP-1).

This section will provide you with the basic understanding of how to use **Source** Mode including:

- Required Setup
- Using Source Mode
- Setting Frequency
- Adjusting Tx Level
- Selecting Modulation Type
- Changing Frequency Step Size
- Function Menu Options
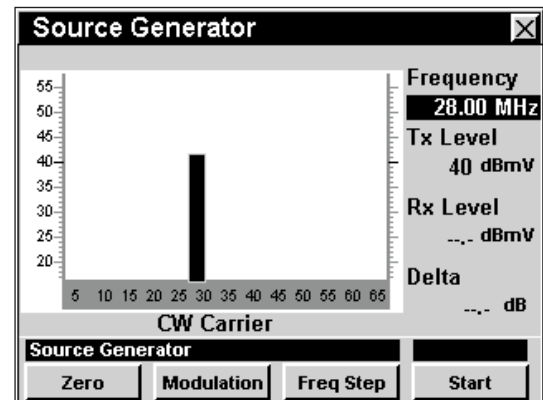
> **Note: Source** Mode is an optional function of the 860 DSP and 860 DSPi. To view the installed functions on your instrument, see **Section IV: Setup Functions**, Chapter 5: Instrument Information Mode. If you do not have **Source** Mode installed in your instrument, you may call Trilithic at (800) 344-2412 to order this option and start using it today.

> **Note:** If your instrument does not include all of the features shown in this chapter, go on-line to *www.trilithic.com* to update your firmware for free. This will allow you to use all of the newest features that are included in this mode.

Required Setup

To use **Source** Mode, you will need to set up some basic parameters, be sure you have completed **Section I: The Basics**, Chapter 5: Initial Setup before proceeding through this chapter.

Using Source Mode

To start using the **Source** Mode, select the `Start` softkey. The graph will no longer display the text **RF Off** and the source signal will be displayed.
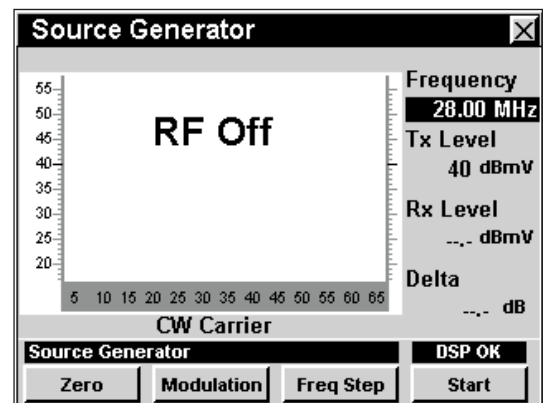
To stop using the **Source** Mode, select the `Stop` softkey. The graph will no longer display the source signal and the text **RF Off** will be displayed.

Setting Frequency

To change the frequency, use the ◄ ► buttons to highlight the frequency, use the ▲ ▼ buttons to increment the value up and down or enter the desired frequency using the alphanumeric keypad, and then press the (Ent) button.

Source Generator

```
                        Frequency
55                        28.00 MHz
50                      Tx Level
45                          40 dBmV
40
35                      Rx Level
30                          --.- dBmV
25
20                      Delta
    5 10 15 20 25 30 35 40 45 50 55 60 65    --.- dB
            CW Carrier
Source Generator
   Zero  │ Modulation │ Freq Step │   Start
```
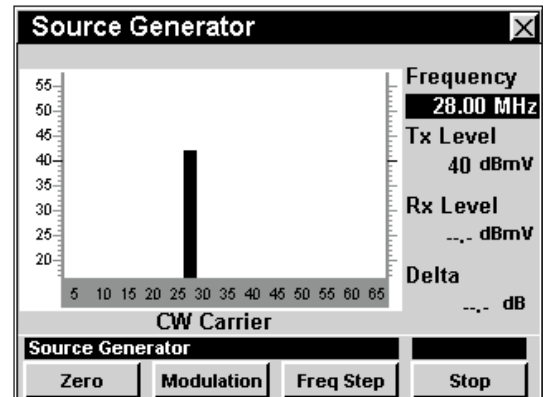
Adjusting Tx Level

To change the output transmit level, use the ◄ ► buttons to highlight **Tx** and use the ▲ ▼ buttons to increment the value up and down.
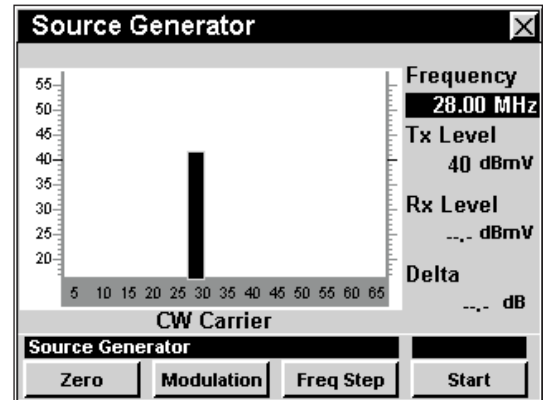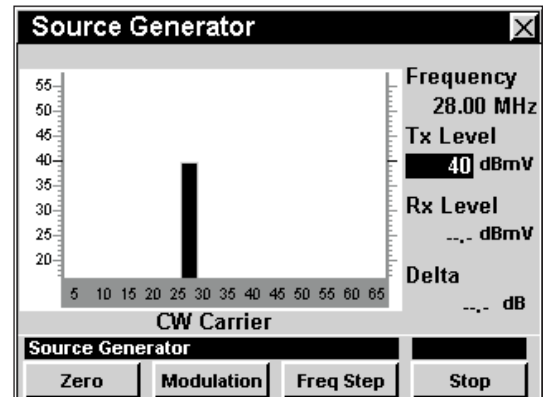
Source Generator

```
                        Frequency
55                        28.00 MHz
50                      Tx Level
45                          40 dBmV
40
35                      Rx Level
30                          --.- dBmV
25
20                      Delta
    5 10 15 20 25 30 35 40 45 50 55 60 65    --.- dB
            CW Carrier
Source Generator
   Zero  │ Modulation │ Freq Step │   Stop
```

Selecting Modulation Type

To change the modulation type, press the `Modulation` softkey, use the ▲ ▼ buttons to highlight the desired modulation type, and press the (Ent) button. You may also select the desired modulation type by pressing the corresponding alphanumeric button.

The signal generated by the **Source** Mode can have several different modulation types as follows:

CW: No modulation.

Pulse: 100% AM square-wave modulation at a 1 kHz rate. The modulation produces an audible tone in the speaker of a signal level meter. This can simplify identification of cables in MDUs.

**Tag:** The signal is Channel Tagged at a 20 Hz rate to be compatible with the Legacy Guardian Isometer.

Sweep 42: The signal is swept across the reverse spectrum range of 5 MHz to 42 MHz.

Seeep 65: The signal is swept across the reverse spectrum range of 5 MHz to 65 MHz.

Single: The signal is a single chirp used to simulate fast ingress signals.

Repeat: The signal is a repeating chirp used to simulate fast ingress signals.

Loop Back: This signal is transmitted from the **Reverse/Both** connection and is read using the **SLM/Forward** connection. This signal is used to test the properties of cables, pads, and transmitters. To "zero out" the **Loop Back** modulation, press the `Zero` softkey.
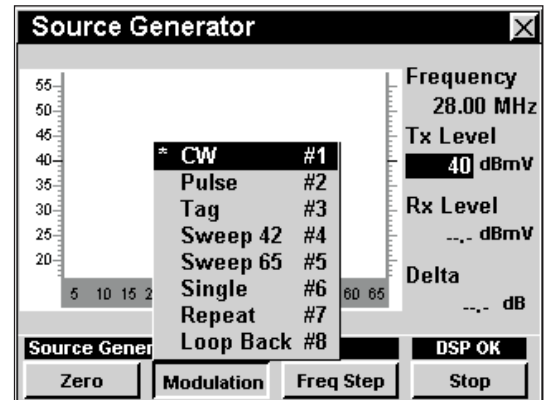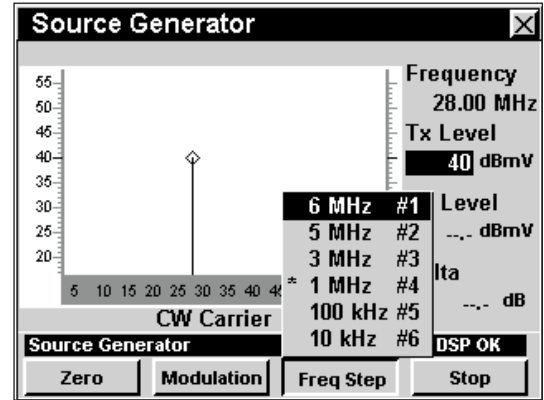
Changing Frequency Step Size

To change the frequency step size, press the `Freq Step` softkey, use the ▲ ▼ buttons to highlight the desired frequency step, and then press the (Ent) button. You may also select the desired frequency step by pressing the corresponding alphanumeric button.

The third frequency step, in this case 1 MHz, is the channel spacing that is configured in **Section IV: Setup Functions**, Chapter 2: Instrument Setup Mode, *Level Mode Settings*.
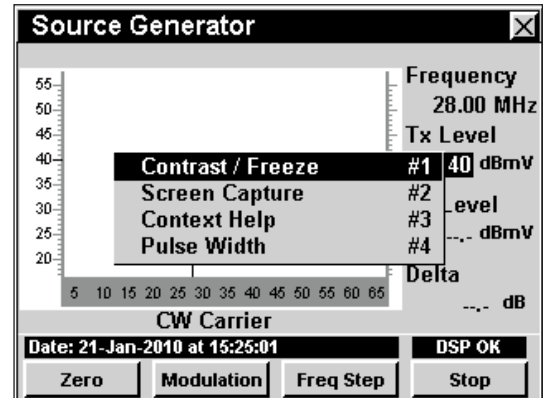
Function Menu Options

The **Function** Menu can be accessed by pressing the (Fn) button while in the **Source** Mode.

The following **Function** Menu options can be accessed while in **Source** Mode:

- Contrast / Freeze
- Screen Capture
- Context Help
- Pulse Width

Basic Function Menu Options

The following functions are described in **Section I: The Basics**, Chapter 6: Basic Function Menu Options:

- Contrast / Freeze
- Screen Capture
- Context Help

Pulse Width

This option is used to enter the pulse width in milliseconds.

The pulse width is used for the **Single** and **Repeat** modulation types.

To use this option, press the (Fn) button, use the ▲ ▼ buttons to highlight **Pulse Width**, and then press the (Ent) button. You may also select **Pulse Width** by pressing (4).

- The **Function** Menu will close and the **Enter Pulse Width in msec** window will open.

- Enter the pulse width value using the alphanumeric keypad, and then press the Required Setup
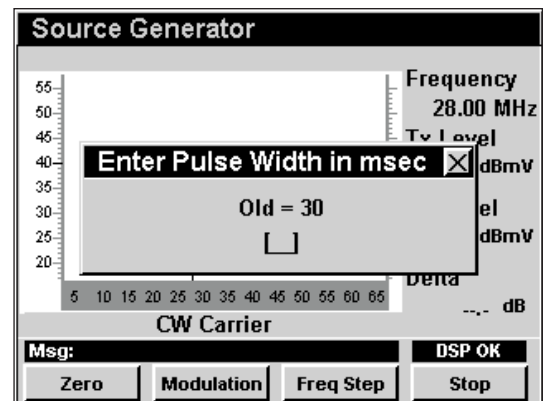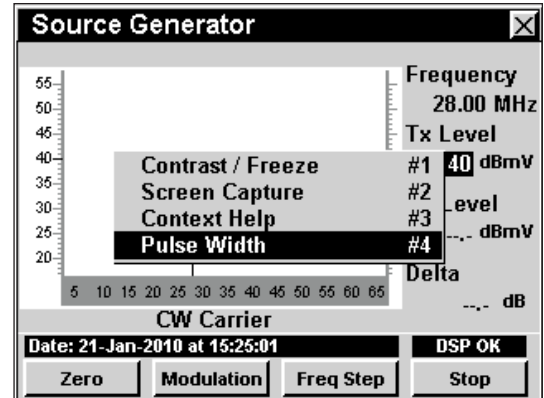
Introduction

**QAM Source** Mode configures the instrument to function as a QAM signal source with settable signal modulation and symbol rate. The basic 860 DSPi comes equipped with the **QAM Source** Mode as a standard feature. This mode is not available for the 860 DSP in any configuration.

This section will provide you with the basic understanding of how to use **QAM Source** Mode including:

- Required Setup

- Using QAM Source Mode

- Setting Frequency

- Adjusting Tx Level

- Selecting Modulation Type

- Changing Symbol Rate

- Changing Frequency Step Size
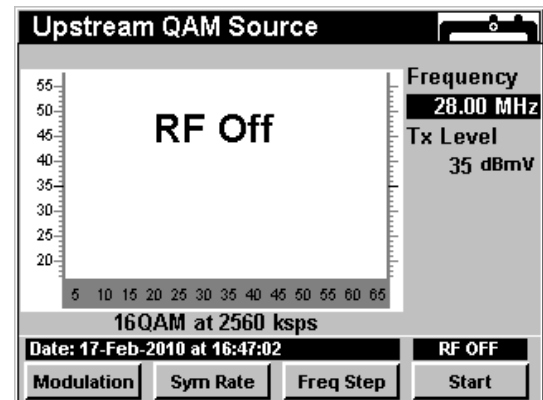
- Function Menu Options

Note: If your instrument does not include all of the features shown in this chapter, go on-line to *www.trilithic.com* to update your firmware for free. This will allow you to use all of the newest features that are included in this mode.

Note: If your instrument is not equipped with the latest internal cable modem, contact Trilithic for details on how to upgrade your instrument.

Required Setup

To use **QAM Source** Mode, you will need to set up some basic parameters, be sure you have completed **Section I: The Basics**, Chapter 5: Initial Setup before proceeding through this chapter.

To use **QAM Source** Mode, you will need to setup the internal cable modem, be sure you have completed **Section IV: Setup Functions**, Chapter 2: Instrument Setup Mode, *CM/CPE Settings* before proceeding through this chapter.
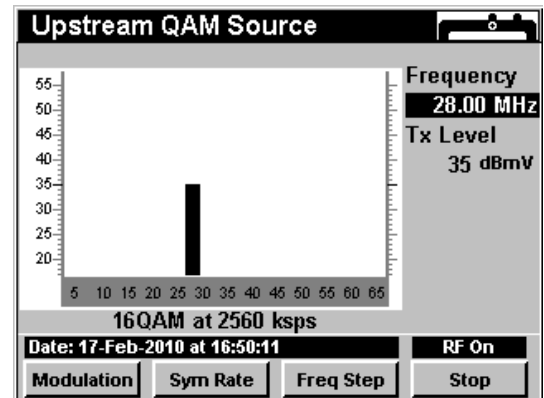
Using QAM Source Mode

To start using the **QAM Source** Mode, select the <kbd>Start</kbd> softkey. The graph will no longer display the text **RF OFF** and the source signal will be displayed.
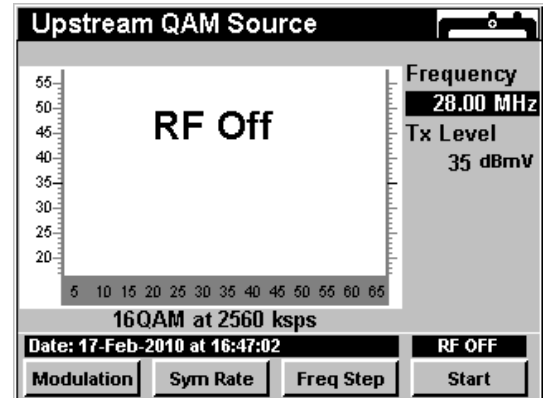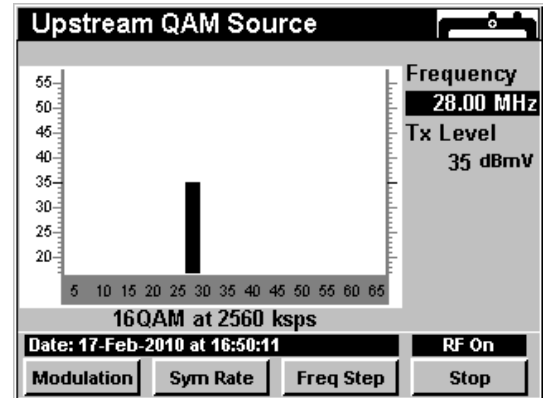
To stop using the **QAM Source** Mode, select the <kbd>Stop</kbd> softkey. The graph will no longer display the source signal and the text **RF Off** will be displayed.
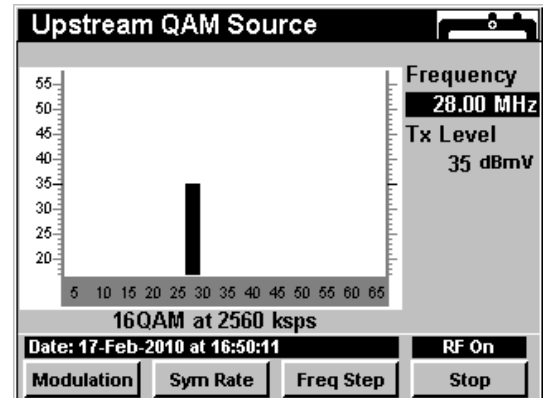
Setting Frequency

To change the frequency, use the ◄ ► buttons to highlight the frequency, use the ▲ ▼ buttons to increment the value up and down or enter the desired frequency using the alphanumeric keypad, and then press the (Ent) button.

Upstream QAM Source

Frequency
28.00 MHz
Tx Level
35 dBmV

16QAM at 2560 ksps

Date: 17-Feb-2010 at 16:50:11 RF On

| Modulation | Sym Rate | Freq Step | Stop |

Adjusting Tx Level

To change the Output Transmit Level (**Tx**), use the ◄ ► buttons to highlight the Tx level, use the ▲ ▼ buttons to increment the value up and down or enter the desired level using the alphanumeric keypad, and then press the (Ent) button.

Upstream QAM Source

Frequency
28.00 MHz
Tx Level
35 dBmV

16QAM at 2560 ksps

Date: 17-Feb-2010 at 16:50:11 RF On

| Modulation | Sym Rate | Freq Step | Stop |

![QAM Src icon]

Selecting Modulation Type

To change the modulation type, press the Modulation softkey, use the ▲ ▼ buttons to highlight the desired modulation type, and press the Ent button. You may also select the desired modulation type by pressing the corresponding alphanumeric button.


The signal generated by the **QAM Source** Mode can have several different modulation types as follows:

QPSK: This represents four points on the constellation diagram, equispaced around a circle. With four phases, QPSK can encode two bits per symbol.

16 QAM: This represents 4 different phases and 4 different amplitudes that are used for a total of 16 different symbols.

64 QAM: This represents 8 different phases and 8 different amplitudes that are used for a total of 64 different symbols.

The modulation type, in this case 64 QAM, that is marked with and asterisk (*) is the currently selected modulation type.
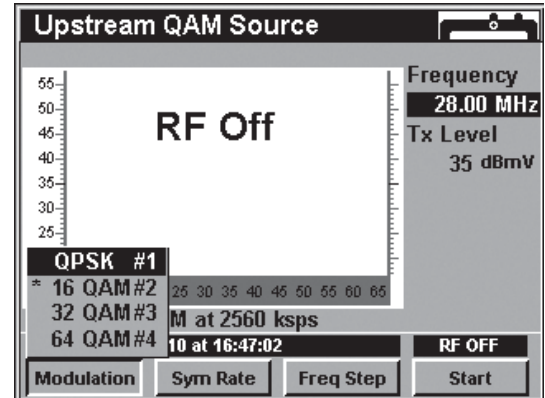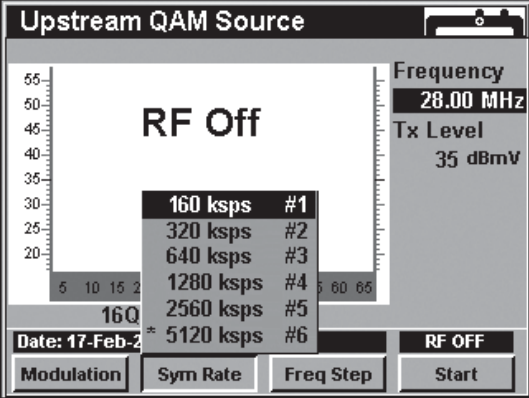
Changing Symbol Rate

To change the symbol rate, press the `Freq Step` softkey, use the ▲ ▼ buttons to highlight the desired symbol rate, and then press the `Ent` button. You may also select the desired symbol rate by pressing the corresponding alphanumeric button.

The symbol rate, in this case 5120 ksps, that is marked with and asterisk (*) is the currently selected symbol rate.
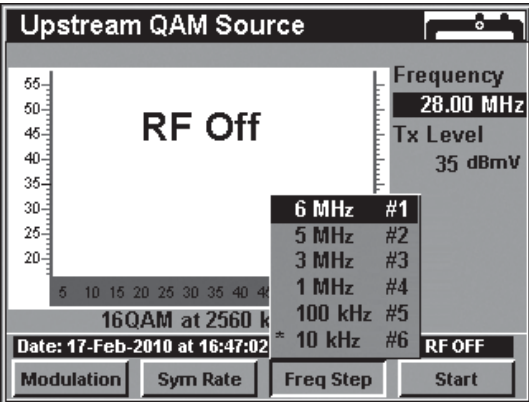

CAUTION: Changing the symbol rate will change the bandwidth of your signal. The screen shows an approximation of this effect but the actual response may be slightly wider than shown. Be careful when changing the symbol rate if you have placed your QAM source signal close to active return band traffic.

Changing Frequency Step Size

To change the frequency step size, press the `Freq Step` softkey, use the ▲ ▼ buttons to highlight the desired frequency step, and then press the `Ent` button. You may also select the desired frequency step by pressing the corresponding alphanumeric button.

The third frequency step, in this case 1 MHz, is the channel spacing that is configured in **Section IV: Setup Functions**, Chapter 2: Instrument Setup Mode, *Level Mode Settings*.
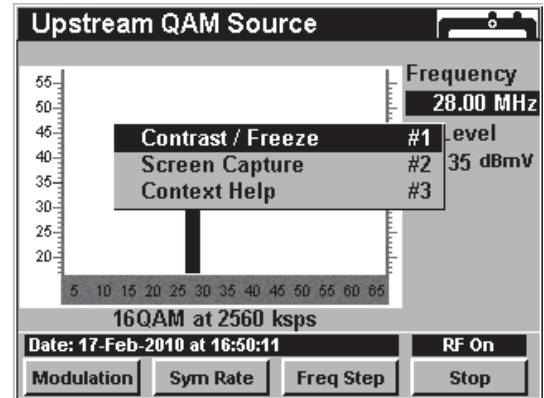
QAM Src

Function Menu Options

The **Function** Menu can be accessed by pressing the
Fn button while in the **QAM Source** Mode.

The following **Function** Menu options can be accessed
while in **QAM Source** Mode and are described in
Section I: The Basics, Chapter 6: Basic Function Menu
Options:

- Contrast / Freeze

- Screen Capture

- Context Help

Wi-Fi (802.11 b/g) in the 860 DSPi

The **Wi-Fi** Mode provided a means for cable technical personnel to verify a company's Wi-Fi access points are properly broadcasting adequate field strength and security protocol.

The **Wi-Fi Survey** Mode can be used on data service installations to verify wireless accessibility throughout a customer's home, and to verify that the configured channel is not conflicting with a neighbor's access point without actually logging on to the company's network.

The Wi-Fi adaptor for the 860 DSPi provides a communications path for measurement data, unit configurations and internet sites, and may also be used to perform common Wi-Fi network verification tests such as:

- Detects in-range wireless IEEE 802.11 b/g access points and lists SSID's and channels.

- Displays the up to 10 access points, with the one currently connected highlighted.

- List includes received signal strength in dBm for each access point, and indicates security enabled/disabled.

- Indicates the type of access point (infrastructure or ad hoc).

This section will provide you with the basic understanding of how to use **Wi-Fi** Mode including:

- Required Setup

- Selecting the Wi-Fi Option

- Using the Wi-Fi Survey Mode

- Checking the 860 DSPi for Wi-Fi Compatibility

- Zone Configuration

- Using the Wi-Fi Mode

- Workbench Support

Required Setup

To use **Wi-Fi** Mode, you will need to set up some basic parameters. Be sure you have completed **Section I: The Basics**, Chapter 5: Initial Setup before proceeding through this chapter.

To use **Wi-Fi** Mode, you will need to set up your Wi-Fi adapter. See **Section IV: Setup Functions**, Chapter 2: Instrument Setup Mode, *Wi-Fi Settings*.

Using the Wi-Fi Survey Mode

This mode allows the user to verify a company's wireless access and parameters. The following screens display the Wi-Fi parameter for the survey mode of operation.

When the user enters the mode, you can select from a list of configured Wi-Fi zones. Once you have chosen a Wi-Fi zone, the instrument will connect to the associated Wi-Fi access point and a list of access points within range is displayed.

The Wi-Fi access point that the meter is currently connected to will appear highlighted by a black bar.

The list is auto-sorted with the access point with the highest level at the top and a descending order of received power level.

Up to 10 access points are shown along with their SSID and power level.

If the SSID is unknown, the word unknown is displayed. An asterisk appearing next to an SSID indicates that security is enabled. Also, the default assumes the access point is part of an infrastructure mode network.

If an SSID is setup for an ad hoc wireless network, the words "ad hoc" appear next to the SSID.
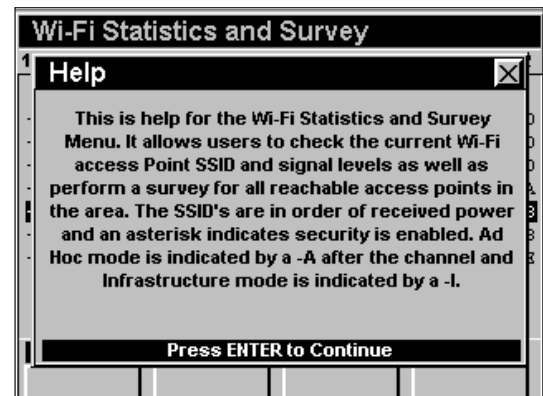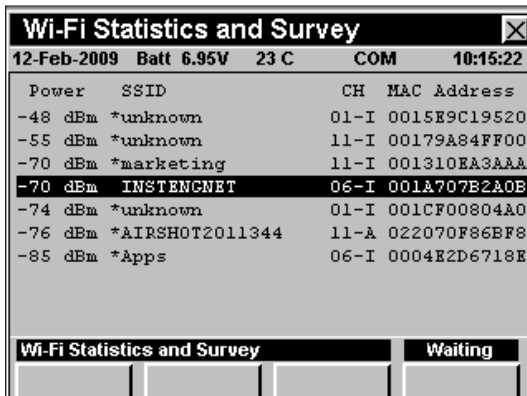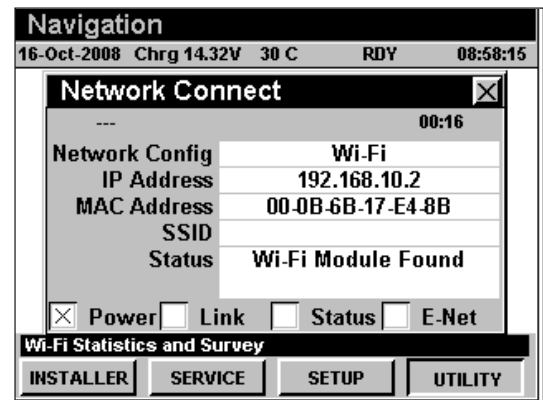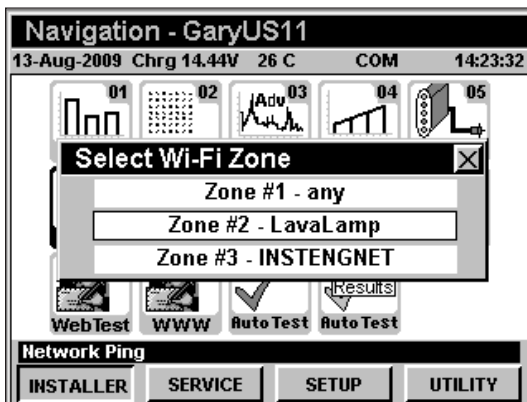
Using the Wi-Fi Mode

Perform the following steps to use the **Wi-Fi** Mode;

Select Wi-Fi as the network login default (similar to ping or cable modem) in the Setup, COM/NET settings.

When the user activates the network by entering Ping, Trace Route, Browser, etc.; the meter logs into the Wi-Fi network and functions the same as when connected using the internal cable modem, or the RJ45 (network adapter) and all network functions should be available.

Alternatively, the user can enter the Wi-Fi survey mode without acquiring an IP address, and the meter will not attempt to login to the Wi-Fi network. In this mode of operation the survey is available, but other network related test modes are not. When you exit the survey mode, the meter automatically powers down the Wi-Fi module.

> **Note:** The meter must either be able to acquire an IP address from the network, or have been setup with a static IP address if using an ad hoc network. The Wi-Fi survey mode is also available at this time.