Seeker D Lite
In-Home Leakage Detector

Operation Manual

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

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 broadend 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.

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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.

Where to Get Technical Support

Trilithic technical support is available Monday through Friday from 8:00AM to 5:00PM EST. Callers in North America can dial 317-895-3600 or 800-344-2412 (toll free). International callers should dial 317-895-3600 or fax questions to 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)
- The version numbers for the Seeker D Lite firmware and Seeker Setup Software
- The version of Windows you are using (including any Service Packs and patches)
- A detailed description of the problem you are having, including any error or information messages

How this Manual is Organized

This manual is divided into the following chapters:

- Chapter 1, “General Information” provides Trilithic contact information and describes how this operation manual is structured.
- Chapter 2, “Seeker D Lite Introduction” introduces what the Seeker D Lite is and what it does. This chapter discusses the practical application, connections and controls of the Seeker D Lite. Finally, this chapter discusses the battery of the Seeker D Lite and how to update your firmware.
- Chapter 3, “Seeker D Lite Operation” describes how to configure and operate the Seeker D Lite.
- Chapter 4, “Leakage Testing” describes the steps needed to perform leakage testing using the Seeker D Lite.
- Chapter 5, “Appendix” shows the technical specifications of the Seeker D Lite as well as any error codes that may appear on the display screen of the Seeker D Lite.

Optional Software

Although the Seeker D Lite comes preconfigured and ready to use from the factory, the following software is required for advanced configuration of the Seeker D Lite:

- **Seeker Setup** is used to configure the Seeker D Lite, enabling the operator to assemble files containing channel frequencies, squelch levels, and other settings. Users can efficiently download configurations to one or more leakage detectors.
- **Leakage Analysis Workshop (LAW)** is software that manages the storage and retrieval of leakage information collected by vehicle mounted Seeker GPS systems. Installed on a server, it receives leakage data uploads via the Internet/LAN, Wi-Fi access point, or cellular connection. Data stored in LAW server may be displayed on maps or as text, used to generate leakage work orders, or downloaded to other Trilithic or third-party applications.

  Data acquired by the Seeker D Lite must be manually entered into LAW, as the Seeker D Lite does not communicate directly to LAW.

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 Seeker D Lite in any manner not recommended by the manufacturer.

A strong electromagnetic field may affect the measurement accuracy of the Seeker D Lite.

Use only the battery charger supplied with the Seeker D Lite.

All spent batteries should be disposed of according to local laws and guidelines.

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What is the Seeker D Lite?

Overview

The new Seeker D Lite™ is a tough, convenient, and flexible leakage test tool. The Seeker D Lite works by measuring tagged RF signals in and around a subscriber's premises.

This leakage detector assists in installation and troubleshooting by verifying that the leakage within the subscriber premises is not great enough to contribute to the cable system's cumulative leakage index (CLI). Leaks can also be important indicators of ingress that can hinder communication on the return band, as well as affecting downstream QAM channels in the LTE band.

The Seeker D Lite works in conjunction with the CT-4™ Channel Tagger in the headend or the Seeker D Lite Source Transmitter at the ground block. Both devices provide an uncompromising tagging solution for active analog or digital systems and can be used to identify and locate all RF leaks in both the Aeronautical and LTE bands.

Testing with the Seeker D Lite Source Transmitter

To overcome the high design and manufacturing cost associated with improvements in instrument sensitivity, this system uses the Seeker D Lite Source Transmitter high output signal source to replace the cable service at the subscriber's ground block. The higher levels transmitted by the Seeker D Lite Source Transmitter will increase the field strength of the signals radiating out of the subscriber network allowing a lower cost receiver to be used for measurement purposes.

The Seeker D Lite Source Transmitter injects two carriers into the subscriber network, one at 135–139 MHz and another at 611–615 MHz, supporting testing in both the Aeronautical and LTE bands. The user may set the output level to 43 dBmV for home certification, but also has the option to reduce the level to 23 dBmV should the subscriber network prove to be too porous for pinpointing the location of a leak at the higher transmit level.

The Seeker D Lite provides both a visual readout of the measured levels in uV/m and a tone proportional to signal strength. To prevent false triggering this system utilizes Trilithic's channel tagging technique. To provide constancy with leakage levels typically found within the subscriber's premise in home cert mode, the levels displayed by the Seeker D Lite have been normalized to represent the value of a leak at typical system levels. This correlation between measured and displayed levels will assist the technician in evaluating the severity and recording of a leak based upon established industry practices.

Seeker D Lite Features

Easy Frequency Configuration

The Seeker Setup software simplifies the configuration process. Instead of going to the factory to make hardware modifications, you can use the Seeker Setup software to adjust frequencies.

Multiple Frequency Presets

Your Seeker D Lite can be setup to operate on up to 10 different frequency presets, which makes it easier to monitor and maintain multiple cable systems. These presets define the leakage monitoring frequency and, if desired, the tag detection frequency as well. You have the option of setting up only one frequency preset for simple operation, or multiple leakage frequencies for maintaining multiple cable systems. Frequency settings range from 135–139 MHz (low band) and 610.5–615 MHz (high band) in 12.5 kHz increments.

NOTE

While in monitoring mode, the Seeker D Lite can toggle between both the low band and high band for dual-band leakage detection.

NOTE

For the sake of this manual, the term "low band" refers to the frequencies of 135–139 MHz and "high band" refers to the frequencies of 610.5–615 MHz.

Channel Tag Compatibility

Compatibility with the Trilithic CT-4 channel tag devices is another feature of your Seeker D Lite. The CT-4 can act as a traditional CT-2™ or CT-3™, and can insert Trilithic's proprietary tagged signals in both the aeronautical range and the near LTE range at the same time. The CT-4 eliminates the risk of affecting any adjacent digital channels by injecting an adjustable signal from 10–30 dBmV, targeting approximately 30 dB below the chosen digital carriers. Channel tag values in the meter are configured using the Seeker Setup software.

Squelch Operation

Squelch level is the RF signal threshold that the Seeker D Lite uses to determine the validity of the signal. The signal “breaks squelch” when the RF leakage is greater than the squelch level and tag qualifiers are met as well. The receiver will not alarm for signals below the squelch level.

The squelch level has a factory default of 20 µV/m. However, it can be reconfigured using the Seeker Setup software.

Source Localization

The Seeker D Lite emits an audible tone to help you pinpoint the leakage source. The tone frequency increases proportional to signal strength. As you move closer to the leak, the frequency of the tone will increase.

NOTE

Common leakage areas are around the tap, drop cable, ground block, CPE, and any connection of the cable to other devices.

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Getting to Know Your Seeker D Lite

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 Seeker D Lite

The Seeker D Lite comes with the following:

- Seeker D Lite Leakage Dectector
- AC to DC Power Adapter & Battery Charger
- USB Charge & Data Cable (Mini-B to Standard-A Male)

Replacement Parts

The following replacement parts are available for the Seeker D Lite:

Part Number	Description
0610169006	AC to DC Power Adapter & Battery Charger with USB Charge/Data Cable
0610169002	AC to DC Power Adapter & Battery Charger without USB Charge/ Data Cable
2071585004	USB Charge & Data Cable
2131590000	Seeker D Lite Protective Carrying Case with Belt Clip
0170109000	Seeker D Lite Belt Clip
0090048000	Seeker D Lite Battery

Field Accessories

The following accessories are available for the Seeker D Lite:

Part Number	Description
0610169007	Vehicle Power Adapter with USB Cable (CL-9)
0610169004	Vehicle Power Adapter without USB Cable (CL-9)
2071585004	USB Charge & Data Cable
0610169012	Euro Power Adapter
0610169013	UK Power Adapter
0610169014	Australian Power Adapter

A Guided Tour of Your Seeker D Lite

Front View

ON/OFF/MODE SELECT/ BACKLIGHT button

Press and hold this button to turn the Seeker D Lite on or off or to switch between Measurement and Cruise Modes. Also, when the meter is on, press this button to activate the display's backlight for approximately 60 seconds.

SELECT button

Press to advance to the next display mode.

CHANGE button

Toggles or alters the current display selection. Also toggles frequency presets from the measurement screen.

Right Side View

Mini-USB connection

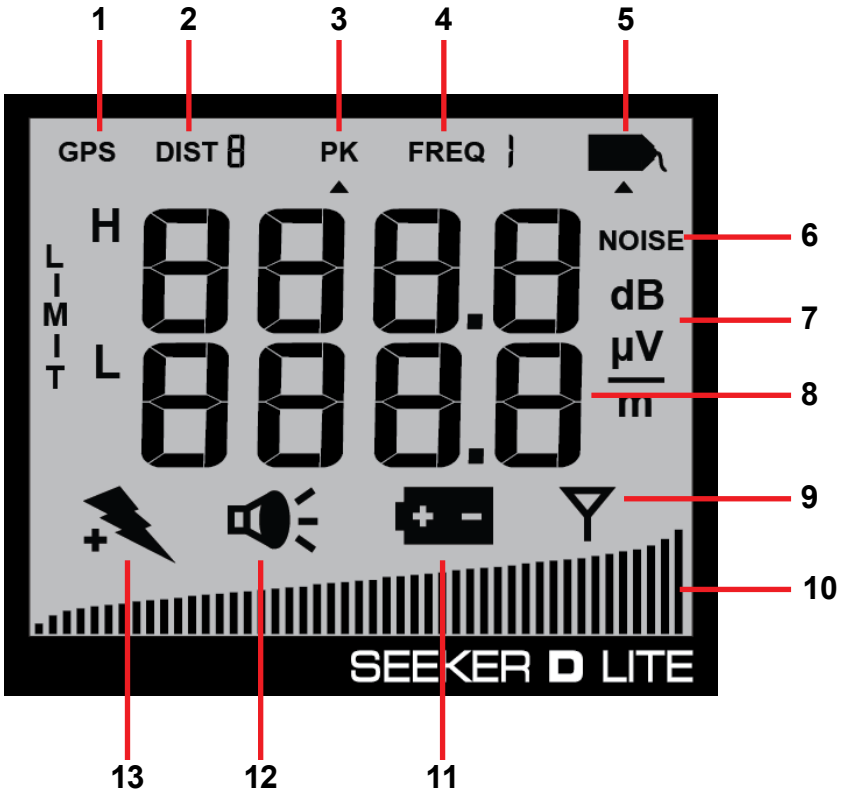
The Mini-USB connection is used to connect the charger to the Seeker D Lite and/or to connect a PC or laptop computer to the Seeker D Lite using the mini-USB charge / data cable.

Protective Carrying Case

The Seeker D Lite 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
- Convenient belt clip for easy portability. To remove clip, turn it 90° and slide off.

Display Screen



1. **GPS** – Not used on this meter.
2. **DIST** – Not used on this meter.
3. **PK** – Shown when the Peak Hold feature is active. When the icon is not shown, the Peak Hold feature is turned off.
4. **FREQ** – Indicates the number of the currently selected frequency preset.
5. **Tag** – Shown when tagged signal leakage is detected.
6. **NOISE** – Indicates the meter is in Noise mode, showing ambient noise levels.
7. **Measurement units** – Indicates leakage measurement units as selected in Seeker Setup.
8. **Main display** – Shows various parameters, and its function depends on the current display mode selection.
9. **Antenna** – Flashes when the signal mode is selected. This is the normal mode for leakage detection.

10. **Bar graph** – Shows the level of various Seeker D Lite parameters, and its function depends on the current display mode selection.
11. **Battery** – Flashes when the battery mode is selected. The icon will stay on when the battery needs to be recharged.
12. **Speaker** – Flashes when the Speaker Volume Level mode is selected.
13. **Charge** – Flashes when the battery is being charged, or when the Battery Charge Level screen is displayed.

If you see any of the following messages on your display:

- **The word "Err" along with a number –** Please call Trilithic Application Engineering at 1-800-344-2412 or (317) 895-3600.
- **PC** – Appears when the Seeker D Lite is connected to a PC and is in PC Communications mode.
- **CH** – Appears when the Seeker D Lite is connected to a battery charger and is in Charge mode.
- **LO** – Appears when the Seeker D Lite battery is too low for the meter to function.

About the Battery of Your Seeker D Lite

The Seeker D Lite uses a Lithium-Ion battery. The battery is charged during manufacture and should be ready to use as long as it has not been stored for a long period of time.

Lithium-Ion batteries operate differently than Nickel-Cadmium batteries. They should be charged daily, and should not be deeply discharged, as this could damage the battery. There is no memory effect, so there is no concern for frequent charging.

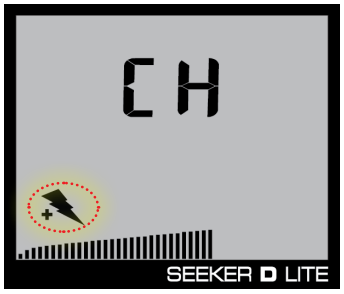
USB Charging

You can charge the Seeker D Lite using either of the following USB charging methods:

- Connecting the Mini-USB cable and charger from an AC power source to the Seeker D Lite. The Mini-USB charge / data cable and charger must be connected to both the Seeker D Lite and a working power outlet before AC charging can begin.
- Connecting the Mini-USB charge / data cable from a PC or laptop computer to the Seeker D Lite. The Mini-USB charge / data cable must be connected to both the Seeker D Lite and a PC or laptop computer that is ON before USB charging can begin.

The following conditions apply when charging the Seeker D Lite via USB:

- When the Seeker D Lite is off and it is charging, the device will go into background charging and nothing will be shown on the display screen.
- If the Seeker D Lite is on when it is connected to a to a PC, laptop computer, or working power outlet, the device will automatically turn off.
- If the Seeker D Lite is turned back on when USB charging, the Measurement mode is disabled while the Seeker D Lite is USB charging.
- When the Seeker D Lite is on and is charging, the screen shown in the image to the right will be displayed, the Charge icon will flash, and the on-screen bar graph will show the charging progress.



Available Configuration Settings

You must configure the settings of the Seeker D Lite using the Seeker Setup software. The Seeker D Lite comes from the factory with default settings, but it is likely they will need to be customized. Detailed instructions can be found in the Seeker Setup Software Operation Manual.

Feature	Available Values	Default Value	Device	Software
Display & Notification Settings				
Toggle Speaker Volume	Low to High	High	YES	NO
Toggle Ambient Noise Measurement	On, Off (momentarily)	Off	YES	NO
Set Display Units	uV/m, dBuV, dBuV/m	uV/m	NO	YES
Home Cert (HC) Squelch	0.1 to 20 uV/m	0.1 uV/m	NO	YES
Squelch	20 to 2000 uV/m	20 uV/m	NO	YES
Frequency Settings				
Enable Presets	Enable, Disable *(min of 1, max of 10)*	2 Enabled	NO	YES
Toggle Between Presets	0 to 9 *(only when enabled)*	1 to 2	YES	NO
Set Frequency Values	135 to 139 & 610.5 to 615 MHz	See the Selecting a Preset Frequency section later in this Chapter	NO	YES
Set Primary Frequency Preset	0 to 9 *(select only one)*			
Set Secondary Frequency Preset	0 to 9 *(one for each primary)*			
Set Tag Spacing	1 or 2			
Peak Hold Settings				
Enable Peak Hold Function	Enable, Disable	Disabled	YES	YES
Toggle Peak Hold Function	On, Off *(only when enabled)*	Off	YES	NO
Device Management				
Technician ID	Custom Alphanumeric	trilithi	NO	YES
Update Firmware	N/A	N/A	NO	YES

Basic Operation

Power On/Off

Press and hold the red **ON/OFF** button until you hear three ascending tones. Within a few moments your Seeker D Lite will startup into the RF Signal Measurement Mode.

Low Battery Warning

A very low battery may cause the Seeker D Lite not to turn on. When the battery is too low for your Seeker D Lite to function, the screen shown to the right will appear. The battery must be charged for a few minutes before using again.

Low Battery Warning

PC Communications Mode

This mode is used by the Seeker Setup software to send and retrieve configuration parameters from your Seeker D Lite. To enter this mode, connect the Seeker D Lite to a PC or laptop computer using a mini-USB charge / data cable and then open the Seeker Setup software to communicate with the Seeker D Lite. The screen shown to the right will be displayed while your Seeker D Lite is in this mode.

PC Communication Mode

RF Signal Measurement Mode

The RF Signal Measurement Mode is the default display mode for leakage testing and is used to accurately determine the strength of a leak, pinpoint its location, and provide a leakage value for documentation. Measured RF leakage values can range from 0.1 to 2000 µV/m and are displayed in large, easy-to-read numbers. A bar graph at the bottom of the display illuminates proportionally to the signal strength of the leak.

Additionally, an audible tone will sound if the measured signal breaks squelch. The signal breaks squelch when the RF leakage is greater than the squelch level and tag qualifiers are also met. This tone can be used to help locate the potential source of the leak.

When the Signal Level display is selected, the Antenna icon flashes as indicated by the red circle in the following images.

NOTE

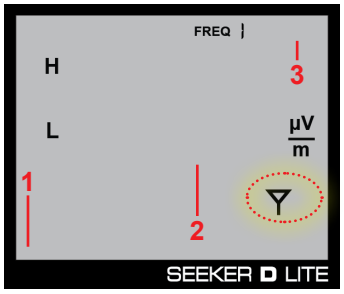
When using a CT-4 installed in the headend, the measurement range for in-home leakage is 20 to 2000 µV/m.

When using a Seeker D Lite Source Transmitter, the measurement range for in-home leakage is 0.1 to 20 µV/m in home cert mode.

No Signal Detected

If there isn't a signal detected for the primary or secondary frequency, the following will occur:

1. The bar graph will remain blank.
2. The numerical display will remain blank.
3. The Tag icon will not appear in the upper right corner of the screen.

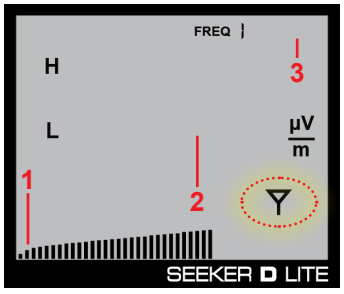


No Signal Detected

Untagged Signal Detected

If there is a signal detected for the primary frequency and it does not contain the CT-4 channel tag (ambient noise), the following will occur:

1. The bar graph will indicate the relative signal level.
2. The numerical display will remain blank.
3. The Tag icon will not appear in the upper right corner of the screen.

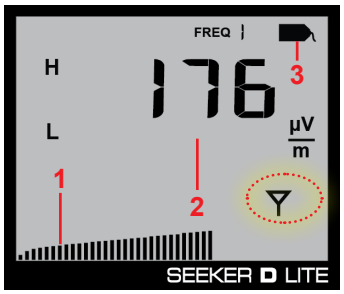


Untagged Signal Detected

Tagged Signal Detected on High/Low Frequency

If there is a signal detected for the high/low frequency and it contains the CT-4 channel tag, the following will occur:

1. The bar graph will indicate the relative signal level.
2. The RF signal level will be displayed numerically.
3. The Tag icon will appear in the upper right corner of the screen.
4. The audible tone will sound proportional to signal strength.



Tagged Signal Detected (High Frequency)

Cruise Mode

In contrast to the continuous monitoring done during Measurement mode, Cruise mode monitoring is done in cycles. Your Seeker D Lite “sleeps” for a short period of time, wakes up, and then takes a measurement. The display mode is never on in Cruise mode. An alarm will beep if the measured signal breaks squelch. If the user wants to investigate the alarm, pressing the red button down until 3 ascending tones are heard returns the meter to Measurement mode.

Less battery life is used during Cruise mode than Measurement mode.

To enter Cruise mode, hold down the red button until you hear 2 beeps and CR shows on the display.

Moving Between Measurement, Cruise, and Off Modes

To put your Seeker D Lite into this mode:	Do this with the red button:	When your Seeker D Lite is in this mode, the front panel display:
Measurement	Press down and hold until your hear 3 ascending tones	Shows signal measurements
Cruise	Press down and hold until you hear 2 beeps	Shows CR
Off	Press down and hold until your hear 3 descending tones*	Is blank

NOTE

**** Your Seeker D Lite will first cycle through other modes before turning off. As a result, you will hear other mode tones before the 3 descending tones sound.***

Device Information & Settings

While testing for leaks, you will need to view the information shown by the Seeker's display modes.

- Use the **SELECT** button to toggle through its display modes. As you toggle, the display modes will appear in the same order in which they are discussed in this section.
- Use the **CHANGE** button to adjust the settings of some display modes.

Viewing the Battery Charge Level

To check the battery level, turn your Seeker D Lite on and press the **SELECT** button once.

- When the Battery Charge Level display is selected, the Battery icon flashes as indicated by the red circle in the following image.
- When this display is selected, the following will occur:
  1. The bar graph will indicate the amount of battery charge available. As long as there are at least a few bars left, your Seeker D Lite has enough charge to operate. If the battery meter shows less than 50%, the Seeker D Lite should be charged.
  2. The numerical display will continue to display the RF signal level.

Battery Charge Level

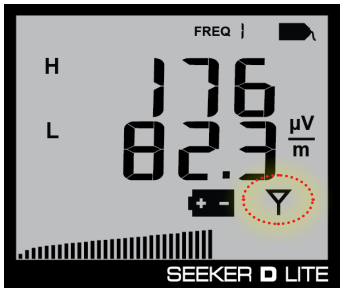
NOTE

The display will revert to the Signal Level display after a few seconds in the Battery Charge Level display (without any action by the user).

Low Battery Alert

If the battery is getting low and needs to be recharged soon, the battery icon is displayed constantly on all screens.

In this example, the antenna icon will still flash in measurement mode, as indicated by the red circle in the image shown to the right.



Low Battery Alert

Firmware Version

When you are in the Battery Charge Level display, pressing the **CHANGE** button will display the following information:

- The Battery icon will continue to flash and the bar graph will continue to indicate the relative battery charge level
- The screen first displays the application firmware version number. In the image shown to the right, the application firmware is version 1.04.

Application Firmware

- After 5 seconds, the screen automatically displays the FPGA firmware version number. In the image shown to the right, the FPGA firmware is version 4.01.

FPGA Firmware

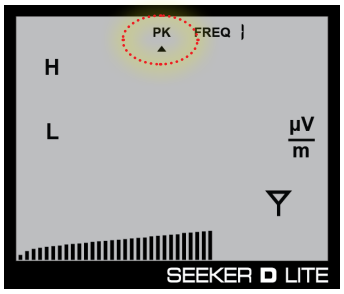
NOTE

The display will revert to the Battery Charge Level display after a few seconds in the Firmware Version display (without any action by the user).

Enable/Disable Peak Hold

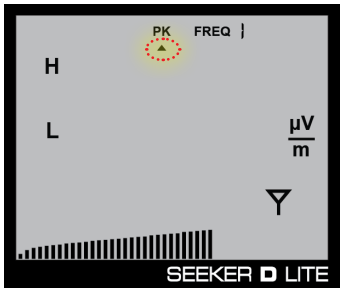
To enable/disable the Peak Hold function, turn your Seeker D Lite on and press the **SELECT** button repeatedly until the arrow appears under the PK icon, as indicated by the red circle in the image below.

- When the Peak Hold display is selected, pressing the **CHANGE** button will enable/disable the Peak Hold function.
- When this display is selected, the following will occur:
  - If the Peak Hold function is currently disabled, the PK icon will flash with the arrow below the icon as indicated by the red circle in the image to the right.



Peak Hold Disabled

  - If the Peak Hold function is currently enabled, only the arrow below the PK icon will flash as indicated by the red circle in the image to the right.



Peak Hold Enabled

NOTE

After a few seconds in the Peak Hold display without any action by the user, the display will revert to the Signal Level display.

- When the Peak Hold function is enabled, the following will occur in the Signal Level display:

Signal Level Display

1. The PK icon will be constantly displayed at the top of the screen.
2. The numerical display will hold the latest peak RF level reading for up to five seconds unless the RF level increases. This is useful if you are not able to look at the display immediately or if you want to confirm the highest level reading.
3. The peak element of the bar graph at the bottom of the display will also hold its peak indication for five seconds while the other elements of the bar graph continue to indicate the signal strength of the live signal.

Selecting a Preset Frequency

The Preset Frequencies display is used to select the RF signal level measurement frequency presets used by the Seeker D Lite. The preset frequencies are numbered from 0 to 9 and can be configured using the Seeker Setup software.

The Seeker D Lite is programmed at the factory with the following preset frequencies:

FREQ #	Default	Enabled	Primary Frequency	Secondary Frequency	Tag
1	YES	YES	612.0000	138.0000	1
2	NO	YES	138.0000	612.0000	1

NOTE ***For detailed instructions on how to set the primary and secondary frequency presets and their associated tag settings, see the Seeker Setup Software Operation Manual.***

To select a preset frequency, turn your Seeker D Lite on and press the **SELECT** button repeatedly until the FREQ icon flashes at the top of the display, as indicated in the below images.

- When the Preset Frequency display is selected, the FREQ icon at the top of the display will flash as indicated by the red circle in the following images.
- When the Preset Frequencies display is selected, pressing the **CHANGE** button will step through the enabled presets in numerical order starting at 1 and ending at 0.

Preset #1

Preset #2

Preset Frequency Toggle

To quickly toggle between preset frequencies:

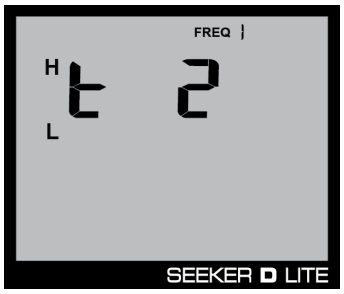
1. Press the **CHANGE** button to show the current preset setting.
2. Press the **CHANGE** button repeatedly to quickly toggle through the presets.

When first entering the Preset Frequencies display or after selecting a new preset frequency, the following will occur:

- The numeric display will show the first three digits of the primary frequency (digits before decimal) on the top line as shown in the image to the right. The last four digits of the primary frequency (digits after decimal) will show on the bottom line as shown in the image to the right.

Preset Frequency

- After a few seconds the numeric display will change to show the tag for the primary frequency.



Tag Selection

- When the numerical display has cycled through the primary frequency information, the display will show the same information for the secondary frequency (if a secondary frequency has been selected).
- When the numerical display has cycled through the information for both the primary and secondary frequency (if selected), the display will resume RF signal level measurement of the selected preset frequencies.

NOTE

In this example, the frequency preset 1 is 138.000 MHz, Tag 2.

If the meter is set to toggle two frequencies, the second frequency preset and tag will follow the above example.

NOTE

After a few seconds in the Preset Frequencies display without any action by the user, the display will revert to the Signal Level display.

Ambient Noise Level Measurement

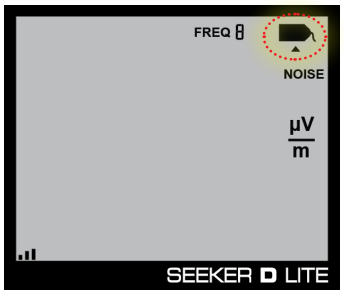
This measurement is used to find ambient noise sources that may be emitting RF signals at the currently selected leakage frequency. This provides a useful tool for troubleshooting noise issues that may occur in and around the house.

To perform a measurement of ambient noise that does not carry the tagged signal of the CT-4, turn your Seeker D Lite on and press the **SELECT** button repeatedly until the arrow appears under the Tag icon, as shown in the image below.

- When the Tag icon is selected, pressing the **CHANGE** button will enable/disable the Ambient Noise Level Measurement function.
- When this display is selected, the following will occur:
    - If the Ambient Noise Level Measurement function is currently disabled, only the arrow below the Tag icon will flash, as indicated by the red circle in the image to the right.

Ambient Level Measurement Disabled

    - If the Ambient Noise Level Measurement function is currently enabled, the Tag icon will flash a few times prior to turning off (with the arrow below the icon), as indicated by the red circle in the image to the right. The NOISE icon will also display, indicating Noise mode is turned on.

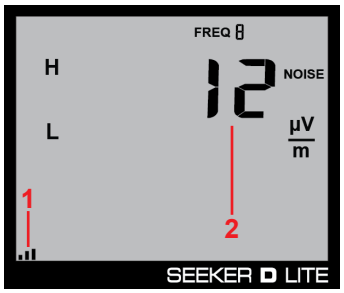


Ambient Level Measurement Enabled

NOTE

After a few seconds in the Ambient Noise Level Measurement display without any action by the user, the display will revert to the Signal Level display.

- When the Ambient Noise Level Measurement function is enabled, the following will occur in the Signal Level display:
    1. The bar graph will indicate the relative signal level of the ambient noise.
    2. The RF signal level of the ambient noise will be displayed numerically.



Signal Level Display

NOTE

Notice there is no Tag icon during this process, indicating there is ambient noise present.

NOTE

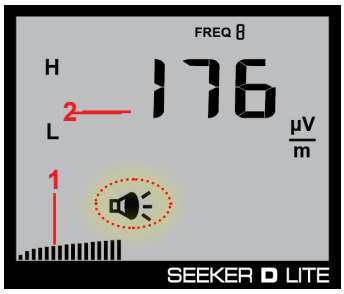
After approximately 1 minute, the display will revert to the normal Signal Level display.

Speaker Volume Level

While testing for leaks, you may need to adjust the volume of the leakage tone.

To check the volume level, turn your Seeker D Lite on and press the **SELECT** button twice.

- When the Speaker Volume Level display is selected, the Speaker icon is continuously displayed as indicated by the red circle in the following image.
- When this display is selected, the following will occur:
    1. The bar graph will indicate the speaker volume.
    2. The numerical display will continue to display the RF signal level.
- Press the **CHANGE** button repeatedly to increase the speaker volume of the leakage tone. Brief presses increase the volume to maximum and then it rolls over to the minimum volume.



Speaker Volume

NOTE

After a few seconds in the Speaker Volume Level display without any action by the user, the display will revert to the Signal Level display.

NOTE

The speaker volume does not change during adjustment, but is instead indicated by the bar graph. When leaks are found, you will hear the volume change in the leakage tone.

Before You Begin Leakage Testing

- A low battery may cause the Seeker D Lite to NOT turn on. Try charging your battery for 3 hours to see if that fixes the problem.
- The Seeker D Lite will retain the setup from when the meter was last shut off. For example, if you were testing frequency preset number two and then turned off your Seeker D Lite, when you turned it back on again the meter would automatically begin testing that same preset.

Testing For Leaks

NOTE

The CT-4 Digital Channel Tagger must be installed and set up within the system before testing for leaks. The Seeker D Lite Source Transmitter can also be used at the ground block.

The Seeker D Lite should be configured with the Seeker Setup software before beginning leakage testing.

1. **Turn on the Seeker D Lite**

   Press the red **ON/OFF** button until you hear 3 ascending tones. The Seeker D Lite will power up in RF Level Measurement Mode.

2. **Confirm the desired frequency preset (0–9) is selected**

   If using the Seeker D Lite for the first time, the default frequency preset during configuration with Seeker Setup software will be selected.

   If the Seeker D Lite has been used since configuration with Seeker Setup software, the last frequency used will be selected.

NOTE

For more information about using the Preset Frequency or Channel Tag features, see Chapter 3: Seeker Operation, Display Modes.

3. **Confirm the Seeker is in the RF Level Measurement mode**

   The Antenna icon on the display should be flashing for the RF Level Measurement mode. If necessary, use the **SELECT** button to move to the Measurement mode (or let it time out and return to Measurement mode automatically).

4. **Begin leakage testing**

   Move the Seeker D Lite around the test area. If the detected leakage level exceeds the squelch levels, the Seeker D Lite will alarm.

   The frequency of the alarm tone will increase as the detected signal strength increases. Continue to move the Seeker D Lite in the direction producing the highest tone frequency to locate the source of the leak.

5. **Cruise Mode**

   If an alarm is not detected in Measurement mode and you wish to continually monitor leakage levels with your Seeker D Lite, you can select the Cruise mode to shutdown the display and conserve the battery charge.

   To select Cruise mode from the Measurement mode, press the red on/off button until 2 beeps are heard and CR is displayed.

   If a signal greater than the squelch level is detected in Cruise mode, the Seeker D Lite will beep to alert the user. Measurement mode can then be used to measure and find the leak.

6. **Turn OFF the Seeker D Lite**

   When testing is complete, turn off the Seeker D Lite by holding down the red **ON/OFF** button until you hear 3 descending tones.


NOTE

The auto time out from the Measurement mode setting to Cruise mode or off can be programmed via the Seeker Setup software.

Specifications

Operation Specifications

Frequency Range	**Low Band:** 135–139 MHz **High Band:** 610.5–615 MHz Adjustable in 12.5 kHz Steps via Seeker Setup Software
Frequency Settings	10 user-adjustable operating frequencies, selectable on front panel Set using the configuration methods listed below
Calibrated Level Range	20 to 2000 µV/m scaled to match an analog carrier or QAM carrier when used with CT-4 channel tagger in the headend 0.1 to 20 µV/m scaled to match an analog carrier or QAM carrier when used with Seeker D Lite Source Transmitter in the home
Level Accuracy	±2.0 dB
Automatic Noise and Overbuild Discrimination	Internal circuitry discriminates between leaks and noise Overbuild discrimination provided by the CT-4 channel tagger installed in hub or headend or the Seeker D Lite Source Transmitter in the home

Physical Specifications

Construction	Plastic housing, with form fit case produced with ballistic nylon for protection
Control	Front panel rubber keypad
Display	Dual numerical readout of detected low and high band leakage within sensitivity range
Speaker	Tone is present if leakage amplitude exceeds squelch setting and digital tag is detected Pitch is proportional to strength of leak
Dimensions (H x W x D)	7.50 x 3.25 x 1.50 in (191 x 83 x 38 mm)
Weight	1.0 lbs (454 grams)

Available Interface Types

Antenna	Internal dual band
USB	Mini-B Port for charging & configuration using Seeker Setup Software

Battery & Power Specifications

Operating Time	8 hours plus, dependent on use
Charge Time	10 hours
Battery	Single 2600 mAh @ 3.7V Li-Ion internal battery, factory replaceable
Power Adapter	**Input:** 100 to 240 VAC ~ 50 to 60 Hz, 0.3A Max **Output:** 5 VDC, 1.0A

Environmental Specifications

Storage & Operating Temperature	**Storage:** -10˚ to +70˚ C (-40˚ to 158˚ F) **Operating:** -20˚ to +50˚ C (-4˚ to 122˚ F)

Display Messages & Error Codes

Seeker D Lite Error Codes

The codes shown below are displayed on the Seeker D Lite display screen as “E##” to indicate an error with the Seeker D Lite.

“E##” Code	Error Description	Solution
01	The checksum is not valid for this area or the calibration date for this area is not set.	If a power cycle does not fix this, return to the factory for recalibration.
02	The checksum is not valid for this area or the calibration date for this area is not set.	If a power cycle does not fix this, return to the factory for recalibration.
03	The identity voltage read does not correspond to a known configuration.	If a power cycle does not fix this, return to the factory for repair.
04	There was an error re-writing the temperature calibration trigger pattern when starting the temperature cal cycle.	If a power cycle does not fix this, return to the factory for repair.
05	An error occurred while writing values during the temperature calibration cycle.	If a power cycle does not fix this, return to the factory for repair.
06	The temperature calibration cycle has completed, but CalibrATE has not yet read and checked the results.	If a power cycle does not fix this, return to the factory for repair.

"E##" Code	Error Description	Solution
08	The flash ID read did not correspond to approved devices.	If a power cycle does not fix this, return to the factory for repair.
12	The FPGA image is not valid.	Try downloading a current FPGA image.
14	Error booting the FPGA.	If a power cycle does not fix this, return to the factory for repair.
15	RF power did not turn on.	If a power cycle does not fix this, return to the factory for repair.
16	RF power did not turn off.	If a power cycle does not fix this, return to the factory for repair.
17	Error in stored unit serial number.	If a power cycle does not fix this, return to the factory for repair.
19	PLL frequency lock failed.	If a power cycle does not fix this, return to the factory for repair.
20	Error during FPGA operation.	If a power cycle does not fix this, return to the factory for repair.
21	No FPGA clock source detected.	If a power cycle does not fix this, return to the factory for repair.

Trilithic Broadband Instruments 2-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 two (2) years 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 0-3 = 100%; months 4-12 = 50%; and months 13–24 = 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.

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