



QAM Compass User's Guide



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Technical Support

ComSonics maintains a Technical Support Service for customer convenience. Representatives may be contacted Monday - Friday: 8:00 a.m. - 5:00 p.m. Eastern Time by phone at 1-800-336-9681 or 540-435-4352; or by E-Mail at Tech-Support@ComSonics.com.

Product information and software updates are available for download at www.ComSonics.com

Introduction

The ComSonics QAM Compass™ is a versatile multi-function cable signal leakage detector designed for medium distance to near-field use. Working in conjunction with ComSonics' QAM Markers™ installed at the local cable system head-end / hub or the portable ComSonics' Mini Mobile Marker (M3™), the QAM Compass™ provides technicians with both visual and audible indications of signal leakage in the VHF and two UHF bands allowing them to find and repair leaks that would otherwise go unrepaired.

General Operation

The QAM Compass™ has five primary functions on the front panel used to control the device (Figure 1).

Turning the Unit On and Off:

The QAM Compass™ is turned ON by a single push of the power button at the bottom left of the panel. To power off the device, push the power button again and the unit will power down.

Modes of Operation

The QAM Compass™ has three modes of operation: (1) Measure Mode (2) Monitor Mode and (3) M3 Mode. The mode button and LED indicators are located on the left hand side of the panel. Each press of the mode button will cycle through each of the modes allowing the user to select their desired mode of operation.

Distance Setting

The mode button is also used to select the distance setting. This allows the user to more accurately measure leakage field strength at a given distance from the leak. The selectable distances are: 1', 10' (default), 30', 75', and 150'. The units can be changed to meters using the configuration utility. In order to change the distance setting, press and hold the Mode button for two seconds. The display will start to flash with the current distance setting displayed. Use the up and down arrows to change the distance to the desired setting. The display will automatically return to its normal state a few seconds after the last arrow push. In addition, the current distance setting is displayed directly after the firmware version when initially powering on the QAM Compass™.

Frequency Band

The QAM Compass™ has three frequency bands for leakage detection: (B1) VHF frequency: 136.5 MHz to 140.5 MHz; (B2) UHF frequency 1: 606.5 MHz to 614.5 MHz; (B3) UHF frequency 2: 720 MHz to 1,200 MHz. Each programmed frequency must coincide with a generated signal from a QAM Marker™ or M3™ device in order to detection to occur. The Band button and LED indicators are located on the right hand side of the panel. Each press of the Band button will cycle through each of the frequency bands allowing the user to select their



Figure 1: Front Panel Controls

desired mode of operation. The exact frequency for each band is programmable using the configuration software application. In addition, each of the three frequency bands can be programmed to be active or inactive to match the users Marker configuration.

MPL Start and Store

The QAM Compass™ has the ability to interface with the ComSonics Mobile Problem Locator (MPL™) smart phone application. The MPL™ control buttons are located at the top of the display panel. There are two primary MPL™ controls: Start and Store. The device must be paired by the MPL™ application in order to communicate with the application. There are three ways in which the measurement data is transmitted from the QAM Compass™ to the ComSonics MPL™ application:

- User presses Start button – The QAM Compass™ will continuously transmit measurement information based on the current mode and frequency band settings. Subsequently, pressing Store will cease the transmission.
- User presses Store button – The QAM Compass™ will transmit one set measurement(s) based on the current mode and frequency band settings.
- Utilize the Compass MPL™ Application to request and send measurement data from the QAM Compass™ based on the current mode and frequency settings

Volume, Mute, and Back Light

The QAM Compass™ allows the user to control the volume level of the device as well as a mute function using the control buttons located in the center of the display panel. To raise or lower the volume level of the QAM Compass™ simply press the up and down arrows. There are 5 different volume levels to choose from. Pressing the center Mute button cycles the mute function to on or off. The mute will remain active for the preconfigured amount of time (default = 5 mins) and then return to a normal state. Pressing any button on the front panel control activates the display backlight for approximately 10 seconds when extra light is needed to see the display.

Battery Charge Level

The QAM Compass™ has one LED light used to indicate the battery charge status located at the bottom right of the front panel. The light will illuminate amber/orange when the unit is charging and will turn green once the battery is fully charged. If the ambient temperature is out of range (too hot or too cold), the LED will turn red and the battery will not receive a charge. This feature prevents premature failure of the battery due to charging at temperature extremes.

Display Indications

Leakage level measurements are displayed in large, easy to read numbers as shown in Figure 2. The leakage level bar indicator on the left of the display shows an alternate leakage level format. The bar level shown is relative to a preprogrammed scale in the configuration utility that changes the high level range from 100 $\mu\text{V}/\text{m}$ to 1,999 $\mu\text{V}/\text{m}$ (default). The top portion of the display indicates if the QAM Compass™ is detecting “Leakage” or “Noise”. A four segment battery charge indicator is shown in the lower right corner of the display. The unit of measure for the leakage measurements is shown at the bottom of the screen.



Figure 2: Display

Modes of Operation

The QAM Compass™ has three modes of operation: (1) Monitor Mode (2) Measure Mode and (3) M3 Mode which is selected using the mode button on the left side of the front panel.

Monitor Mode

The monitor mode automatically cycles between the pre-programmed band frequencies. The QAM Compass™ can be programmed to activate one, two, or all three of the available band frequencies. The monitor mode will automatically cycle between the active frequency bands every 3 seconds. This mode is typically used when the QAM Compass™ is not being actively used to make measurements or find leaks. The mode allows a technician to detect leakage in all active frequency bands while they perform their normal workday tasks.

Measure Mode

The measure mode operates at the selected frequency band on the QAM Compass™ front panel. The QAM Compass will not automatically cycle between frequency bands in this mode but rather allows the user to select one of three available frequency bands. This mode is typically used when the QAM Compass™ is being used to measure and locate a detected leak.

M3 Mode

The M3™ mode allows the QAM Compass™ to detect the unique marker signal generated from the M3™. This mode must be used in conjunction with the M3™ for special troubleshooting and plant qualification. When operating in the M3™ mode, please ensure the frequency band on the QAM Compass™ is set to match the M3™ frequency band. The frequency band for the M3 is selected using the same control panel button used to select the frequency in the measure mode. The M3™ User's Guide provides a detailed description of the operation and configuration of the M3™ device. It can be downloaded at www.ComSonics.com.

Docking/Charging Station

The QAM Compass™ has an optional docking/charging station that mounts in a vehicle. The station serves two primary functions: 1) A safe and convenient method of storing the QAM Compass™ while in a vehicle and 2) Charge the QAM Compass™ battery. The docking station should be mounted in the vehicle using the supplied

hardware and connected to the +12V supply and ground of the vehicle using the supplied wiring harness, typically at the vehicles fuse box.

Warble Tone

When cable leakage is detected, either in measure, monitor, or M3™ modes, the internal speaker emits the classic ComSonics Sniffer® Warble tone. Leaks detected at the VHF frequency band creates a warble tone that is repeated more slowly than leaks at UHF1 or UHF2 which repeats the tones at a higher frequency allowing the technician to differentiate between the detected frequencies without needing to look at the display.

Battery Charging and Auto Shutdown

An internal Lithium Ion rechargeable battery powers the QAM Compass™. Charge the battery for three hours before using the unit for the first time. The charging LED light on the front panel will illuminate amber/orange when the unit is charging and will turn green once the battery is fully charged. If the ambient temperature is out of range (too hot or too cold), the light flashes red and the battery will not receive a charge. Only use the included AC Charger, the optional DC Car Charger, or the optional QAM Compass™ docking station to charge the battery. Use of other chargers may cause equipment failure, create a safety hazard, and void the warranty. The QAM Compass™ will not charge through the Mini-USB port.

In the Measure mode, the unit will automatically switch to Monitor mode to protect the battery from excessive discharge after 10 minutes of non-use or if a leak has not been detected during this period of time (time is programmable via the configuration utility). In the Monitor mode, the device default is set to power down after 8 hours of nonuse: no button pushes or leakage detected. The amount of time before power down in the Monitor mode can be preprogrammed in the configuration utility between 1 minute and 27.5 hours.

QAM Compass Configuration Utility

The QAM Compass™ operates in conjunction with QAM Markers™ installed at the local head-end/hub or with the portable ComSonics' M3™. The QAM Marker and M3™ generate a unique signal at a specified frequency for detection by the QAM Compass™, therefore the QAM Compass™ must be configured to exactly match the generated signals. Each of the frequency bands are programmed by using the QAM Compass™ Configuration Utility.

The standard defaults for programmable functions in the QAM Compass™ are as follows:

Mode:	Monitor
Band:	B2
Units of Measure:	uV/m
Distance Units:	feet
Measure Squelch:	20 uV/m
Monitor Squelch:	20 uV/m
M3 Squelch:	20 uV/m
Backlight Timeout:	10 seconds

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Monitor Mode Timeout:	8 hours (480 mins)
Measure Mode Timeout:	10 minutes
Mute Timeout:	5 minutes
B1 Frequency:	138 MHz
B2 Frequency:	612 MHz
B3 Frequency:	776.5 MHz

Download and Install

The utility is available for download at www.ComSonics.com. New users must create a user ID and password to gain access to the site. On the Downloads tab under the “Software and Drivers” section, select the QAM Compass link. In the center of the page, locate and download the QAM Compass Configuration Utility Installation file to your PC. When the download is complete, right click on the file icon and select “Extract to Here” to extract the required installation files. After the file extraction is completed, double-click on the Setup.exe icon to begin. Follow the on-screen prompts to complete the installation process. When the installation is complete double-click the QAM Compass Configuration Utility icon.

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Patent information www.comsonics.com/pat

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ComSonics, Inc.
1350 Port Republic Road
Harrisonburg, VA 22801 USA

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