802 AWE
Advanced Wireless Expert

Operation Manual

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. See Page iv for complete details.

Industry Canada / Industrie Canada

This equipment has been tested and found to comply with Industry Canada Standards. See Page v for complete details.

innovative technology to keep you a ***step ahead***

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Putting Innovation Within Reach

Product innovation at Trilithic has always been characterized by one thing: it's practical. It makes life easier for customers. It's the natural result of listening to them. That philosophy has been the driving force behind the company's growth from its beginnings as a two-man engineering team in 1986 to its current position as a global manufacturer with more than 130 employees.

A privately held company, Trilithic broadened its original RF and microwave component product line by acquiring Filters manufacturer Cir-Q-Tel and instruments manufacturer Texscan, adding broadband solutions to the product line. The company also expanded operations to Thailand in 2001, to meet increasing demand for its products in the growing markets of Asia.

As new communications applications continue to emerge, part of Trilithic's business has evolved into managing change—helping customers respond quickly to market opportunities with innovative technology and individualized solutions. But the core value of Trilithic's business approach—listening to customers—hasn't changed. Keeping that focus intact will help provide better products in the long run and ensure continued growth for decades to come.

Trilithic is comprised of two major divisions:

Broadband Instruments

The company is best known for innovations in signal level measurement, leakage detection and reverse path maintenance—like the use of Digital Signal Processing (DSP) technology, which lets field technicians upgrade their signal analyzers by simply downloading firmware.

Emergency Alert Systems

Trilithic's EAS division is a leading supplier of homeland security government-mandated emergency alert systems for broadband and other communication system providers. As the communications industry continues its rapid evolution, Trilithic has begun offering comprehensive systems and services to address a wide variety of emergency alert system needs, including the design and architectural layout of complex analog and digital EAS networks.

FCC Part 15 Compliance

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

Pursuant to FCC 15.21 of the FCC rules, changes not expressly approved by Trilithic, Inc. might cause harmful interference and void the FCC authorization to operate this product.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the device and receiver
- Connect the device into an output on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Industry Canada Compliance

Industry Canada

This device complies with Industry Canada license-exempt RSS standard(s). Operation of this device is subject to the following two conditions; 1) This device may not cause harmful interference and 2) this device must accept any interference received, including interference that may cause undesired operation.

This Class B digital apparatus complies with Canadian ICES-003.

Industrie Canada Conformité

Industrie Canada

Cet appareil est conforme au Cahier des charges sur les normes radioélectriques d'Industrie Canada concernant les appareils radio exempts de licence. Le fonctionnement de cet appareil est soumis aux deux conditions suivantes : 1) cet appareil ne doit pas produire de brouillage et 2) cet appareil doit accepter tout brouillage, y compris celui pouvant causer un mauvais fonctionnement de l'appareil.

Cet appareil numérique de classe B est conforme à la norme canadienne ICES-003.

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802 AWE
Advanced Wireless Expert

Section I: The Basics

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Helpful Website

The following website contains general information which may be of interest to you:

http://www.trilithic.com

Trilithic's website contains product specifications and information, tips, release information, marketing information, frequently asked questions (FAQs), bulletins and other technical information. You can also check this website for product updates.

Trilithic technical support is available Monday through Friday from 8:00 AM to 5:00 PM EST. Callers in North America can dial 1-317-895-3600 or 1-800-344-2412 (toll free). International callers should dial 1-317-895-3600 or fax questions to 1-317-895-3613. You can also e-mail technical support at *support@trilithic.com*.

For quicker support response when calling or sending e-mail, please provide the following information:

- Your name and your company name
- The technical point of contact (name, phone number, e-mail)
- A detailed description of the problem you are having, including any error or information messages
- The serial number of the 802 AWE that you are having problems with

How this Manual is Organized

Thank you for choosing the 802 AWE. This manual is provided with the 802 AWE to help the user become better acquainted with the device and to become productive faster. Each section is written as though the user is familiar with the basic operation of the instrument and is broken into chapters for each function.

This manual is divided into the following sections:

- Section I: The Basics – This section provides Trilithic contact information, describes how this operation manual is structured, and gives an overview of the instrument and its basic features. Before using the instrument, it is recommended that the user read this section for an overview of features, basic commands and other important details.
- Section II: Setup Menu – This section includes instructions on how to use the features shown in the Setup Menu of the instrument.
- Section III: Survey Menu – This section includes instructions on how to use the features shown in the Survey Menu of the instrument.
- Section IV: Troubleshoot Menu – This section includes instructions on how to use the features shown in the Troubleshoot Menu of the instrument.
- Section V: Appendix – This section provides instrument specifications and warranty information.

Conventions Used in this Manual

This manual has several standardized conventions for presenting information:

- Connections, menus, menu options, and user-entered text and commands appear in **bold**.
- Section names, web, and e-mail addresses appear in *italics*.

A NOTE is information that will be of assistance to you related to the current step or procedure.

A CAUTION alerts you to any condition that could cause a mechanical failure or potential loss of data.

A WARNING alerts you to any condition that could cause personal injury.

Precautions

Do not use the instrument in any manner not recommended by the manufacturer.

A strong electromagnetic field may affect the measurement accuracy of the 802 AWE.

Use only the battery charger supplied with the 802 AWE. Use of any other charger may damage the battery.

Damage caused by improper cleaning of the display screen will void the warranty of the 802 AWE.

Never use abrasive pads, paper towels, tissue paper, or clothing to wipe the screen. If you do, these non-ultrasoft materials can cause permanent damage by scratching the screen or stripping the anti-glare coating off the screen.

Never use any type of window cleaner, soap, scouring powder, or any cleanser with solvents such as alcohol, benzene, ammonia, or paint thinner. These chemicals can react with the materials used to construct the display which can lead to hazing, yellowing, brittleness, or other types of damage.

Never spray liquid directly on the display screen as it could run inside the unit and cause damage.

What is the 802 AWE?

Overview

As wireless networks and technologies continue to expand, the new 802 AWE™ Advanced Wireless Test Set from Trilithic is designed to help identify and resolve many problems that are encountered during wireless network deployments.

- Powerful all-in-one Device Designed for Troubleshooting of Wi-Fi (a/b/g/n/ac*), Ethernet (10/100), ZigBee & Bluetooth Networks
- Easily Identify Coverage Problems, Connectivity Issues, Security Risks, Unauthorized/Failed Access Points & Clients in the 2.4 and 5 GHz Bands
- Analyze Overlaps in Wireless Channel Broadcasts to Prevent Interference Between Wi-Fi and ZigBee Wireless Home Security & Automation Networks
- Certify Wi-Fi Installations Using Convenient, One-Touch Survey Apps *(Coming Soon)*

The 802 AWE is ideal for wireless network installation or troubleshooting and features a compact rugged design, easy-to-use color user interface and built-in antenna for testing of Wi-Fi (a/b/g/n/ac*), ZigBee or Bluetooth wireless networks. The device also includes an Ethernet port for connectivity, traceroute, and throughput testing through wired networks.

The 802 AWE offers a superior solution for proactive troubleshooting of wired and wireless networks and is the most cost-effective testing tool available for 2.4 GHz and 5 GHz wireless networks.

Available Functions

The 802 AWE supports a variety of functions, including:

- Multi-User Support
- Multi-Language Support
- Interactive Surveying Apps
- Datalogs and Screen Captures

Simple Yet Powerful

Providing the widest range of standard functions for installation and maintenance technicians available today, the 802 AWE provides you with a total end-to-end testing solution for all of your network installation, verification and troubleshooting needs. With the 802 AWE you can quickly and easily analyze overlaps in wireless channel broadcasts to prevent interference between Wi-Fi and ZigBee wireless home security & automation networks.

802.11ac Survey & Connectivity Support

The 802 AWE provides next generation support for 802.11ac networks using its built-in 802.11 a/b/g/n wireless adapter. As with other wireless standards, the 802.11ac standard provides backwards compatibility with the 802.11n standard. This means that the 802 AWE can be used to detect, find, and connect to 802.11ac access points. Just like with other network devices, the 802 AWE provides information such as channel number, SSID, standard, security, max speed, channel width and number of streams for 802.11ac network devices. The 802 AWE can also connect to 802.11ac access points at 802.11n speeds using 20 or 40 MHz channels with 64 QAM modulation in the 5 GHz frequency band over a 1x1 MIMO stream.

In-Depth Measurements

For the more advanced user, the 802 AWE is a total end-to-end testing solution for all of your network installation, verification, and troubleshooting needs. The 802 AWE provides a wide variety of in-depth measurement tools and a full network test suite for both Ethernet and Wi-Fi networks.

Standard Testing Features

- Wi-Fi Frequency Band Survey
- Wi-Fi Channel Usage
- Zigbee Survey
- Bluetooth Survey
- Client Device Survey
- Client Device Finder
- Ping, Traceroute, & Throughput Measurements (RJ-45)

Standard Measurements

- Signal Level
- Noise Level
- Signal-to-Noise Ratio
- % Channel Usage
- SSID
- Number of Access Points
- Security Type
- Supported Wireless Standards
- Ping
- Traceroute
- Throughput

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Getting to Know Your 802 AWE

Overview

Before using your instrument, take a few minutes to familiarize yourself with the instrument, its basic conventions and its navigational tools. This section provides a brief overview of the instrument's features, buttons, and controls.

Equipment Supplied with the 802 AWE

The 802 AWE comes with the following:

- 802 AWE Advanced Wireless Expert
- Two Built-In Li-Ion Batteries
- Protective Carrying Case with Shoulder Strap
- AC to DC Power Adapter & Battery Charger
- USB Charge & Data Cable (Mini-B to Standard-A Male)
- USB Flash Drive Adapter (Mini-B Male to Standard-A Female)

Replacement Parts

The following replacement parts are available for the 802 AWE:

Part Number	Description
0090048000	Li-ION Replacement Battery (Replacement Requires 2 Batteries)
2131593000	802 AWE Protective Carrying Case with Belt Clip
0320052000	Shoulder Strap
0610169006	AC to DC Power Adapter & Battery Charger with USB Charge & Data Cable
0610169002	AC to DC Power Adapter & Battery Charger
2071585004	USB Charge & Data Cable
2071585050	USB Flash Drive Adapter

Field Accessories

The following accessories are available for the 802 AWE:

Part Number	Description
0610169007	CL-9 Vehicle Power Adapter with USB cable
0610169004	CL-9 Vehicle Power Adapter without USB cable
2071585004	Mini-USB Power/Data Cable (I/O-20)
0610169012	Euro Power Adapter
0610169013	UK Power Adapter
0610169014	Australian Power Adapter

A Guided Tour of the 802 AWE

Front View

LCD Screen

Soft Keys

Back Button

Arrow Buttons

Power Button

Enter Button

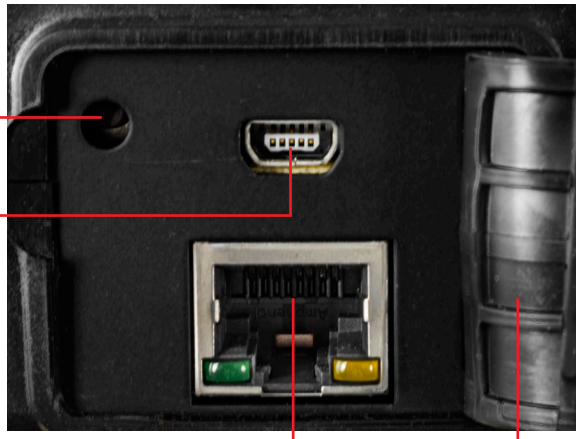
Water Resistant Speaker

Function Button

Rear View

Identification Label (S/N, FCC ID & Notice)

Bottom View



System Reset Button

Charge and Data Port (Mini-USB Type B)

Ethernet Port (10/100 Mbit/s)

Protective Rubber Door

NOTE

In the image above, the protective rubber door is in the open position for illustrative purposes. This door should remain closed when not using any of these ports.

Protective Carrying Case

The 802 AWE includes a protective carrying case with the following features:

- Molded form-fit design that includes an impact resistant foam core with coated ballistic nylon finish to provide maximum protection
- High-strength zipper to ensure secure closure
- Adjustable Velcro hand strap
- Removable shoulder strap (not shown)
- Metal D-rings for shoulder strap or line hook with reinforced stitching throughout
- Front flap with magnetic closure provides full access to the screen, keypad, and bottom ports when open
- When the front flap is closed, it provides protection to the screen and keypad as well as the bottom ports
- Convenient belt clip for easy portability. To remove clip, turn it 90° and slide off.

Cleaning the Display Screen

The LCD display of the 802 AWE requires special care when cleaning. This display is sensitive and can be easily scratched or damaged while cleaning. To clean the display screen of the 802 AWE, use an ultrasoft, clean, lint free, microfiber cloth.

To clean fingerprints and greasy smudges off the display screen, use a bottle of screen cleaning solution designed for LCD displays. Put a small amount of screen cleaning solution on a cleaning cloth and then wipe the screen gently.

For correct cleaning of the display, follow these four simple steps:

1. Turn off the 802 AWE before you begin. If the screen is dark, it will be easier to see any areas that aren't clean.
2. Very gently, wipe the display with an ultrasoft, clean, lint free, dry cloth. If this does not completely clean the display, DO NOT press harder on the screen in an attempt to clean the screen as this may cause permanent damage.
3. If Step 2 does not work, spray screen cleaning solution onto the cloth. Never spray the screen cleaning solution directly onto the display screen.
4. Let the screen dry completely before turning on the 802 AWE.

Damage caused by improper cleaning of the display screen will void the warranty of the 802 AWE.

Battery Charging

Before you can use your instrument, you will need to charge its batteries. Your instrument's Li-Ion batteries (two internal) provide approximately 6 hours of power during continuous operation.

The instrument comes with a AC to DC Power Adapter & Battery Charger which can be used to charge the batteries in approximately 6 hours or to trickle charge the batteries while the instrument is in use.

Plug the power adapter & battery charger into the DC charge port of the 802 AWE on the bottom of the instrument under a protective cover.

Your instrument is equipped with a "smart" battery charging circuit so that the charging method (fast or trickle) is an auto function. Fast Charge is used to charge the battery quickly. Trickle Charge is used to keep the battery fully charged.

Every time your instrument is plugged into the charging cube, it starts charging automatically via the Trickle Charge method. If the unit determines Fast Charge is necessary, it defaults to the Fast Charge method.

Charging Status

The Title Bar at the top of the 802 AWE screen displays the battery voltage and the following charging status icons:

Charging – This icon is displayed when the 802 AWE battery is charging. When charging, the battery voltage will be shown between 3 and 4 VDC (dependent on charging source).

100% Charge – This icon is displayed when the 802 AWE battery is at a minimum of 4.0 VDC or approximately 100% of battery capacity.

75% Charge – This icon is displayed when the 802 AWE battery is at a minimum of 3.75 VDC or approximately 75% of battery capacity.

50% Charge – This icon is displayed when the 802 AWE battery is at a minimum of 3.50 VDC or approximately 50% of battery capacity.

25% Charge – This icon is displayed when the 802 AWE battery is at a minimum of 3.40 VDC or approximately 25% of battery capacity. When the battery charge drops to this level, it is recommended that the battery is charged soon.

0% Charge – This icon is displayed when the 802 AWE battery is less than 3.40 VDC or approximately 0% of battery capacity. When the battery charge drops to this level, it is recommended that the battery is charged immediately.

NOTE

If the  ***icon is displayed, the unit is in calibration mode. See Section II: Setup, Chapter 3: Meter Configuration, Global Settings to change the operating level back to normal.***

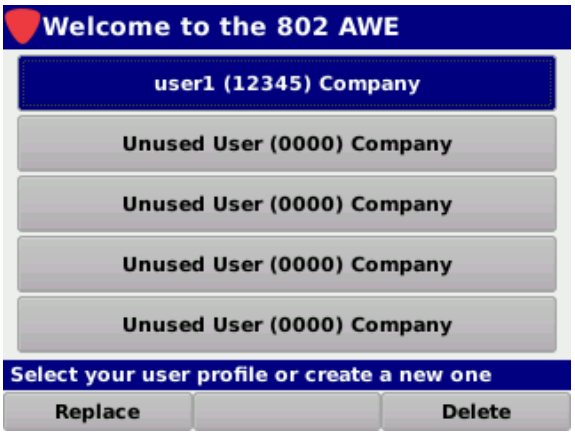
Basic Navigation & Control

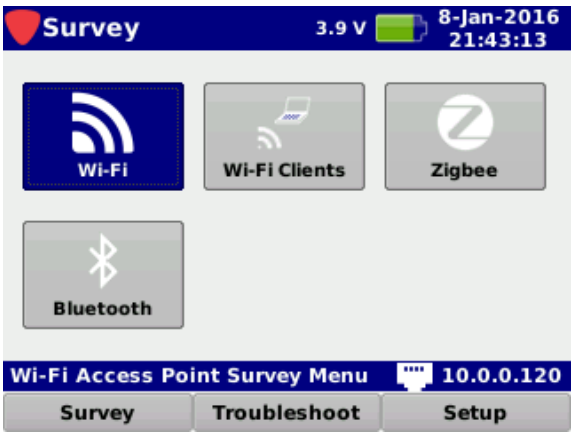
Startup

Once the instrument's battery is charged, you may startup the 802 AWE by pressing the **Power** button at the bottom left of the keypad.

Upon startup one of the following will occur:

- If multiple user profiles are activated, the instrument will display the **Welcome to** the **802 AWE** screen as shown in the image above. Use the keypad to select the user profile that you wish to use. The **Troubleshoot** menu will be displayed as shown in the image to the right.
- If multiple user profiles are deactivated, the 802 AWE will automatically display the **Troubleshoot** menu as shown in the image to the right.





NOTE

For more information about configuring multiple user profiles, see Section II: Setup, Chapter 3: Meter Configuration, Global Settings.

NOTE

For more information on how to log off the current user or to switch to another user, see Section I: The Basics, Chapter 4: Function Menu, Log Off User.

Sleep Mode

The sleep mode is used to conserve power by putting the 802 AWE to sleep when not in use. This also allows the 802 AWE to be turned back on quickly when moving from one test location to another throughout the work day

Automatic Sleep Mode

The 802 AWE will automatically enable the sleep mode to conserve power after the 802 AWE has been idle for a specified period of time.

The default setting for the sleep mode delay is **5 Minutes**. The sleep mode delay can be set from a minimum of one (1) minute up to a maximum of 60 minutes.

NOTE ***For more information about setting the Sleep Mode Delay, see Section II: Setup, Chapter 3: Meter Configuration, Interface Settings.***

NOTE ***Whenever the 802 AWE is being powered by the AC to DC power adapter & battery charger, the sleep mode delay will be deactivated automatically.***

Manual Sleep Mode

To manually enter the sleep mode, quickly press the **Power** button.

Wake from Sleep Mode

Quickly Press the **Power** button to wake the 802 AWE from sleep mode. The sleep mode delay timer will automatically restart.

Shutdown

Shutdown allows the 802 AWE to be turned off at the end of the work day to conserve power.

Automatic Shutdown

The 802 AWE will automatically enable the automatic shutdown mode to conserve power after the 802 AWE has been idle for a specified period of time.

The default setting for the turn off delay is **1 Hour**. The turn off delay can be set from a minimum of one (1) hour up to a maximum of 24 hours.

NOTE ***For more information about setting the Turn Off Delay, see Section II: Setup, Chapter 3: Meter Configuration, Interface Settings.***

NOTE ***Whenever the 802 AWE is being powered by the AC to DC power adapter & battery charger, the turn off delay will be deactivated automatically.***

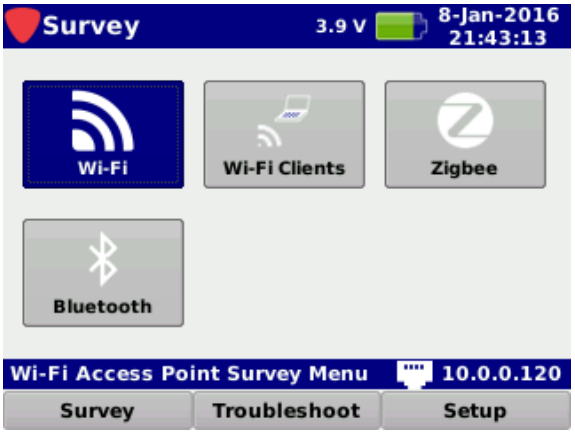
Manual Shutdown

Press and hold the **Power** button to shutdown the 802 AWE. A notification window will be displayed. Select the **OK** button to shutdown or select the **Cancel** button to exit without shutting down the device.

Display Screen

The instrument has been designed with simple, intuitive navigational tools. For your convenience, the display has a large, easy to read, menu style navigation. In some menus you will also notice on-screen cursors which enhance functions.

The display screen contains several tools which you should become familiar with before using the instrument. Take a moment to locate the basic features of the display screen.



Title Bar

The title bar is located at the top of the display screen, an example is shown in the image below. The left side of the title bar displays the name of the currently selected screen, such as the **Survey**, **Troubleshoot**, and **Setup** menus, the right side of the Title Bar displays the battery voltage, charging status, date, and time.

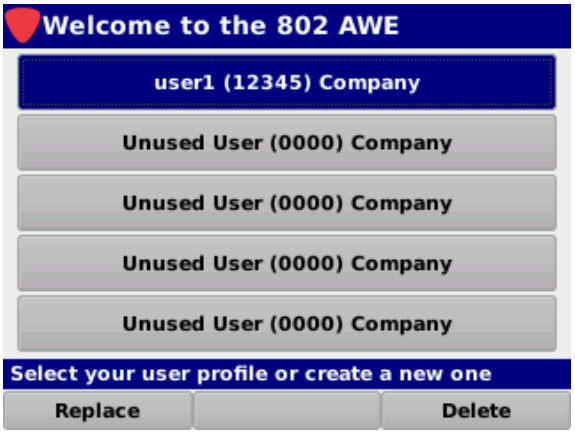
Message Bar

The message bar is located below the main display area, an example is shown in the image below. This area displays single line text entries to help you navigate the 802 AWE menus and show information when the instrument is performing tests. On the **Survey**, **Troubleshoot**, and **Setup** menus, the right side of the message bar displays network connection icons to indicate which types of network connections are currently active.

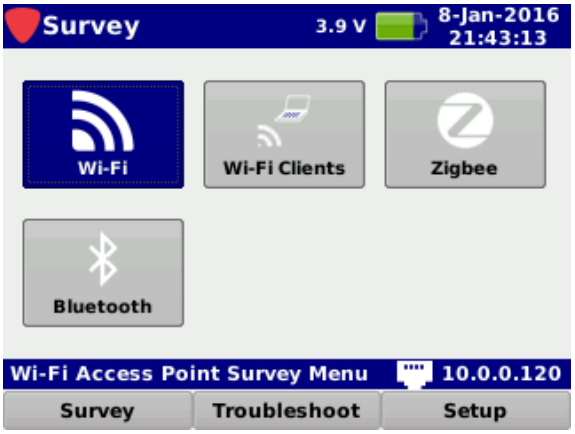
Main Display Area

The main display area, located below the Title Bar, displays text and graphic information such as function icons, measurement, graphs, and interactive pop-up boxes which vary depending on which screen has been accessed.

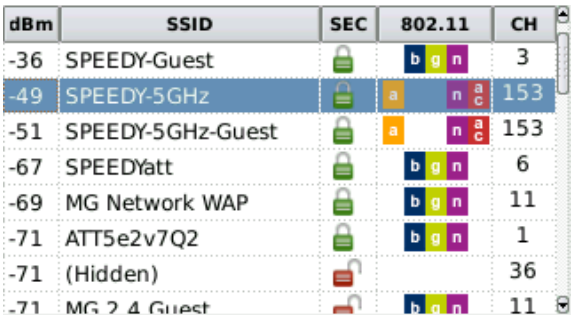
If multiple user profiles are enabled, the **Welcome to the 802 AWE** screen will always be displayed upon startup as shown in the image to the right.



After selecting a user profile, the **Survey** Menu will automatically be displayed by default with the **Wi-Fi** icon highlighted.



After selecting a function icon from any navigation menu, the measurements and data will be displayed in this area. For example, the image shown to the right represents the type of information that would be displayed in a measurement mode.



Softkey Labels

Below the message bar, are three softkeys which correspond to and identify the actions assigned to the three yellow buttons on the keypad.

Most screens utilize from one to three of the softkeys which are used to toggle between different menus and access various measurement functions.

Navigation Menus

All navigation menus will show the same softkeys. For example, the following image shows a navigation menu with the **Survey**, **Troubleshoot**, and **Setup** softkeys.

Other Screens

On measurement screens the softkeys are used to access additional measurement functions such as:

SETUP FUNCTIONS

- **Device Information** – Display Unit ID & Enter Option Codes
- **Device Setup** – Select Default & Delete Saved Access Points
- **File Management** – Backup and Restore the Device Database, Import, Export, Delete and Display Files or Sort Displayed Files by Name, Type, Date/Time and Size
- **Firmware Update** – Accept Software Terms, Choose from Web or USB Firmware and Download/Install Firmware Packages

SURVEY FUNCTIONS

- **Wi-Fi Survey** – Select from List or Graph Displays, Find Wireless Devices and Sort Displayed Networks by Level, Security Type, Frequency, Channel, and SSIS
- **Clients** – Clear Client List and Find Wireless Devices
- ***Zigbee*** *– Coming Soon*
- ***Bluetooth*** *– Coming Soon*

TROUBLESHOOTING FUNCTIONS

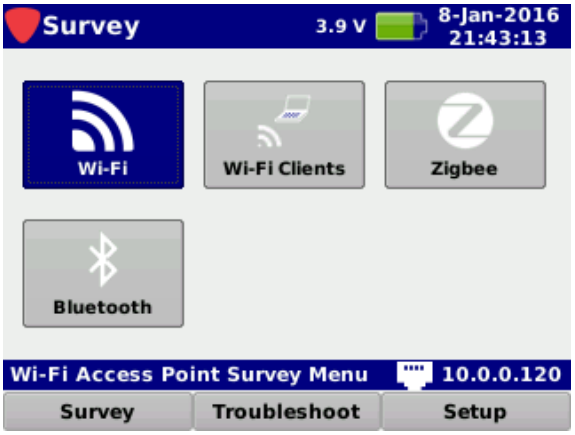
- **Channel Usage** – Select from 2.4 or 5 GHz Measurement Modes, Toggle Between Bar or Waterfall Graph Views, and Toggle Between 5 GHz Measurement Bands
- **Device Finder** – Choose the Access Point or Client Device to Find and Mute the Speaker
- **Net Tests** – Select from Ping, Throughput or Traceroute Measurement Modes, Select a Favorite Network Test Endpoint, and Start Network Tests
- **Cable Diagnostics** – Select from Time Domain Reflectometer (TDR) or Active Link Cable Diagnostics (ALCD) Tests, and Start or Stop the Cable Diagnostics Tests

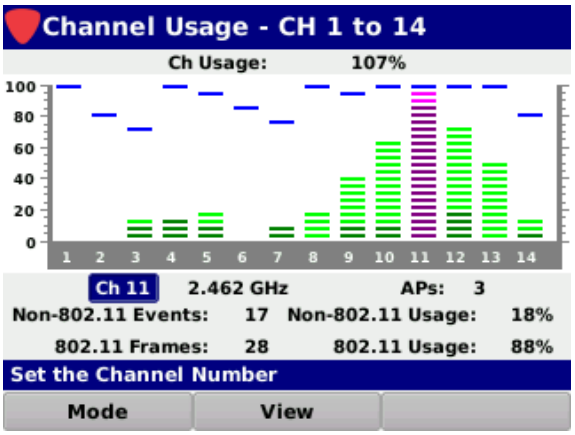
Selecting On-Screen Items

To select items on the display screen, use the arrow buttons on the keyboard to highlight the desired item and then press the **Enter** button.

In the example images shown to the right, notice how the currently selected item is highlighted blue and the other items remain gray.

Once you select an item, you will either enter a new function or a window will appear.





Main Keypad

The main keypad is the set of buttons that are shown in the image to the right.

Enter Button

The **Enter** button is used to select the highlighted items in order to:

- Select icons from the navigation menus
- Select custom setting fields to open the **Virtual Keyboard** and enter custom values
- Select functions from the **Function** menu
- Select menu options from pop-up menus
- Select channel plans and limit sets from file lists

Arrow Buttons

The arrow buttons are used to navigate, highlight items, scroll lists, or change values on the display screen.

Back Button

The **Back** button is used to take you back to a previous screen or to close a menu. It can also be used to exit a pop-up entry window without accepting entry information. If you hold down the **Back** button, this will cause the instrument to go back multiple screens.

Function Button

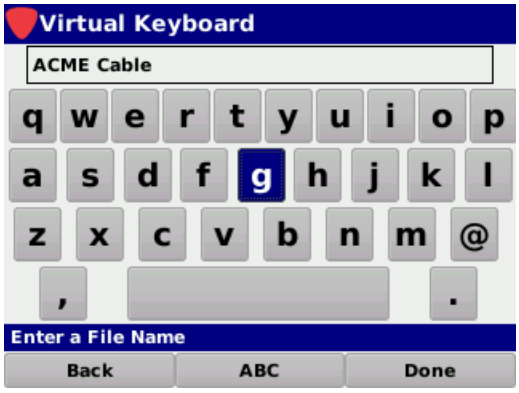
The **Function** button can be selected at any time to display a pop-up menu with additional functions. These functions vary from capturing screens for future reference to saving configuration files.

Using the Virtual Keyboard

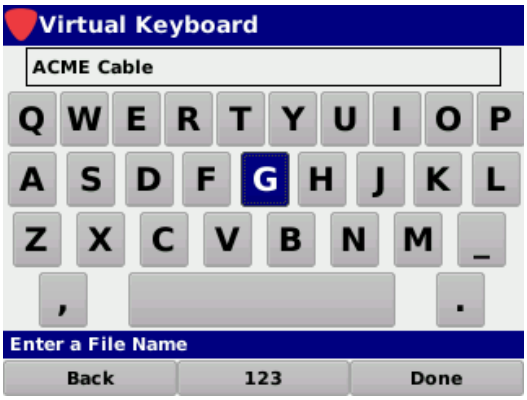
The instrument makes use of a **Virtual Keyboard** similar to that of a smart device for entering both numbers and letters.

The following **Virtual Keyboards** can be accessed by toggling the **abc/ABC/123/123+** combined softkey:

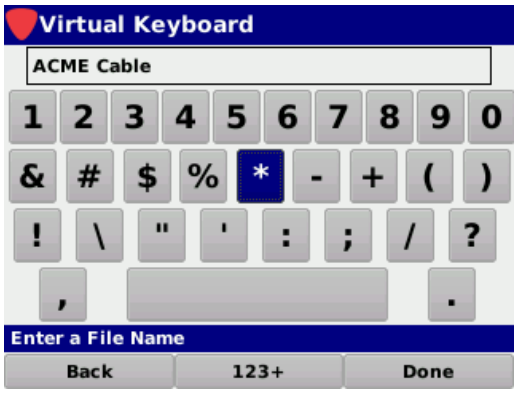
- Select the **abc** softkey to display a keyboard with lower case letters
- Select the **ABC** softkey to display a keyboard with upper case letters
- Select the **123** softkey to display a keyboard with numbers and symbols
- Select the **123+** softkey to display a keyboard with additional symbols



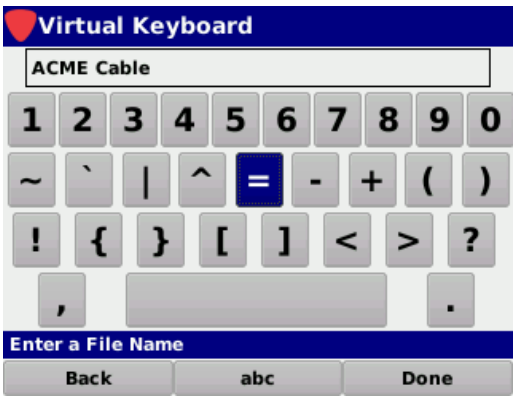
abc softkey selected



ABC softkey selected



123 softkey selected



123+ softkey selected

To delete existing text, use the **Back** softkey. Once you have finished making changes, select the **Done** softkey to save your changes and exit, or select the **Back** button on the keyboard to exit without saving your changes.

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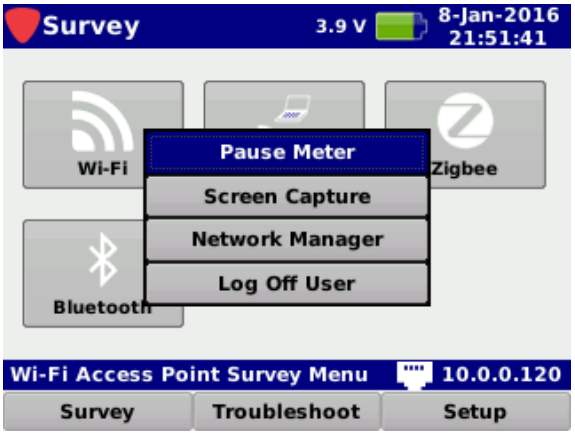
Introduction

While in any of the navigation menus or from within many of the instrument functions, Press the **Function** button to display the **Function** menu as shown in the image to the right.



This chapter will provide you with an understanding of the most common **Function** menu options as follows:

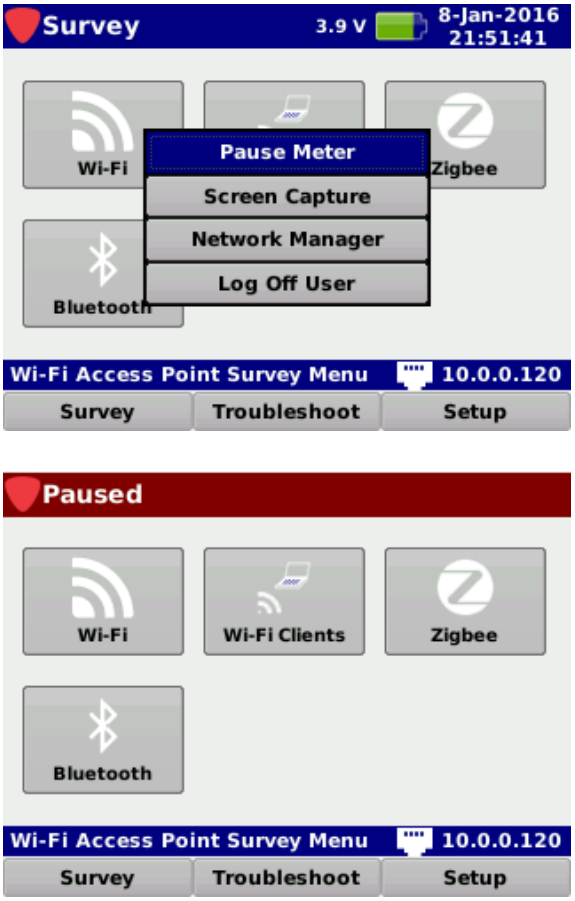
- Pause Meter
- Screen Capture
- Network Manager
- Log Off User

Pause Meter

This function is used to pause the meter during measurements. To pause meter measurements, select the **Pause Meter** button from the **Function** menu as shown in the image to the right.

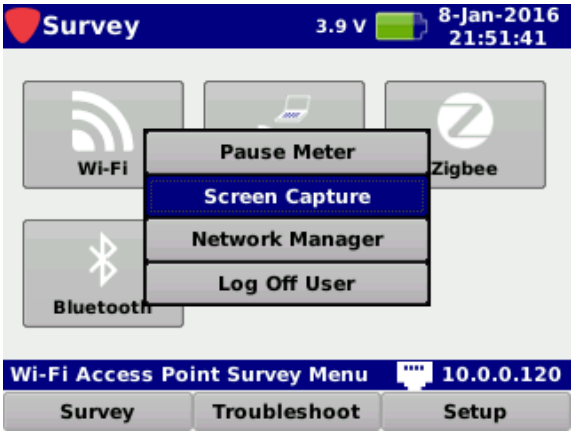
The **Title Bar** will be highlighted in red and display **Paused** until the pause meter function is disabled.

To exit the pause meter function, Press the **Back** button.



Screen Capture

This function is used to take a screen capture of the currently displayed screen. To take a screen capture, select the **Screen Capture** function from the **Function** menu as shown in the image to the right.



You will be prompted to enter a file name using the **Virtual Keyboard**. It will then be saved to the internal memory of the 802 AWE.

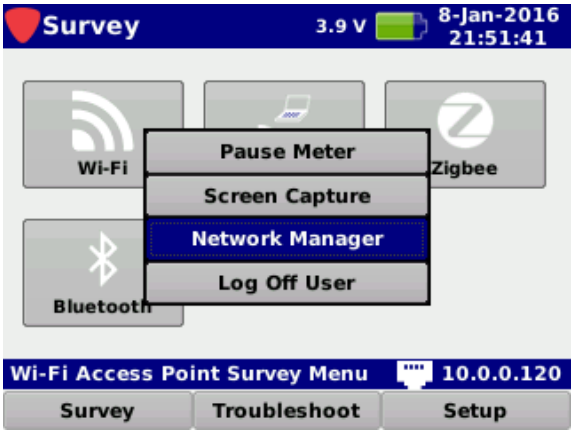
NOTE

To view the files saved to the internal memory of the 802 AWE, see Section II: Setup, Chapter 4: File Management.

Network Manager

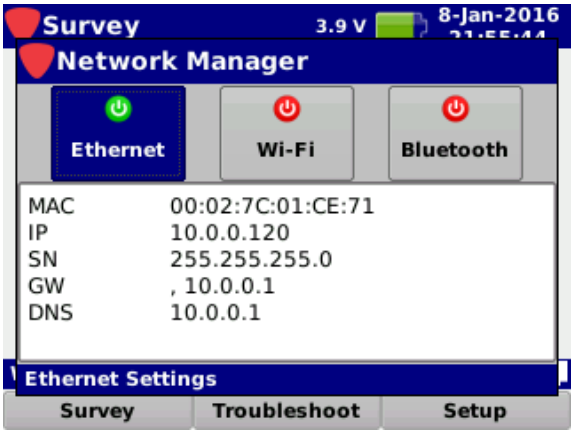
> NOTE
>
> ***Before proceeding through this section, you should first setup the default network configuration as shown in Section II: Setup, Chapter 3: Meter Configuration.***

This function is used to enable or disable network connections. To open the network manager, select the **Network Manager** button from the **Function** menu as shown in the image to the right.



The **Network Manager** window provides controls for the following type of network connection:

- **Ethernet** – This enables the built-in 10/100 Mbit/s Ethernet Port.
- **Wi-Fi** – This enables the built-in 802.11 (a/b/g/n/ac*) Wi-Fi Adapter.
- **Bluetooth** – This enables the built-in Bluetooth Wireless Adapter.



Connection Indicators

Once connected, the **Network Manager** window will automatically display the MAC, IP, Subnet, Gateway, and DNS of the active connection.

Within the **Network Manager** window, each connection button is labeled with the connection name and status as follows:

Active – This symbol indicates the connection is currently active.

Inactive – This symbol indicates the connection is currently inactive.

From any navigation menu, the active connection is shown in the right side of the Status Bar as follows:

Ethernet – This symbol indicates the Ethernet connection is currently active.

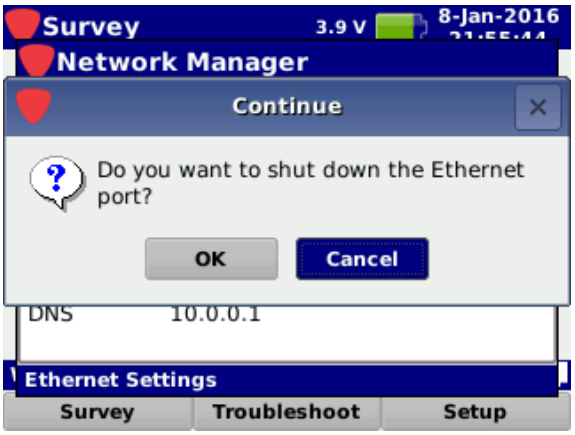
Wi-Fi – This symbol indicates the Wi-Fi connection is currently active.

Bluetooth – This symbol indicates the Bluetooth connection is currently active.

Disconnect a Network Connection

To disconnect an active network connection, select any connection button with an active status.

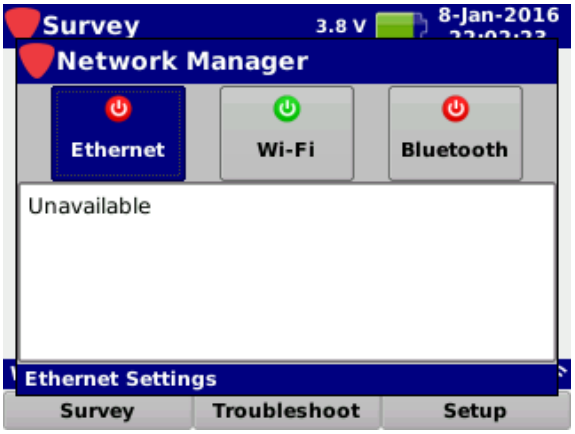
The **Continue** window will appear as shown in the image to the right. Select the **OK** button to disconnect or select the **Cancel** button to exit without disconnecting.



Ethernet Connection

Perform the following steps to connect using the Ethernet connection:

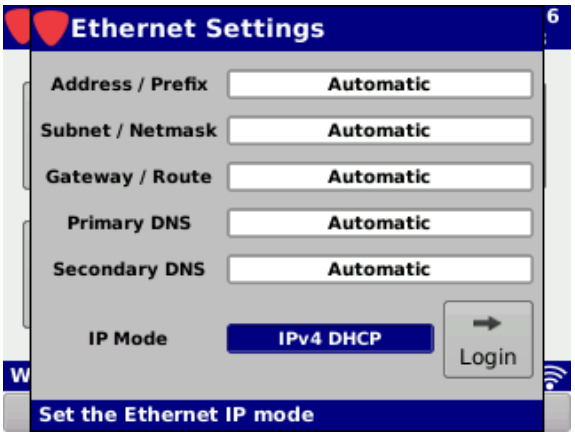
1. Connect an Ethernet cable to the Ethernet Port of the 802 AWE.
2. Select the **Ethernet** connection button from the **Network Manager** window as shown in the image to the right.



NOTE

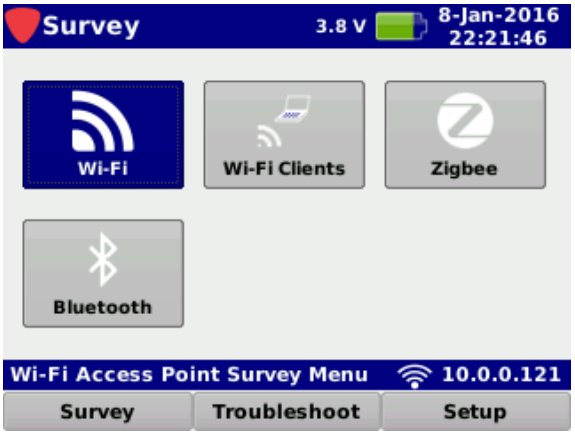
If the Prompt User option is set to No from within the Ethernet Settings option of the Setup Menu, the Ethernet Settings window will not appear. If so, proceed to Step 4.

3. If the **Prompt User** option is set to **Yes** from within the **Ethernet Settings** option of the **Setup** menu, the **Ethernet Settings** window will appear as shown in the image to the right. Adjust the Ethernet settings as desired and then select the **Login** button.

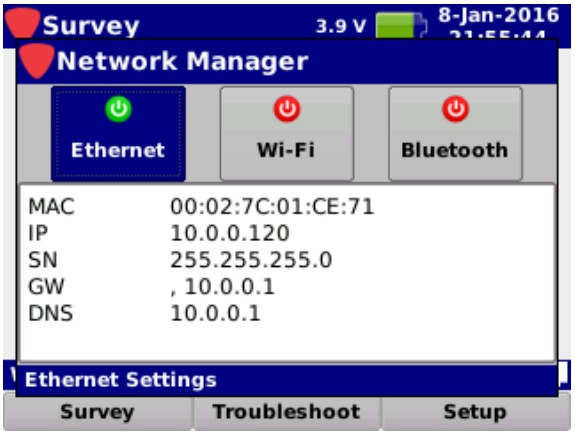


4. The **Ethernet Settings** window will display the network connection progress as shown in the image to the right.

5. Once connected, the icon of the active connection and the IP address will be displayed in the **Message Bar** as shown in the image to the right.



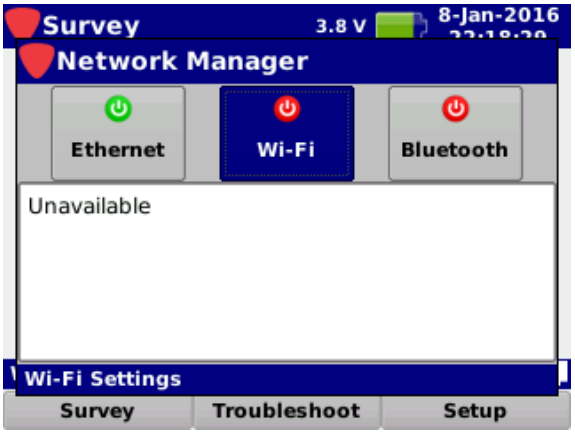
6. Return to the **Network Manager** window to view the MAC, IP, Subnet, Gateway, and DNS of the Ethernet connection as shown in the image to the right.



Wi-Fi Connection

Perform the following steps to connect using the Wi-Fi connection:

1. Select the **Wi-Fi** connection button from the **Network Manager** window as shown in the image to the right.

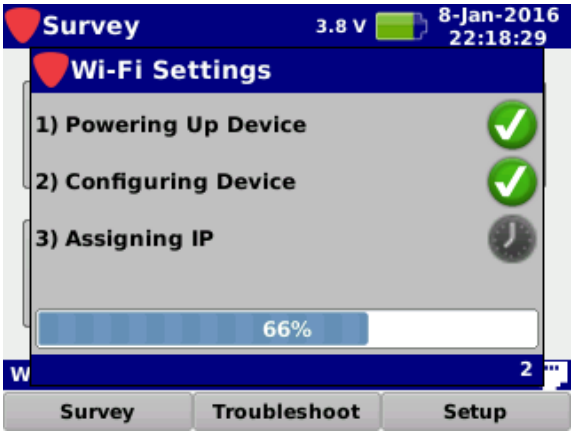


NOTE

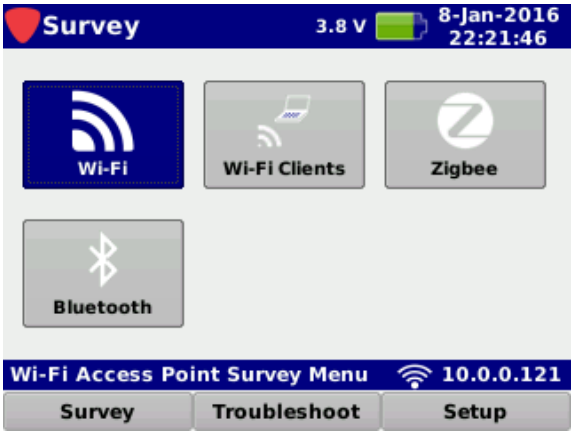
If the Prompt User option is set to No from within the Wi-Fi Settings option of the Setup Menu, the Wi-Fi Settings window will not appear. If so, proceed to Step 3.

2. If the **Prompt User** option is set to **Yes** from within the **Wi-Fi Settings** option of the **Setup** menu, the **Wi-Fi Settings** window will appear as shown in the image to the right. Adjust the Wi-Fi settings as desired and then select the **Login** button.
3. After approximately 15 seconds the Wi-Fi adapter will show a list of the available networks will appear as shown in the image to the right. Select the desired network from the list, adjust the Wi-Fi settings as needed and then select the **Login** button.

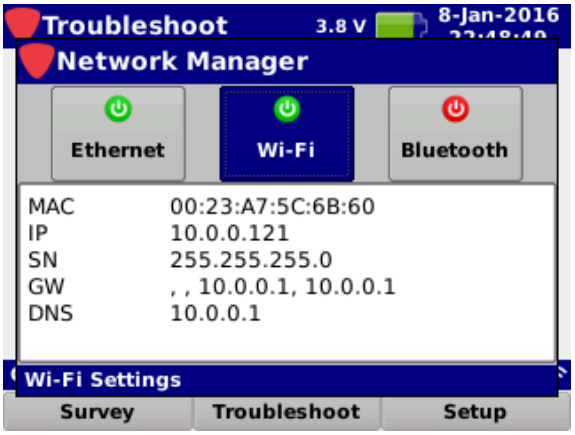
4. The **Wi-Fi Settings** window will display the network connection progress as shown in the image to the right.



5. Once connected, the icon of the active connection and the IP address will be displayed in the **Message Bar** as shown in the image to the right.

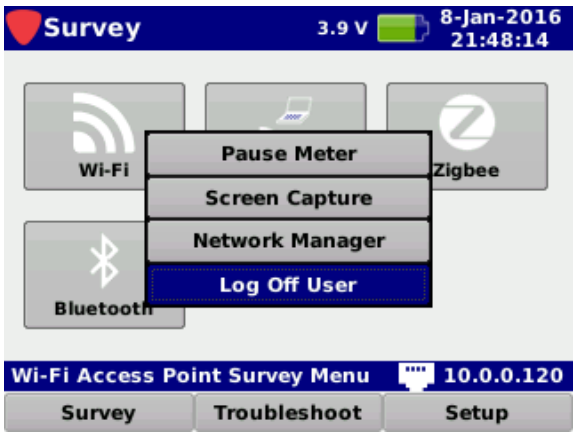


6. Return to the **Network Manager** window to view the SSID, MAC, IP, Subnet, Gateway, and DNS of the Wi-Fi connection as shown in the image to the right.

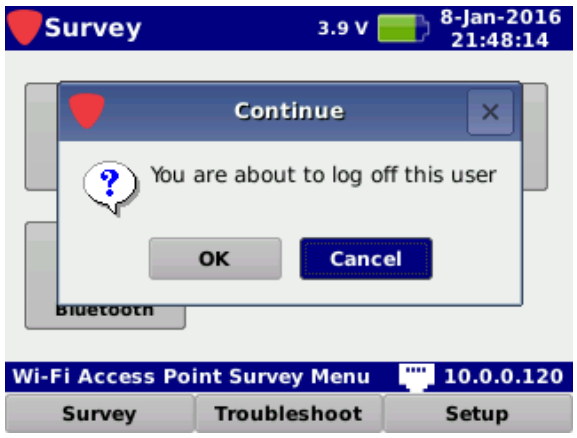


Log Off User

This function is used to log off the current user. To log off, select the **Log Off User** button from the **Function** menu as shown in the image to the right.



The **Continue** window will appear as shown in the image to the right. Select the **OK** button to log off or select the **Cancel** button to exit without logging off.



The **Welcome to** the **802 AWE** screen will be displayed, from this screen you can now log in as a different user.

NOTE

If the Multiple Users option is set to No from within the Global Settings option of the Setup Menu, the Log Off User function and welcome screen will not be displayed.

802 AWE
Advanced Wireless Expert

Section II: Setup Menu

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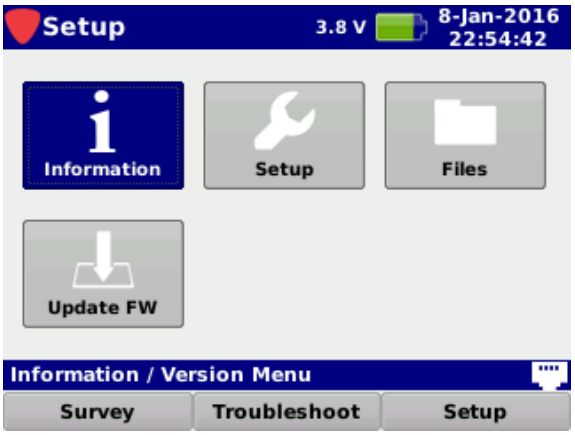
Introduction

Select the **Setup** softkey to display the **Setup** menu as shown in the image to the right. The 802 AWE enables you to select from numerous instrument setup functions. These functions allows you to view, edit, and adjust information and setup parameters for the meter.



This section will provide you with instructions on how to utilize the functions available in the Setup menu of the instrument including:

- Instrument information
- Meter configuration
- File management
- Firmware updates

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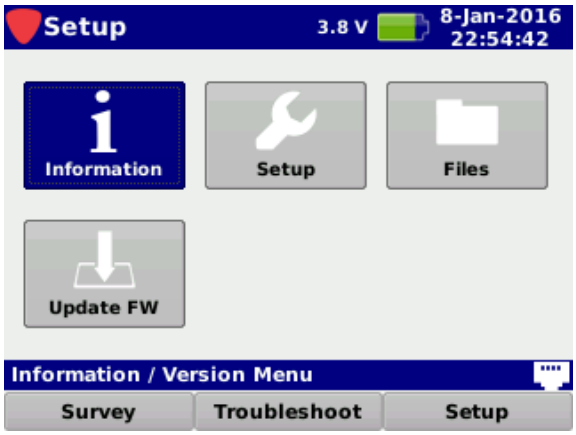
Instrument Information

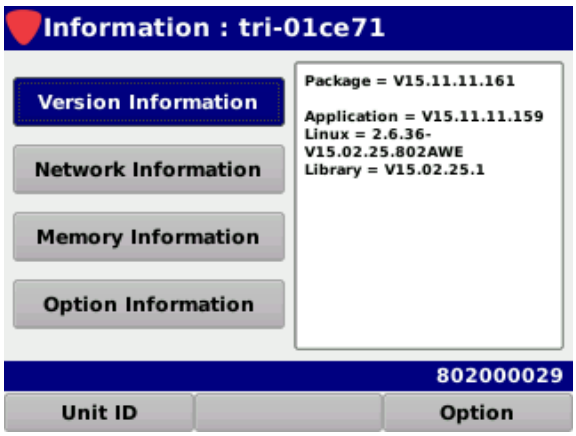
Overview

Select the **Information** icon as shown in the image to the right to view information about the 802 AWE.



The **Information** screen will be displayed as shown in the image to the right. This screen allows you to view the following types of instrument information:

- Serial Number
- Version
- Network
- Memory
- Options
- Activate Options
- View Unit ID

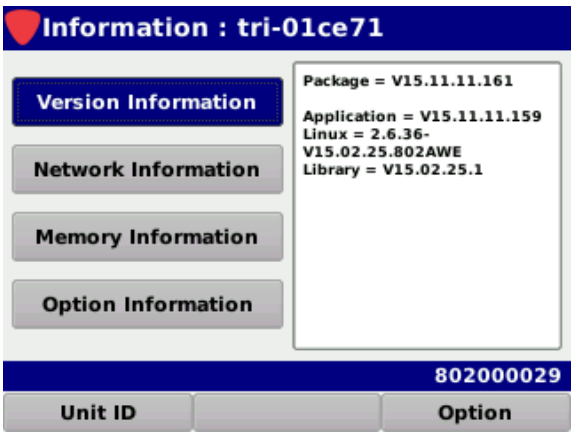


NOTE ***All information displayed in the Instrument Information Mode is static and is to be used as a reference only. To edit any settings you will need to use the Instrument Setup Mode.***

The unit serial number is located on the right side of the **Message Bar**. This information is set at the Trilithic factory and cannot be changed by the user. The serial number also appears on a label on the back side of the 802 AWE. Please provide this number when requesting an RMA for troubleshooting, service, calibration, or repair.

Version Information

Select the **Version Information** button to display details on the version of software/firmware installed in the 802 AWE. This information will be helpful if you are updating your firmware or upgrading your instrument's option package.

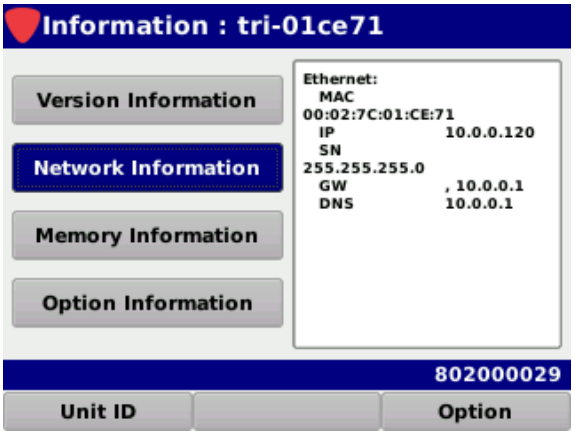


NOTE

When you perform a firmware update, this information will be automatically updated.

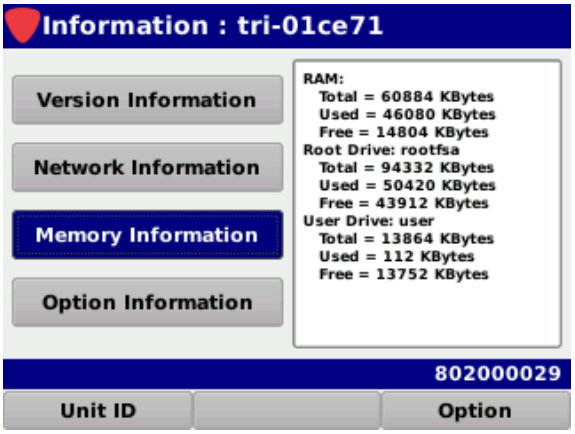
Network Information

Select the **Network Information** button to displays network details such as MAC, IP, SN, GW, and DNS. This information is helpful for quick reference of your current network status.



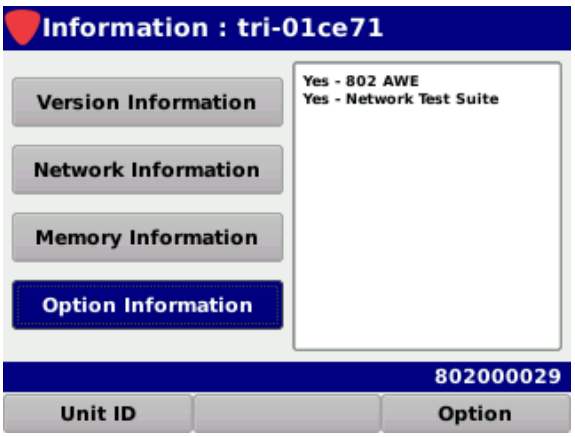
Memory Information

Select the **Memory Information** button to display details of the memory available and used on the 802 AWE. This information is automatically updated as files are saved and stored in the 802 AWE.



Option Information

Select the **Option Information** button to display which options that are available to use and those options that you can install on the 802 AWE.

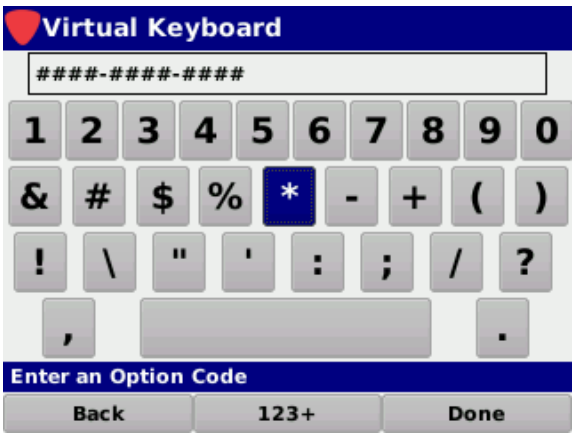


NOTE

This information is automatically updated as options are added to the 802 AWE. After initial sale, most options can be simply added with the purchase of an option activation code. For more information, call your sales representative or Trilithic at 800-344-2412.

Option Activation

Select the **Option** softkey and then enter the option activation key that you purchased from Trilithic. The dash between each four digits of the code as shown in the image to the right is not required when entering the option activation key.

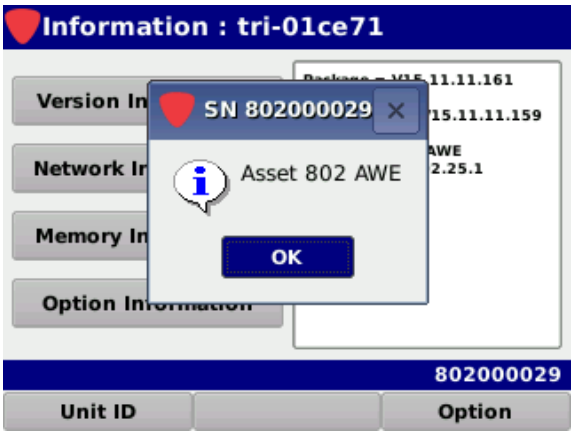


NOTE

The option code is a unique activation number that is specifically generated for your instrument. You should have received this code with your order for new options. If you are missing this code, contact Trilithic at 800-344-2412.

Unit ID

Select the **Unit ID** softkey to view the serial number associated with this meter. Select the **OK** button to exit this window.

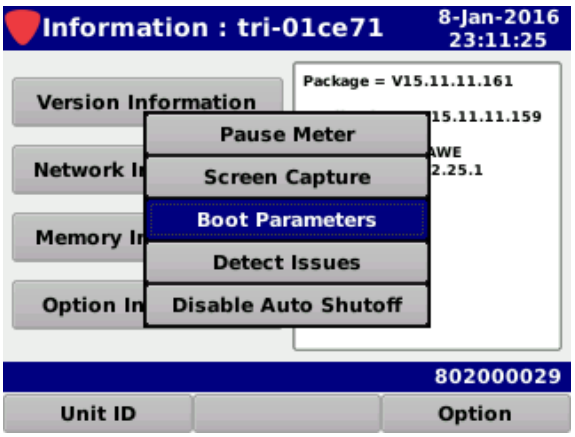


Function Menu Options

The Function menu can be accessed by pressing the **Function** button while in the Instrument Information Mode.

The following **Function** menu options can be accessed while in Instrument Information Mode:

- Pause Meter
- Toggle Flashlight
- Screen Capture
- Boot Parameters
- Detect Issues



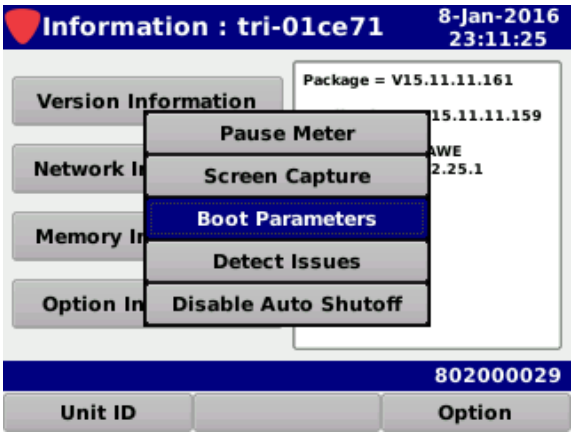
The following functions are described in Section I: The Basics, Chapter 4: Function Menu:

- Pause Meter
- Toggle Flashlight
- Screen Capture

Boot Parameters

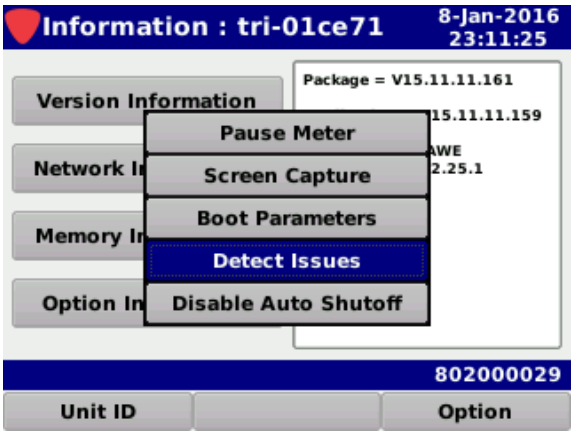
Select the **Boot Parameters** button to view the more information about the boot parameters of the 802 AWE.

The boot parameters will be displayed in the right side of the Information screen. This information is used for advanced troubleshooting by Trilithic technical support.

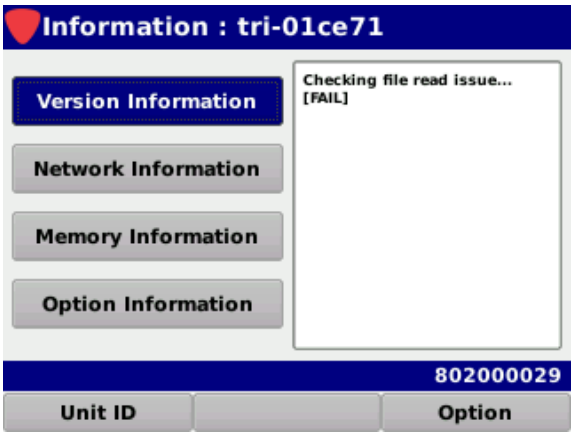


Detect Issues

Select the **Detect Issues** button to detect any file system issues of the 802 AWE.



Any detected file system issues will be displayed in the right side of the Information screen. This information is used for advanced troubleshooting by Trilithic technical support.



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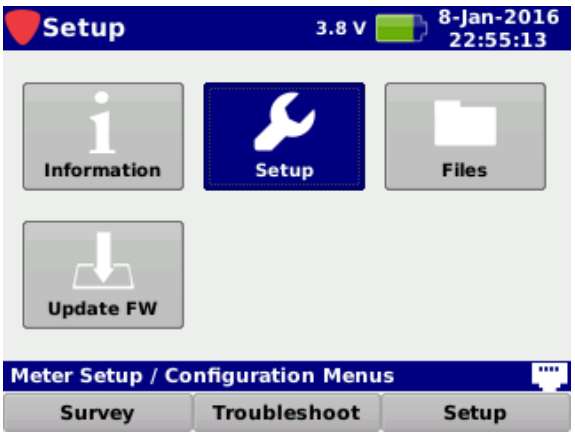
Meter Configuration

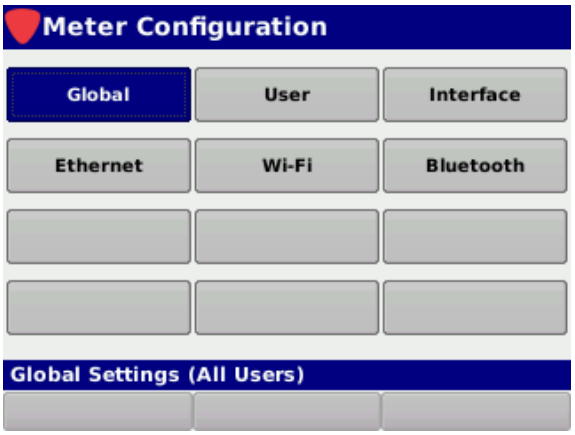
Overview

Select the **Setup** icon as shown in the image to the right to adjust the meter configuration of the 802 AWE.



The **Meter Configuration** screen will be displayed as shown in the image to the right. This screen allows you to modify the following types of settings:

- Global
- User
- Interface
- Ethernet
- Wi-Fi
- Bluetooth

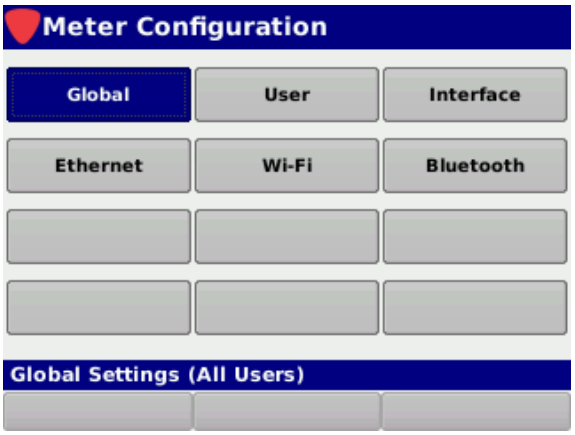


NOTE

All changes that are made in this mode are automatically saved.

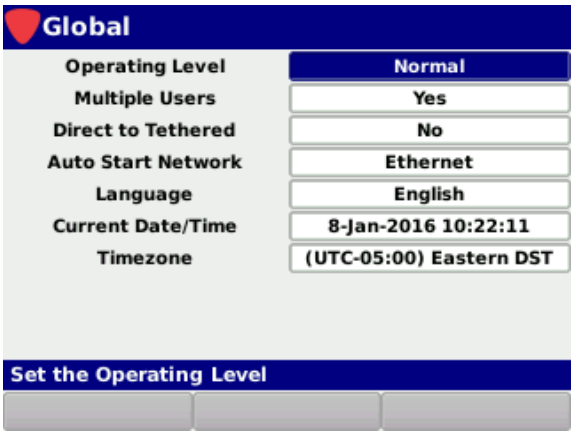
Global Settings

Select the **Global** button as shown in the image to the right to adjust the global settings for all users of the 802 AWE.



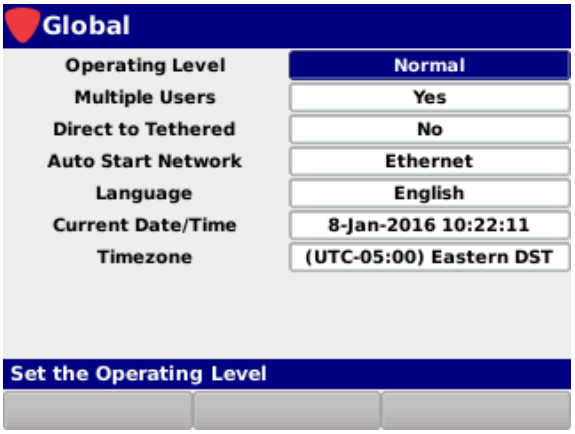
The **Global Settings** screen will be displayed as shown in the image to the right. This screen allows you to modify the global settings of the 802 AWE.

From within the **Global Settings** screen, use the left/ right arrow buttons on the keypad to navigate through the list of setup items.



Operating Level

The **Operator Level** setting is used to control whether the 802 AWE is operating in its normal mode or in an advanced logging mode. The logging mode is used for advanced troubleshooting by Trilithic technical support.



The default setting for **Operator Level** is **Normal**, use the up/down arrow buttons to select from the following preset values:

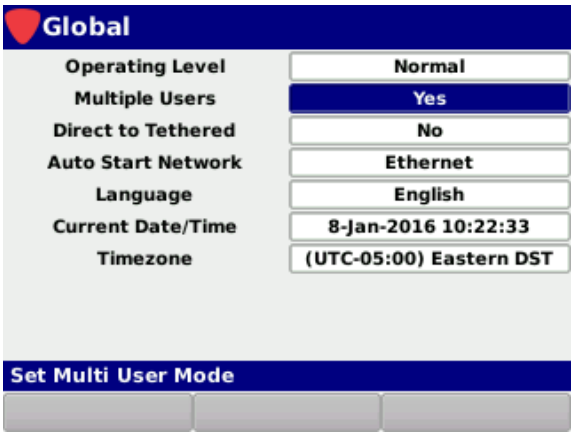
- Select **Normal** for the normal mode of operation.
- Select **Logging** for troubleshooting with Trilithic technical support.
- Select **Calibrate** to enter the calibration mode.

NOTE

When the Operating Level is set to Calibrate, you will see the  ***icon. Use the up/down arrow buttons to change the setting back to Normal to charge the battery.***

Multiple User Control

The **Multiple Users** setting is used to control whether multiple user profiles are displayed when the 802 AWE is powered on.



The default setting for **Multiple Users** is **Yes**, use the up/down arrow buttons to select from the following preset values:

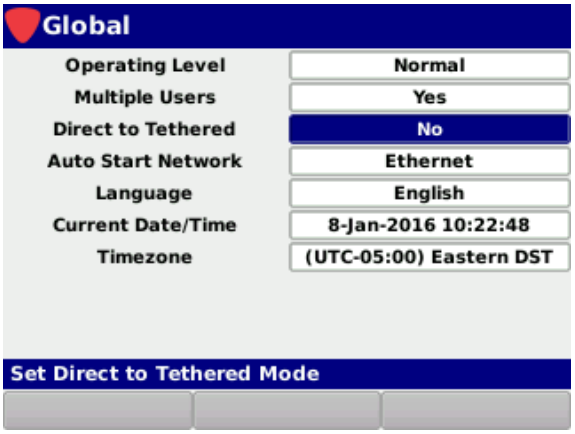
- Select **Yes** to allow multiple user profiles.
- Select **No** to use only one user profile.

Tethering Control

The **Direct to Tethered** setting is used to control whether the 802 AWE automatically enters its tethered mode upon startup/login.

The default setting for **Direct to Tethered** is **No**, use the up/down arrow buttons to select from the following preset values:

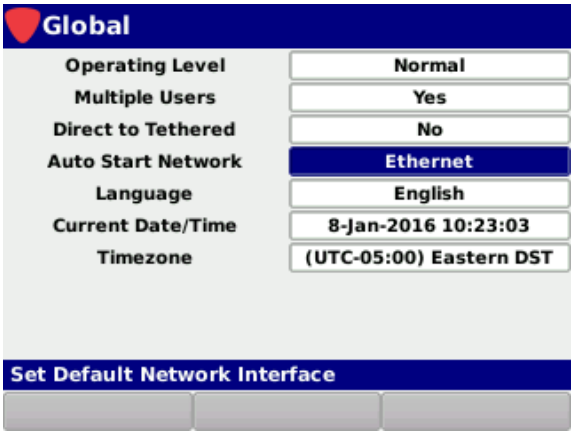
- Select **Yes** to allow automatic tethering upon startup/login.
- Select **No** to disable automatic tethering upon startup/login.



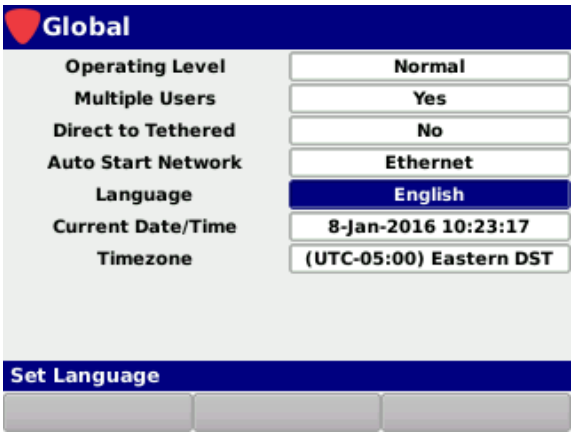
Auto-Start Network

The **Auto-Start Network** setting is used to control what network the 802 AWE automatically connects to when entering the tethered mode upon startup/login.

It is set to **Ethernet** and is fixed.



Language



The 802 AWE can be equipped to work in various languages.

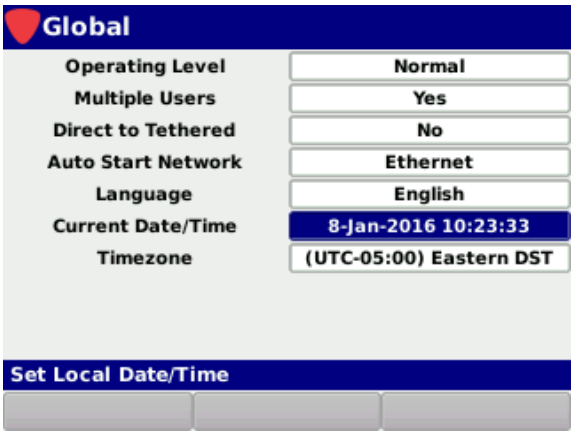
The default language is **English**, use the up/ down arrow buttons to select from the following languages.

- **English**
- **Spanish**
- **Portuguese**
- **Chinese**
- **Chinese (Simplified)**
- **Japanese**

If you have other language options available on your instrument, you can change the default language. You must restart the device before language changes take affect.

Current Date/Time

The **Current Date/Time** setting is used to set the current date and time for the 802 AWE. This information is displayed in the Title Bar of any navigation screen and is added to every data log, measurement, job, and Survey.



Press the **Enter** button and the **Virtual Keyboard** will be displayed as shown in the image to the right.

Use the **Virtual Keyboard** to enter the current date in the mm/dd/yyyy format.

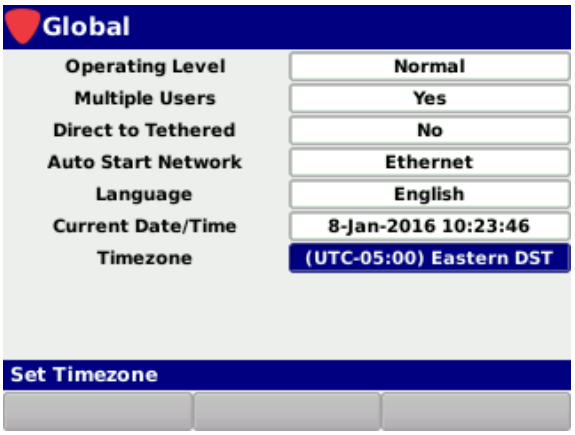
Select the **Done** softkey and the **Virtual Keyboard** will be displayed as shown in the image to the right.

Use the **Virtual Keyboard** to enter the current time in the hh:mm:ss format.

Select the **Done** softkey again to save the current date and time or Press the **Back** button at any time to exit without saving the changes.

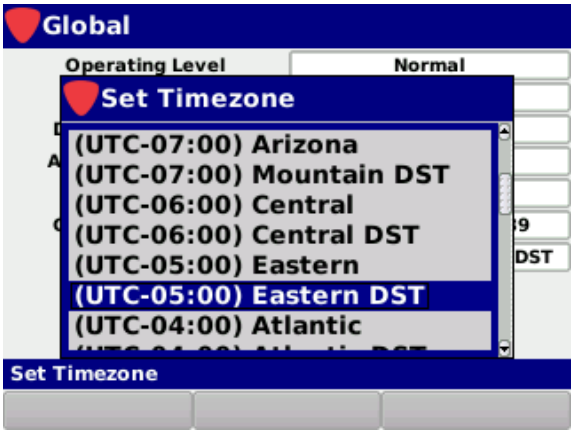
Timezone

The **Timezone** setting allows you to set the time zone of the 802 AWE. This is useful when using the instrument in areas that automatically adjust their local time based on Daylight Savings Time (DST).



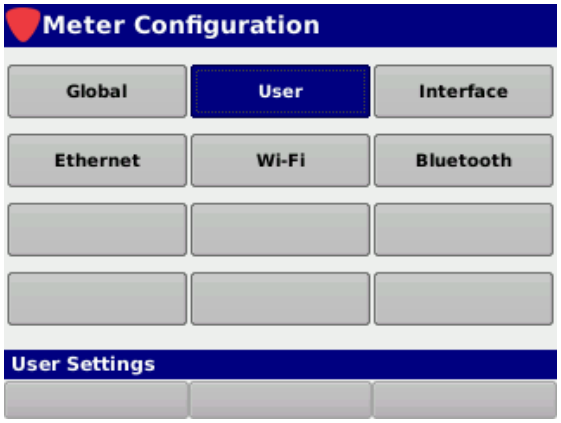
Press the **Enter** button and the **Set Timezone** window will be displayed as shown in the image to the right.

Use the up/down arrow buttons to choose the desired timezone and then press the **Enter** button to select the timezone.



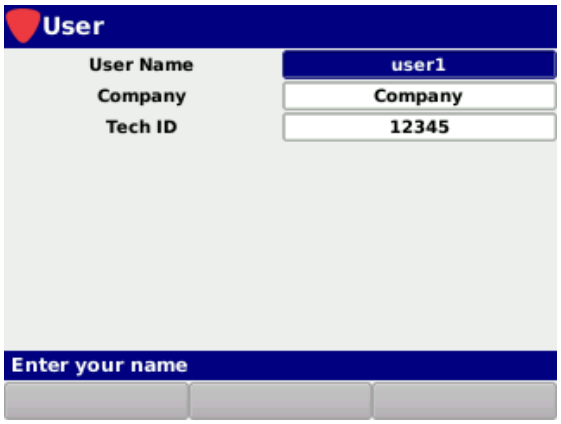
User Settings

Select the **User** button as shown in the image to the right to adjust the user information that is associated with the currently logged in user of the 802 AWE.

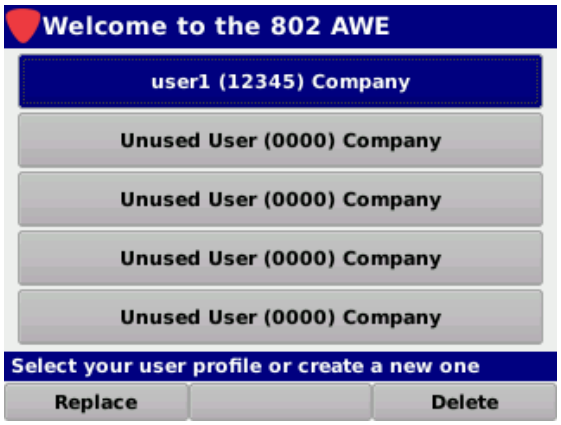


The **User** screen will be displayed as shown in the image to the right. This screen allows you to modify the user settings of the currently logged in user of the 802 AWE.

From within the **User** screen, use the left/right arrow buttons on the keypad to navigate through the list of setup items.

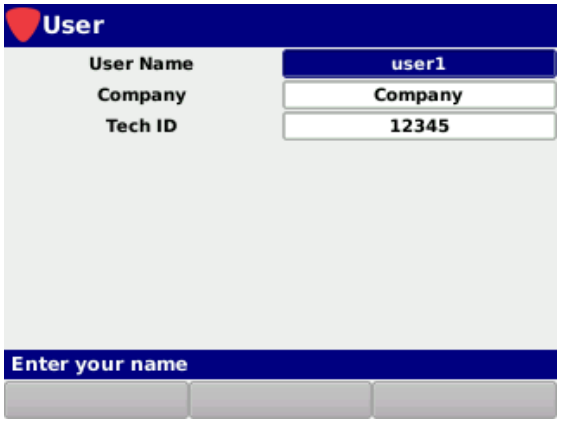


This information is added to every data log and is displayed on the welcome screen of the 802 AWE as shown in the image to the right.



User Name

The **User Name** setting is used to set the user name for the user profile that is currently logged into the 802 AWE. This information is displayed on the welcome screen and is added to every data log, measurement, job, and survey.

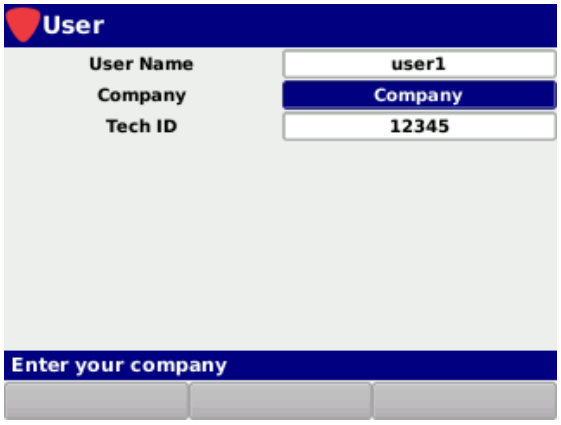


Press the **Enter** button and the **Virtual Keyboard** will be displayed as shown in the image to the right.

Use the **Virtual Keyboard** to enter the user name.

Company

The **Company** setting is used to set the company name for the user profile that is currently logged into the 802 AWE. This information is displayed on the welcome screen and is added to every data log, measurement, job, and survey.

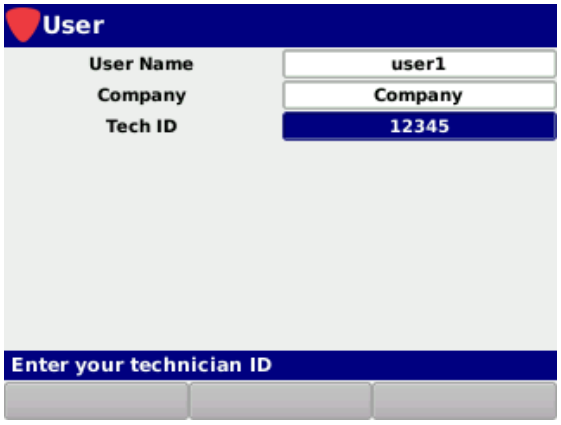


Press the **Enter** button and the **Virtual Keyboard** will be displayed as shown in the image to the right.

Use the **Virtual Keyboard** to enter the company name.

Tech ID

The **Tech ID** setting is used to set the technician ID for the user profile that is currently logged into the 802 AWE. This information is displayed on the welcome screen and is added to every data log, measurement, job, and survey.

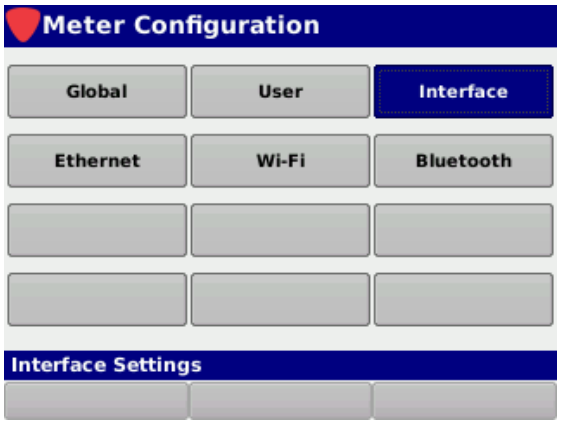


Press the **Enter** button and the **Virtual Keyboard** will be displayed as shown in the image to the right.

Use the **Virtual Keyboard** to enter the technician ID.

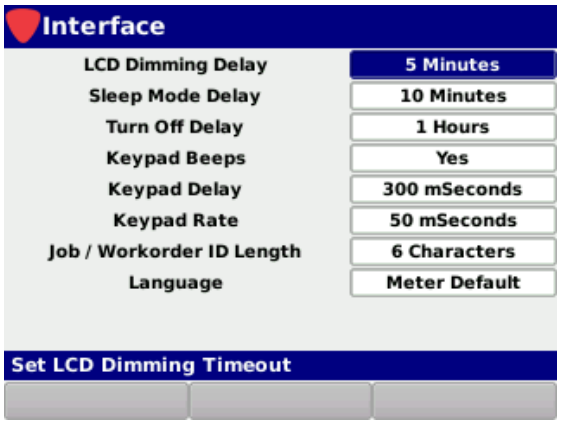
Interface Settings

Select the **Interface** button as shown in the image to the right to adjust the interface settings for the currently logged in user of the 802 AWE.



The **Interface** screen will be displayed as shown in the image to the right. This screen allows you to modify the user interface settings.

From within the **Interface** screen, use the left/right arrow buttons on the keypad to navigate through the list of setup items.



LCD Dimming Delay

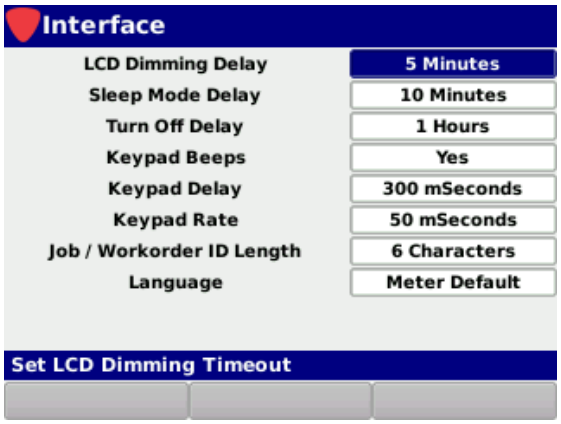
The **LCD Dimming Delay** setting is used to conserve power by automatically dimming the display screen backlight after the 802 AWE has been idle for a specified period of time.

The default setting for the LCD dimming delay is **1 Minute**. The LCD dimming delay can be set from a minimum of one (1) minute up to a maximum of five (5) minutes.

Use either of the following methods to change the LCD dimming delay:

- Use the up/down arrow buttons to change the value in one (1) minute increments.
- Press the **Enter** button and use the **Virtual Keyboard** to directly enter the LCD dimming delay as shown in the image to the right.

Upon any button press, the LCD will automatically brighten and the delay timer will restart.



NOTE

Whenever the 802 AWE is being powered by the AC to DC power adapter & battery charger, the LCD dimming delay will be deactivated automatically.

Sleep Mode Delay

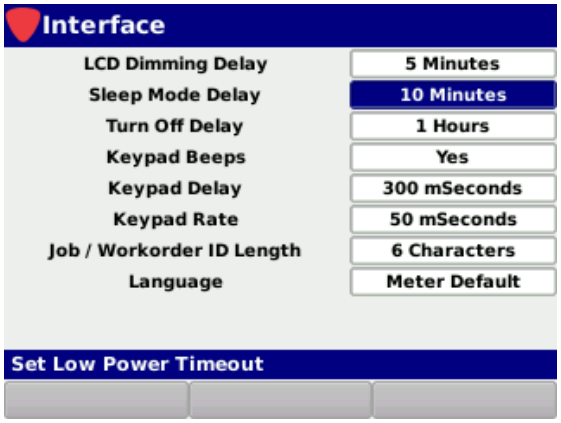
The **Sleep Mode Delay** setting is used to conserve power by automatically enabling the sleep mode after the 802 AWE has been idle for a specified period of time.

The default setting for the sleep mode delay is **5 Minutes**. The sleep mode delay can be set from a minimum of one (1) minute up to a maximum of 60 minutes.

Use either of the following methods to change the sleep mode delay:

- Use the up/down arrow buttons to change the value in one (1) minute increments.
- Press the **Enter** button and use the **Virtual Keyboard** to directly enter the sleep mode delay as shown in the image to the right.

Quickly Press the **Power** button to awaken the 802 AWE from sleep mode. The sleep mode delay timer will automatically restart.



NOTE

Whenever the 802 AWE is being powered by the AC to DC power adapter & battery charger, the sleep mode delay will be deactivated automatically.

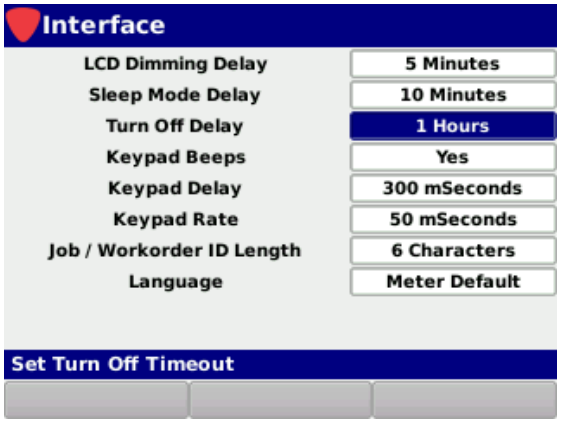
Turn Off Delay

The **Turn Off Delay** setting is used to conserve power by automatically turning off the device after the 802 AWE has been idle for a specified period of time.

The default setting for the turn off delay is **1 Hour**. The turn off delay can be set from a minimum of one (1) hour up to a maximum of 24 hours.

Use either of the following methods to change the turn off delay:

- Use the up/down arrow buttons to change the value in one (1) hour increments.
- Press the **Enter** button and use the **Virtual Keyboard** to directly enter the turn off delay as shown in the image to the right.

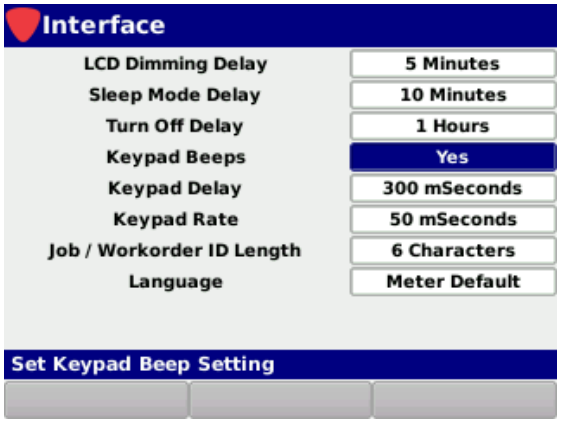


Keypad Beeps

The **Keypad Beeps** setting is used to enable or disable keypad beeps for the internal speaker.

The default setting for **Keypad Beeps** is **Yes**, use the up/down arrow buttons to select from the following preset values:

- Select **Yes** to hear the keypad beeps.
- Select **No** to mute the keypad beeps.



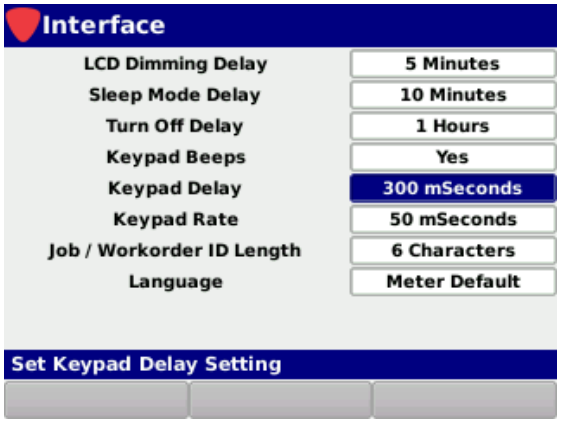
Keypad Delay

The **Keypad Delay** setting is used to adjust the keypad delay.

The default setting for the keypad delay is **300 mSeconds**. The keypad delay can be set from a minimum of 100 mSeconds up to a maximum of 1000 mSeconds.

Use either of the following methods to change the keypad delay:

- Use the up/down arrow buttons to change the value in 50 mSecond increments.
- Press the **Enter** button and use the **Virtual Keyboard** to directly enter the keypad delay as shown in the image to the right.



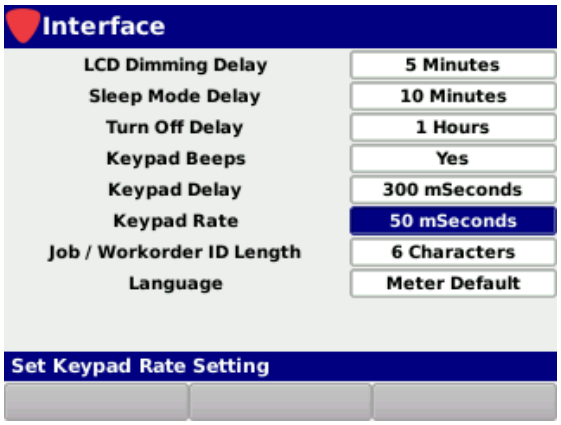
Keypad Rate

The **Keypad Rate** setting is used to adjust the keypad rate.

The default setting for the keypad rate is **50 mSeconds**. The keypad rate can be set from a minimum of 50 mSeconds up to a maximum of 1000 mSeconds.

Use either of the following methods to change the keypad rate:

- Use the up/down arrow buttons to change the value in 50 mSecond increments.
- Press the **Enter** button and use the **Virtual Keyboard** to directly enter the keypad rate as shown in the image to the right.



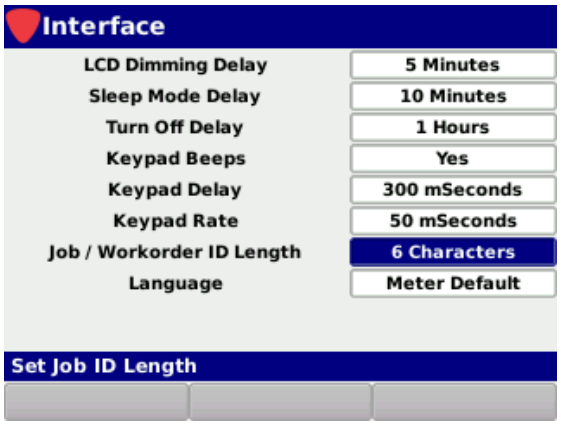
Job & Workorder ID Length

The **Job/Workorder ID Length** setting is used to set the maximum number of characters to display for jobs and workorders on the 802 AWE.

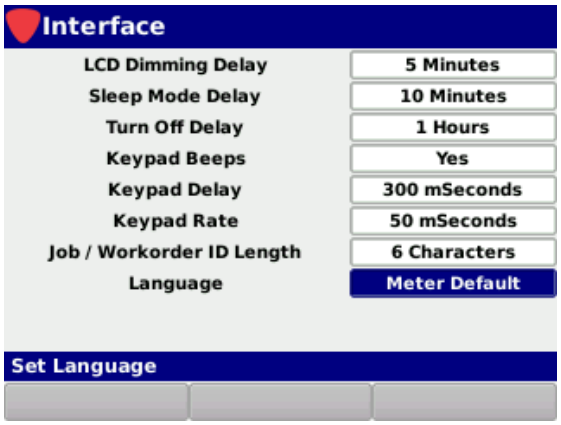
The default setting for the job and workorder ID length is **6 Characters**. The character length can be set from a minimum of 6 characters up to a maximum of 32 characters.

Use either of the following methods to change the maximum number of characters:

- Use the up/down arrow buttons to change the value in one (1) character increments.
- Press the **Enter** button and use the **Virtual Keyboard** to directly enter the number of characters as shown in the image to the right.



Language



The 802 AWE can be equipped to work in various languages.

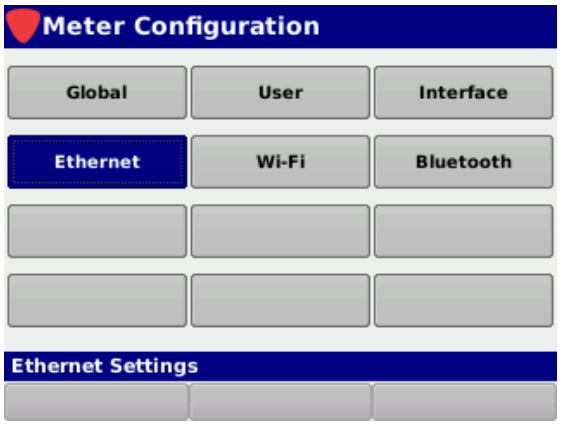
The default language is defined by the **Global** menu and shows here as **Meter Default**, but can be adjusted per user. Use the up/down arrow buttons to select from the following languages.

- **Meter Default**
- **English**
- **Spanish**
- **Portuguese**
- **Chinese**
- **Chinese (Simplified)**
- **Japanese**

If you have other language options available on your instrument, you can change the default language. You must restart the device before language changes take affect.

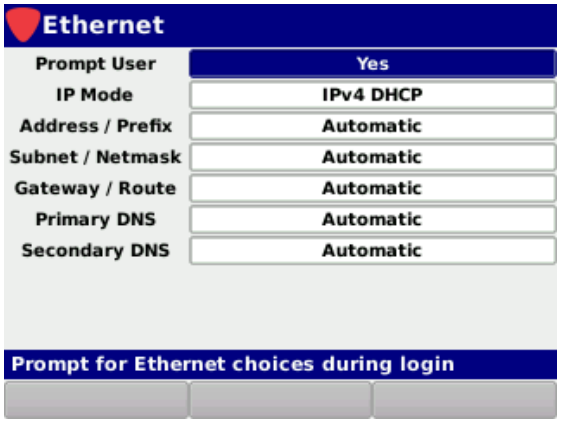
Ethernet Settings

Select the **Ethernet** button as shown in the image to the right to view/edit the Ethernet settings for the 802 AWE.



The **Ethernet** screen will be displayed as shown in the image to the right. This screen allows you to modify the Ethernet connection settings.

From within the **Ethernet** screen, use the left/right arrow buttons on the keypad to navigate through the list of setup items.

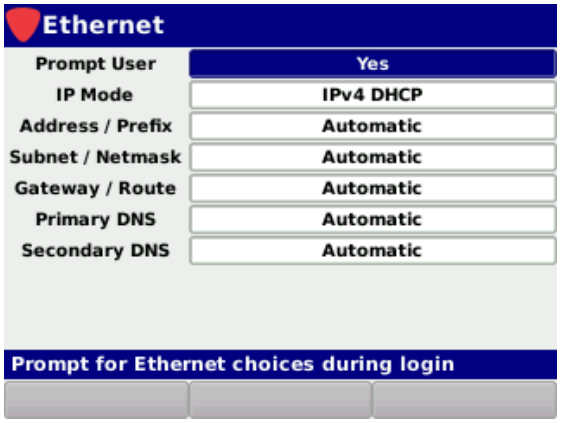


Prompt User

The **Prompt User** setting is used to prompt a user with the **Network Settings** window before connecting to a network.

The default setting for **Prompt User** is **Yes**, use the left/right arrow buttons to select from the following preset values:

- Select **Yes** to prompt the user with the **Network Settings** window before connecting to a network.
- Select **No** to automatically connect using the default network settings.

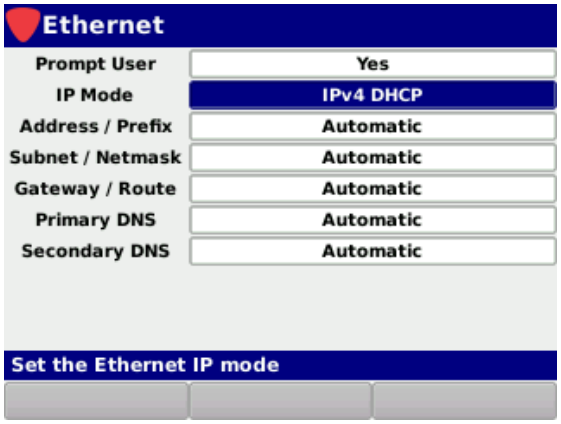


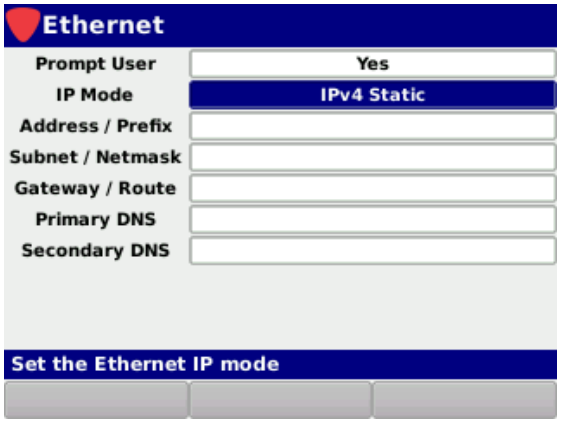
IP Mode

The **IP Mode** setting is used to set which type of network connection to establish when logging into a network.

The default setting for **IP mode** is **IPv4 DHCP**, use the left/right arrow buttons to select from the following preset values:

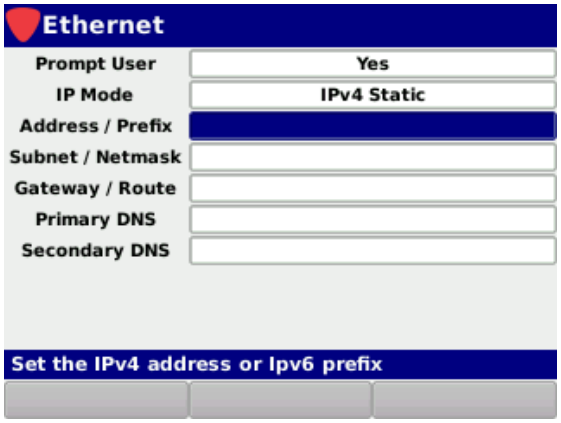
- Select **IPv4 DHCP** to automatically obtain an IP address from a DHCP server. In this mode, the network settings cannot be adjusted and are populated with the text **Automatic**.
- Select **IPv4 Static** to manually enter the network settings. In this mode, all of the network settings must be manually adjusted as shown in the following sections.



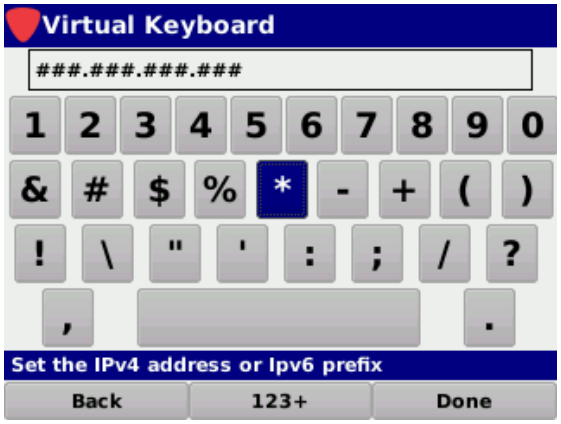


Address / Prefix

When **IP Mode** is set to **IPv4 Static**, the **Address / Prefix** setting is used to set the IP address of the network connection.

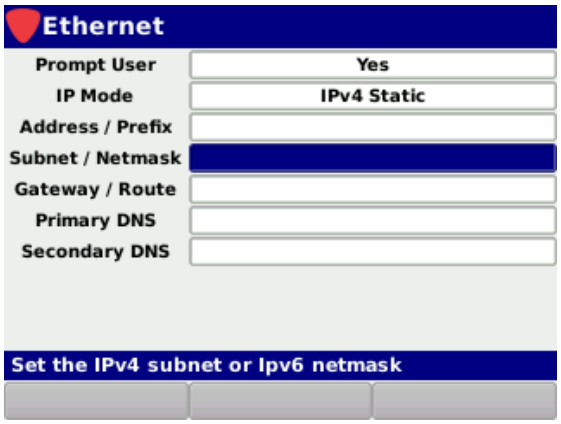


Press the **Enter** button and the **Virtual Keyboard** will be displayed as shown in the image to the right. Use the **Virtual Keyboard** to enter the IP Address in the ###.###.###.### format.

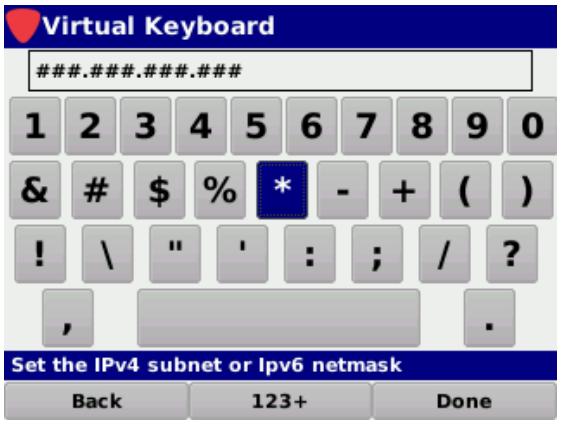


Subnet / Netmask

When **IP Mode** is set to **IPv4 Static**, the **Subnet / Netmask** setting is used to set the subnet address of the network connection.

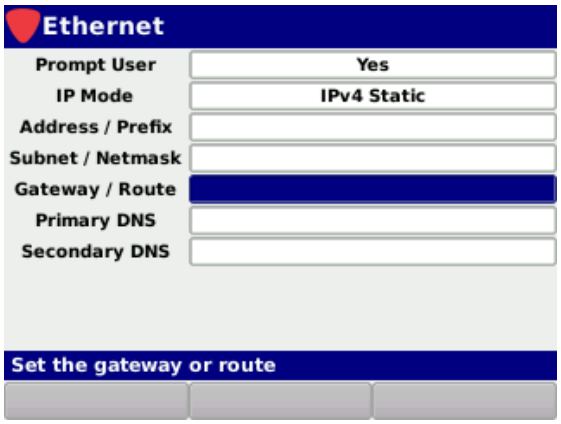


Press the **Enter** button and the **Virtual Keyboard** will be displayed as shown in the image to the right. Use the **Virtual Keyboard** to enter the subnet address in the ###.###.###.### format.

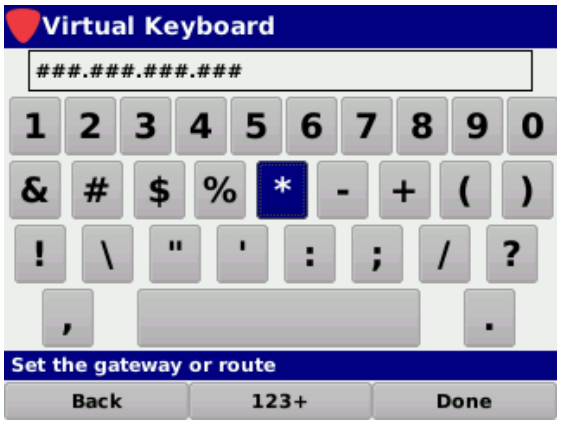


Gateway / Route

When **IP Mode** is set to **IPv4 Static**, the **Gateway / Route** setting is used to set the subnet address of the network connection.

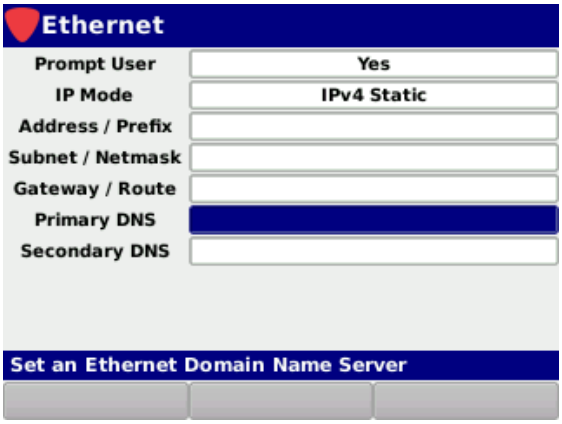


Press the **Enter** button and the **Virtual Keyboard** will be displayed as shown in the image to the right. Use the **Virtual Keyboard** to enter the gateway address in the ###.###.###.### format.

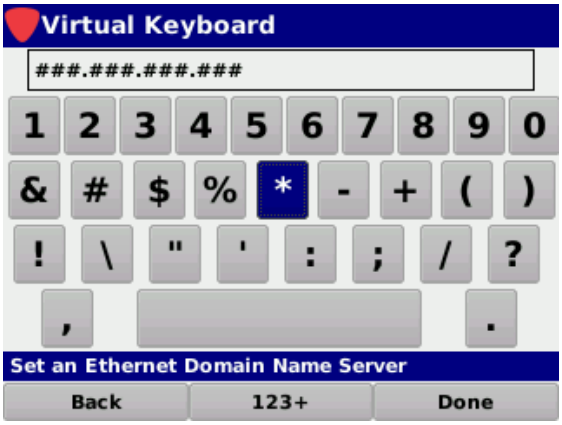


Primary DNS

When **IP Mode** is set to **IPv4 Static**, the **Primary DNS** setting is used to set the primary domain name server address of the network connection.

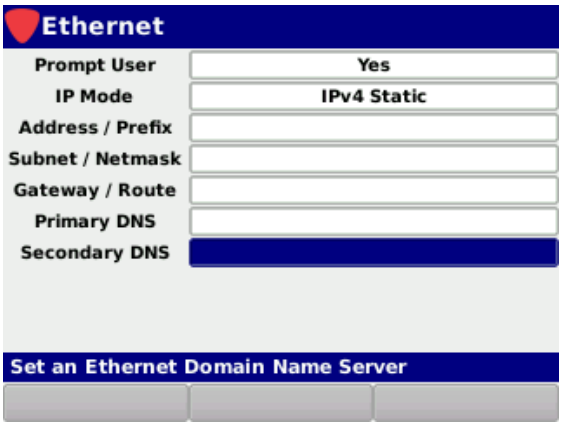


Press the **Enter** button and the **Virtual Keyboard** will be displayed as shown in the image to the right. Use the **Virtual Keyboard** to enter the primary DNS address in the ###.###.###.### format.

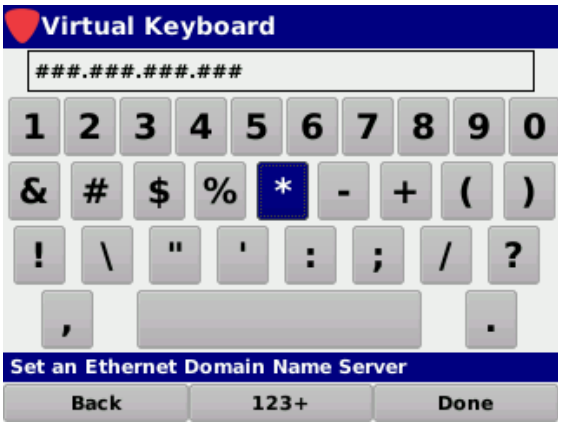


Secondary DNS

When **IP Mode** is set to **IPv4 Static**, the **Secondary DNS** setting is used to set the secondary domain name server address of the network connection.

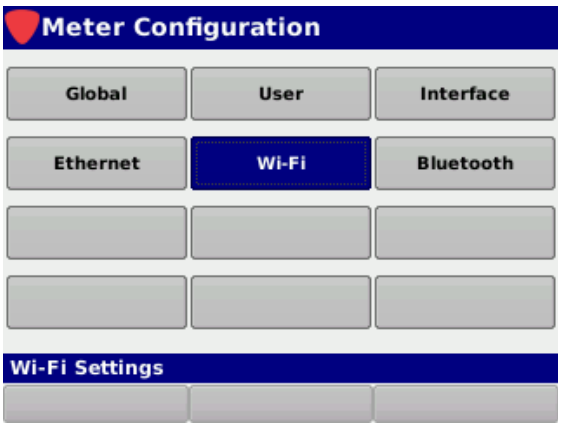


Press the **Enter** button and the **Virtual Keyboard** will be displayed as shown in the image to the right. Use the **Virtual Keyboard** to enter the secondary DNS address in the ###.###.###.### format.



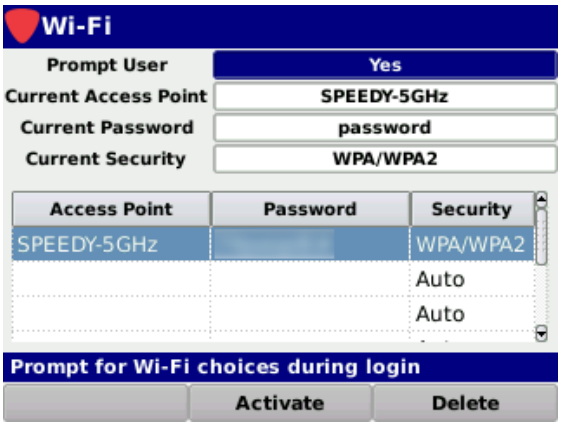
Wi-Fi Settings

Select the **Wi-Fi** button as shown in the image to the right to view/edit the Wi-Fi settings for the 802 AWE.



The **Wi-Fi** screen will be displayed as shown in the image to the right. This screen allows you to modify the Wi-Fi connection settings.

From within the **Wi-Fi** screen, use the left/right arrow buttons on the keypad to navigate through the list of setup items.

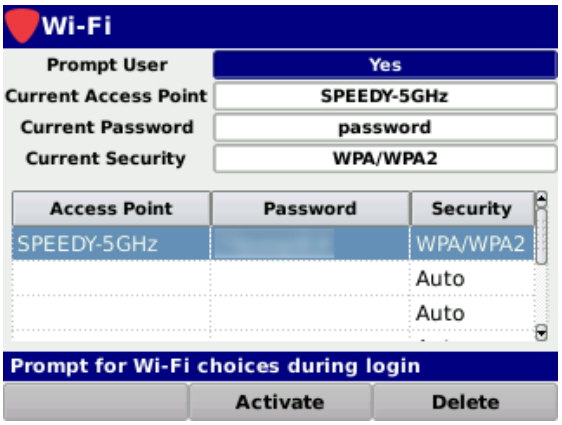


Prompt User

The **Prompt User** setting is used to prompt a user with the **Network Settings** window before logging into a network.

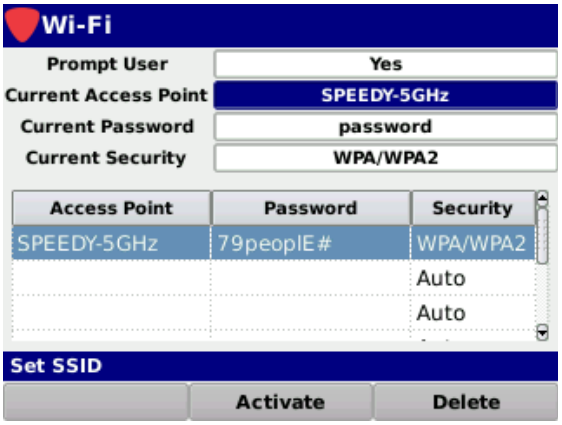
The default setting for **Prompt User** is **Yes**, use the left/right arrow buttons to select from the following preset values:

- Select **Yes** to prompt the user with the **Network Settings** window before connecting to a network.
- Select **No** to automatically connect using the default network settings.



Current Access Point

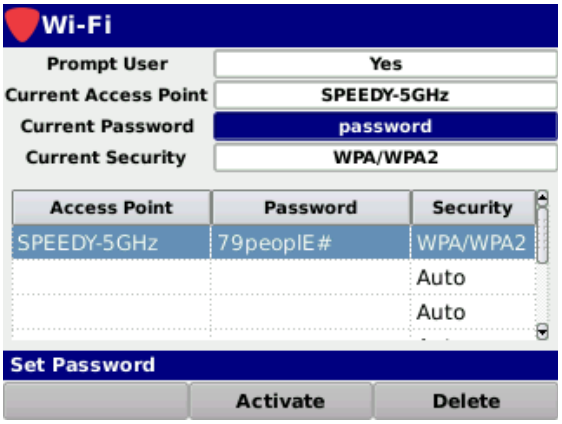
The **Current Access Point** setting is used to set the SSID of the default Wi-Fi network.



Press the **Enter** button and the **Virtual Keyboard** will be displayed as shown in the image to the right. Use the **Virtual Keyboard** to enter the name of the access point.

Current Password

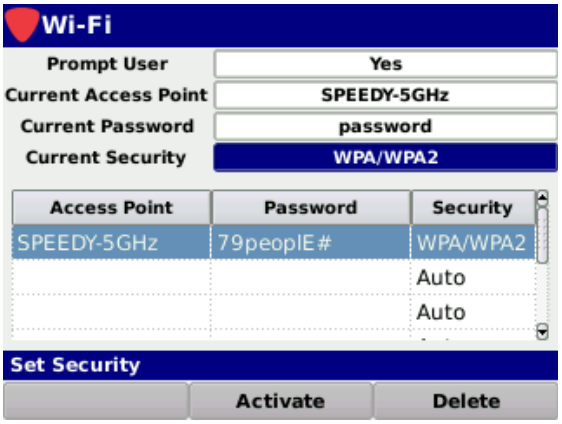
The **Current Password** setting is used to set the password of the default Wi-Fi network.



Press the **Enter** button and the **Virtual Keyboard** will be displayed as shown in the image to the right. Use the **Virtual Keyboard** to enter the password of the Wi-Fi network.

Current Security

The **Current Security** setting is used to set the security of the selected Wi-Fi network.



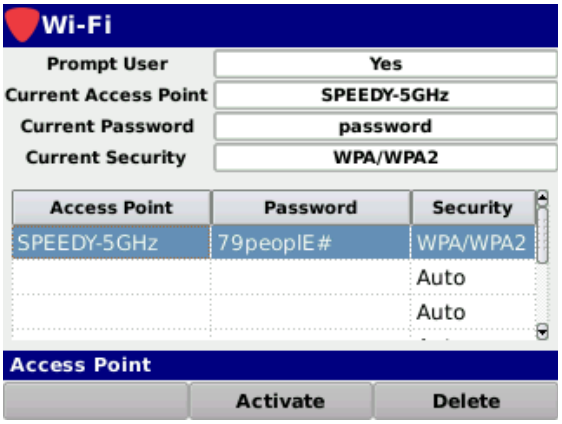
The default setting for **Current Security** is **Auto**, use the left/right arrow buttons to select from the following preset values:

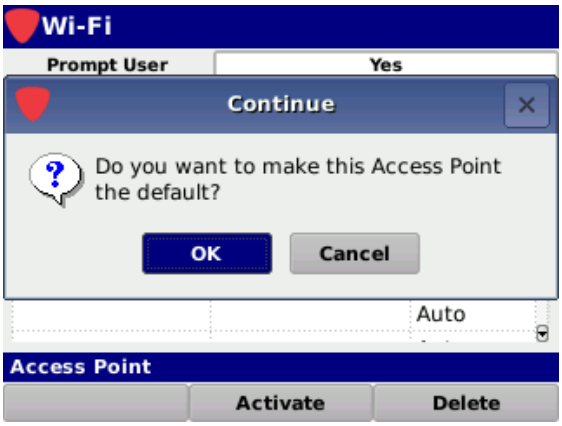
- **Auto** – This will automatically set the security protocol of the Wi-Fi access point.
- **WEP 40/64** – This is the Wired Equivalency Privacy (WEP) security protocol with a 40 or 64 bit hexadecimal security key.
- **WEP 104/128** – This is the Wired Equivalency Privacy (WEP) security protocol with a 104 or 128 bit hexadecimal security key.
- **WPA/WPA2** – This is either the Wi-Fi Protected Access (WPA-PSK, TKIP) with a 256 bit key (64 hexadecimal digits) or Wi-Fi Protected Access II (WPA2-PSK) security protocol with a passphrase of 8 to 63 ACSII characters.

Select Default Access Point

Highlight the desired access point from the access points table and then select the **Activate** softkey.

The **Continue** window will be displayed as shown in the image to the right. Select the **OK** button to continue or select the **Cancel** button to exit without setting the default access point.

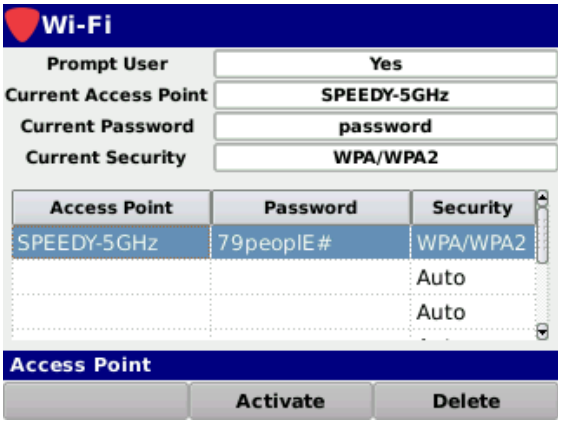




Delete a Saved Access Point

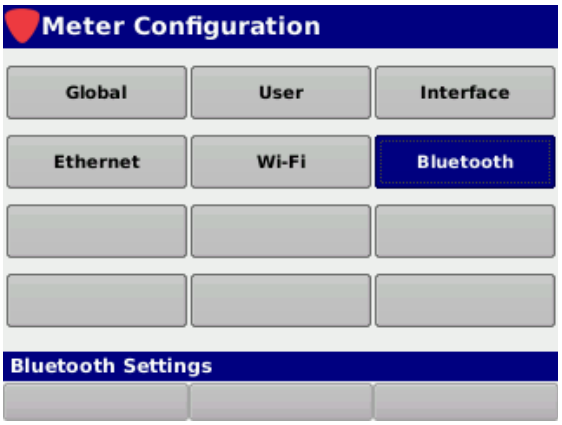
Highlight the desired access point from the access points table and then select the **Delete** softkey.

The **Continue** window will be displayed as shown in the image to the right. Select the **OK** button to continue or select the **Cancel** button to exit without deleting the saved access point.



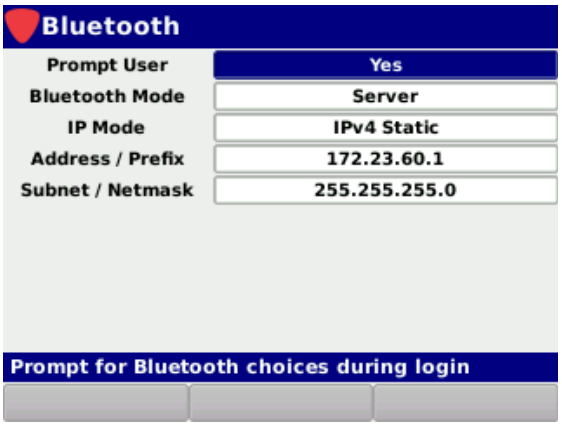
Bluetooth Settings

Select the **Bluetooth** button as shown in the image to the right to view/edit the Bluetooth settings for the 802 AWE.



The **Bluetooth** screen will be displayed as shown in the image to the right. This screen allows you to modify the Bluetooth connection settings.

From within the **Bluetooth** screen, use the left/right arrow buttons on the keypad to navigate through the list of setup items.

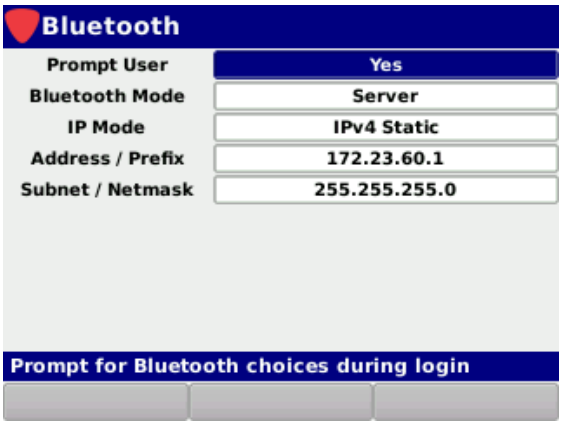


Prompt User

The **Prompt User** setting is used to prompt a user with the **Network Settings** window before logging into a network.

The default setting for **Prompt User** is **Yes**, use the left/right arrow buttons to select from the following preset values:

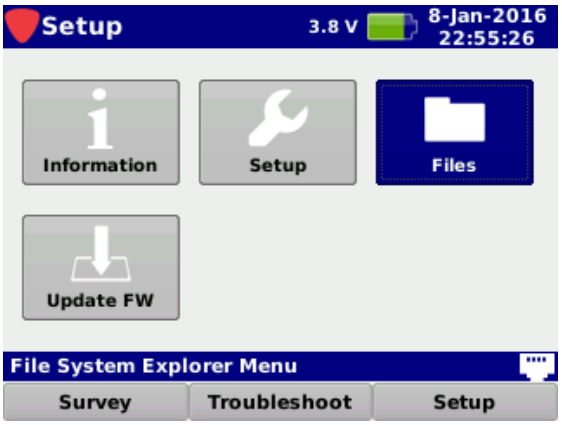
- Select **Yes** to prompt the user with the **Network Settings** window before connecting to a network.
- Select **No** to automatically connect using the default network settings.



File Management

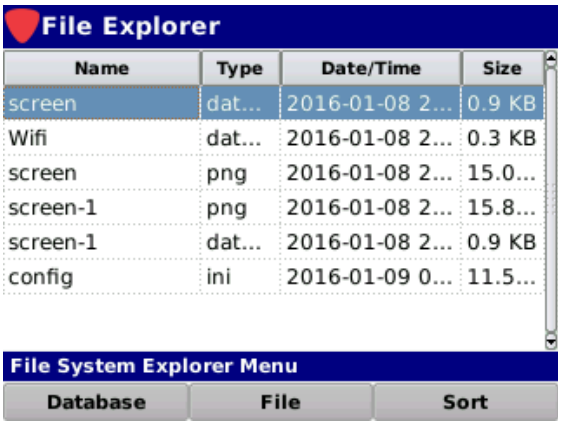
Overview

Select the **Files** icon as shown in the image to the right to view the files that are stored in the internal memory of the 802 AWE.



The **File Explorer** screen will be displayed as shown in the image to the right. This screen allows you to perform the following actions:

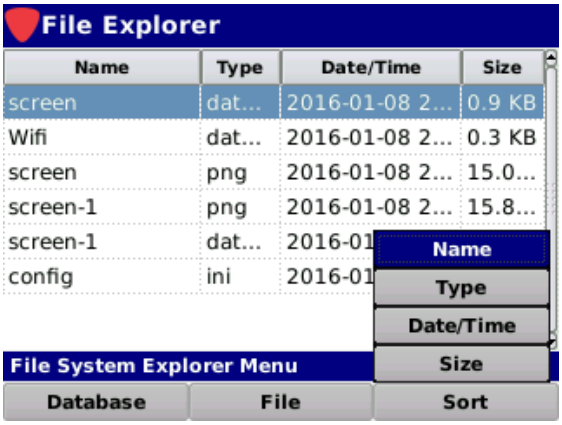
- View and sort files by; name, type, size and date/time saved
- Export files to USB
- Delete files
- Database backup & restore
- Save system logs



View & Sort

From within the **File Explorer** screen, use the arrow buttons on the keypad to navigate through the list of files.

Select the **Sort** softkey to sort the file list. Select from **Name**, **Type**, **Date/Time**, or **Size** sort types as shown in the image to the right.

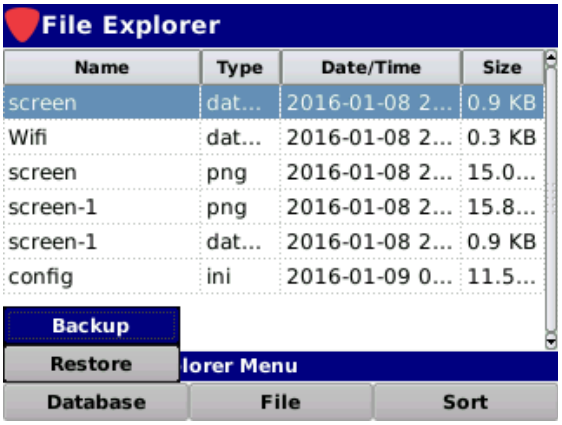


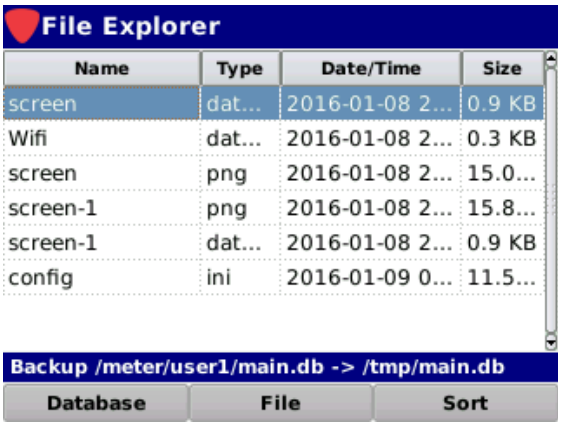
Database Backup

Backup to Internal Memory

Perform the following steps to backup the 802 AWE database file to the internal memory of the 802 AWE:

1. Select the **Database** softkey.
2. From the **Database** pop-up menu, select the **Backup** button as shown in the image to the right.
3. The Status Bar will indicate a successful backup to the internal memory by displaying the text **"-> /tmp/main.db"** as shown in the image below.





NOTE

This internal memory is lost on power down and is only used to clone users on the meter by backing up the database of one user and restoring the database to another user.

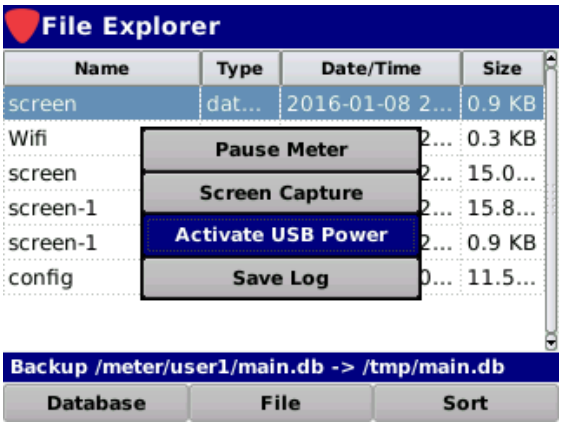
NOTE

This function is useful when cloning the device settings between users on the same meter. When importing the database file under another user, all device settings will be updated while retaining the existing user information.

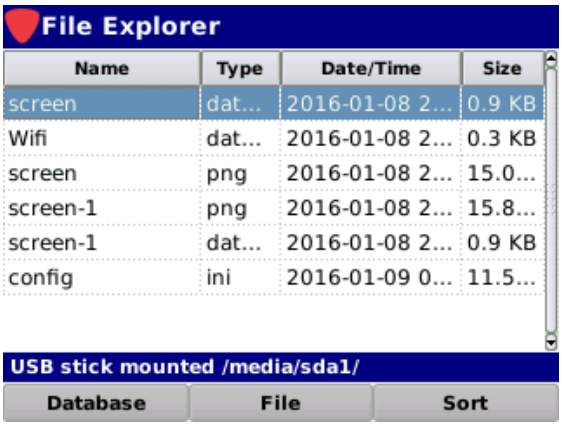
Backup to USB Flash Drive

Perform the following steps to backup the 802 AWE database file to a USB flash drive:

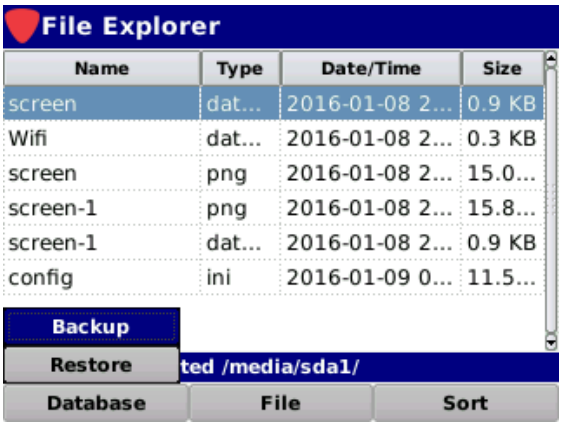
1. Insert the USB flash drive adapter into the USB port of the 802 AWE
2. Then insert a USB flash drive into the USB flash drive adapter.
3. Press the **Function** button and select the **Activate USB Power** function as shown in the image to the right.



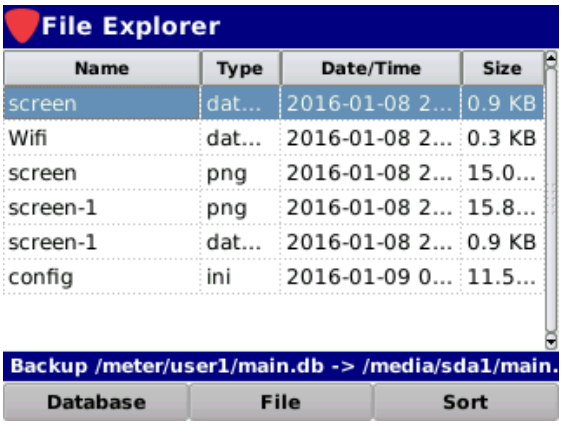
4. The power to the USB flash drive is activated and the drive is now mounted to the file system as shown in the image to the right. The 802 AWE is now capable of transferring files to and from the USB flash drive.



5. Select the **Database** softkey.
6. From the **Database** pop-up menu, select the **Backup** button as shown in the image to the right.



7. The **Message Bar** will indicate a successful backup to the flash drive by displaying the text **"-> /media/sda1/main.db"** as shown in the image below.



NOTE

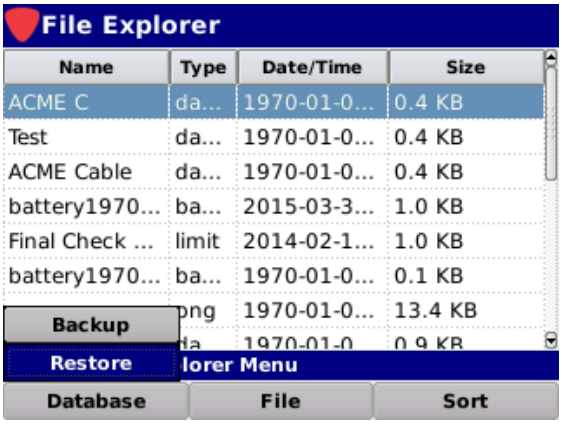
This function is useful when cloning the device settings between different meters. When importing the database file on another meter, all device settings will be updated while retaining the existing user information.

Database Restore

Restore from Internal Memory

Perform the following steps to restore the 802 AWE database file from the internal memory of the 802 AWE:

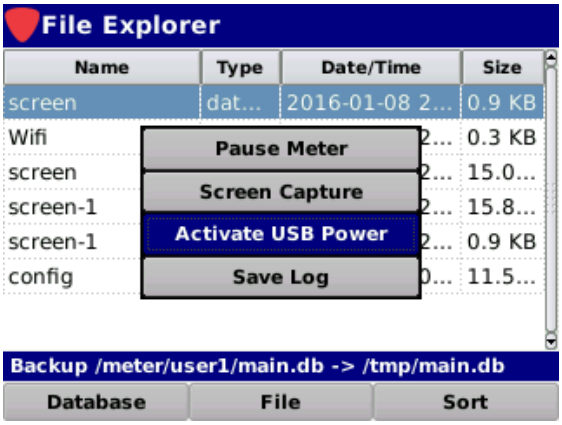
1. Select the **Database** softkey.
2. From the **Database** pop-up menu, select the **Restore** button as shown in the image to the right.
3. The entire database will be restored from the internal memory of the 802 AWE.



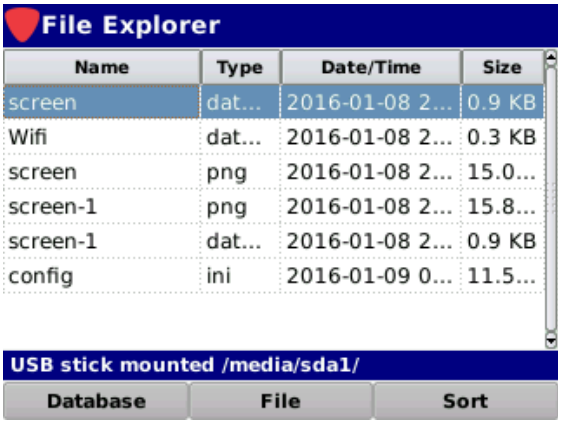
Restore from USB Flash Drive

Perform the following steps to restore the 802 AWE database file from a USB flash drive:

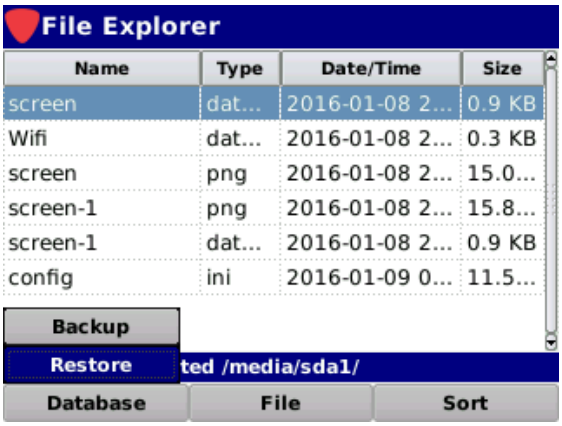
1. Insert the USB flash drive adapter into the USB port of the 802 AWE.
2. Insert a USB flash drive into the USB flash drive adapter.
3. Press the **Function** button and select the **Activate USB Power** function as shown in the image to the right.



4. The power to the USB flash drive is activated and the drive is now mounted to the file system as shown in the image to the right. The 802 AWE is now capable of transferring files to and from the USB flash drive.



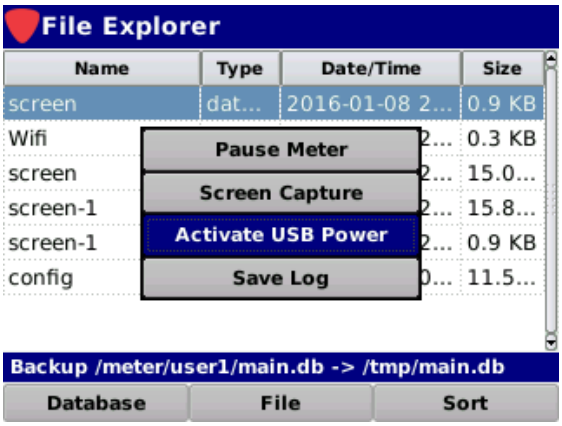
5. Select the **Database** softkey.
6. From the **Database** pop-up menu, select the **Restore** button as shown in the image to the right.
7. The entire database will be restored from the USB flash drive.



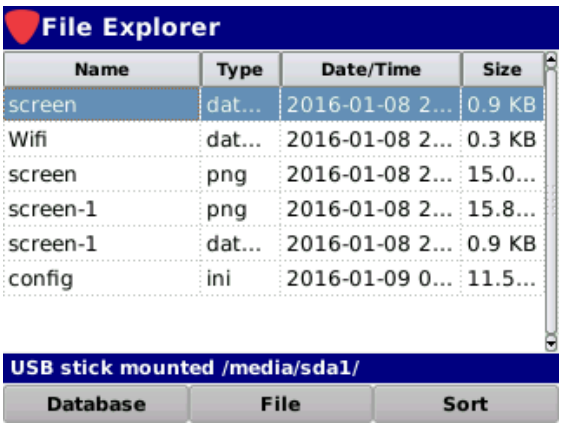
Cloning Meter Settings to a New Meter

Perform the following steps to clone all files from one 802 AWE to another:

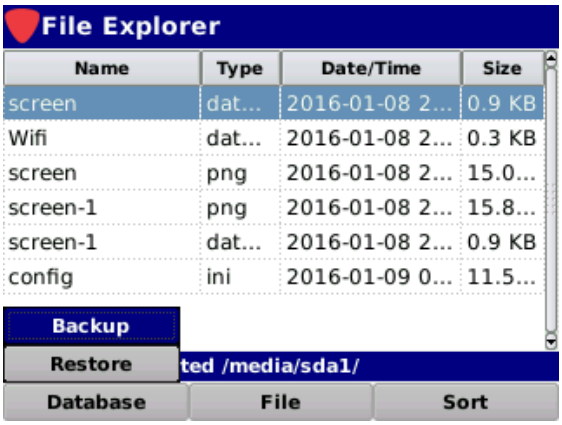
1. Insert the USB flash drive adapter into the USB port of the 802 AWE.
2. Insert a USB flash drive into the USB flash drive adapter.
3. Press the **Function** button and select the **Activate USB Power** function as shown in the image to the right.



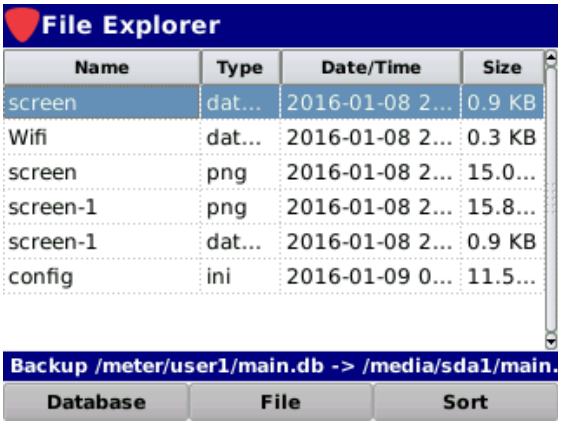
4. The power to the USB flash drive is activated and the drive is now mounted to the file system as shown in the image to the right. The 802 AWE is now capable of transferring files to and from the USB flash drive.



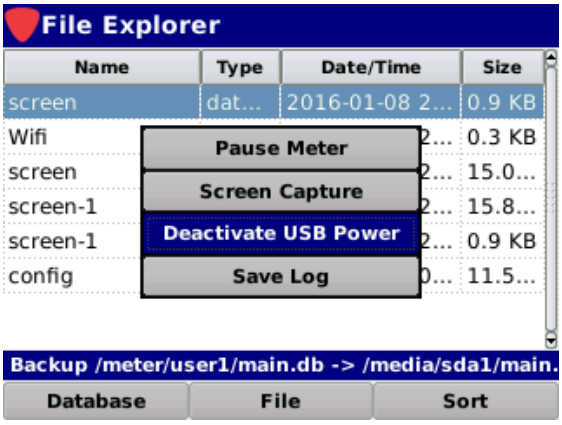
5. Select the **Database** softkey.
6. From the **Database** pop-up menu, select the **Backup** button as shown in the image to the right.



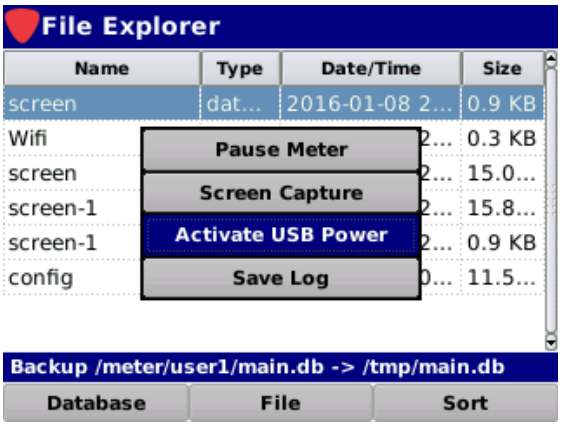
7. The **Message Bar** will indicate a successful backup to the flash drive by displaying the text **"-> /media/sda1/main.db"** as shown in the image to the right.



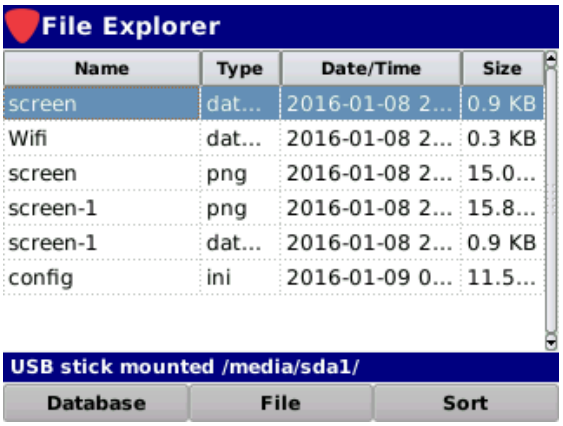
8. Press the **Function** button and select the **Deactivate USB Power** function as shown in the image to the right.
9. Remove the USB flash drive and adapter from the meter to clone.
10. Login to an existing user or create a new user on the new meter to clone to.
11. Insert the USB flash drive adapter and USB flash drive into the USB port of the new meter to clone to.



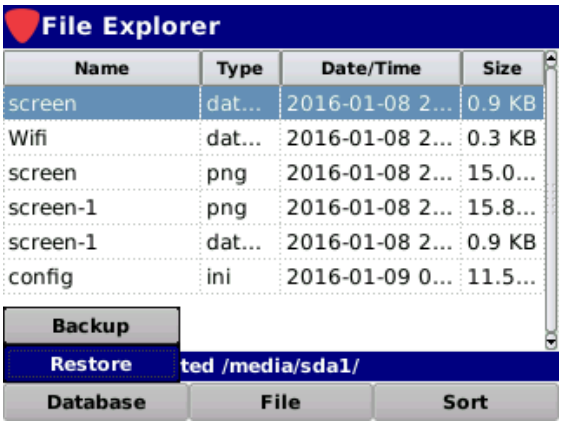
12. Press the **Function** button and select the **Activate USB Power** function as shown in the image to the right.



13. The power to the USB flash drive is activated and the drive is now mounted to the file system as shown in the image to the right. The 802 AWE is now capable of transferring files to and from the USB flash drive.



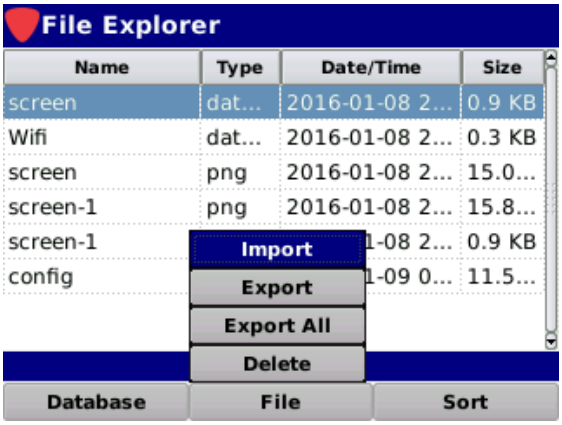
14. Select the **Database** softkey.
15. From the **Database** pop-up menu, select the **Restore** button.
16. The clone process is now complete. To continue with additional meters, return to step 8, as the database file on your memory stick may be used for all your meters. You will not have to export another database file unless there are additional files you want to move.

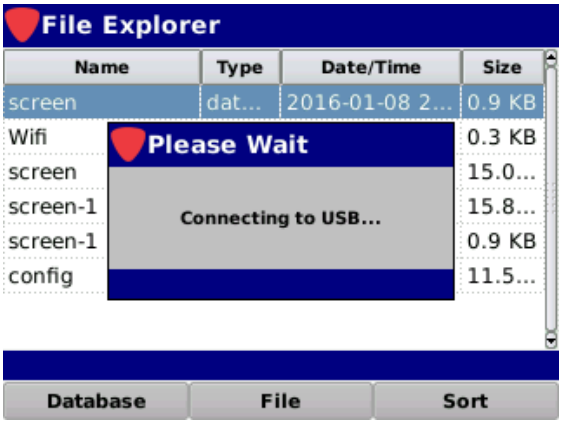


Import ViewPoint Files from a USB Flash Drive

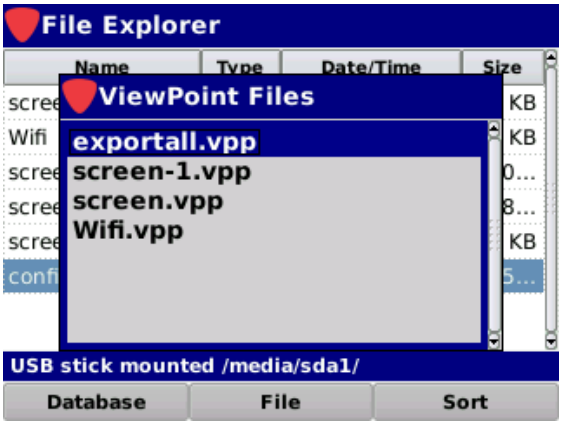
Perform the following steps to import a ViewPoint package file from a USB flash drive:

1. Insert the USB flash drive adapter into the USB port of the 802 AWE.
2. Then insert a USB flash drive into the USB flash drive adapter.
3. Press the **Function** button and select the **Activate USB Power** function as shown in the image to the right.
4. Select the **File** softkey.
5. From the **File** pop-up menu, select the **Import** button as shown in the image to the right.
6. The 802 AWE will automatically connect to the attached USB flash drive as shown in the image to the right.

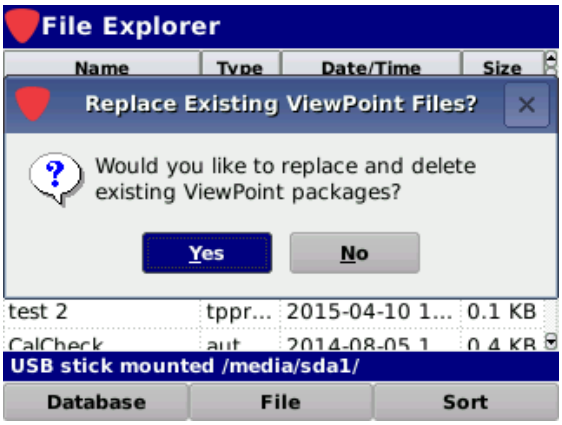




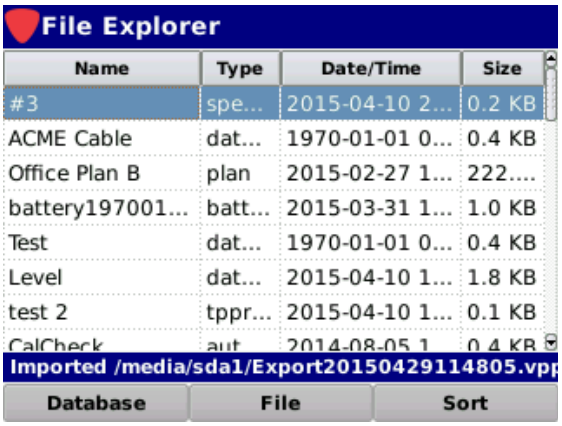
7. From the **ViewPoint Files** window, use the arrow buttons to highlight the file you would like to import.



8. A confirmation window will be displayed as shown in the image to the right. If you have existing ViewPoint files on the meter, it will ask if you want to replace them.
9. Select the **Yes** button to import the file and replace existing files or select **No** to keep the existing package files and import the new package.



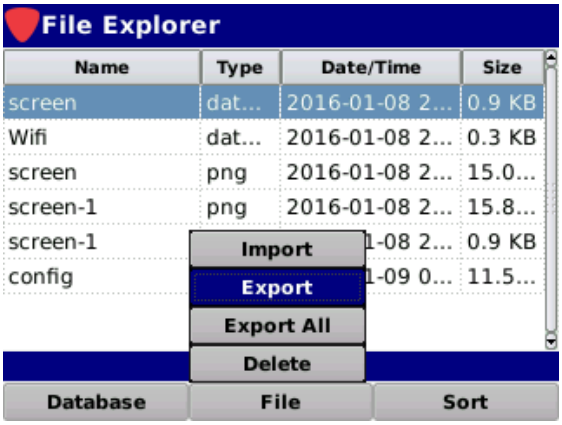
10. The **Message Bar** will indicate a successful import from the flash drive by displaying the text **"Imported /media/sda1/<file_name>"** as shown in the image to the right.

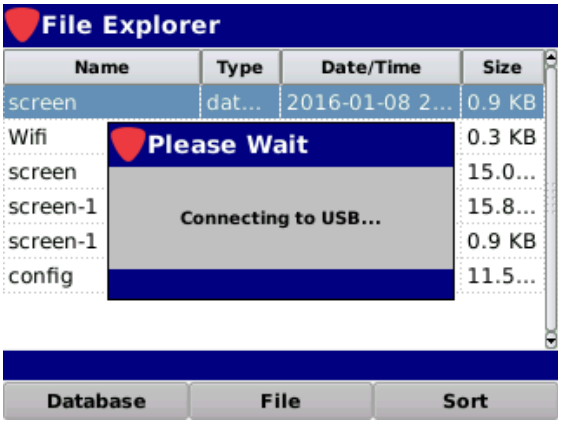


Export a File

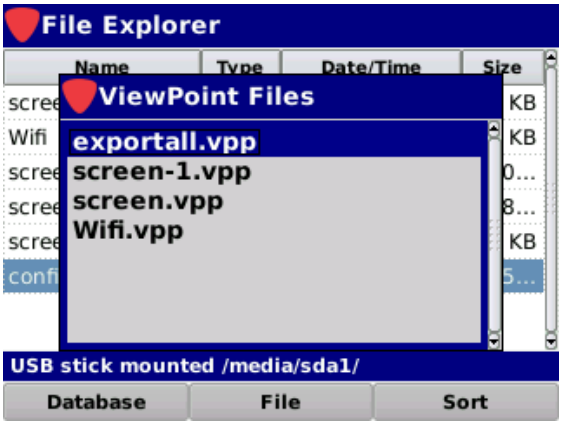
Perform the following steps to export a single file to a USB flash drive:

1. Insert the USB flash drive adapter into the USB port of the 802 AWE
2. Then insert a USB flash drive into the USB flash drive adapter.
3. Use the arrow buttons to highlight the file that you would like to export.
4. Select the **File** softkey.
5. From the **File** pop-up menu, select the **Export** button as shown in the image to the right.
6. The 802 AWE will automatically connect to the attached USB flash drive as shown in the image to the right.





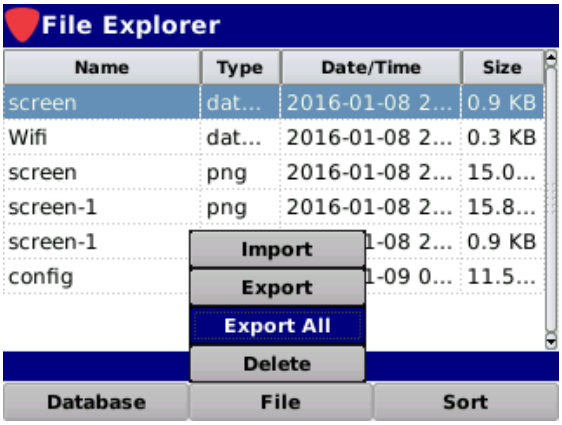
7. Later when you are ready to import, you will see the file listed in the ViewPoint files on the USB flash drive, as shown here.



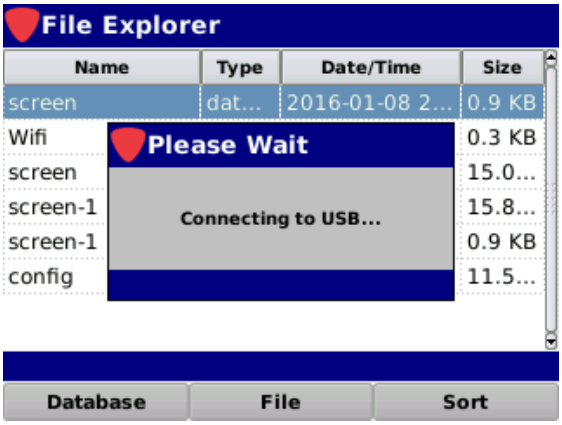
Export All Files

Perform the following steps to export all files to a USB flash drive:

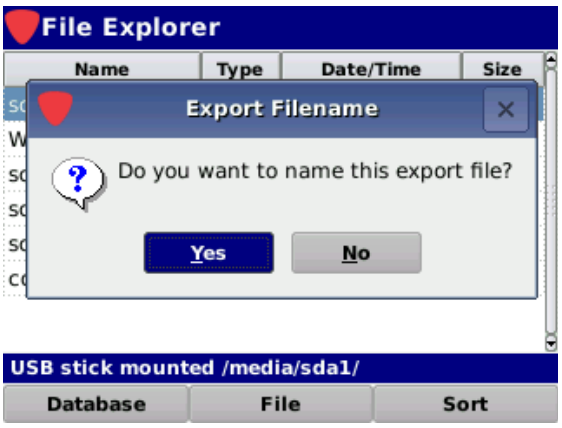
1. Insert the USB flash drive adapter into the USB port of the 802 AWE
2. Then insert a USB flash drive into the USB flash drive adapter.
3. Select the **File** softkey.
4. From the **File** pop-up menu, select the **Export All** button as shown in the image to the right.



5. The 802 AWE will automatically connect to the attached USB flash drive as shown in the image to the right.

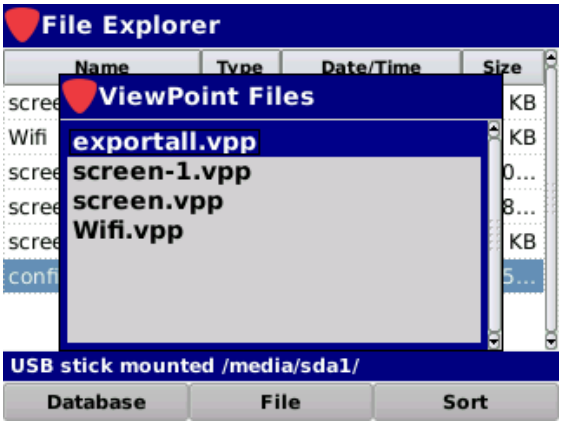


6. The **Export Filename** window will be displayed as shown in the image to the right.
7. Select the **Yes** button to name the export file or select **No** to use the date for the filename.



8. Use the **Virtual Keyboard** to enter the name of the new export file as shown in the image to the right.

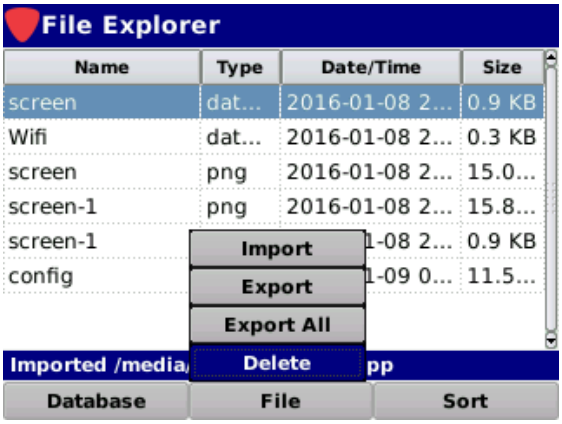
9. Later when you are ready to import, you will see the file listed in the ViewPoint files on the USB flash drive, as shown here.



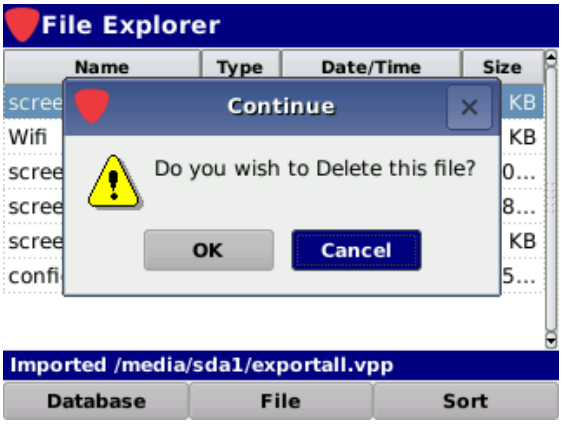
Delete Files

Perform the following steps to delete files from the internal memory of the 802 AWE:

1. Use the arrow buttons to highlight the file you want to delete.
2. Select the **File** softkey.
3. From the **File** pop-up menu, select the **Delete** button as shown in the image to the right.

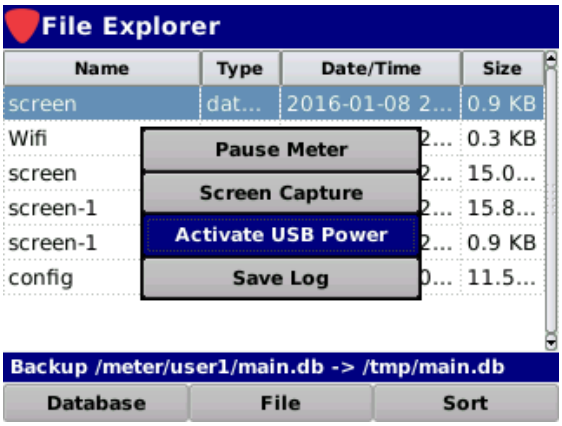


4. The **Continue** window will be displayed as shown in the image to the right.
5. Select the **OK** button to delete the file or select the **Cancel** button to exit without deleting the file.



Function Menu Options

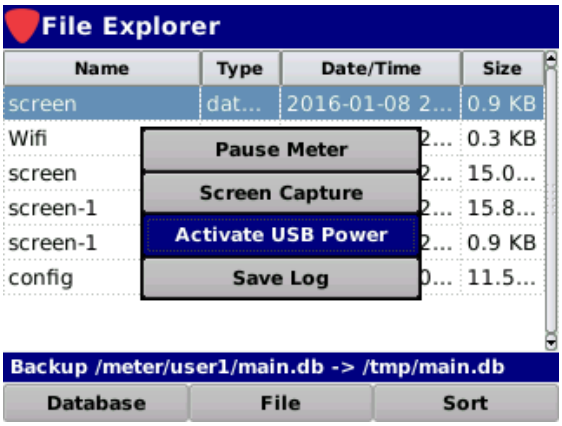
Additional functions can be accessed from within the **File Explorer** screen by pressing the **Function** button. The **Function** menu will be displayed as shown in the image to the right and includes the following functions specifically for the **File Explorer** screen.



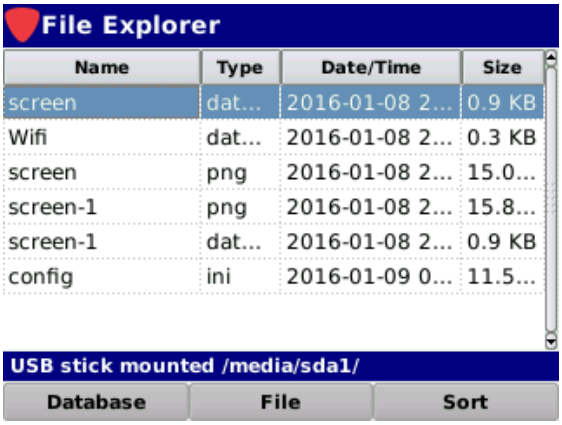
Activate USB Power

This function is used to activate power to the USB flash drive inserted into the USB port of the 802 AWE. The USB flash drive must be enabled before being able to be used.

Select the **Activate USB Power** button from the **Function** menu.



The power to the USB flash drive is activated and the drive is now mounted to the file system as shown in the image to the right. The 802 AWE is now capable of transferring files to and from the USB flash drive.

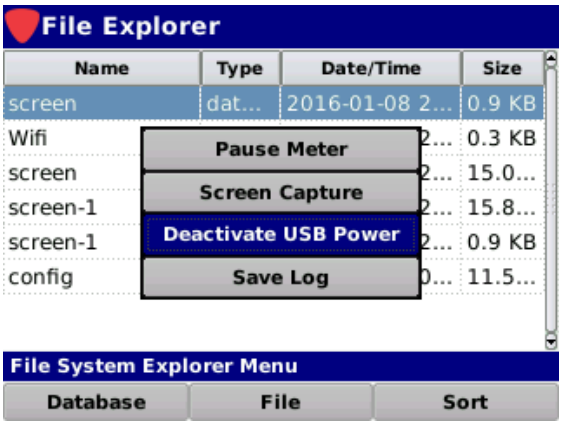


Deactivate USB Power

This function is used to deactivate power to the USB flash drive inserted into the USB port of the 802 AWE. The USB flash drive should be deactivated before removing.

Select the **Deactivate USB Power** button from the **Function** menu. The USB flash drive can now be removed.

The 802 AWE automatically deactivates the power to the USB flash drive when you exit the **File Explorer** screen.



Save Log File

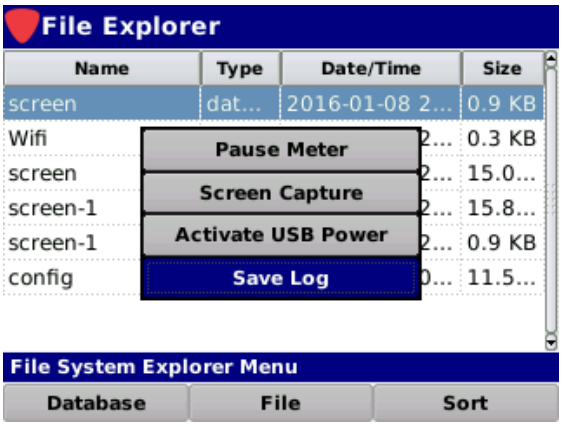
This function is used when experiencing unexpected operation of the 802 AWE.

> NOTE
>
> ***To save a log file, the Operating Level setting must be set to Logging, see Section II: Setup, Chapter 3: Meter Configuration, Global Settings.***

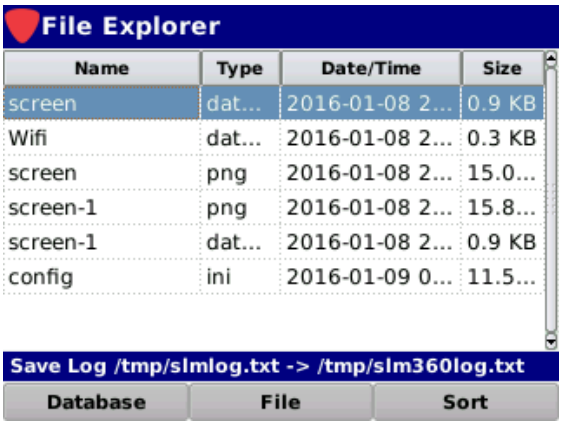
Save to Internal Memory

This function is used primarily for hands-on factory and repair center troubleshooting. Perform the following steps to save the 802 AWE log file to the internal memory of the 802 AWE:

1. Select the **Save Log** button from the **Function** menu.



2. The **Message Bar** will indicate a successful save to the internal memory of the 802 AWE by displaying the text **"-> /tmp/slm360log.txt"** as shown in the image to the right.

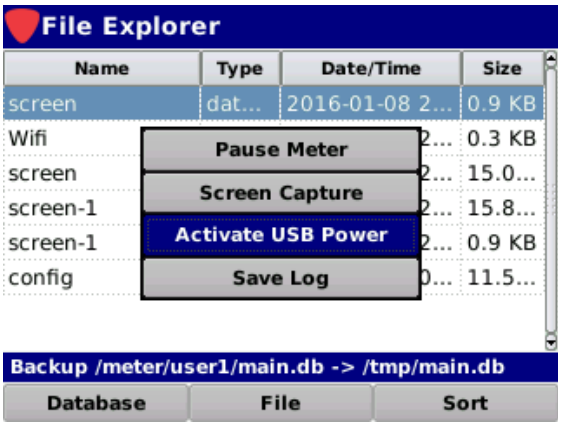


Save to a USB Flash Drive

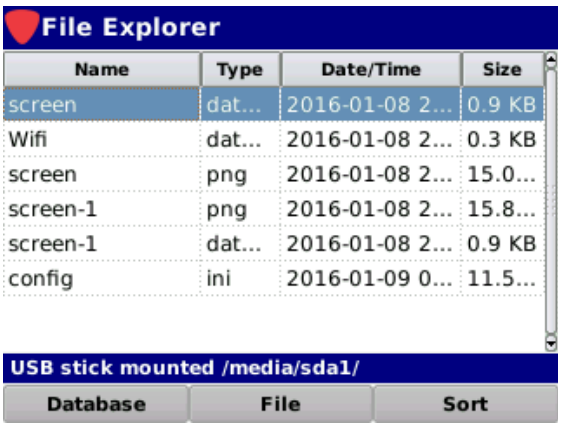
This function is used primarily for remote troubleshooting with the Trilithic Applications Support Department. This file can be emailed to Trilithic for advanced troubleshooting.

Perform the following steps to save the 802 AWE log file to a USB flash drive:

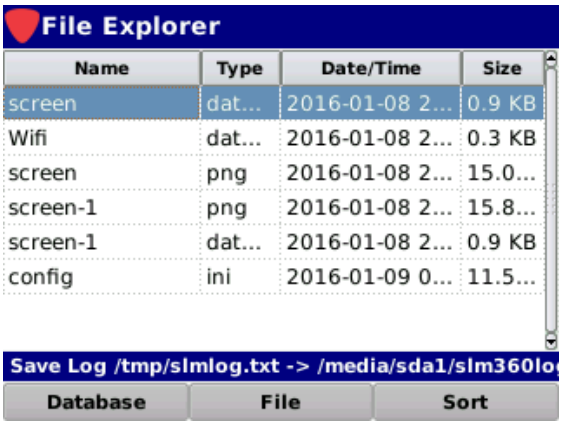
1. Insert the USB flash drive adapter into the USB port of the 802 AWE
2. Then insert a USB flash drive into the USB flash drive adapter.
3. Press the **Function** button and select the **Activate USB Power** function as shown in the image to the right.



4. The power to the USB flash drive is activated and the drive is now mounted to the file system as shown in the image to the right. The 802 AWE is now capable of transferring files to and from the USB flash drive.



5. Select the **Save Log** softkey.
6. The **Message Bar** will indicate a successful save to the flash drive by displaying the text **"-> /media/sda1/slm360log.txt"** as shown in the image to the right.

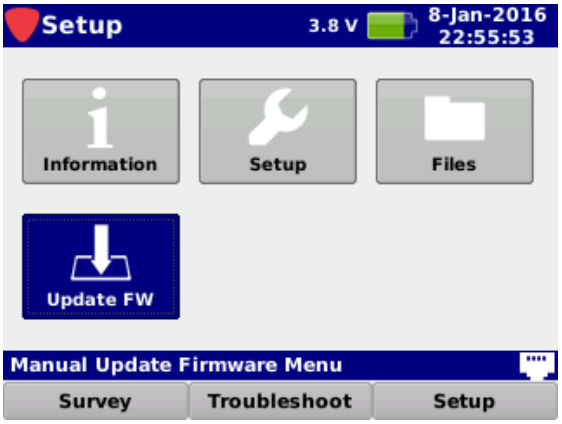


Overview

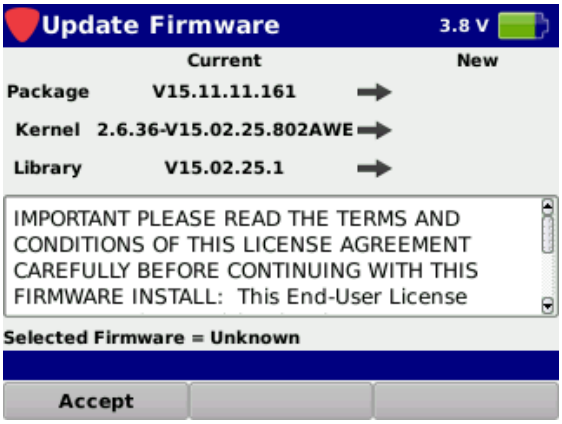
CAUTION

Before updating the firmware, make sure the battery is fully charged or the meter is powered via the AC to DC Power Adapter & Battery Charger.

Select the **Update FW** icon as shown in the image to the right to update the firmware of the 802 AWE.



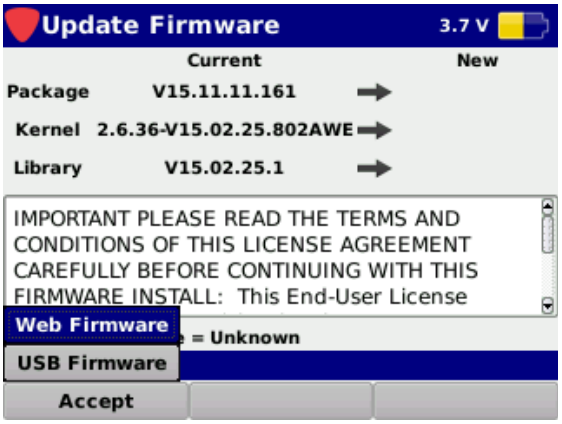
The **Update Firmware** screen will be displayed as shown in the image to the right. This screen allows you to perform a firmware update. Before performing a firmware update, you must accept the End User License Agreement (EULA) by selecting the **Accept** softkey.



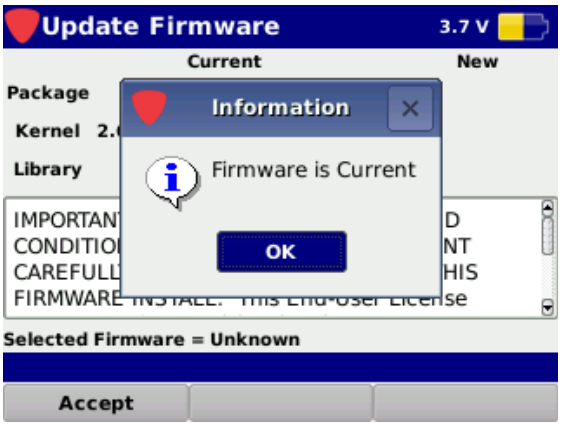
Update Firmware from Website

Perform the following steps to update the 802 AWE firmware from a website:

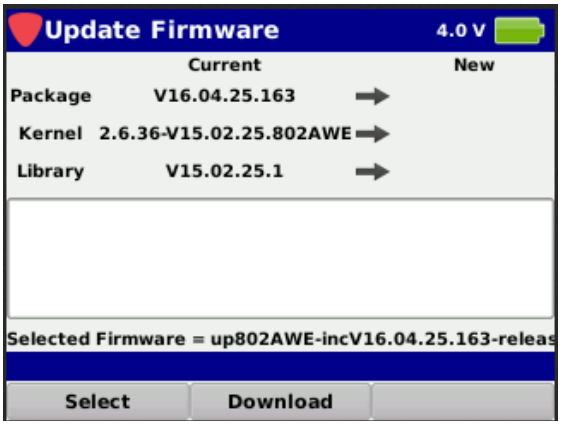
1. Select the **Accept** softkey.
2. From the **Accept** pop-up menu, select the **Web Firmware** button as shown in the image to the right.



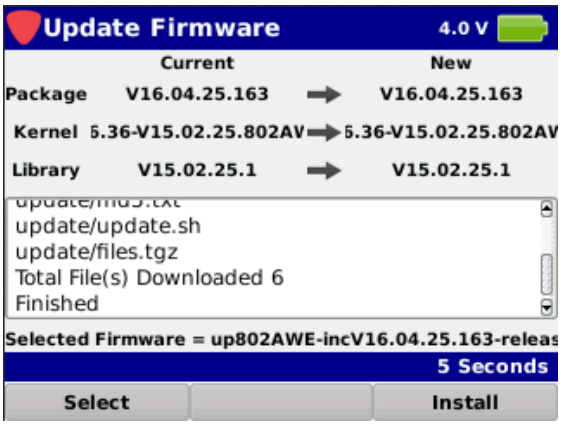
3. If the firmware installed in the 802 AWE is current, the **Information** window will be displayed as shown in the image to the right. Select the **OK** button to return to the previous screen.



4. If the firmware installed in the 802 AWE is not current, select the **Download** softkey as shown in the image to the right to download the firmware file.



5. The download progress will be displayed in the activity area of the **Update Firmware** screen as shown in the image to the right.
6. Once the download has finished, the new firmware information will be displayed as shown in the image to the right. Select the **Install** softkey to install the firmware file.
7. Once the installation is finished, the 802 AWE will automatically restart with the new firmware.



Update Firmware from a USB Flash Drive

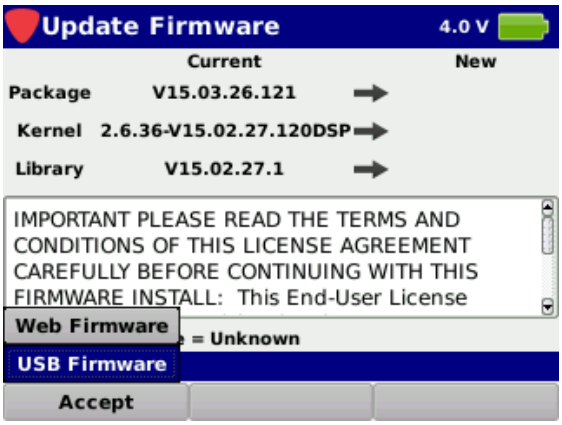
NOTE

Please ensure you have a USB flash drive that is formatted using the FAT or FAT32 file system and contains no other data.

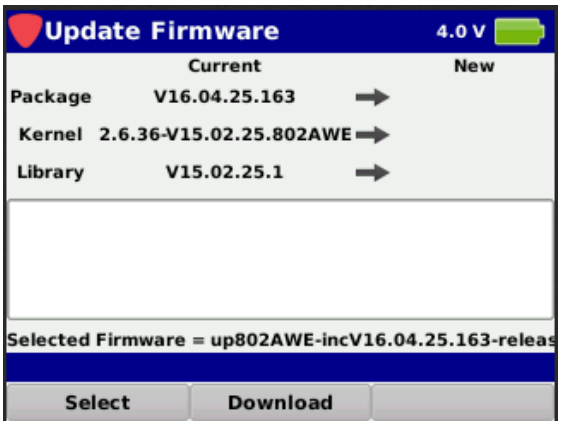
For the latest firmware, contact Trilithic Applications Engineering at support@trilithic.com.

Perform the following steps to update the 802 AWE firmware from a USB flash drive:

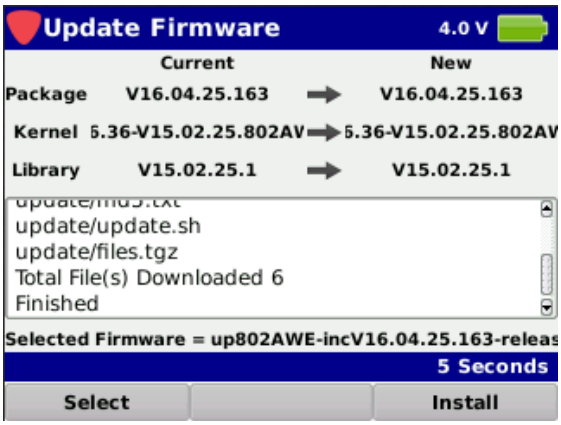
1. Insert the USB flash drive adapter into the USB port of the 802 AWE.
2. Then insert a USB flash drive into the USB flash drive adapter.
3. Select the **Accept** softkey.
4. From the **Accept** pop-up menu, select the **USB Firmware** button as shown in the image to the right.



5. The firmware version will be displayed at the bottom of the screen, as shown in the image to the right. Select the **Download** softkey to transfer the firmware from the USB flash drive to the unit.



6. Once the file has been transferred from the USB flash drive, the new firmware information will be displayed as shown in the image to the right. Select the **Install** softkey to install the firmware file.
7. Once the installation is finished, the 802 AWE will automatically restart with the new firmware.



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802 AWE
Advanced Wireless Expert

Section III: Survey Menu

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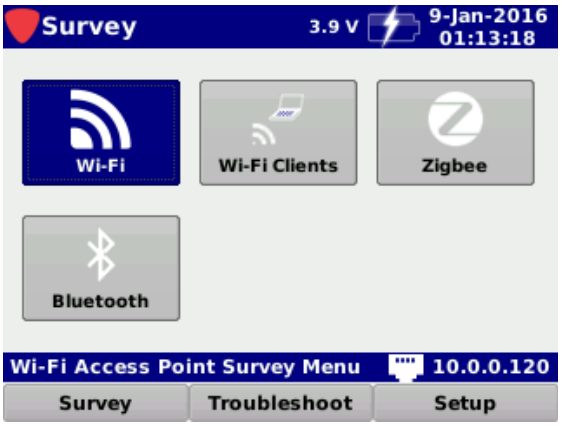
Introduction



Select the **Survey** softkey to display the **Survey** menu as shown in the image to the right. This section will provide you with instructions on how to utilize the functions available in the **Survey** menu of the instrument including:

- **Wi-Fi** – This function is used to perform a Wi-Fi survey of all 2.4 & 5 GHz 802.11 (a/b/g/n/ac) access points within range of the 802 AWE.
- **Wi-Fi Clients** – This function is used to perform a Wi-Fi survey of all 2.4 & 5 GHz 802.11 (a/b/g/n/ac) clients within range of the 802 AWE.
- **Zigbee** – This function is used to perform a wireless survey of all Zigbee devices within range of the 802 AWE.
- **Bluetooth** – This function is used to perform a wireless survey of all Bluetooth devices within range of the 802 AWE.

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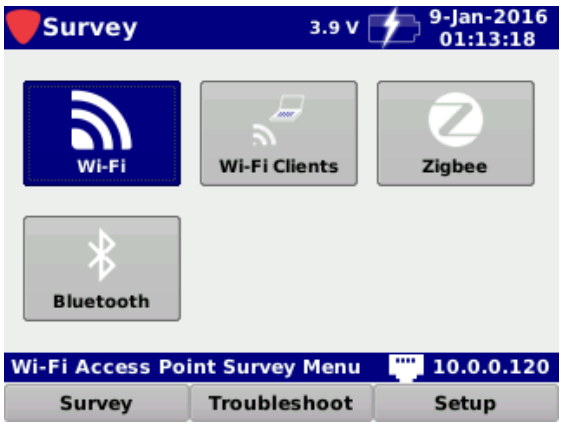
Chapter 2

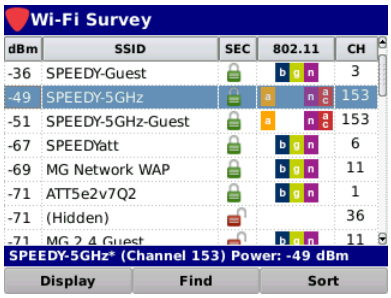
Wi-Fi Access Point Survey

Overview

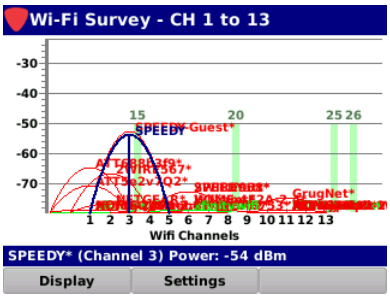
Select the **Wi-Fi** icon as shown in the image to the right to perform a Wi-Fi survey of all 2.4 & 5 GHz 802.11 (a/b/g/n/ac) access points within range of the 802 AWE.



The **Wi-Fi Survey** screen will be displayed as shown in one of the following images based on the settings selected by the user the last time the application was used. Each of these screens allow you to adjust the display settings between the list view, 2.4 GHz graph, and 5 GHz graph.



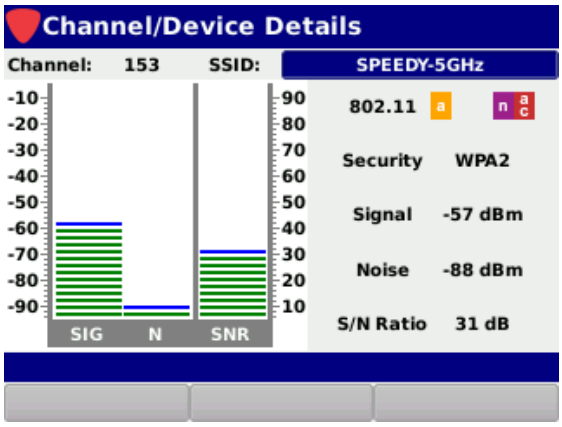
List View



2.4/5 GHz Graph

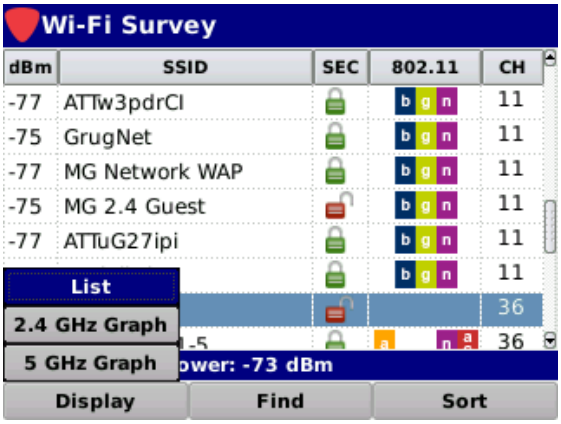
From within any of the display modes of the **Wi-Fi Survey** screen;

- Use the up/down arrow buttons on the keypad to navigate through the list of wireless access points. The currently selected access point is highlighted in blue.
- The **Message Bar** at the bottom of the screen will display the SSID, channel number, and power of the currently selected access point.
- Press the **Enter** key on the keypad to display the **Channel/Device Details** screen of the selected access point, as shown in the image to the right.

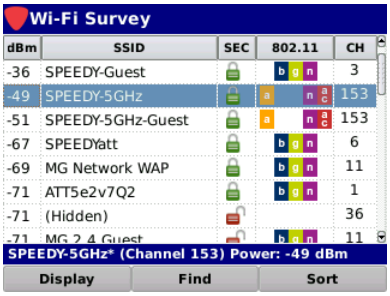


Selecting the Display Mode

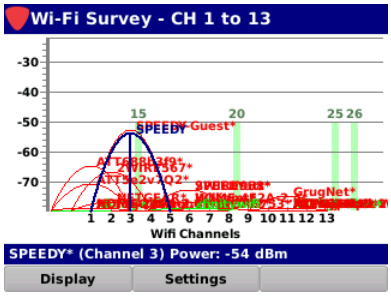
Select the **Display** softkey to choose between the following types of display modes:



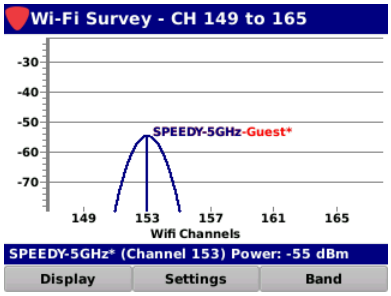
- **List** – This display mode shows all access points within range of the 802 AWE in the form of a tabular list with rows and columns.
- **2.4 GHz Graph** – This display mode shows all access points using the 2.4 GHz frequency band within range of the 802 AWE in the form of a wireless channel level graph.
- **5 GHz Graph** – This display mode shows all access points using the 5 GHz frequency band within range of the 802 AWE in the form of a wireless channel level graph.



List View



2.4 GHz Graph

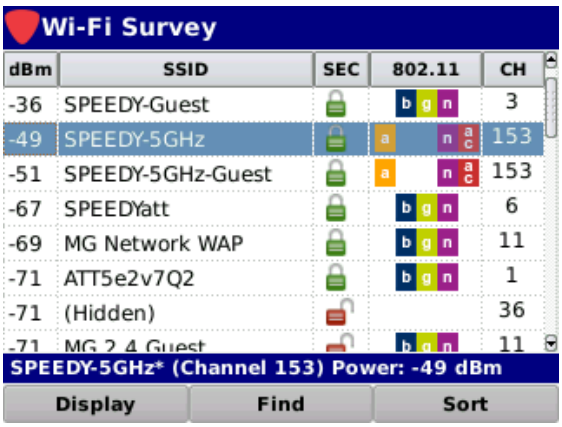


5 GHz Graph

List Display Mode

This display mode shows all access points within range of the 802 AWE in the form of a tabular list with rows and columns:

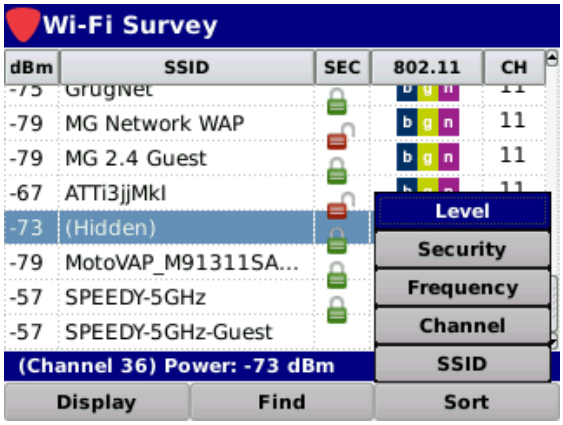
- Use the up/down arrow buttons on the keypad to scroll through the wireless access points. The currently selected access point is highlighted in blue.
- The **Message Bar** at the bottom of the screen will display the SSID, channel number, and power of the currently selected access point.
- Columns within the table display the following information as outlined in the following sections.
    - **dBm** – Signal Level
    - **SSID** – Access Point Name
    - **SEC** – Security Status
    - **802.11** – Wireless Frequencies
    - **CH** – Wireless Channel



Sorting List Data

Perform the following steps to sort the tabular list of access points:

1. Select the **Sort** softkey.
2. From the **Sort** pop-up menu, select the desired method for sorting the tabular list. The tabular list can be sorted by **Level**, **Security**, **Frequency**, **Channel**, or **SSID**.



Access Point Properties

Signal Level

The column labeled **dBm** within the table displays the signal level measurement in dB from a minimum of -100 dBm to a maximum of 0 dBm.

Access Point Name

The column labeled **SSID** within the table displays the name of the access point.

Security Status

The column labeled **SEC** within the table displays the security status of the access point as follows:

When this icon is displayed, it indicates that the access point is using either WEP, WPA, or WPA2 security.

When this icon is displayed, it indicates that the access point is not using either WEP, WPA, or WPA2 security.

Wireless Frequencies

The column labeled **802.11** within the table displays the wireless frequencies of the access point as follows:

When this icon is displayed, it indicates that the access point is using 802.11a wireless within the 5 GHz frequency spectrum.

When this icon is displayed, it indicates that the access point is using 802.11b wireless within the 2.4 GHz frequency spectrum.

When this icon is displayed, it indicates that the access point is using 802.11g wireless within the 2.4 GHz frequency spectrum.

When this icon is displayed, it indicates that the access point is using 802.11n wireless within the 2.4 GHz & 5 GHz frequency spectrums.

When this icon is displayed, it indicates that the access point is using 802.11ac wireless within the 5 GHz frequency spectrum.

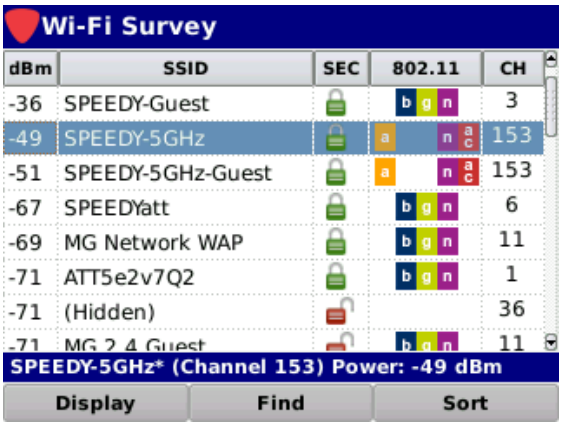
Wireless Channel

The column labeled **CH** within the table displays the wireless channel of the access point.

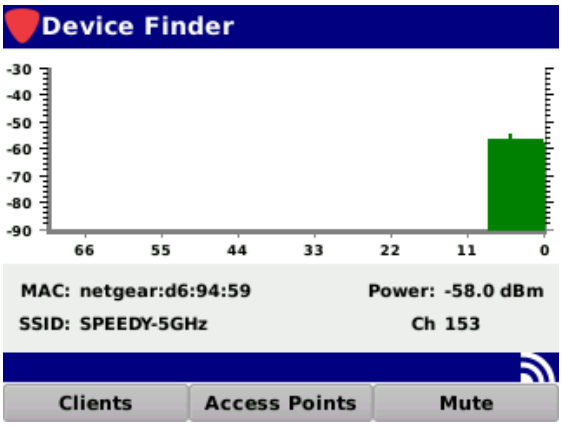
Finding Devices

Perform the following steps to find the selected device:

1. Use the up/down arrow buttons on the keypad to scroll through the wireless access points. The currently selected access point is highlighted in blue as shown in the image to the right.
2. Select the **Find** softkey.

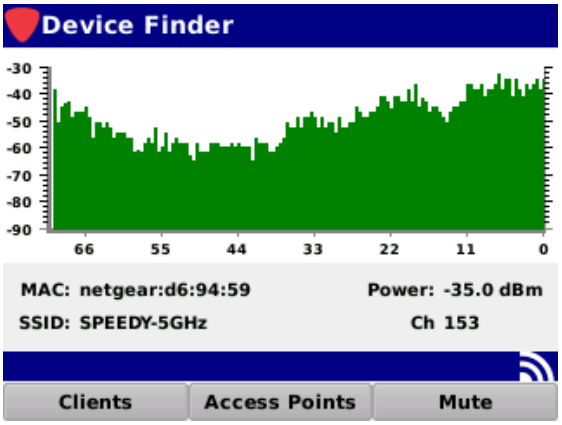


3. The **Device Finder** screen will be displayed as shown in the image to the right.
    - This screen displays the following information about the selected device:
        - **MAC** – Device MAC Address
        - **SSID** – Access Point Name
        - **Power** – Signal Power Level
        - **CH** – Wireless Channel



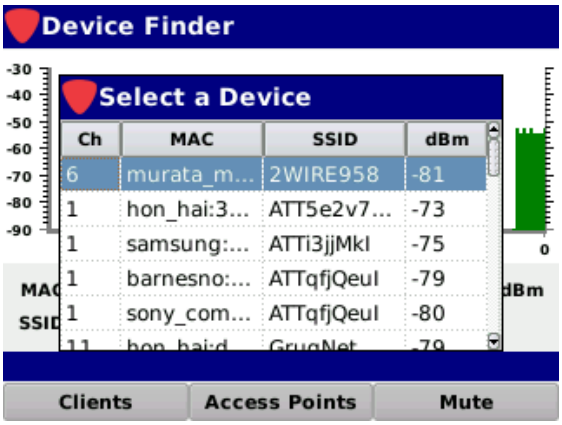
- The internal speaker of the 802 AWE will emit an audible beeping sound when trying to locate devices.
    - As the user moves closer to the device they are trying to find, the beeping becomes more frequent and increases in tone.
    - When the user moves away from the device, the beeping becomes less frequent and decreases in tone.
    - Select the **Mute** softkey to disable the beeping sound or select the **Unmute** softkey to enable the beeping sound.
- The vertical axis (up/down) of the graph represents the signal level of the selected device. The graph displays a maximum level of -30 dBm (top of graph) and minimum level of -90 dBm (bottom of graph).

- The horizontal axis (left/right) of the graph represents the number of measurement samples taken from when you first entered the **Device Finder** screen.

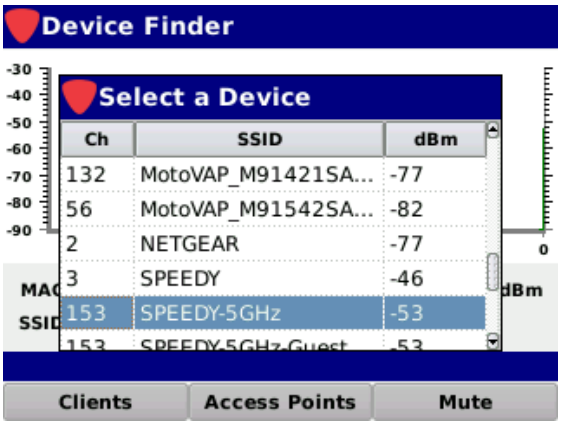


    - The measurement samples continuously move from the right hand side of the graph toward the left hand side of the graph.
    - The newest measurement sample is displayed at the far right hand side of the screen.
    - The oldest measurement sample is displayed at the far left hand side of the screen.
    - The graph can display 70 measurement samples over a time period of approximately 45 seconds as shown in the image above.

4. Select the **Clients** or **Access Points** softkeys to open the **Select a Device** screen as shown in the following images.
    - Use the up/down arrow buttons on the keypad to navigate through the list of wireless clients or access points. The currently selected access point is highlighted in blue.
    - Press the **Enter** key on the keypad to select the highlighted client or access point and return to the **Device Finder** screen.



Clients List

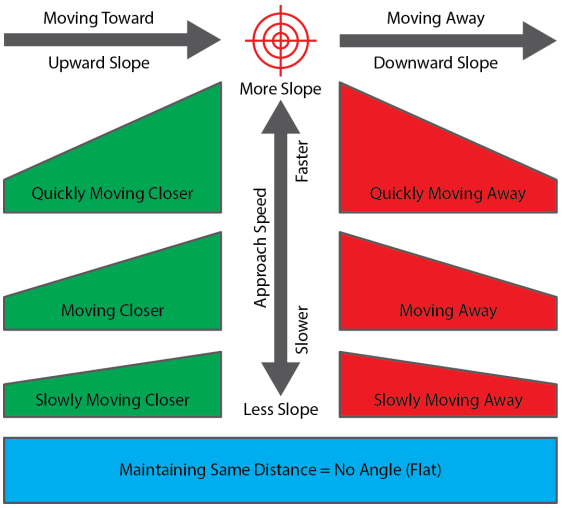


Access Points List

Rules to Follow when Finding Wireless Devices

The illustration shown to the right provides helpful hints on how to properly read the Device Finder graph.

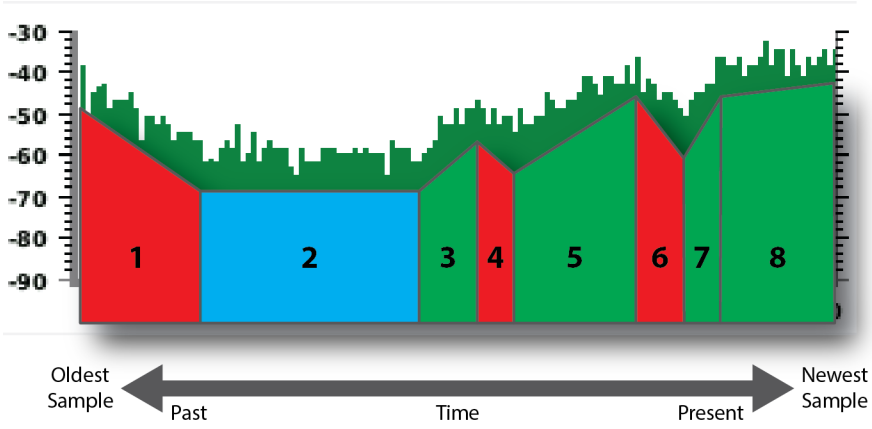
- The graph will display an upward slope when the 802 AWE is moving toward the device you are trying to find.
- The graph will display a downward slope when the 802 AWE is moving away from the device you are trying to find.
- The graph will not display any slope or will appear flat when the 802 AWE is maintaining the same distance from the device you are trying to find.
- The upward or downward slope of the device will have more or less slope based on how quickly you are moving towards or away from the device you are trying to find.



Real World Example of Finding Wireless Devices

The illustration shown below provides a real world example of how to properly read the Device Finder graph.

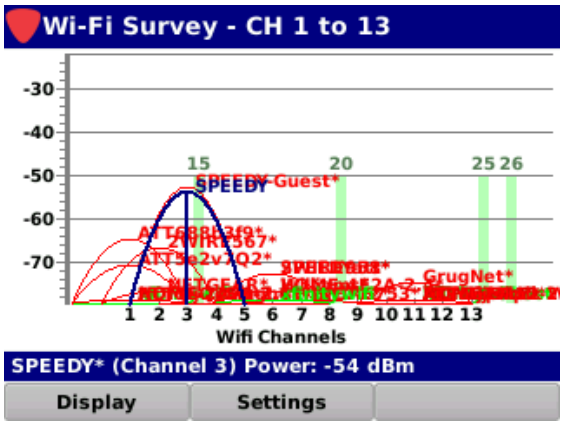
- During this measurement period, we can identify eight segments of time where the user was getting closer to, farther away, or staying the same distance from the device they were trying to find.
- In segments 1, 4, and 6 the user was in closer proximity to the device they were trying to find at the beginning of the segment than they were at the end of the segment. This is indicated by the downward slope of these segments.
- In segment 2, the user stayed in constant proximity of the device and was neither moving toward or away from the device they were trying to find.
- In segments 3, 5, 7, and 8, the user was in closer proximity to the device that they were trying to find at the end of the segment than they were at the beginning of the segment. This is indicated by the upward slope of these segments.
- In segments 7 and 8, the user was always moving toward the device they were trying to find. However, during segment 7, the user was moving toward the device at a faster rate than they were moving during segment 8. This is indicated by the greater slope of the measurement samples within segment 7, versus those of segment 8, which can be seen to be relatively flat by comparison.

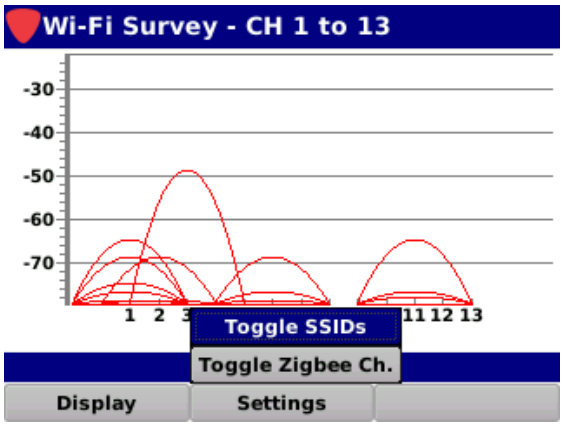


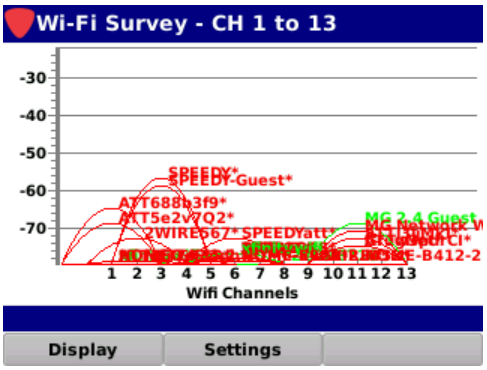
2.4 GHz Graph Display Mode

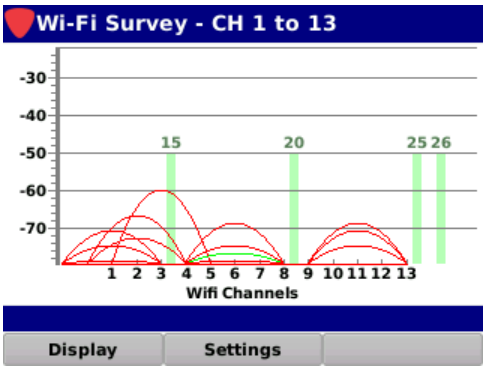
This display mode shows all access points using the 2.4 GHz frequency band within range of the 802 AWE in the form of a wireless channel level graph.

- Use the up/down arrow buttons on the keypad to scroll through the wireless access points.
- The vertical axis (up/down) of the graph represents the signal level of the access points within the 2.4 GHz frequency band. The graph displays a maximum level of -20 dBm (top of graph) and minimum level of -80 dBm (bottom of graph).
- The horizontal axis (left/right) of the graph represents the individual channels within the 2.4 GHz frequency band.
- Select the **Settings** softkey to toggle the SSID and Zigbee channel labels as described below:
  - In the above-right image, all labels are turned on.
  - In the image to the right, all labels are turned off.
  - In the below-left image, the SSID labels have been turned on.
  - In the below-right image, the ZigBee Channel labels have been turned on.





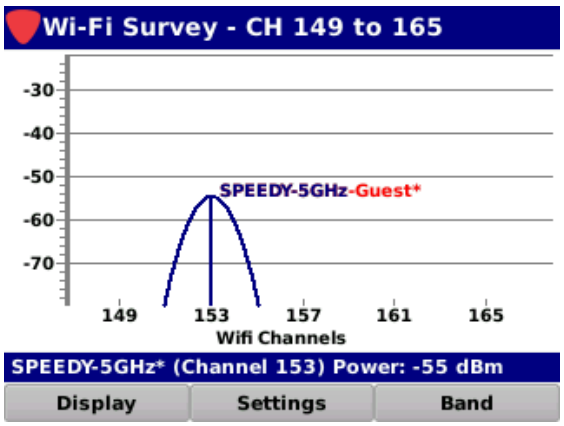


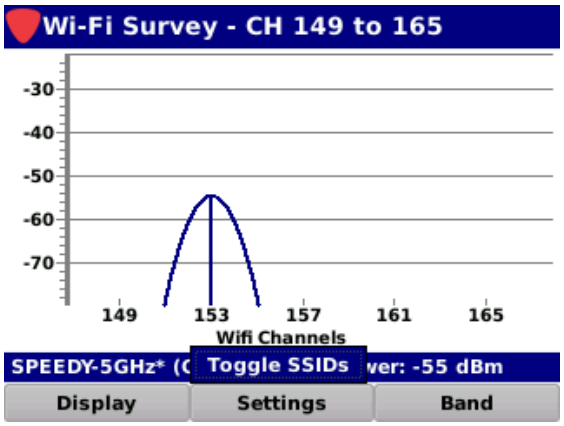


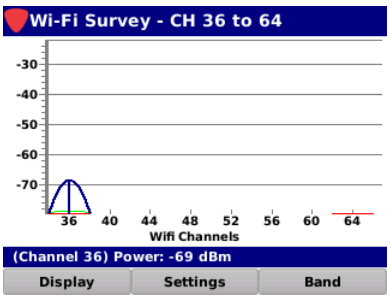
5 GHz Graph Display Mode

This display mode shows all access points using the 5 GHz frequency band within range of the 802 AWE in the form of a wireless channel level graph.

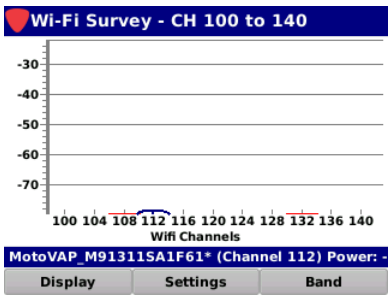
- Use the up/down arrow buttons on the keypad to scroll through the wireless access points.
- The vertical axis (up/down) of the graph represents the signal level of the access points within the 5 GHz frequency band. The graph displays a maximum level of -20 dBm (top of graph) and minimum level of -80 dBm (bottom of graph).
- The horizontal axis (left/right) of the graph represents the individual channels within the 5 GHz frequency band.
- Select the **Settings** softkey to toggle the SSID labels on and off as shown as described below:
  - In the above-right image, all labels are turned on.
  - In the image to the right, all labels are turned off.
- Select the **Band** softkey to toggle between the three different wireless channel frequency bands shown below.



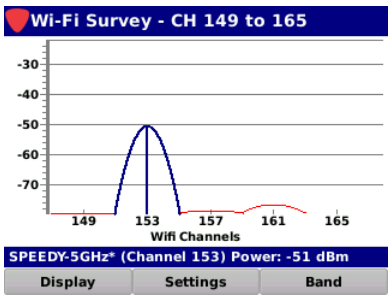




Channels 36 to 64



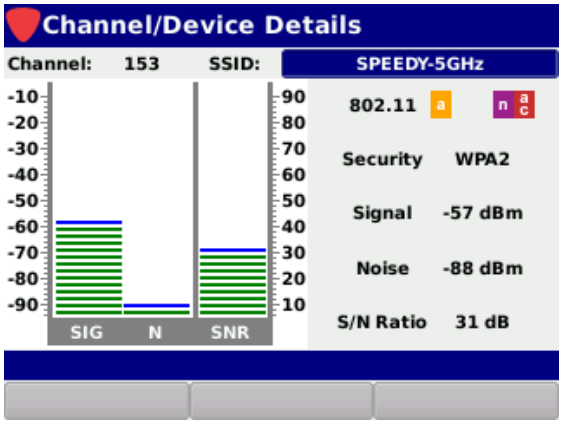
Channels 100 to 144



Channels 149 to 165

Viewing Channel/Device Details

From within any of the display modes of the **Wi-Fi Survey** screen, press the **Enter** key on the keypad to display the **Channel/Device Details** screen.



Use the up/down arrow buttons on the keypad to navigate through the list of wireless access points.

The channel number, 802.11 wireless frequencies, security type, and the selected channel are displayed for the currently selected wireless access point.

Additionally, the signal level, noise level, and signal-to-noise ratio will be displayed both numerically and as a bar graph, as shown in the image to the right.

- The vertical axis (up/down) of the signal and noise bar graphs represents the signal level of the selected access point. The graph displays a maximum level of 0 dBm (top of graph) and minimum level of -100 dBm (bottom of graph).
- The vertical axis (up/down) of the signal-to-noise bar graph represents the ratio between the signal level of the access point and that of interfering non Wi-Fi noise. The graph displays a maximum level of 100 dB (top of graph) and minimum level of 0 dBm (bottom of graph).

S/N Ratio (dB)	Connectivity	Speed	Overall Quality
> 40	★★★★	★★★★	★★★★
25 to 40	★★★★	★★★	★★★
15 to 25	★★★★	★★	★★
10 to 15	★★★	★	★
5 to 10			

To return to the **Wi-Fi Survey** screen, select the **Back** button on the keypad.

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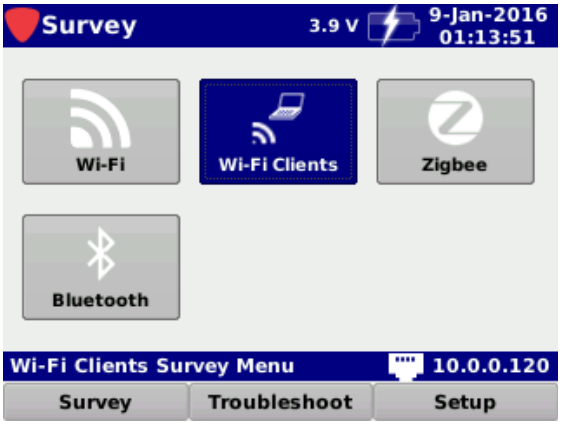
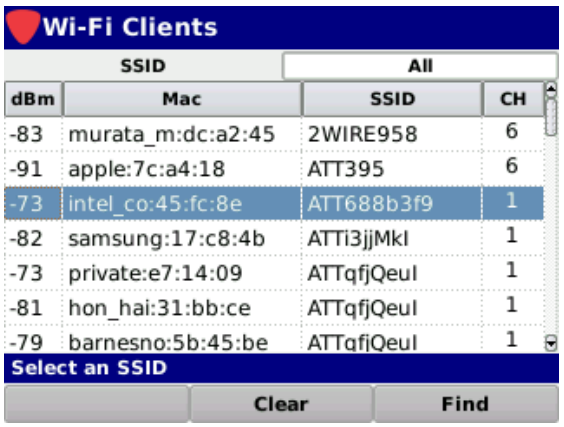
Wi-Fi Client Device Survey

Overview

Select the **Wi-Fi Clients** icon as shown in the image to the right to perform a survey of all Wi-Fi clients broadcasting within range of the 802 AWE.



The **Wi-Fi Clients** screen will be displayed as shown in the image to the right. This display mode shows all Wi-Fi clients broadcasting within range of the 802 AWE in the form of a tabular list with rows and columns.



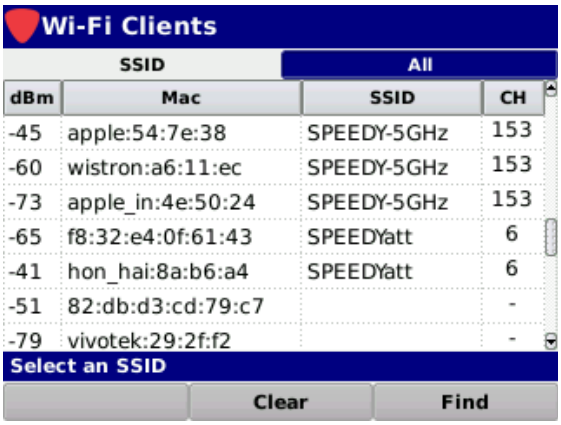
- Use the up/down arrow buttons on the keypad to navigate through the list of Wi-Fi clients. The currently selected Wi-Fi client is highlighted in blue.
- Columns within the table display the following information:
  - **dBm** – Signal Level
  - **Mac** – Client MAC Address
  - **SSID** – Access Point Name
  - **CH** – Wireless Channel
- Select the **Clear** softkey to refresh the list of client devices and remove the Wi-Fi clients that are no longer broadcasting.
- Press the **Enter** key on the keypad to display the client details for the highlighted Wi-Fi client as shown in the image to the right. Press the **Enter** key again to return to the **Wi-Fi Clients** screen.

Filtering Client Devices by SSID

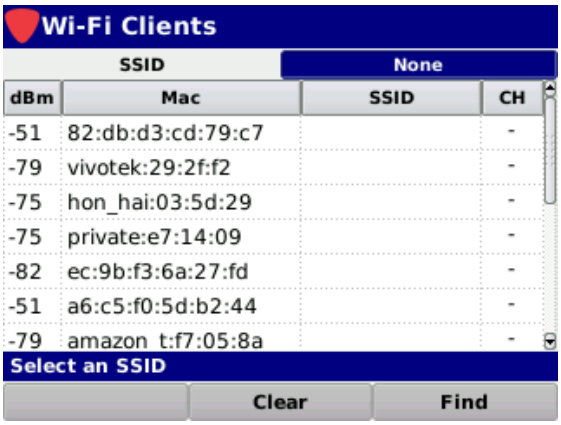
Use the left/right arrow buttons on the keypad to move between the **SSID** field and the body of the table. When the **SSID** field is selected, the field is highlighted in blue as shown in the images below.

Use the up/down arrow buttons on the keypad to select the wireless access point(s) used to filter the list of Wi-Fi clients that are displayed.

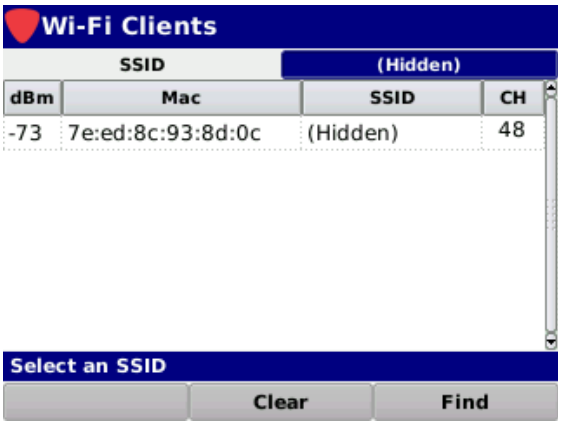
- Selecting **All** within this field will display the client devices for all access points.
- Selecting **None** within this field will display the client devices for all access points without an SSID.
- Selecting **(Hidden)** within this field will display the client devices for all access points with a hidden SSID.
- Selecting the name of a specific network SSID within this field will display the client devices for only that specific access point.



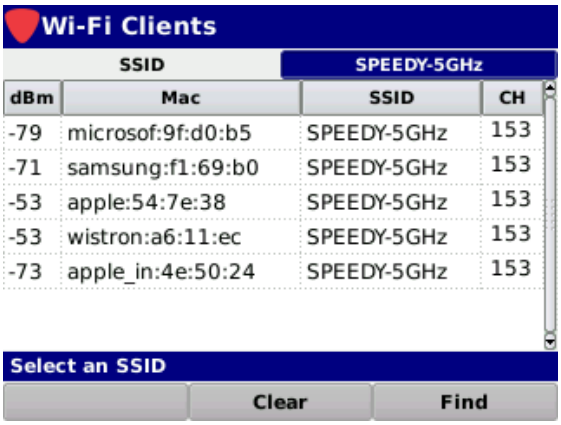
All Access Points



Access Points without SSID



Access Points with Hidden SSID

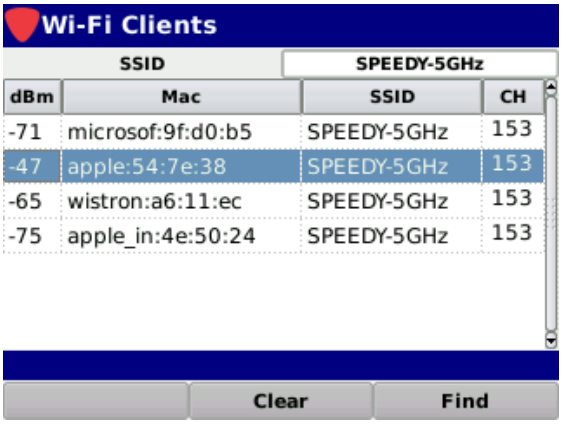


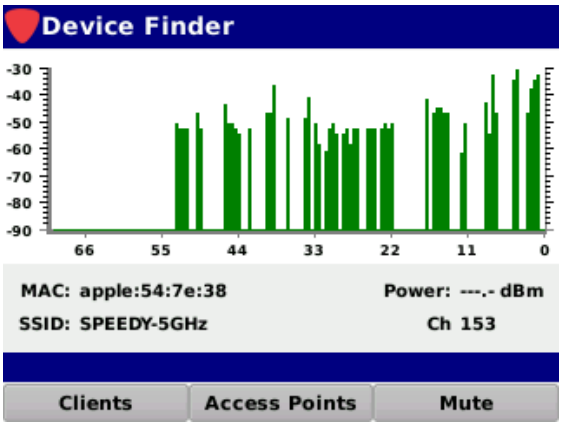
Specific SSID

Finding Devices

Perform the following steps to find the selected device:

1. Use the up/down arrow buttons on the keypad to scroll through the Wi-Fi Clients. The currently selected Wi-Fi client is highlighted in blue as shown in the image to the right.
2. Select the **Find** softkey.
3. The **Device Finder** screen will be displayed as shown in the image to the right.

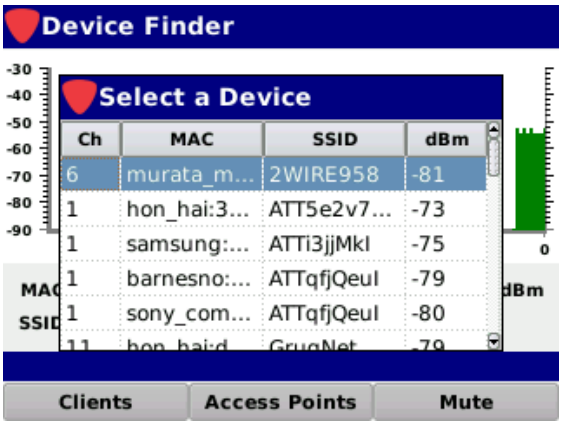




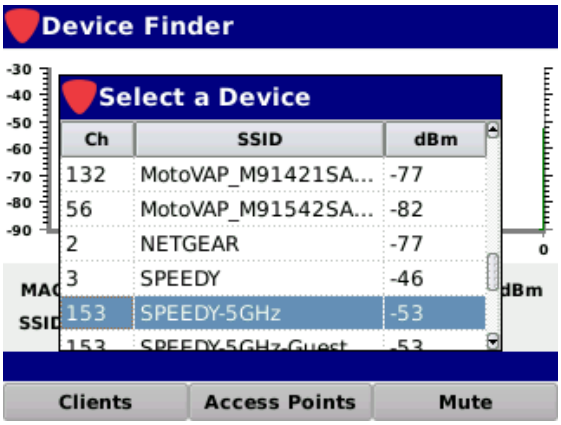
   - This screen displays the following information about the selected device:
     - **MAC** – Device MAC Address
     - **SSID** – Access Point Name
     - **Power** – Signal Power Level
     - **CH** – Wireless Channel
   - The internal speaker of the 802 AWE will emit an audible beeping sound when trying to locate devices.
     - As the user moves closer to the device they are trying to find, the beeping becomes more frequent and increases in tone.
     - When the user moves away from the device, the beeping becomes less frequent and decreases in tone.
     - Select the **Mute** softkey to disable the beeping sound or select the **Unmute** softkey to enable the beeping sound.
   - The vertical axis (up/down) of the graph represents the signal level of the selected device. The graph displays a maximum level of -30 dBm (top of graph) and minimum level of -90 dBm (bottom of graph).
   - The horizontal axis (left/right) of the graph represents the number of measurement samples taken from when you first entered the **Device Finder** screen.

- The measurement samples continuously move from the right side of the graph toward the left hand side of the graph.
- The newest measurement sample is displayed at the far right side of the screen.
- The oldest measurement sample is displayed at the far left side of the screen.
- The graph can display 70 measurement samples over a time period of approximately 45 seconds as shown in the image above.

4. Select the **Clients** or **Access Points** softkeys to open the **Select a Device** screen as shown in the following images.
   - Use the up/down arrow buttons on the keypad to navigate through the list of wireless clients or access points. The currently selected access point is highlighted in blue.
   - Press the **Enter** key on the keypad to select the highlighted client or access point and return to the **Device Finder** screen.



Clients List

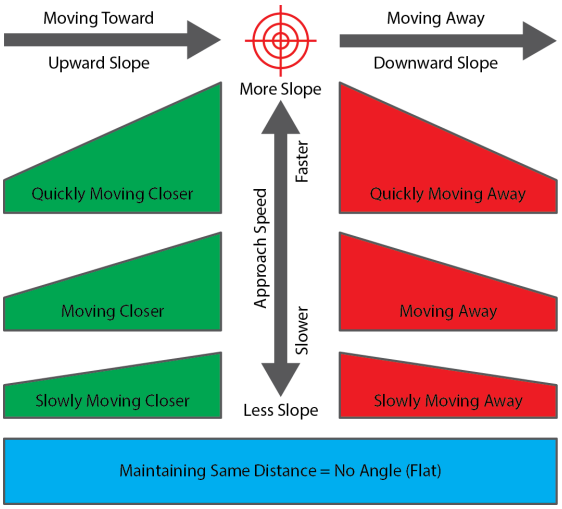


Access Points List

Rules to Follow when Finding Wireless Devices

The illustration shown to the right provides helpful hints on how to properly read the Device Finder graph.

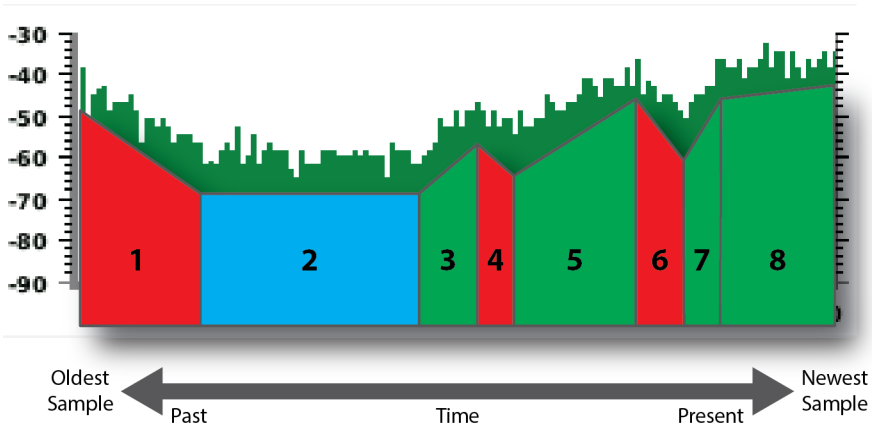
- The graph will display an upward slope when the 802 AWE is moving toward the device you are trying to find.
- The graph will display a downward slope when the 802 AWE is moving away from the device you are trying to find.
- The graph will not display any slope or will appear flat when the 802 AWE is maintaining the same distance from the device you are trying to find.
- The upward or downward slope of the device will have more or less slope based on how quickly you are moving towards or away from the device you are trying to find.



Real World Example of Finding Wireless Devices

The illustration shown below provides a real world example of how to properly read the Device Finder graph.

- During this measurement period, we can identify eight segments of time where the user was getting closer to, farther away, or staying the same distance from the device they were trying to find.
- In segments 1, 4, and 6 the user was in closer proximity to the device they were trying to find at the beginning of the segment than they were at the end of the segment. This is indicated by the downward slope of these segments.
- In segment 2, the user stayed in constant proximity of the device and was neither moving toward or away from the device they were trying to find.
- In segments 3, 5, 7, and 8, the user was in closer proximity to the device that they were trying to find at the end of the segment than they were at the beginning of the segment. This is indicated by the upward slope of these segments.
- In segments 7 and 8, the user was always moving toward the device they were trying to find. However, during segment 7, the user was moving toward the device at a faster rate than they were moving during segment 8. This is indicated by the greater slope of the measurement samples within segment 7, versus those of segment 8, which can be seen to be relatively flat by comparison.



Zigbee Device Survey

Coming Soon

This feature is still in development and will be arriving soon.

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Bluetooth Device Survey

Coming Soon

This feature is still in development and will be arriving soon.

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802 AWE
Advanced Wireless Expert

Section IV: Troubleshoot Menu

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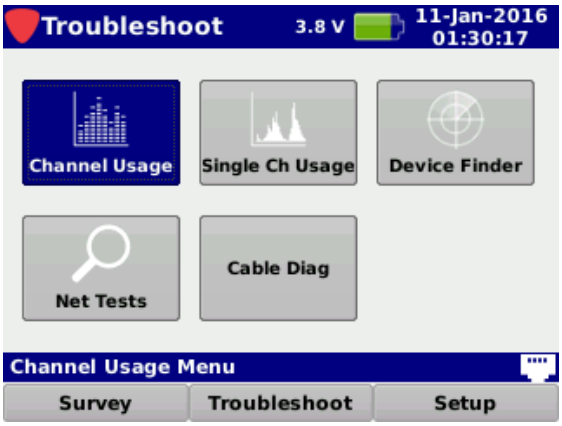
Introduction



Select the **Troubleshoot** softkey to display the **Troubleshoot** menu as shown in the image to the right. This section will provide you with instructions on how to utilize the functions available in the **Troubleshoot** menu of the instrument including:

- **Channel Usage** – This function is used to view the percentage of utilization for both 802.11 and non-802.11 (interference) signals on all channels within the 2.4 GHz and 5 GHz frequency bands.
- **Single Ch Usage** – This function is used to view the percentage of utilization for both 802.11 and non-802.11 (interference) signals on a single channel within the 2.4 GHz and 5 GHz frequency bands.
- **Device Finder** – This function is used to target and find any 2.4 & 5 GHz 802.11 (a/b/g/n/ac) access points or client devices within range of the 802 AWE.
- **Net Tests** – This function is used to perform ping, throughput, and traceroute tests over networks that are connected to the 802 AWE using either the Ethernet or Wi-Fi network connections.
- **Cable Diag** – This function is used to perform diagnostics on cables that are connected to the Ethernet port of the 802 AWE.

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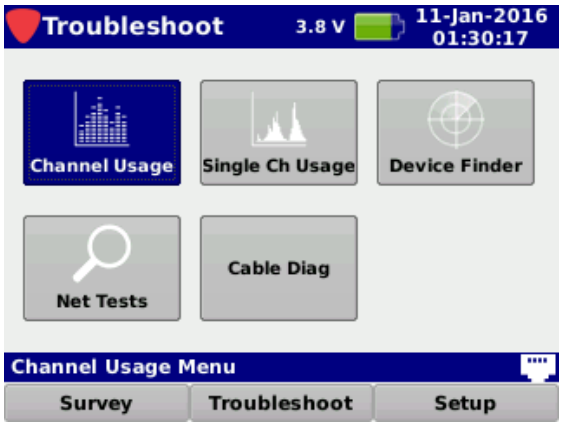
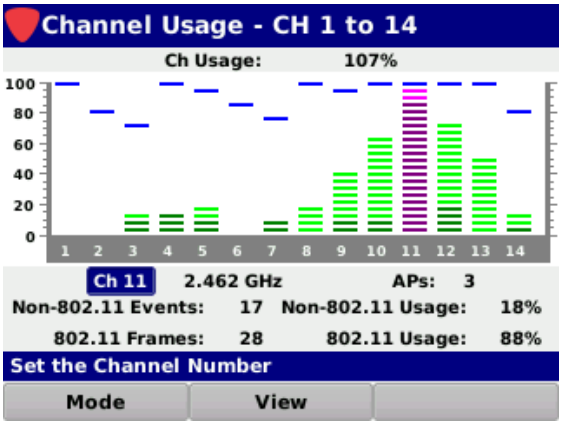
Frequency Band Channel Usage

Overview

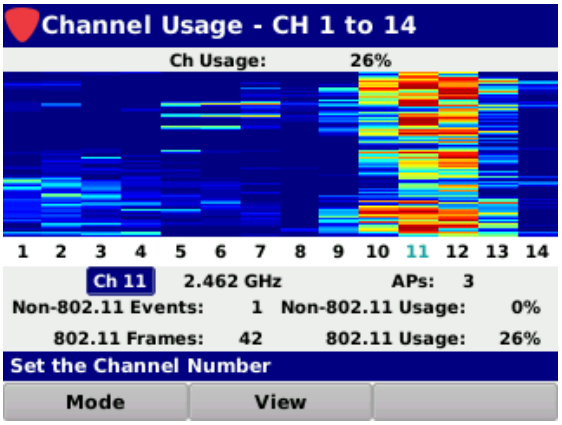
Select the **Channel Usage** icon as shown in the image to the right to view the percentage of utilization for both 802.11 and non-802.11 (interference) signals on all channels within the 2.4 GHz and 5 GHz frequency bands.



The **Wi-Fi Survey** screen will be displayed as shown in one of the following images based on the settings selected by the user the last time the application was used. Each of these screens allow you to select either the 2.4 GHz or 5 GHz display mode and either the bar or waterfall graph view.



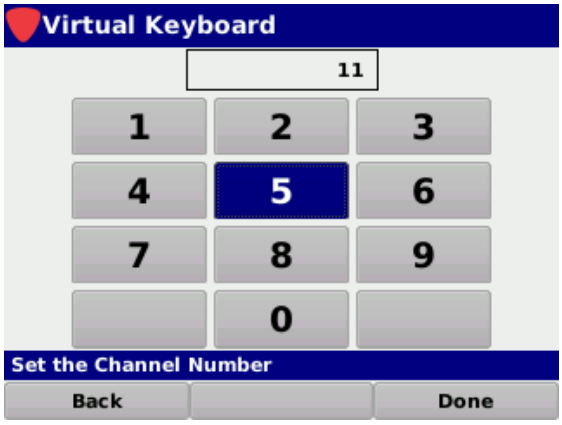
2.4 or 5 GHz Bar Graph

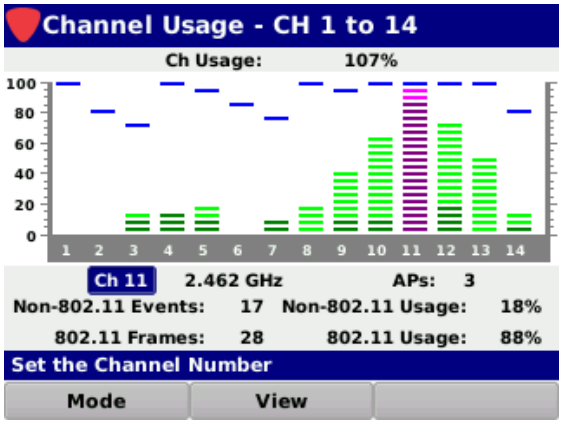


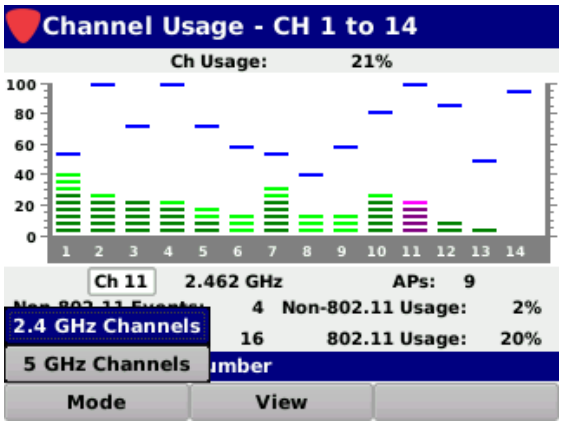
2.4 or 5 GHz Waterfall Graph

From within any of the display modes or graph views of the **Channel Usage** screen;

- The currently selected channel is highlighted in magenta and can be adjusted by:
  - Using the up/down arrow buttons on the keypad
  - Pressing the **Enter** key on the keypad and entering the channel number using the **Virtual Keyboard** as shown in the imageto the right.
- The center frequency of the selected channel and number of access points currently using that channel are displayed to the right of the channel number as shown in the image to the right.
- The following usage measurements for the selected channel are displayed within the main display area:
  - **Ch Usage** – This displays the real-time total percentage of utilization from both 802.11 and non-802.11 sources.
  - **Non-802.11 Events** – This displays the real-time number of events for non-802.11 sources only.
  - **Non-802.11 Usage** – This displays the real-time percentage of utilization for non-802.11 sources only.
  - **802.11 Events** – This displays the real-time number of events for 802.11 sources only.
  - **802.11 Usage** – This displays the real-time percentage of utilization for 802.11 sources only.

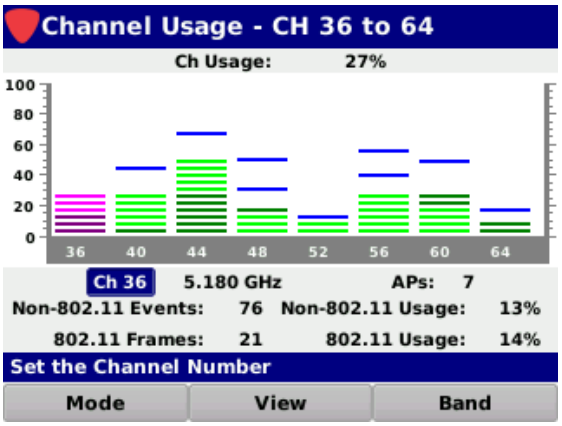




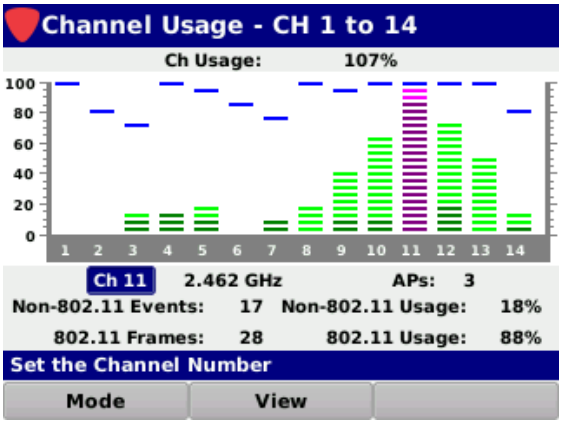


- Select the **Mode** softkey to toggle the display mode between 2.4 GHz and 5 GHz channels**.**

- At any given time, the total percentage utilization for the selected channel is the sum of the individual percentage of utilization components (802.11 and non-802.11).
    - For example, in the image to the right the 802.11 percentage of utilization is 14% and the non-802.11 percentage of utilization is 13%. So, the total percentage of utilization for the selected channel is 27%.



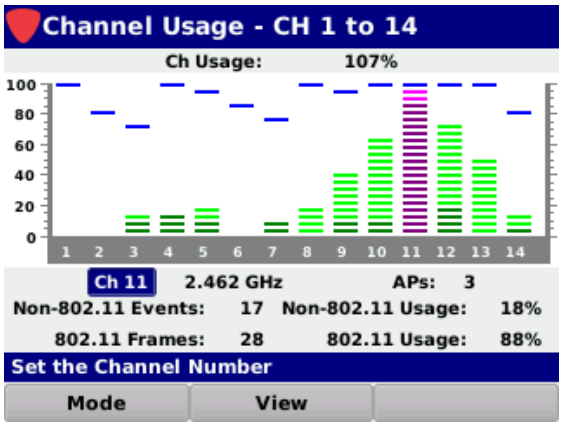
    - In the case where a channel exceeds 100% total utilization, the graph will display the full measurement value of the non-802.11 percentage of utilization as the noise floor, while the remaining space on the graph will be occupied by part of the 802.11 percentage of utilization. In this case, the non-802.11 percentage of utilization acts as a noise floor that squeezes out the desired 802.11 percentage of utilization.
        - For example, in the image to the right the 802.11 percentage of utilization is 18% and the non-802.11 percentage of utilization is 88%. So, the total percentage of utilization is actually 106%, which exceeds the maximum percentage of utilization (100%).

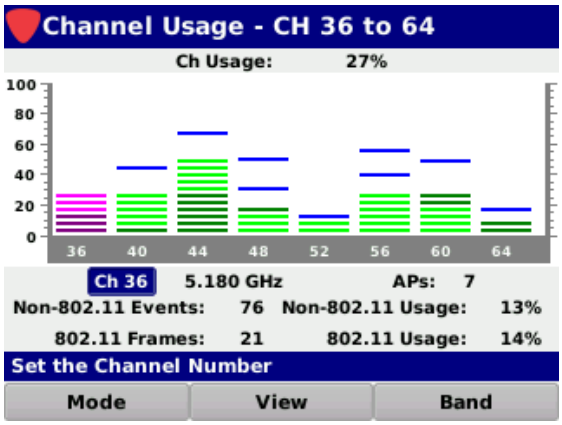


        - The remaining 802.11 percentage of utilization (6%) is squeezed out of the graph by the non-802.11 percentage of utilization and will not be displayed.

Bar Graph Display Mode

This display mode shows the percentage of utilization for all channels within a selected frequency band in the form of a bar graph.

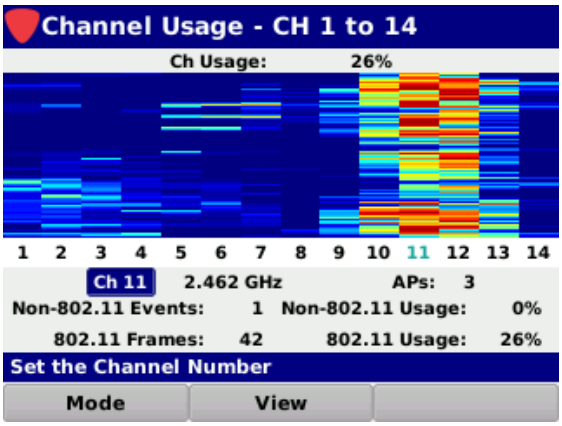




- The horizontal axis (left/right) of the graph represents the individual channels within the selected frequency band.
- The bar graph of the currently selected channel will be displayed in shades of purple, while all other channels will appear in shades of green.
- The vertical axis (up/down) of the graph represents the total percentage of utilization for the channel within the 2.4 GHz frequency band.
  - The graph displays a maximum level of 100% (top of graph) and minimum level of 0% (bottom of graph).
  - Each column within the graph will appear in shades of either green or purple.
- Each horizontal bar within a column of the graph represents approximately 5% utilization and is color coded as follows:
  - Horizontal bars of these darker colors correspond to the measurement value displayed by the **802.11 Usage** field. When present, these darker bars will always appear at the bottom of the column.
  - Horizontal bars of these lighter colors correspond to the measurement value displayed by the **non-802.11 Usage** field. When darker bars are present, the lighter bars will be placed at the top of the column.
  - Horizontal bars in blue always appear at the top of the column and represent the maximum total percentage of utilization that was recorded during the sampling period.
- When the display mode is set to **5 GHz Channels**, use the **Band** softkey to toggle between the three different 5 GHz wireless frequency bands.

Waterfall Graph Display Mode

This display mode shows the percentage of utilization over time for all channels within a selected frequency band in the form of a waterfall graph.

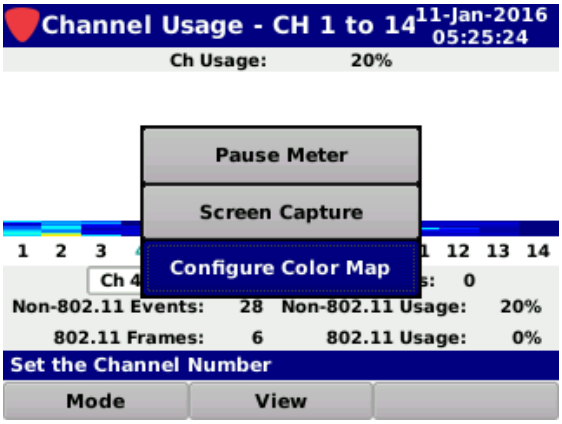


- The horizontal axis (left/right) of the graph represents the individual channels within the selected frequency band.
- Below the graph, the channel number that is currently selected will be highlighted in light blue while all other channels numbers will appear black.
- The vertical axis (up/down) of the graph represents the number of measurement samples taken from when you first entered the **Channel Usage** screen. The graph displays the oldest samples at the top of the graph and the newest samples at the bottom of the graph.
- When the display mode is set to **5 GHz Channels**, use the **Band** softkey to toggle between the three different 5 GHz wireless frequency bands.

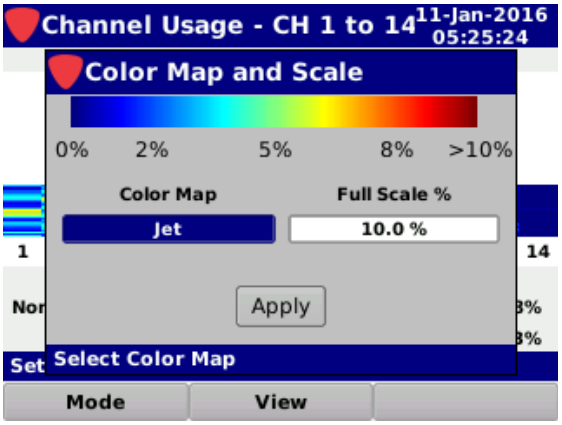
Color Settings

The color coding for the horizontal bars within the columns of the graph is user configurable.

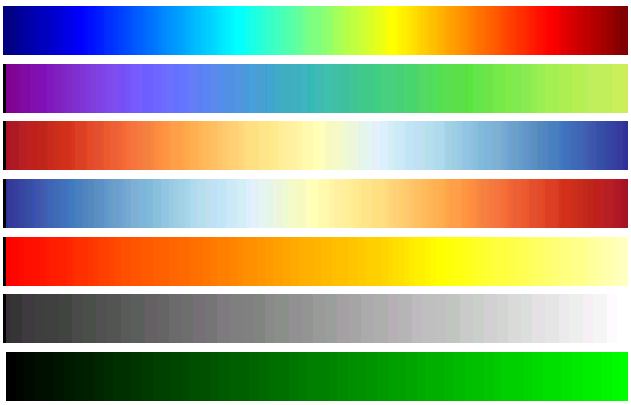
- To modify the color coding, press the **Function** button and select **Configure Color Map** from the **Function** menu as shown in the image to the right.



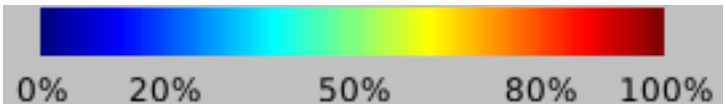
- The **Color Map and Scale** window will be displayed as shown in the image to the right.



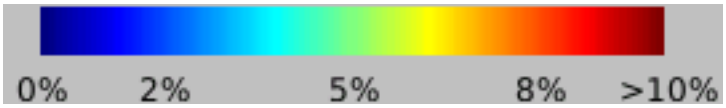
- To adjust the color scheme, use the left/right arrow buttons on the keypad to highlight the **Color Map** field. Then, use the up/down arrow buttons on the keypad to select from the following color schemes:
  - Jet
  - Rainbow
  - Red Yellow Blue
  - Blue Yellow Red
  - Heat
  - Black to White
  - Black to Green



- To adjust the maximum percentage of utilization that is displayed within the graph, use the left/right arrow buttons on the keypad to highlight the **Full Scale %** field. Then, use the up/down arrow buttons on the keypad to adjust the maximum value.



Maximum Value = 100%

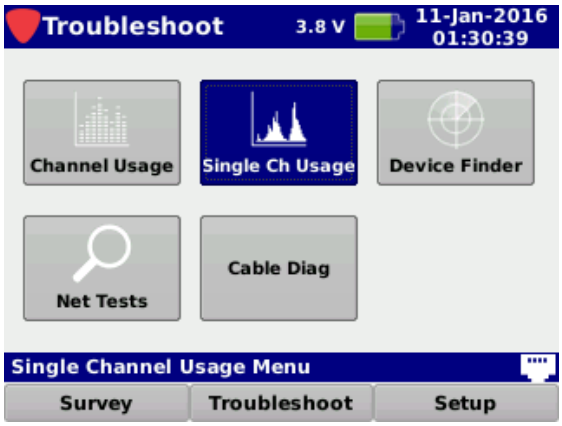


Maximum Value = 10%

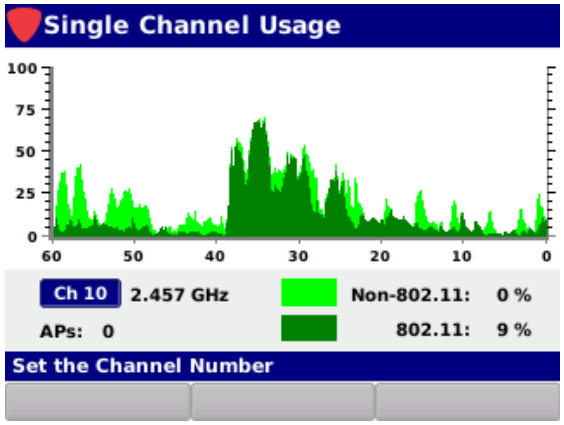
Single Channel Usage

Overview

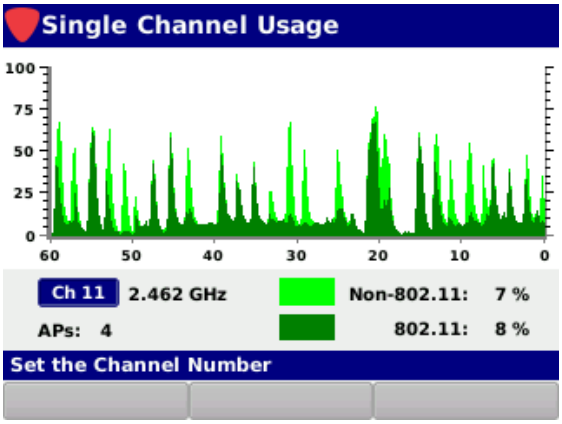
Select the **Single Ch Usage** icon as shown in the image to the right to view the percentage of utilization for both 802.11 and non-802.11 (interference) signals on a single channel within the 2.4 GHz and 5 GHz frequency bands.



The **Single Channel Usage** screen will be displayed as shown in the image to the right. Each of these screens allows you to select a single 2.4 GHz or 5 GHz wireless channel.

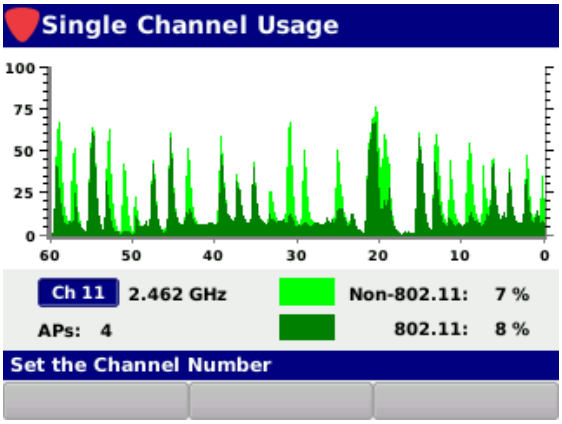


The **Single Channel Usage** screen shows the percentage of utilization over time for a single channel in the form of an area graph.



- The horizontal axis (left/right) of the graph represents the last sixty seconds of measurements. The graph displays the oldest samples at the left of the graph (60 seconds) and the newest samples at the right of the graph (0 seconds or current time).
- The vertical axis (up/down) of the graph represents the total percentage of utilization for the selected channel.
    - The graph displays a maximum level of 100% (top of graph) and minimum level of 0% (bottom of graph).
    - The percentage of utilization within the graph will appear in shades of green as follows:
        - This darker color corresponds to the measurement value displayed by the **802.11** field. When present, this darker 802.11 percentage of utilization will always appear at the bottom of the graph.
        - This lighter color corresponds to the measurement value displayed by the **non-802.11** field. When the darker non-802.11 percentage of utilization is present, the lighter 802.11 percentage of utilization will be placed at the top of the graph.
- Below the graph, the channel number that is currently selected will be highlighted in blue and the number of access points using this channel will also be displayed.

- At any given time, the total percentage utilization for the selected channel is the sum of the individual percentage of utilization components (802.11 and non-802.11). However, the total percentage of utilization cannot exceed 100%
    - For example, in the image to the right the 802.11 percentage of utilization is 8% and the non-802.11 percentage of utilization is 7%. So, the total percentage of utilization for the selected channel is 15%.



    - In the case where a channel exceeds 100% total utilization, the graph will display the full measurement value of the non-802.11 percentage of utilization as the noise floor, while the remaining space on the graph will be occupied by part of the 802.11 percentage of utilization. In this case, the non-802.11 percentage of utilization acts as a noise floor that squeezes out the desired 802.11 percentage of utilization.
        - For example, the 802.11 percentage of utilization is 74% and the non-802.11 percentage of utilization is 48%. So, the total percentage of utilization is actually 122%, which exceeds the maximum percentage of utilization (100%).
        - In this example, the full percentage of utilization for non-802.11 signals (48%) is displayed at the bottom of the graph and the remaining space on the graph will be filled with the 802.11 percentage of utilization (52%).
        - The remaining 802.11 percentage of utilization (22%) is squeezed out of the graph by the non-802.11 percentage of utilization and will not be displayed.

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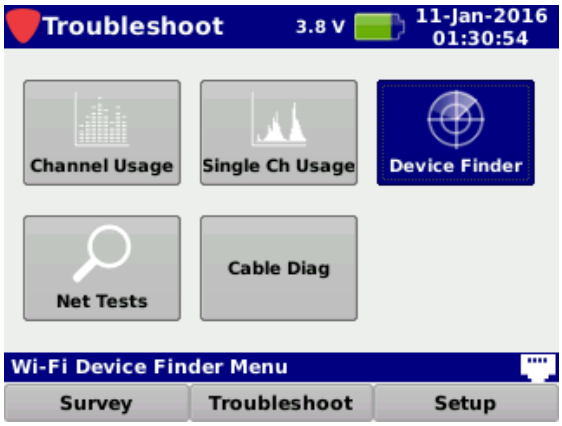
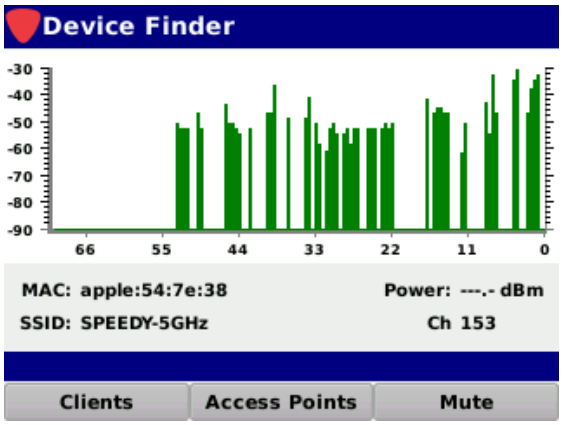
Device Finder

Overview

Select the **Device Finder** icon as shown in the image to the right to find access points and client devices that are currently broadcasting within the 2.4 GHz and 5 GHz frequency bands.

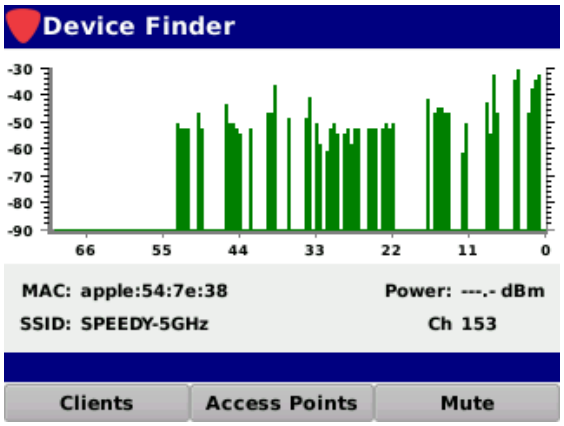


The **Device Finder** screen will be displayed as shown in the image to the right.



Finding Devices

The **Device Finder** screen shows the signal level over time for a single device in the form of a bar graph.



- The vertical axis (up/down) of the graph represents the signal level of the selected device. The graph displays a maximum level of -30 dBm (top of graph) and minimum level of -90 dBm (bottom of graph).
- The horizontal axis (left/right) of the graph represents the number of measurement samples taken from when you first entered the **Device Finder** screen or selected a new device.

This screen displays the following information about the selected device:

- **MAC** – Device MAC Address
- **SSID** – Access Point Name
- **Power** – Signal Power Level
- **CH** – Wireless Channel

The internal speaker of the 802 AWE will emit an audible beeping sound when trying to locate devices.

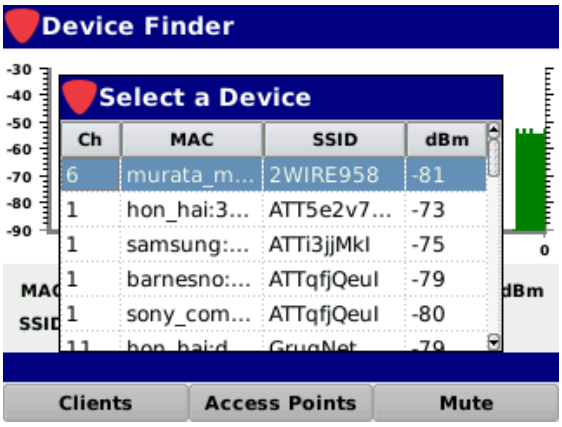
- As the user moves closer to the device they are trying to find, the beeping becomes more frequent and increases in tone.
- When the user moves away from the device, the beeping becomes less frequent and decreases in tone.
- Select the **Mute** softkey to disable the beeping sound or select the **Unmute** softkey to enable the beeping sound.

The measurement samples continuously move from the right side of the graph toward the left side of the graph.

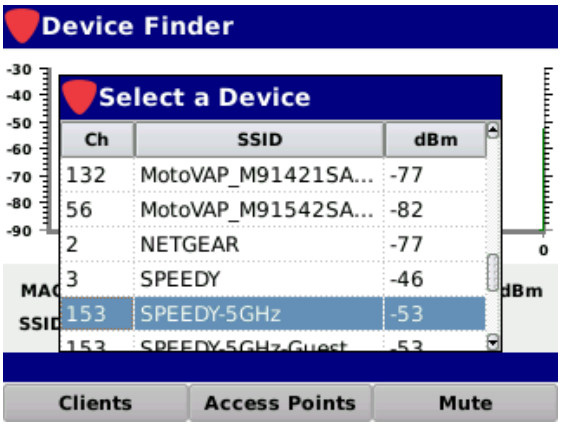
- The newest measurement sample is displayed at the far right side of the screen.
- The oldest measurement sample is displayed at the far left side of the screen.
- The graph can display 70 measurement samples over a time period of approximately 45 seconds, as shown in the image above.

Select the **Clients** or **Access Points** softkeys to open the **Select a Device** screen as shown in the following images.

- Use the up/down arrow buttons on the keypad to navigate through the list of wireless clients or access points. The currently selected access point is highlighted in blue.
- Press the **Enter** key on the keypad to select the highlighted client or access point and return to the **Device Finder** screen.



Clients List

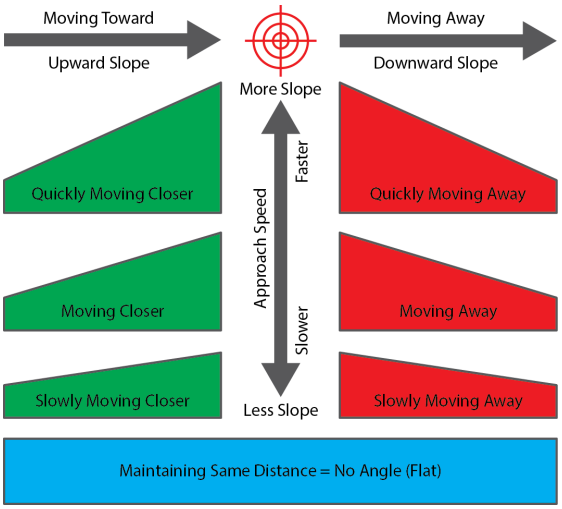


Access Points List

Rules to Follow when Finding Wireless Devices

The illustration shown to the right provides helpful hints on how to properly read the Device Finder graph.

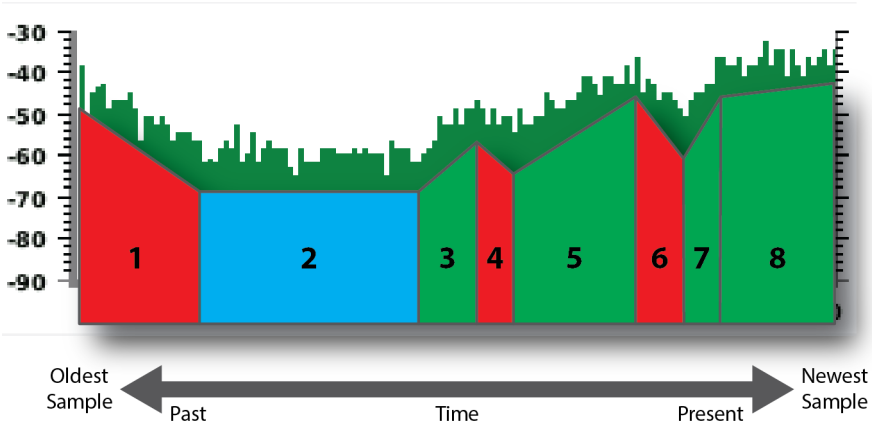
- The graph will display an upward slope when the 802 AWE is moving toward the device you are trying to find.
- The graph will display a downward slope when the 802 AWE is moving away from the device you are trying to find.
- The graph will not display any slope or will appear flat when the 802 AWE is maintaining the same distance from the device you are trying to find.
- The upward or downward slope of the device will have more or less slope based on how quickly you are moving towards or away from the device you are trying to find.



Real World Example of Finding Wireless Devices

The illustration shown below provides a real world example of how to properly read the Device Finder graph.

- During this measurement period, we can identify eight segments of time where the user was getting closer to, farther away, or staying the same distance from the device they were trying to find.
- In segments 1, 4, and 6 the user was in closer proximity to the device they were trying to find at the beginning of the segment than they were at the end of the segment. This is indicated by the downward slope of these segments.
- In segment 2, the user stayed in constant proximity of the device and was neither moving toward or away from the device they were trying to find.
- In segments 3, 5, 7, and 8, the user was in closer proximity to the device that they were trying to find at the end of the segment than they were at the beginning of the segment. This is indicated by the upward slope of these segments.
- In segments 7 and 8, the user was always moving toward the device they were trying to find. However, during segment 7, the user was moving toward the device at a faster rate than they were moving during segment 8. This is indicated by the greater slope of the measurement samples within segment 7, versus those of segment 8, which can be seen to be relatively flat by comparison.



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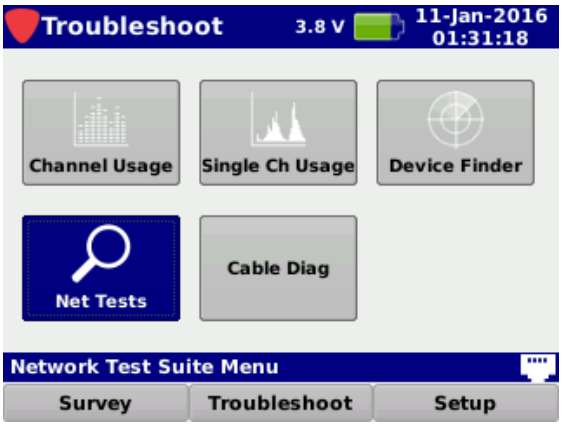
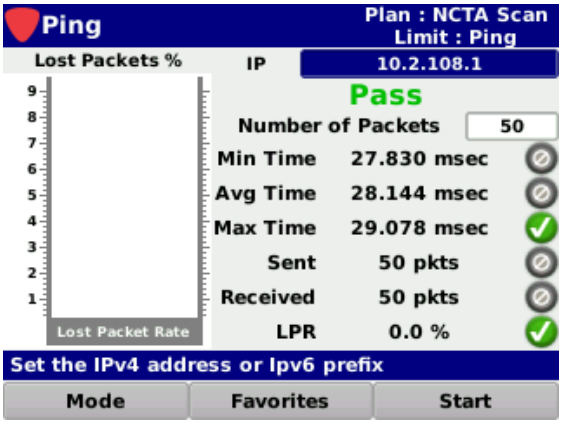
Overview

The Network Test Suite is used to perform network tests that include Ping, Trouceroute, and Throughput tests. Select the **Net Tests** icon as shown in the image to the right to perform network tests using either the Ethernet or Wi-Fi network connections of the 802 AWE.



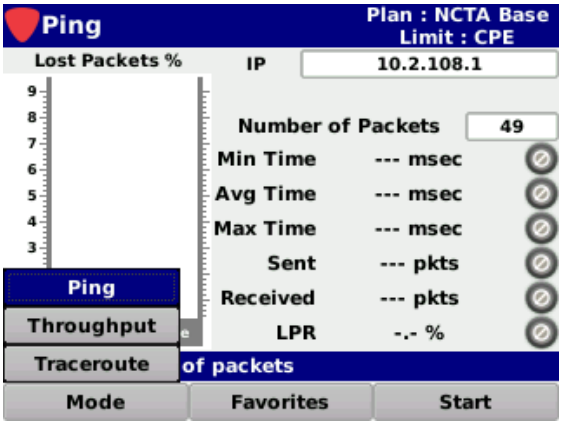
The **Network Tests** screen will be displayed as shown in the image to the right. This screen displays a measurement bar graph specific to the type of measurement, along with relevant measurement values.

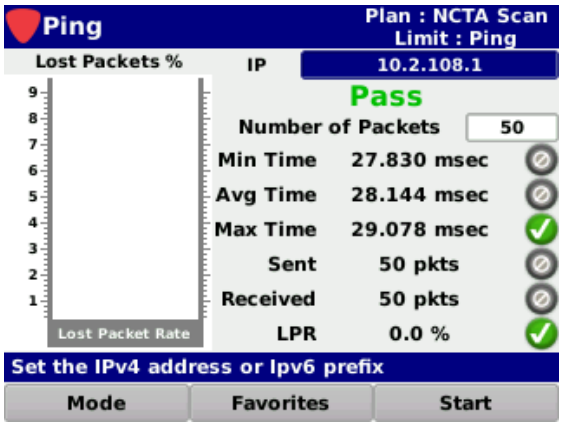


Selecting the Test Mode

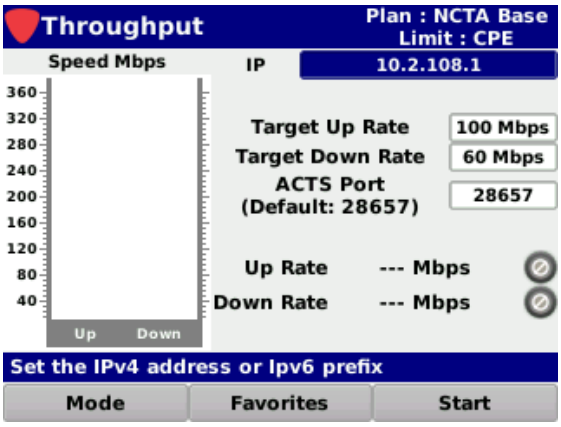
Select the **Mode** softkey to choose from the following network tests:

- Ping
- Throughput
- Traceroute

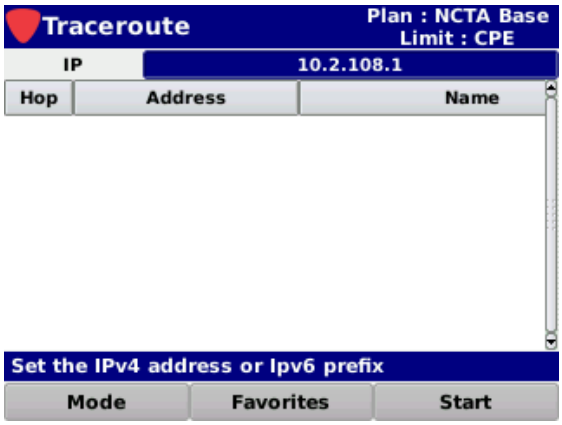




Ping



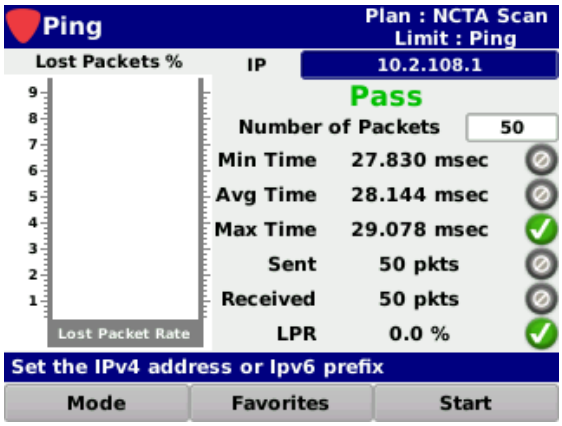
Throughput



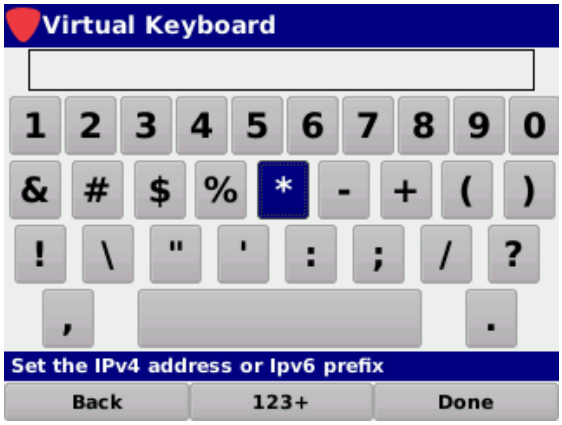
Traceroute

Setting the Destination IP Address

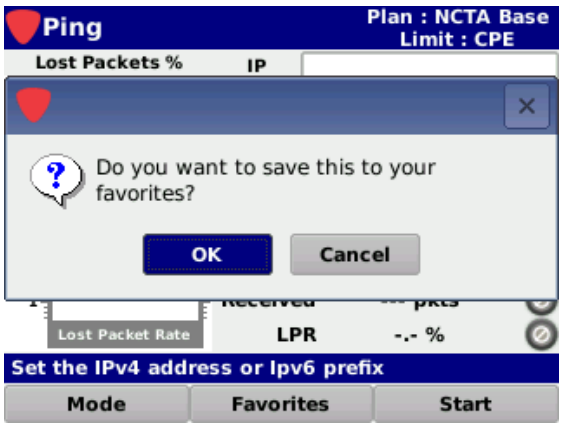
To manually enter the destination IP address for the network testing, highlight the **IP** field as shown in the image to the right.



Then, press the **Enter** button and use the **Virtual Keyboard** to directly enter the IP address as shown in the image to the right.



After selecting the **Done** softkey, a confirmation window will be displayed as shown in the image to the right. Select the **OK** button to save the location to your favorites or select the **Cancel** button to accept the changes without saving to your favorites.

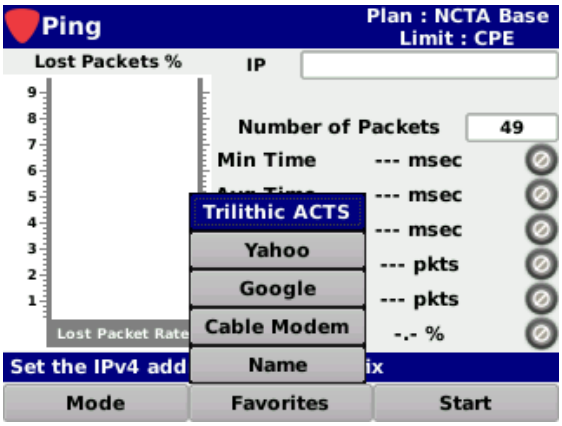


Selecting a Favorite

After entering a destination IP address as shown in the previous section, the 802 AWE allows you to save the entered IP address as a favorite location for quick and easy access.

Select the **Favorites** softkey to view a list of up to six (6) favorite destination IP addresses.

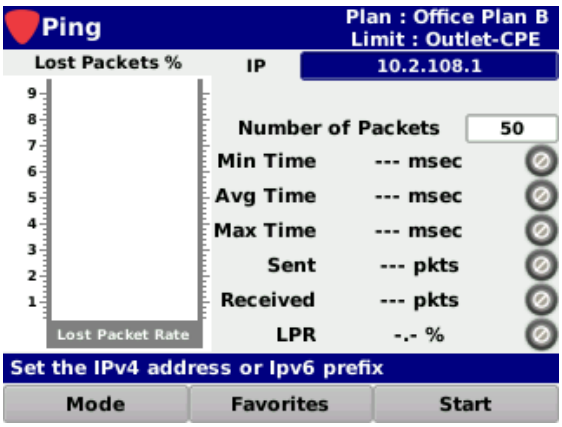
From the **Favorites** pop-up menu, select the name of the favorite to use for testing. The IP address or URL of the selected location will be entered automatically in the **IP** field.

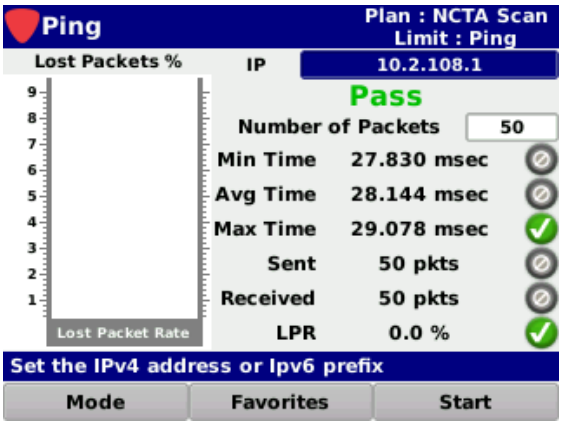


Executing Network Tests

After entering a destination IP address or selecting a favorite, select the **Start** softkey to execute the selected test.

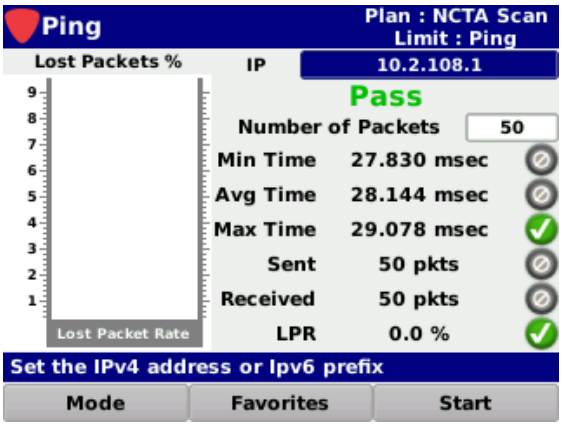
The 802 AWE will display the measurement results for each test mode as shown in the following sections.





Ping Mode

When the **Ping** mode is selected, the following measurement results are displayed as shown in the image to the right:

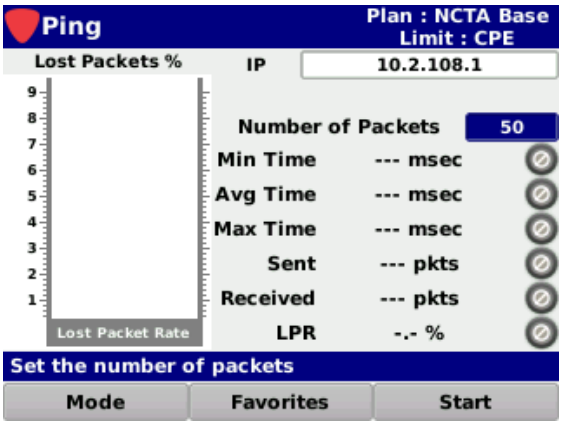


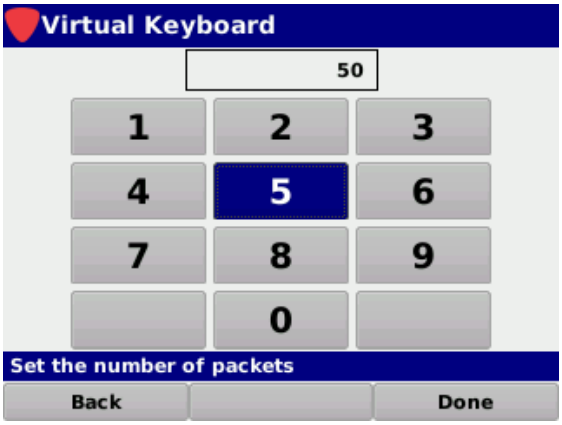
- **Minimum Time** – This is the minimum time required to send/receive a single test packet.
- **Average Time** – This is the average time required to send/receive all test packets.
- **Maximum Time** – This is the maximum time required to send/receive a single test packet.
- **Sent** – This is the number of packets sent by the 802 AWE to the destination IP address.
- **Received** – This is the number of packets received by the 802 AWE from the destination IP address.
- **LPR** – This is the lost packet ratio. This measurement is displayed in the bar graph and as a numeric value. The LPR is calculated as the percentage of packets received to those which were sent (LPR = {Received Packets / Sent Packets} * 100%), for example:
    - 50 sent packets
    - 25 received packets
    - LPR = {25 / 50} * 100%
      {0.50} * 100%
      50%

Setting the Number of Packets

To manually enter the number of packets for the ping test, highlight the **Number of Packets** field as shown in the image to the right and then use either of the following methods to change the packet number:

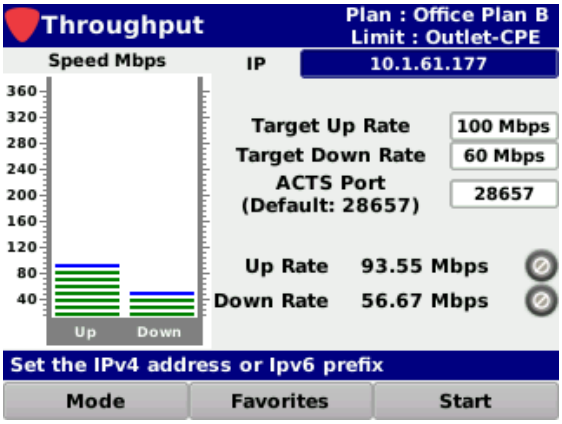
- Use the up/down arrow buttons to adjust the number in 1 packet increments.
- Press the **Enter** button and use the **Virtual Keyboard** to directly enter the number of packets as shown in the image to the right.





Throughput Mode

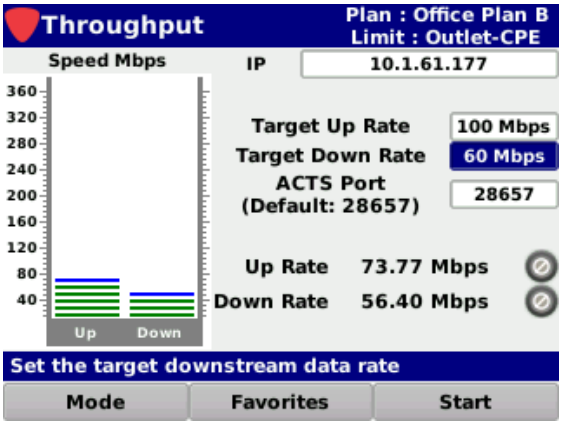
When the **Throughput** mode is selected, the following measurement results are displayed as shown in the image to the right:



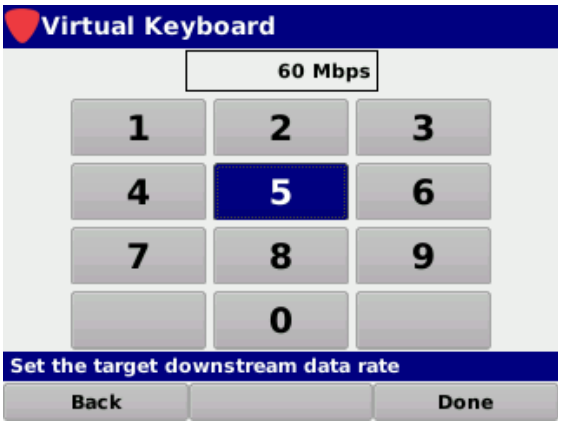
- **Target Up Rate** – This is the up stream data rate. This measurement is displayed in the bar graph and as a numeric value. This value is fixed.
- **Target Down Rate** – This is the down stream data rate. This measurement is displayed in the bar graph and as a numeric value.

Setting the Target Downstream Rate

To manually enter the target downstream rate for the throughput test, highlight the **Target Down Rate** field as shown in the image to the right and then use either of the following methods to change the target downstream rate:



- Use the up/down arrow buttons to adjust the rate in 1 Mbps increments.
- Press the **Enter** button and use the **Virtual Keyboard** to directly enter the target downstream rate as shown in the image to the right.

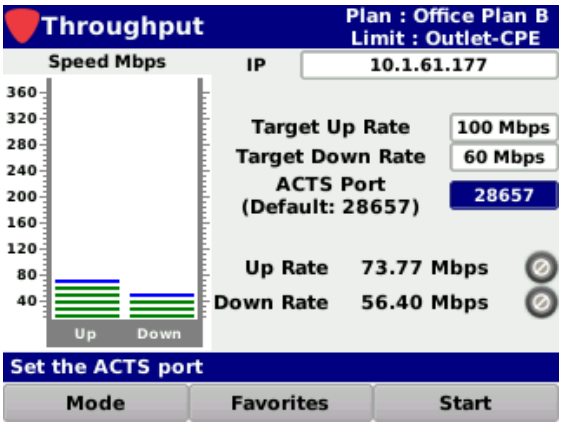


Setting the ACTS Port

To manually enter the ACTS server port for the throughput test, highlight the **ACTS Port** field as shown in the image to the right and then use either of the following methods to change the port:

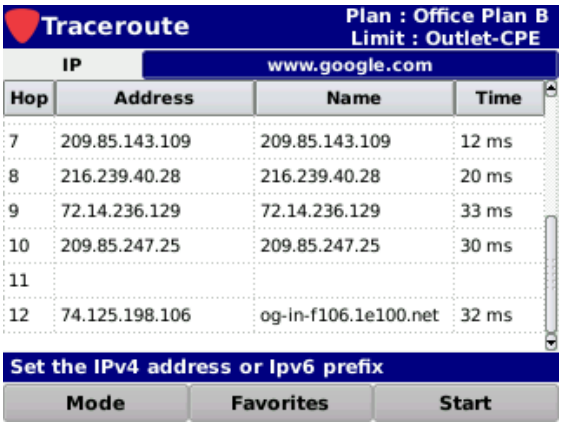
- Use the up/down arrow buttons to adjust the port number.
- Press the **Enter** button and use the **Virtual Keyboard** to directly enter the ACTS port as shown in the image to the right.

The default ACTS port is set to **28657**.



Traceroute

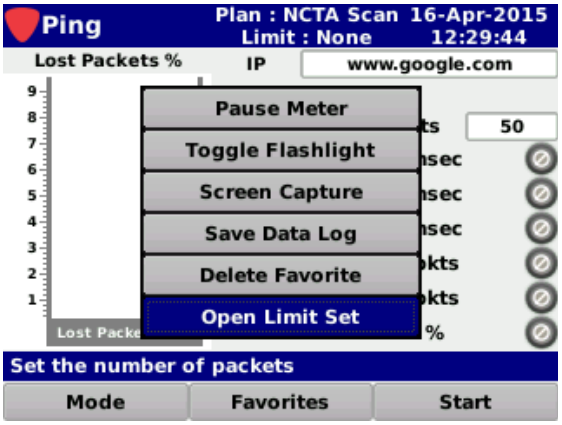
When the **Traceroute** mode is selected, the following measurement results are displayed as shown in the image to the right:



- **Hop** – This is the number of the intermediary point (hop) in the route between the meter and the destination address.
- **Address** – This is the IP address of the corresponding intermediary point (hop).
- **Name** – This is the name of the corresponding intermediary point (hop).
- **Time** – This is the time to each intermediary point (hop).

Opening a Limit Set

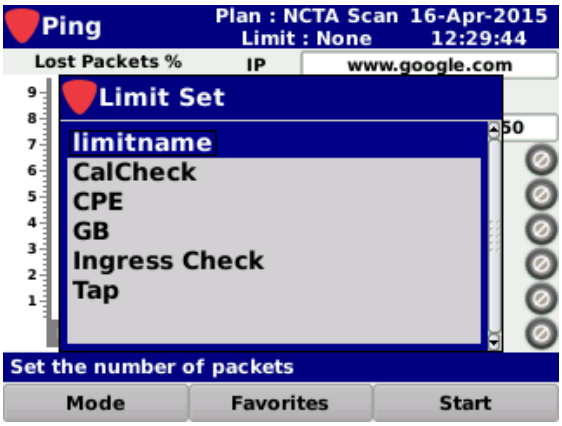
Select the **Open Limit Set** button in the **Function** menu as shown in the image to the right to select the limit set to use for the network testing.



The **Limit Set** window will be displayed as shown in the image to the right.

From the **Limit Set** window, select the name of the limit set to use for the network testing.

After selecting the limit set, the **Network Tests** screen will be displayed again.

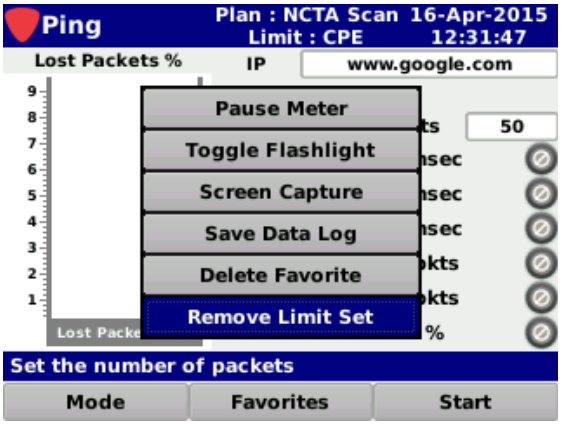


NOTE

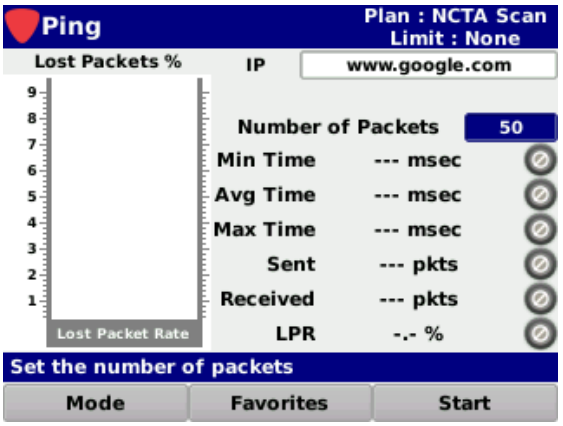
The Limit Set window will be bypassed if there is only one limit set to choose from.

Removing a Limit Set

Select the **Remove Limit Set** button in the **Function** menu as shown in the image to the right to remove the limit set for the network testing.



The pass/fail results will no longer be displayed as shown in the image to the right.



Pass/Fail Measurement Indicators

When a limit set has been opened, the network tests will be tested against the current limit set. When any of the individual measurement parameters of a network tests fail, the network tests as a whole will indicate a Fail status.

A Pass/Fail status will be displayed next to each measurement parameter. The pass/fail status of the network tests will be indicated using the following icons:

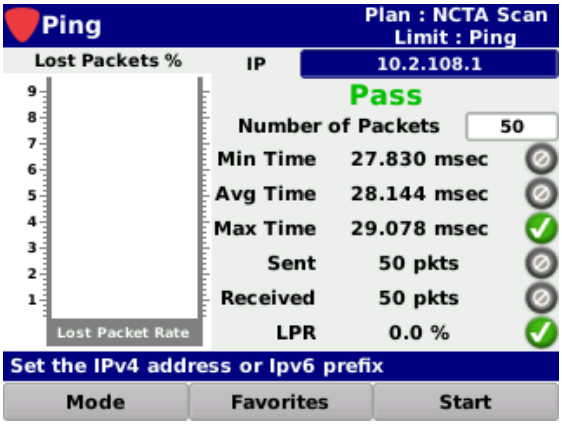
This icon indicates that this measurement was skipped. This only applies to measurements that have been removed from the currently selected limit set.

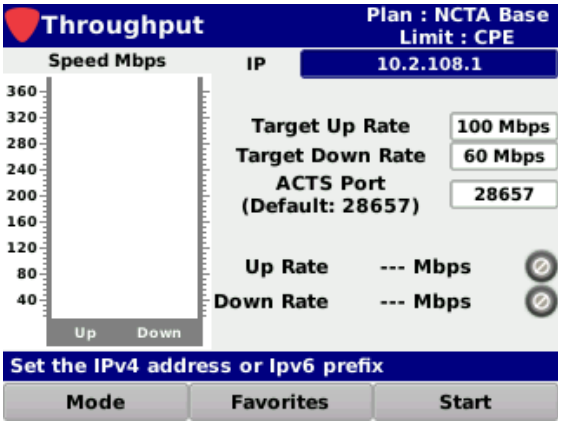
This icon indicates that this measurement is within the measurement thresholds of the currently selected limit set.

This icon indicates that the measurement limit set has failed.

This icon indicates that the measurement has failed the high limit measurement threshold.

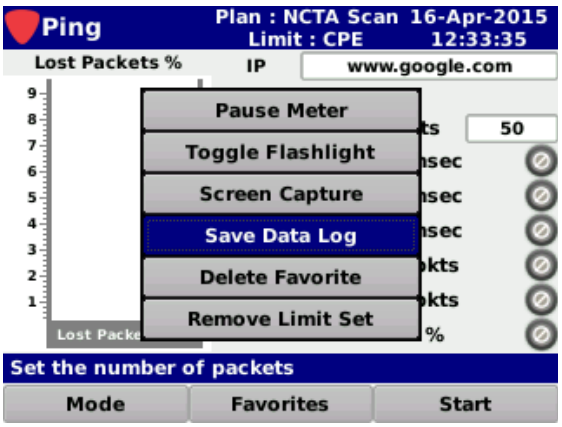
This icon indicates that the measurement has failed the low limit measurement threshold.





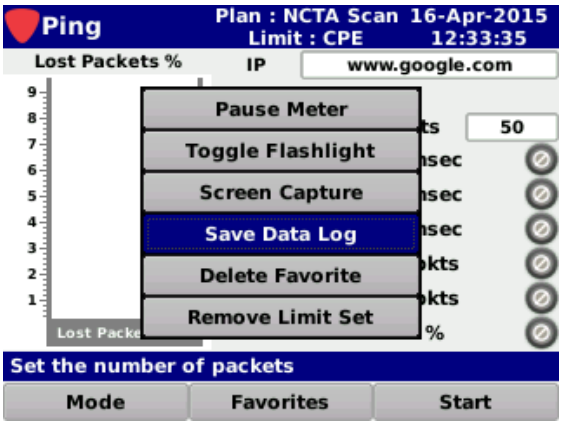
Function Menu Options

Additional functions can be accessed from within the **Network Tests** screen by pressing the **Function** button. The **Function** menu will be displayed as shown in the image to the right and includes the following functions specifically for the **Network Tests** screen.

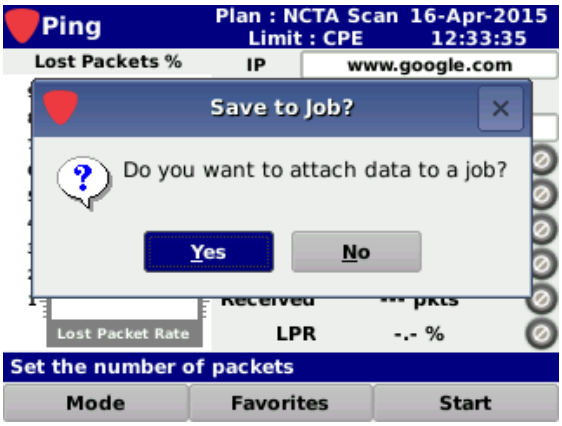


Save Data Log

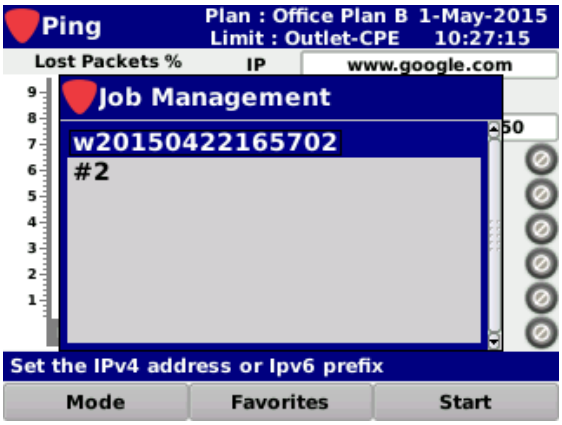
Select the **Save Data Log** button from the **Function** menu to save a copy of the measurement result data log.



If you have an open job, you can also save the test to the job by selecting **Yes**.



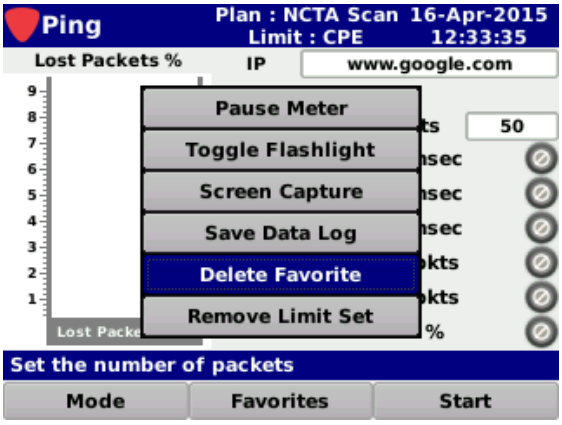
If you have multiple open jobs, the **Job Management** window will be displayed. Choose the job you would like to save the log to.



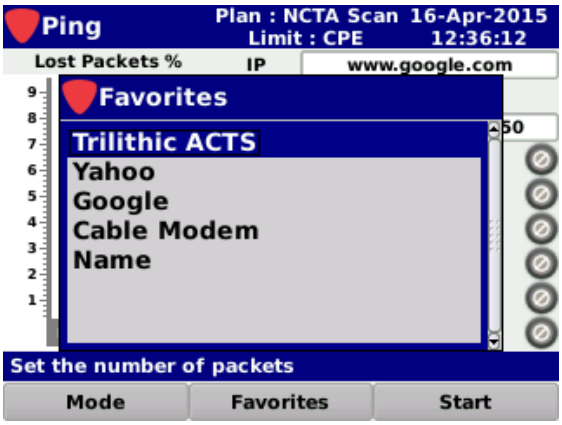
If you don't want to save the test to the open job, select **No** and you will be prompted to enter a file name using the **Virtual Keyboard**. It will then be saved to the internal memory of the 802 AWE.

Delete Favorites

Select the **Delete Favorite** button from the **Function** menu to delete any one of the six available favorites.



The **Favorites** window will be displayed as shown in the image to the right. Select the name of the favorite you want to delete.



NOTE

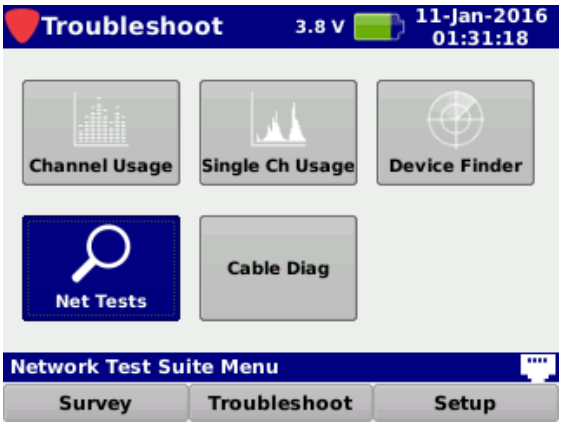
The Open Limit Set and Remove Limit Set buttons in the Function menu were covered previously. For more information, see these sections earlier in this chapter.

Chapter 6

Cable Diagnostics

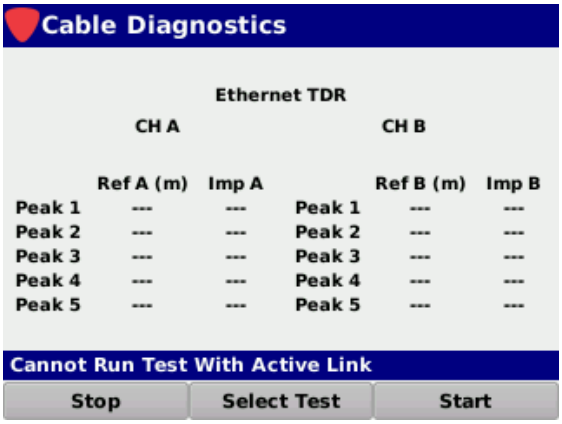
Overview

The Cable Diagnostics Test Suite of the 802 AWE is used to perform cable diagnostics tests on Ethernet cables connected to the 802 AWE. Select the **Cable Diag** icon as shown in the image to the right to perform cable diagnostics testing.



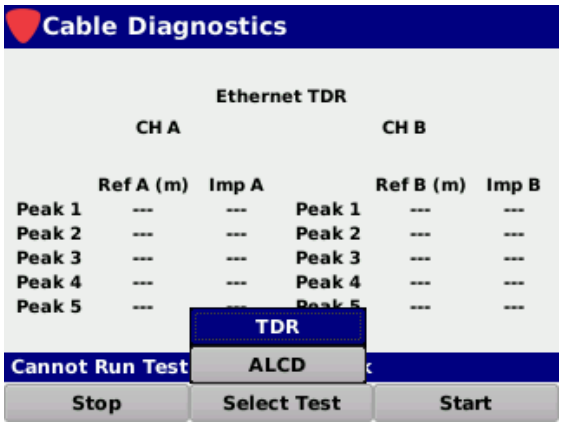
The **Cable Diagnostics** screen will be displayed as shown in the image to the right. The following measurements can be performed from this screen:

- Time Domain Reflectometry (TDR)
- Active Link Cable Diagnostic (ALCD)

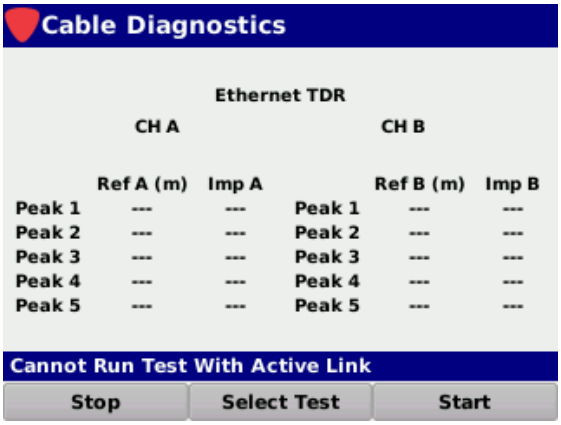


Selecting the Test Type

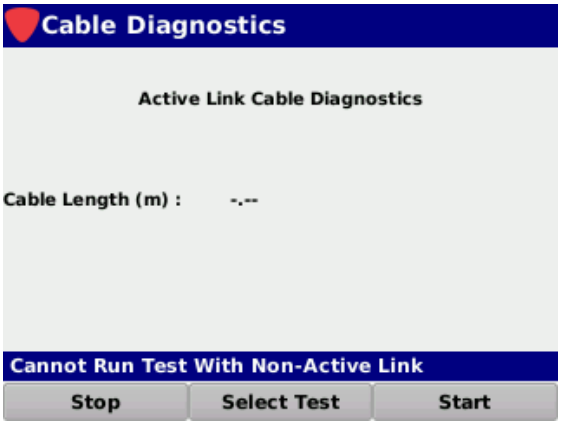
Select the **Select Test** softkey to choose between the following types of cable diagnostic tests:



- **TDR** – This test is performed over an inactive cable and uses Time Domain Reflectometry (TDR) to determine the quality of the cables, connectors, and terminations in addition to estimation of the cable length. Some of the possible problems that can be diagnosed include opens, shorts, cable impedance mismatch, bad connectors, termination mismatches, and any other discontinuities on the cable.
- **ALCD** – This test is performed over an active cable that uses a passive measurement method to estimate the cable length present during an active link.



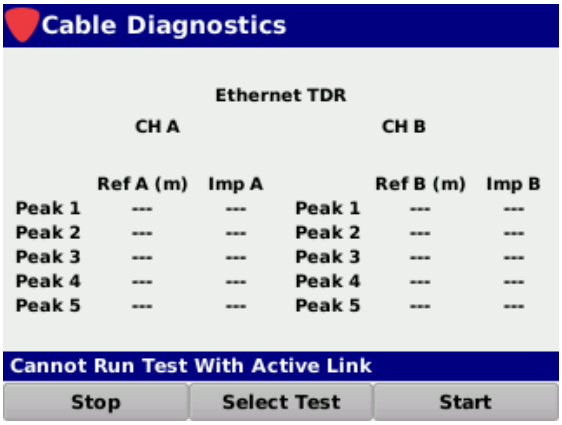
TDR



ALCD

Ethernet TDR

The Ethernet TDR function of the 802 AWE device transmits a test pulse of known amplitude (1V) down both Channel A and Channel B (twisted pairs 1,2 & 3,6) of an attached cable. The transmitted signal travels down each pair of cables and reflects from each cable imperfection, fault, bad connector and the end of the cable itself.



After the pulse transmission, the 802 AWE measures the return time and amplitude of all these reflected pulses and displays the following measurement values:

- **Ref** – This is the distance to a fault measured in meters with an accuracy of ±1m.
- **Imp** – This is the impedance type of the detected fault. The values that can be displayed within this field are as follows:
  - **Open** – This is a non-terminated twisted-pair whose ends are not in contact with each other.
  - **Short** – This is a non-terminated twisted-pair whose ends are in contact with each other, producing an undesirable electrical path.
  - **Terminated** – This is a properly terminated twisted-pair.
  - **No Info** – This is some other type of impedance mismatch.

The 802 AWE is capable of recording up to five reflections within each tested pair. In a situation where more than 5 reflections are recorded, the 802 AWE will only display the last 5 recorded reflections.

Fault Detection

When using a terminated cable:

- Open peaks are cable faults (open / short to shield / strong impedance match)
- All other peaks are impedance mismatches (according to their values)

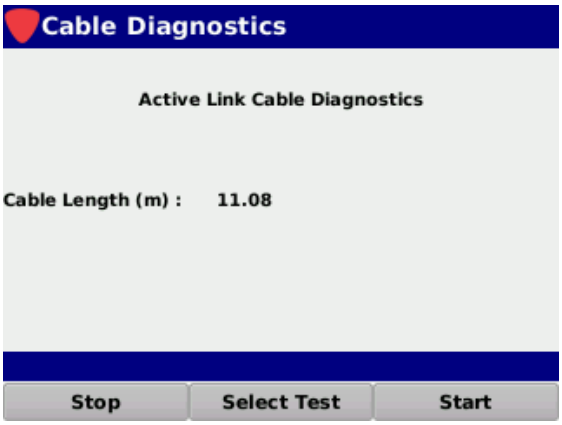
When having open peak followed by additional peaks:

- The open peak is a cable fault (open / short to shield / strong impedance match)
- The additional peaks are either end of cable or impedance mismatches (according to their values)

Active Link Cable Diagnostics (ACLD)

The Active Link Cable Diagnostic (ALCD) feature of the 802 AWE offers a passive method of measuring in the Rx path to estimate the cable length during active link. It uses passive digital signal processing based on adapted data, thus enabling measurement of cable length with an active link partner. The ALCD Cable length measurement accuracy is ±5 m.

Select the **Start** softkey to start the test and select the **Stop** softkey to stop the test. The length of the cable will be displayed in meters as shown in the image to the right.



802 AWE
Advanced Wireless Expert

Section V: Appendix

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Wi-Fi Specifications

Supported Protocols	IEEE 802.11a, 802.11b, 802.11g, 802.11n and 802.11ac* *limited to 802.11n speeds)
WI-FI Modes	Embedded Wi-Fi Client
802.11ac Features	Detection/Location of Access Points, Network Connectivity & Performance Validation, Connects to 802.11ac Access Points at 802.11n data rates
Device Analysis	Access Point and Client Detection/Properties/Login Smart Device Classification Rogue Access Point and Client Detection/Location
Channel & Noise Analysis	Wi-Fi Signal Strength, Noise, SNR, Channel Utilization & Availability
Network Protocols	DHCP or Static IP
Performance Analysis	Ping & Trace Route
Receive Channels/ Frequencies	**2.4 GHz Band** 2402 to 2494 MHz (Channels 1 to 14) **5 GHz Band** 5170 to 5330 MHz (Channels 34, 36, 38, 40, 42, 44, 46, 48, 52, 56, 60 & 64) 5490 to 5710 MHz (Channels 100, 104, 108, 112, 116, 120, 124, 128, 132, 136 & 140) 5735 to 5835 MHz (Channels 149, 153, 157, 161 & 165)
Transmit Channels/ Frequencies	**2.4 GHz Band** 802.11b, 22 MHz BW 2401 to 2483 MHz (Channels 1 to 14) 802.11g/n, 20 MHz BW (HT20) 2402 to 2482 MHz (All combinations of legally available bonded channel pairs) 802.11n, 40 MHz BW (HT40) 2402 to 2482 MHz (All combinations of legally available bonded channel pairs) **5 GHz Band** *802.11a/n, 20 MHz BW (HT20)* 5170 to 5250 MHz (All combinations of legally available bonded channel pairs) 5735 to 5835 MHz (All combinations of legally available bonded channel pairs) *802.11n, 40 MHz BW (HT40)* 5170 to 5330 MHz (All combinations of legally available bonded channel pairs) 5735 to 5815 MHz (All combinations of legally available bonded channel pairs)
Modulation	OFDM with BPSK, QPSK, 16-QAM and 64-QAM 802.11b with CCK and DSSS
Data Rates	802.11b: from 1 Mbps to 11 Mbps 802.11a/g: from 6 Mbps to 54 Mbps 802.11n/ac: from 6.5 Mbps to 150 Mbps (MCS 0-7)

*802.11ac connection and testing limited to 802.11n speeds

Bluetooth Specifications

Supported Protocols	Bluetooth v2.1 + EDR, v3.0 + HS, v4.0
Bluetooth Modes	Master, Slave
Modulation	GFSK, DQPSK and 8DPSK
Data Rates	1, 2 or 3 Mbps

Zigbee Specifications

Supported Protocols	802.15.4-2009 (2.4 GHz)
ZigBee Modes	End Device
ZigBee Advanced Features	CCM Security, Orphan Scanning, Coordinator Realignment and Mesh Routing
Modulation	DSSS
Data Rates	250 Kbps
Typical Transmit Power	19 dBm, ±2 dBm
Receiver Sensitivity	250 Kbps: -101 dBm (< 8& PER)

Physical & Environmental Specifications

Physical Specifications

Construction	Rugged plastic housing
Control	Water resistant front panel solid membrane keypad
Display	Color LCD screen 320 x 240 pixels (approx 3.5" x 2.67")
Annunciators	Audible annunciator for key strokes
Dimensions w/o Case (H x W x D)	7.00 x 4.50 x 1.75 in (20.32 x 13.97 x 5.08 cm)
Dimensions w/ Case (H x W x D)	8.00 x 5.50 x 2.75 in (22.86 x 16.51 x 7.62 cm)
Weight w/o Case	1.00 lbs (0.45 Kg)
Weight w/ Case	1.50 lbs (1.09 Kg)

Available Interface Types

USB	Mini-USB 2.0 Type B female receptacle
Ethernet (Optional)	RJ45 Ethernet Port (10/100 Mbps)

Battery & Power Specifications

Operating Time	10 hours, dependent on use
Charge Time	12 hours
Battery	Two 2600 mAh @ 3.6V Li-Ion internal battery, factory replaceable
Power Adapter Input	**Type:** 2-prong un-grounded male plug (NEMA 1-15p) **Voltage:** 100 to 240 VAC ~ 50 to 60 Hz **Current:** 0.3 A Max
International Power Adapters (Optional)	**Type:** Interchangeable clip-on, US adapter (included) **Euro:** CEE 7/16 Europlug, Type C **UK:** BS 546, Type D **AUS:** AS/NZS 3112
Power Adapter Output	**Type:** USB Type A female receptacle **Voltage:** 5 VDC **Current:** 1.0A
Data & Charge Cable	USB Type A male plug to Mini-USB Type B male plug

Environmental Specifications

Storage & Operating Temperature	-18˚ to +50˚ C (0˚ to 122˚ F)

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802.11 Standards & Channels

Wireless Standard	Frequency Band (GHz)	Channel Width (MHz)	Channels
802.11a	5	20	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144, 149, 153, 157, 161, 165
802.11b	2.4	22	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
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		40	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
	5	20	36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144, 149, 153, 157, 161, 165
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Trilithic Broadband Instruments 1-Year Limited Warranty

Trilithic, Inc. (“Trilithic”) warrants to the buyer that the product will be free from defects in materials and workmanship, under normal use, operating conditions and service for a period of one (1) year from date of delivery. Trilithic reserves the right, before having any obligation under this limited warranty, to inspect the damaged product, and all costs of shipping the product to Trilithic for inspection shall be borne solely by the buyer. Trilithic’s obligation under this limited warranty shall be limited, at Trilithic’s sole option, to replacing or repairing the product, or to replacing or repairing any defective part, F.O.B. Indianapolis, Indiana. If neither of the two options is reasonably available, then Trilithic, in its sole discretion, may provide a prorated refund to the buyer of the purchase price of the product, as evidenced by the proof of purchase, less any applicable service fees in accordance with the following schedule: months 0–1 = 100%; months 2–6 = 50%; and months 7–12 = 25%. Batteries and fans are not included or covered by this limited warranty. Any product or part that is repaired or replaced under this limited warranty shall be covered only for the remainder of the original warranty period which applied to the original product or part, or for ninety (90) days, whichever is longer. All products or parts that are exchanged for replacement shall become the property of Trilithic.

In order to recover under this limited warranty, buyer must make a written claim to Trilithic within sixty (60) days of the occurrence and must present acceptable proof of original ownership of the product (such as an original receipt, purchase order or similar documentation). In order for this limited warranty to be effective, the product must have been handled and used as set forth in the documentation accompanying the product and/or its packaging. This limited warranty shall not apply to any damage due to accident, misuse, abuse, neglect, fire or other casualty. Further, this limited warranty shall not apply to any product which has been altered or where the damage was caused by a part not supplied by Trilithic. Trilithic retains the final decision whether a product is within warranty conditions.

THE REMEDY SET FORTH HEREIN SHALL BE THE ONLY REMEDY AVAILABLE TO THE BUYER AND TO THE FULLEST EXTENT PERMITTED BY LAW, IN NO EVENT SHALL TRILITHIC BE LIABLE FOR ANY SPECIAL, INCIDENTAL, PUNITIVE OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO, LOST REVENUES, LOST PROFITS, LOSS OF USE OF SOFTWARE, LOSS OR RECOVERY OF DATA, DOWNTIME, REPLACEMENT EQUIPMENT AND ANY THIRD PARTY CLAIMS ARISING OUT OF ANY THEORY OF RECOVERY INCLUDING WARRANTY, CONTRACT, STATUTORY OR TORT IN CONNECTION WITH THE PRODUCT, EVEN IF TRILITHIC HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. NOTWITHSTANDING THE FOREGOING, IN THE EVENT THAT THIS LIMITED WARRANTY FAILS OF ITS ESSENTIAL PURPOSE, IN NO EVENT SHALL TRILITHIC’S ENTIRE LIABILITY TO BUYER EXCEED THE PURCHASE PRICE OF THE DEFECTIVE PRODUCT.

EXCEPT FOR THE LIMITED WARRANTY PROVIDED HEREIN, TO THE FULLEST EXTENT PERMITTED BY LAW, TRILITHIC DISCLAIMS ALL WARRANTIES, EXPRESSED OR IMPLIED (INCLUDING WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), WITH RESPECT TO THE PRODUCT OR ITS SUITABILITY FOR ANY USE INTENDED FOR IT BY THE BUYER. TO THE EXTENT ANY IMPLIED WARRANTIES MAY NONETHELESS EXIST BY OPERATION OF LAW, ANY SUCH WARRANTIES ARE LIMITED TO THE DURATION OF THIS LIMITED WARRANTY.

This limited warranty is non-transferable. This limited warranty does not affect any other legal rights buyer may have by operation of law. No agent, reseller, distributor or business partner of Trilithic is authorized to modify the terms of this limited warranty on behalf of Trilithic.

TRILITHIC

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