GQ Electronics

GQ EMF-360V2/360+V2/380V2/390

EMF Multi-Field/Multi-Function Meter

User Guide

Document Revision History:

Re.1.50 Jan-2019   Rewriting for clarity (contribution by François Planque)
Re.1.41 Dec-2018 Content update for EMF-390 USB driver section
Re.1.40 Nov-2018 Content update for EMF-390 USB driver section
Re.1.30, Sep-2018 Content update for V2 and EMF-390 section
Re.1.20, Jul-2018   Content update for new firmware update Re1.17
Re.1.10 , Apr-2018   Content revised for RF power section.
Re.1.00 , Oct-2017   Initial release.

Table of Contents

Overview

The GQ EMF-360V2 / EMF-360+V2 / EMF-380V2 / EMF-390 advanced multi-function digital EMF meter is designed and developed by GQ Electronics, Seattle, USA. It is designed to be a portable and convenient device. It can be used as regular EMF, EF and RF radiation detection. This high sensitivity meter lets you check EMF/RF radiation easily. Examples: computer mouse, car remote key, cell phone, cell tower, cordless phone, static, electric field, WiFi, computer laptop, microwave, electric heater, hair dryer, vehicle engine, light, outdoor power line, monitor the WiFi signal, smart meter signal, spy wireless video camera signal, even track radio signal in air.

The meter features multiple sensors to ensure maximum scale/range measurement and highest accuracy:

- Three axis Electromagnetic Fields

- Electric Field

- Radio Frequency

Additionally, the testing features also include:

- Radio Spectrum Power Analyzer (EMF-360+V2/380/390 only)

- Real-time (every second) data logging (EMF-390 only).

The meter is able to identify the common source from EMF/RF measured, such as Power Line, WiFi/Cell phone, Cell Tower, Microwave etc. It also comes with built-in audible and visual alarm.

The device can be used for EMF, EF and RF detection and monitoring, both indoors and outdoors (the unit must be protected from rain), as well as in other similar environments.

The device also features a high contrast black/white LCD module and one front LED indicator.

The unique GQ RF Browser feature allows to visualize the RF radiation precisely with an on-screen graph. With the RF Browser, the user is able to see the Digital RF equivalent in bytes as well as an RF power spectral histogram.

The EMF-380V2 and EMF-390 come with an on-board real time clock for time related data measurements.

USB port/Battery Charging

The device is equipped with an USB port, utilized for communication and charging of the internal rechargeable Li-Ion 3.6V/3.7V battery. The battery can be charged by connecting unit with a USB port. Such as cell phone charger, computer USB port etc.

The GQ EMF-360V2/ EMF-360+V2/EMF-380V2/EMF-390 internal rechargeable battery can be charged with a standard USB charger or with a computer USB port. Using external power, continuous data monitoring is possible. Using an external power source, you will not have to worry about the battery's charge condition or any data loss.

When the device is connected to a PC, in addition to charging, the free companion PC software can be used to:

- Monitor the measurements on the computer screen

- Download the history data recorded through the EMF-390's data logging feature and convert it into a standard .csv file for further analysis.

Specifications

- EMF (Electromagnetic Field)
    - Triple axis (X, Y, Z) up to 400Khz
    - Range: 0.00~500mG, 0.00 to 50µT
    - Resolution: 0.1/1 mG or 0.01/0.1 µT
    - RF Frequency: up to 8G Hz
    - up to 10GHz(EMF-390 only)

- EF (Electric Field)
    - Range: 0V/m to 1000V/m
    - Resolution: 0.1 V/m
    - Frequency independent

- RF Field (Radio Frequency Field)
    - Range: 0.02µW/m² ~ 9999mW/m²
    - Resolution: 0.01µW/m², 0.1µA/m, 0.1mV/m, 0.001µW/cm², 1dB
    - Frequency: up to 8GHz
    - Up to 10GHz(EMF-390 only)
- RF Spectrum Power Analyzer (**EMF-360+V2 only**)
    - Frequency band 6: 2.4Ghz – 2.5GHz (WiFi, Bluetooth, Microwave oven, Smartmeter etc.)
        - Frequency step: 25KHz – 405KHz
        - Frequency span: 58KHz – 812KHz
- RF Spectrum Power Analyzer (**EMF-380V2, EMF-390 only**)
    - Frequency band 1: 150KHz – 534KHz
        - Frequency step: 1KHz – 3KHz
        - Frequency span: 1KHz – 3KHz
    - Frequency band 2: 520Khz – 1710KHz
        - Frequency step: 1KHz – 6KHz

- Frequency span: 1KHz – 6KHz
  - o Frequency band 3: 64MHz – 108MHz (FM Radio)
    - Frequency step: 10KHz – 100KHz
    - Frequency span: 40KHz – 100KHz
  - o Frequency band 4: 2.3MHz – 23.00MHz
    - Frequency step: 1KHz – 180KHz
    - Frequency span: 1KHz – 6KHz
  - o Frequency band 5: 240MHz – 1040MHz (Cell phone, Wireless phone Smartmeter, etc.)
    - Frequency step: 1KHz – 10KHz
    - Frequency span: 50KHz – 4000KHz
  - o Frequency band 6: 2.4Ghz – 2.5GHz (WiFi, Bluetooth, Microwave oven, Smartmeter, etc.)
    - Frequency step: 25KHz – 405KHz
    - Frequency span: 58KHz – 812KHz

The spectrum analyzer relies on 3 specific hardware sensors which cover the 6 bands above. This is limited in order to contain the cost of the unit.

- Battery life: ~24 hours continually monitoring (on a full charge)
- Internal flash memory for data logging (EMF-390 only): 1 Mbyte
- Audible alarm: buzzer
- Visual alarm: green/red LED
- Operating temperature & humidity: 5°C to 40°C, below 80% RH (The LCD screen will not refresh properly below 5°C)
- Storage temperature & humidity: -10°C to 60°C, below 70%
- Working Voltage: 3.6-3.7V
- Display: LCD dot matrix, back lighted
- Power consumption: 25mW – 125mW (backlight dependent)
- Power supply: rechargeable 3.7V Li-Ion battery (Size:18650) / USB power
- Dimensions   135 x 78 x 25 mm (5.25"x 3" x 1")

Model Selection Guide

	EMF-360 V2	EMF-360 Plus V2	EMF-380 V2	EMF-390
Three Axis EMF	Yes	Yes	Yes	Yes
RF Radiation	Up to 7GHz	Up to 7GHz	Up to 8GHz	Up to 10GHz
RF Spectrum Power Analyzer	No	2.40 to 2.5GHz	2.40 to 2.5GHz 240 to 1040Mhz 2.30 to 23.00MHz 64 to 108MHz 520 to 1710KHz 150 to 534KHz	2.40 to 2.5GHz 240 to 1040Mhz 2.30 to 23.00MHz 64 to 108MHz 520 to 1710KHz 150 to 534KHz
Real-time Clock	No	No	Yes	Yes
Real-time Every Second Data Logging/Saving (~24hrs)	No	No	No	Yes

Package List

1. GQ EMF meter main unit.

2. USB cable for battery charge and USB communication

3. Quick start guide

4. Download link for a complete user guide in PDF version.

Caution

1. Avoid measuring when battery low. (The unit will stop working if the battery voltage falls below 3.3V, which may happen before the battery level shows 0%) Do not get the meter wet. Use a sealed plastic bag if measuring in the rain.

2. Turn off the unit when not in use in order to conserve the battery.

3. When the unit is not in use, store it in a dry place or box. This will avoid oxidation of the mechanical parts, such as the button or battery contacts.

Location of the sensors

The EF should pick up with same direction as the X, Y, and Z. However, Y direction is preferable.

RF Spectrum Analyzer sensor location

Red: 240-1040 MHz band

Yellow: 2.4-2.5GHz band

Green: 150K-125.34MHz bands

Hold and position the meter

To get as accurate reading as possible, always point the meter front (sensors) side to the source.

You can hold the meter at the lower part of the meter, or just simply place the meter to the location where is close to the target source.

Hardware setup

1. Pressing the power key (S4) for 1 second will show the battery level. Charge the battery fully before the first use. It may take a few hours to get the battery fully charged. Check the battery icon on the display, a fully charged battery icon will be filled with solid color, without flashing.
2. Power up the unit. Pressing the power key (S4) for 2 seconds will turn on the unit.
3. Set the backlight timeout (in seconds), in order to minimize the power consumption.
4. You can hand hold and meter or place to the location to measure. The sensors should always point to the source. See above diagram.
5. Now the unit is ready to use. You should see the background EMF/EF/RF reading.

For technical questions and support, please use the forum at the following link:

http://www.GQElectronicsLLC.com/forum

For the latest version user guide, please visit our software download page:

http://www.gqelectronicsllc.com/comersus/store/download.asp

GQ EMF Meter Multi-Function Keys

The multi-function keys S1, S2, S3 and S4 explained:
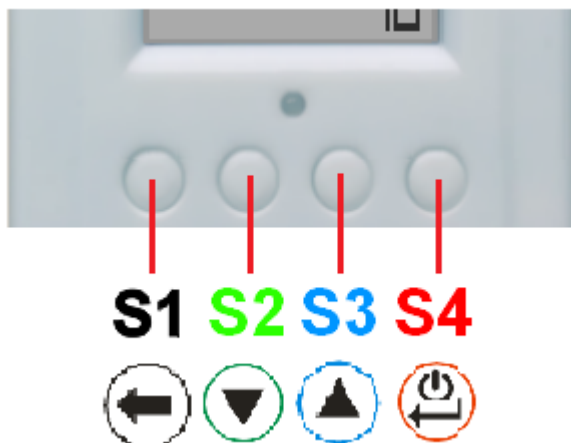
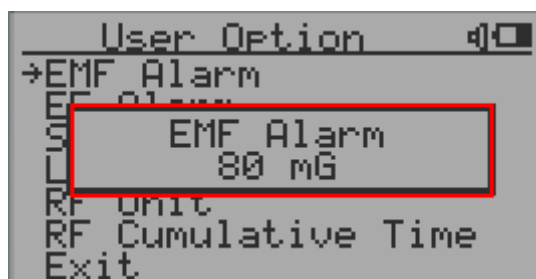**Vertical Display Mode**   **Horizontal Display Mode**

These keys's function will be reassigned dynamically based on the context of the current screen displayed.

Popup Windows

The Popup Windows will show the current status/value of selected features. The current status/value can be changed only when it is displayed in the Popup Window and the currently displayed status/value will be stored when the Popup Window has timed out after 3 seconds if no key has been pressed.

Dual Display Modes

The device supports multiple display formats to fit user's display preferences.

The Vertical Display Mode can be used in these modes: Basic (EMF-360/+ only), All-in-one, vertical EMF mode and RF mode.

The Horizontal Display Mode can be used in these modes: All-in-one, **Table**, **RF Graph, EMF Graph and Spectrum Analyzer**.
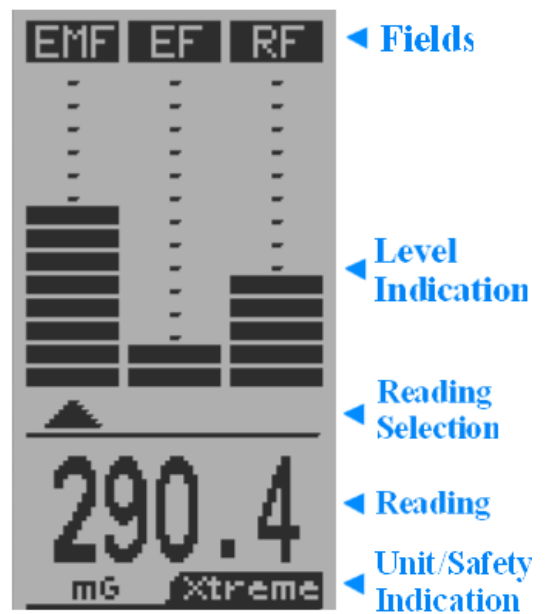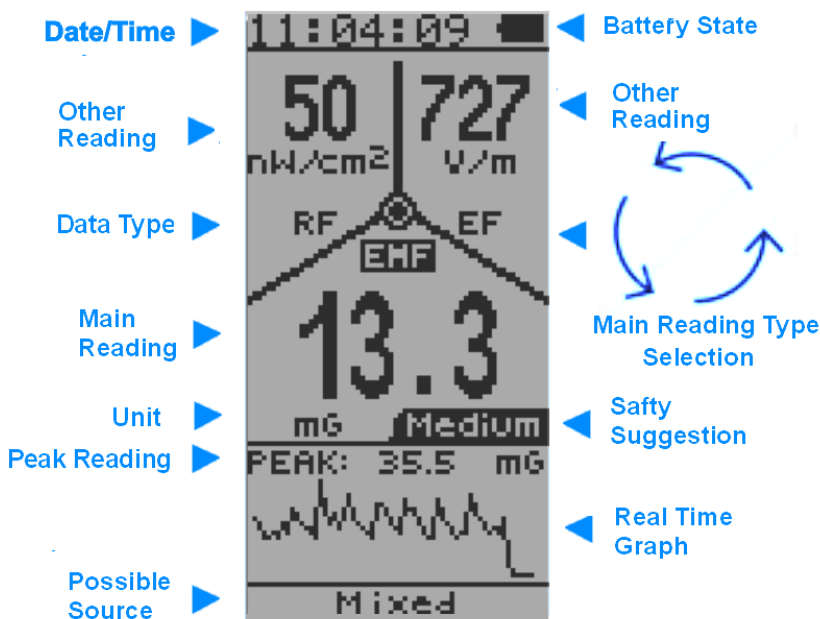
# Vertical EMF/EF Display Layout
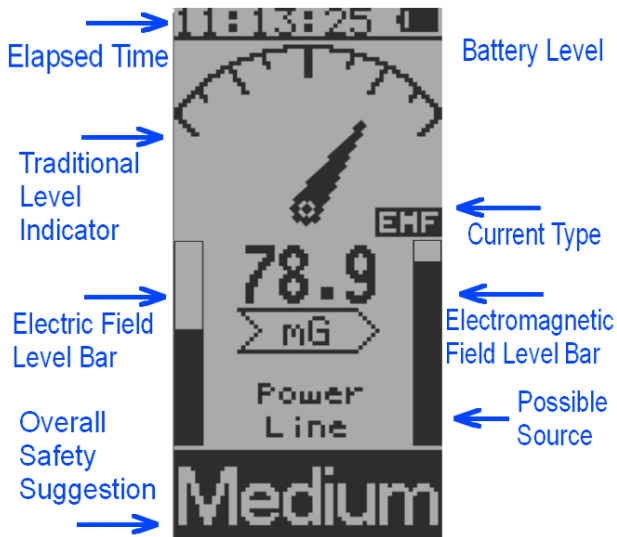
Electromagnetic Field Display

- Elapsed Time
- Battery Level
- Traditional Level Indicator
- Current Type
- Electric Field Level Bar
- Electromagnetic Field Level Bar
- Overall Safety Suggestion
- Possible Source

Reading: 78.9 mG — Power Line — Medium

Electric Field Display

- Elapsed Time
- Battery Level
- Current Type
- Traditional Level Indicator
- Electric Field Level Bar
- Electromagnetic Field Level Bar
- Overall Safety Suggestion
- Possible Source

Reading: 21.1 V/m — WiFi — Normal

- Date/Time
- Battery State
- Other Reading
- Other Reading
- Data Type
- Main Reading Type Selection
- Main Reading
- Safty Suggestion
- Unit
- Peak Reading
- Real Time Graph
- Possible Source

Readings: 50 nW/cm², 727 V/m, RF, EF, EMF, 13.3 mG Medium, PEAK: 35.5 mG, Mixed

- Fields
- Level Indication
- Reading Selection
- Reading
- Unit/Safety Indication

EMF EF RF — 290.4 mG Xtreme

Basic Display
(EMF-360, EMF-360+ only)

737 V/m — EF — RF — 151 nW/cm² — PEAK: 40.3 mG Medium — EMF — 15.5 Power Line

Table Mode RF Power top 5 list

(EMF-360+V2, EMF-380V2, EMF-390 Only)
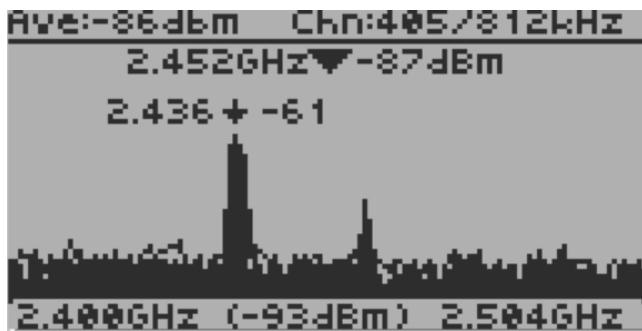
RF Power Graph (Except EMF-360)

Information shown on this graph:

Average (top left): -86dbm

Frequency checked scope (bottom line, left and right): 2.400GHz – 2.504GHz

Channel step: 405 kHz

Channel bandwidth: 812 kHz
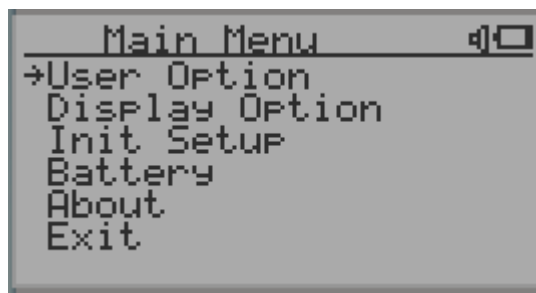
User cursor position: 2.452Ghz, -87dBm

Current peak: 2.436 Ghz, -61dBm

Main Menu

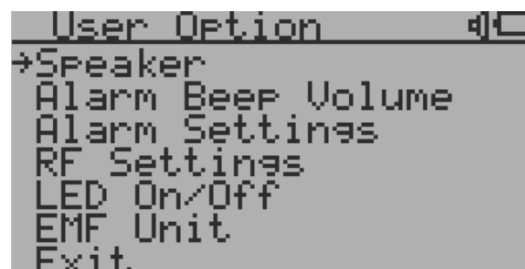In any display mode, press S4 to enter the menu mode.

Navigation keys:

S1: Back   S2: Up   S3: Down   S4: Select/Enter

User Option

Navigation keys:

S1: Back   S2: Up   S3: Down   S4: Select/Enter

Here you can set your personal preferences for your EMF device:

1. The Speaker ON/OFF for all audio alarms.

2. The alarm Beep volume.

3. The alarm related settings.

4. RF related settings

5. LED indicator on and off.

Display Option

Navigation keys:

S1: Back   S2: Up   S3: Down   S4: Select/Enter

1. Backlight Timer: Set the duration before for the backlight switches off.

2. Backlight Level: Set the level for the backlight.

3. Contrast: Set the contrast for the backlight.

4. Swivel Display: Pressing the S4 key will cycle between: Normal -> Swivel -> Auto Swivel modes.

   In the Auto Swivel mode, the horizontal display will be rotated by 180° if the unit is held upside down.

5. Reverse Display: Invert the colors for the screen.

Alarm Setting

S1: Back   S2: Up   S3: Down   S4: Select/Enter

```
 Alarm Settings   ◄)▮
→Alarm Type
 EMF Alarm
 EF Alarm
 RF Alarm
 Exit
```

1. The alarm audio type can be selected (beep/siren/ghost).

2. The threshold for the EMF Alarm (in mG).

3. The threshold for the EF Alarm (in V/m).

4. The threshold for the RF Alarm (in $\mu W/cm^2$).
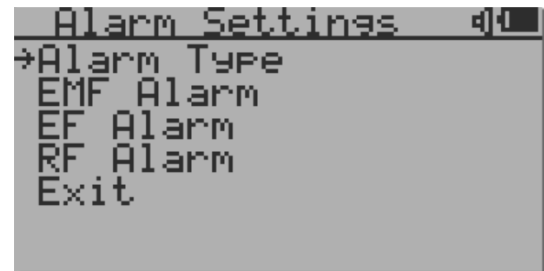
RF Setting

S1: Back   S2: Up   S3: Down   S4: Select/Enter

1. RF sensitivity selection. The RF standard mode provides a standard average reading. The RF sensitivity mode provides a aggressive high sensitivity reading. The reading may be higher than standard mode.

```
 RF Settings      ◄)▯
→RF Sensitivity
 RF Browser Scale
 RF Browser Unit
 RF Density Unit
 RF Sample-Hold Time
 Exit
```

2. Set the RF browser graph scale.

3. Select a preferred RF browser unit between V/m or mW/m^2

4. Preferred unit for power density(mW/m^2, $\mu w/cm^2$, auto)

5. RF Sample and hold: the time duration (in seconds) for RF graph to hold the maximum sampled value line on the graph. The maximum graph line will be cleared and start a new session after this duration.
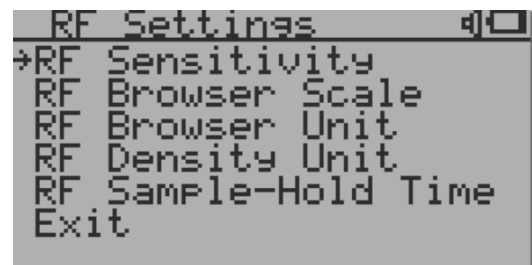
Initial Setup

Date and Time setting (Not available on EMF-360)

Navigation keys:

```
    Init Setup        ▯
→Date/Time
 Factory Reset
 Zero EMF Calib.
 Exit
```

S1: Back/Exit

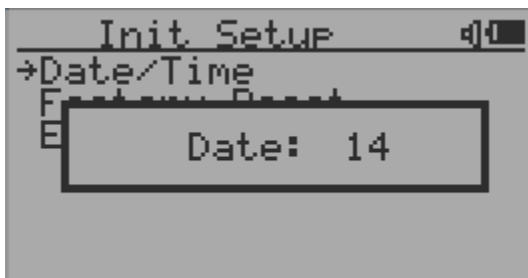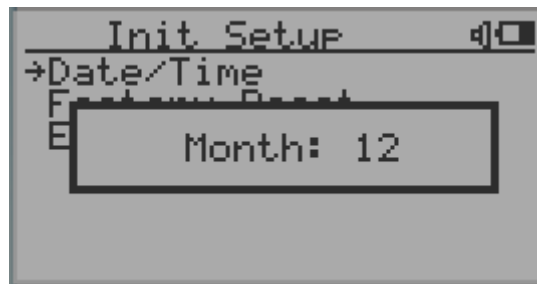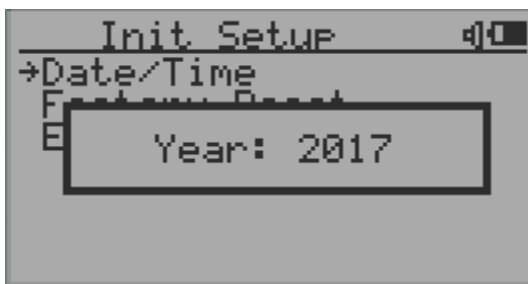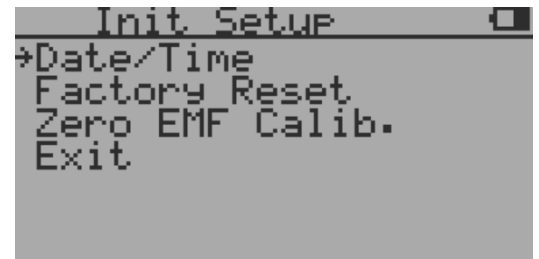S2: Increase value by 1 (or hold the key down)

S3: Decrease value by 1 (or hold the key down)

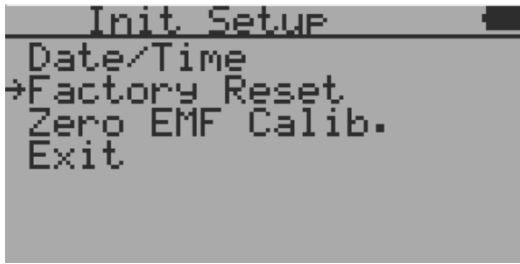S4: Select setting mode between Year, Month, Date, Hour, Minute and Second.

   Each key press will change the mode to be set.

NOTE: Setting of Date and Time is important, all history data use Date and Time as a timestamp reference.

NOTE: You can also synchronize the time with your PC with the use of the companion software.

```
    Init Setup     ◁▯            Init Setup     ◁▯
→Date/Time                    →Date/Time
 F┌──────────────┐            F┌──────────────┐
 E│  Year: 2017  │            E│  Month: 12   │
  └──────────────┘             └──────────────┘
```

```
    Init Setup     ◁▯            Init Setup     ◁▯
→Date/Time                    →Date/Time
 F┌──────────────┐            F┌──────────────┐
 E│  Date:  14   │            E│  Hour:  10   │
  └──────────────┘             └──────────────┘
```

```
    Init Setup     ◁▯            Init Setup     ◁▯
→Date/Time                    →Date/Time
 F┌──────────────┐            F┌──────────────┐
 E│  Minute: 33  │            E│  Second: 00  │
  └──────────────┘             └──────────────┘
```
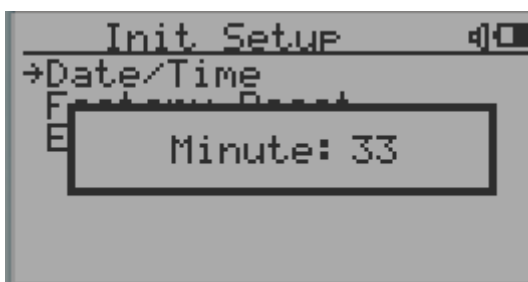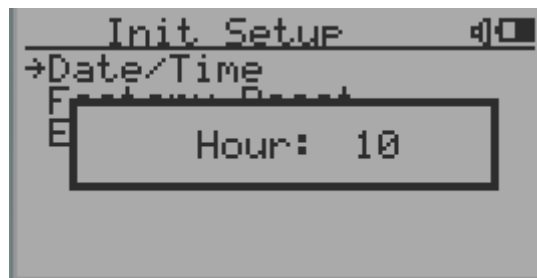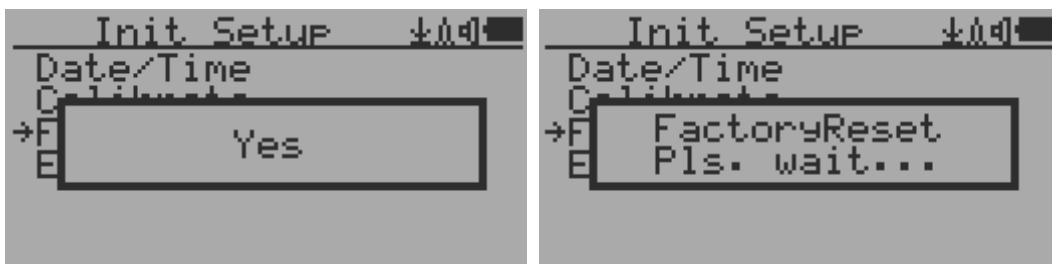
Factory Reset

Select Factory Reset to reset the unit to the factory default settings.

Note: The reset will erase all user settings and recorded history data.


Select Factory Reset menu item and change the popup Windows message to Yes. Wait for popup message window's timeout to confirm the reset request. Any other key press will cancel the reset request. It may take up to 30 seconds to complete the reset.

Zero EMF Calibration
For more accurate reading, you can set the zero reference reading when the unit is believed to be in a zero EMF environment. Example: in a professional Faraday cage.

In order to set the zero reading reference, you need to select Yes and then wait for about 10 seconds to allow device to detect the lowest reading value as the zero reading reference during that period.

This feature only works when the EMF reading less than 10mG.
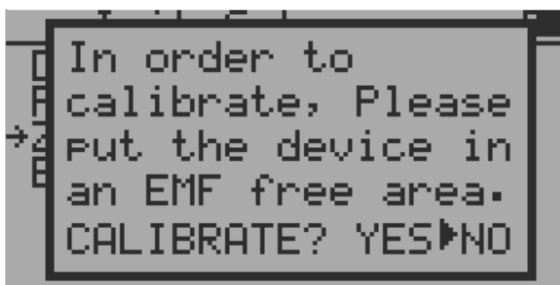
Battery
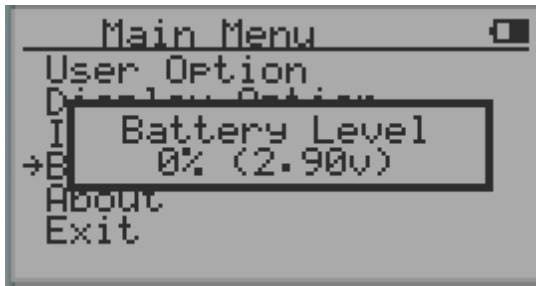
The battery submenu shows the information about the battery level: percentage and the voltage.

About

This menu item is used to gather information about the instruments model number, firmware revision and serial number.
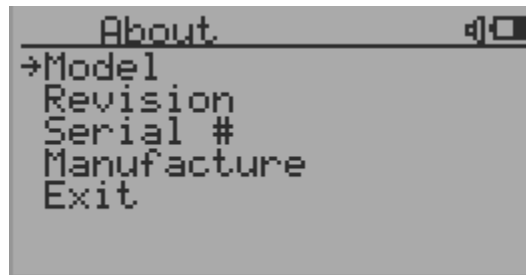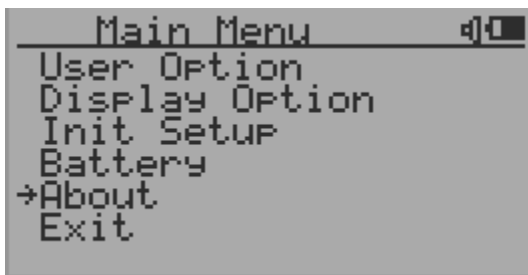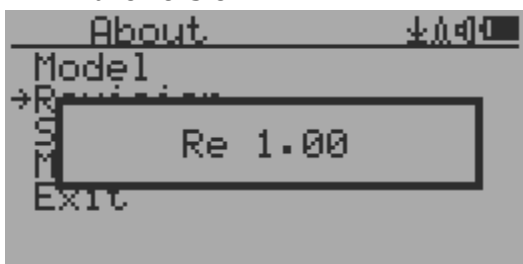

Navigation keys:

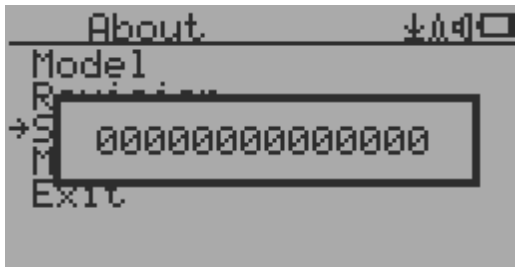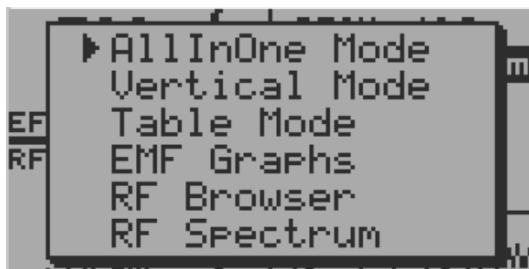S1: Back   S2: Up   S3: Down   S4: Select/Enter

Model information

Firmware version

Unit serial number

Display Modes

(EMF-380V2/EMF-390 only)   EMF-360V2
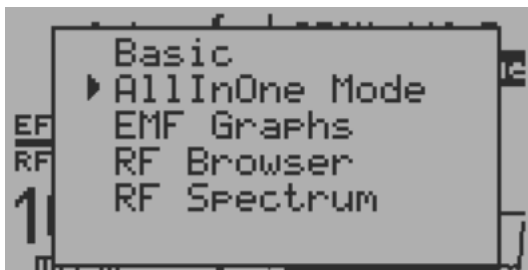
EMF-360+ V2

You can access display modes list by pressing S1 in any of the display modes.

All-in-one Mode

The All-in-one display mode provides an overall picture of all main readings in one screen. The device will auto rotate into vertical or horizontal mode based on the position of the device.

The reading displayed in the largest font is the main data type. It can be changed to a different data type by pressing the S3 key at any time.
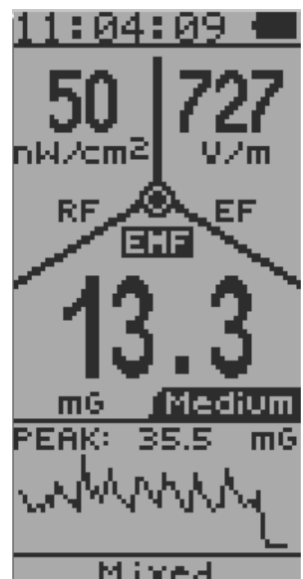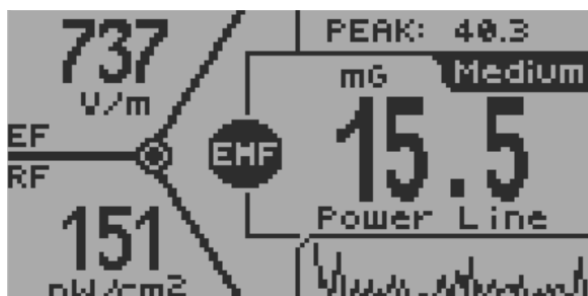
The RF readings shows measures from all RF bands.
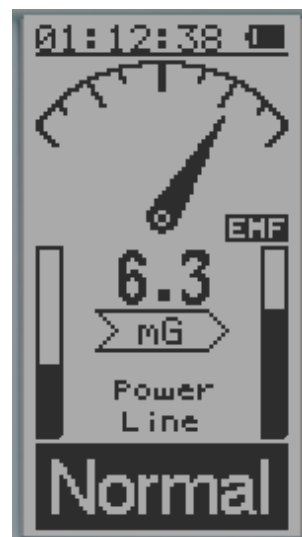
Vertical Mode (EMF/EF)

Navigation keys:

S1: Display mode selector

S2: Display the value for EF/EMF only

S3: Toggle between and RF mode

S4: Main Menu

The left bar is used to indicate the EF value and the right bar is used to indicate EMF value. The actual EMF/EF value will be displayed when you press S2.

The dose of EF/EMF will be displayed as Normal/Medium/High.
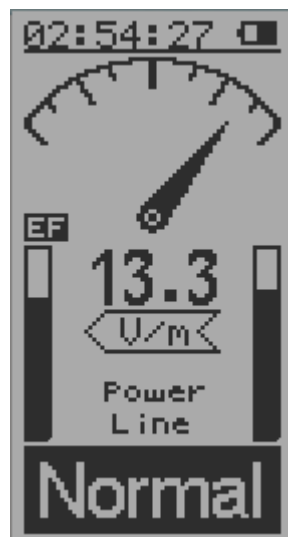
EF Mode   EMF mode

Possible radiation source

The possible source will be displayed once the data has been identified.

These are the possible sources the device can identify:

WiFi, Microwave, WiFi/Microwave, Power Line, AC EF (AC voltage Electric Field), Static, Phone Call, Call Tower.

If more than one kind of source are identified at same time, then the device will display the possible source as "Mixed".

When there are **4 dashes** ("----") in the possible source field, it means the measured data is not sufficient to identify a specific source. To get more accurate source information, you may **rotate** or change the location of device in order to let the sensors pick up a clearer signal.

Vertical Large Font Mode (RF) (EMF-380/EMF-390 only)
Navigation keys:

S1: Display mode selector

S2: Display the unit between mW/cm^2 , mW/m^2 and auto unit.

S3: Toggle between EMF/EF and RF mode

S4: Main Menu

Unit selection in Vertical Large Font Mode (RF)
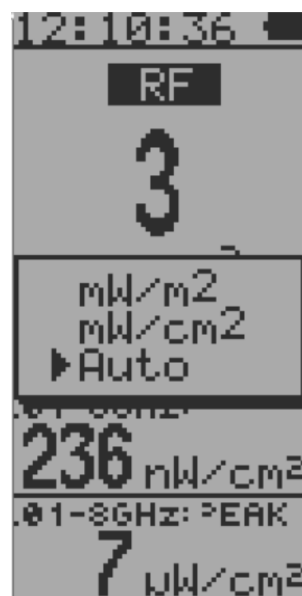
S2: to select different unit from a unit list.

We recommend you use Auto unit for most large scale reading measurements.

GQ RF Browser

GQ RF Browser provides an instant RF reading in graph. It includes three different way to graph the RF signal: General RF, Digital RF, Power Histogram.

It is used to detect the RF signal changing event.

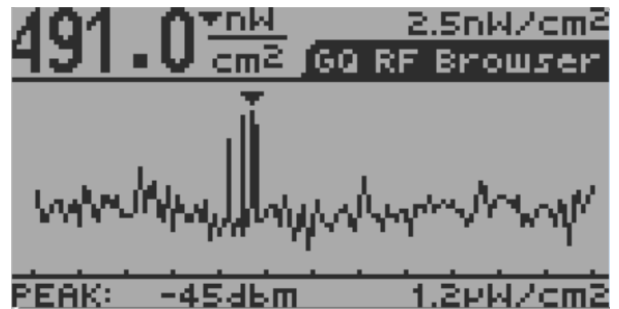Such as cell phone transmission RF signal.

General RF

Navigation keys:

S1: Display mode selector

S2: Buffer length selection. From 1-12 seconds.

S3: Toggle between General RF/Digital RF/Power Histogram mode.

S4: Main Menu

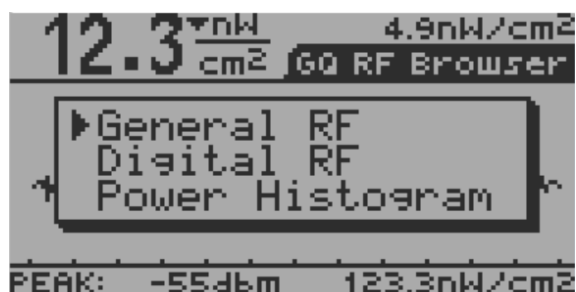The top left displays peak value in this period.

The top right displays the latest value.

The triangle in graph is the location of peak value.

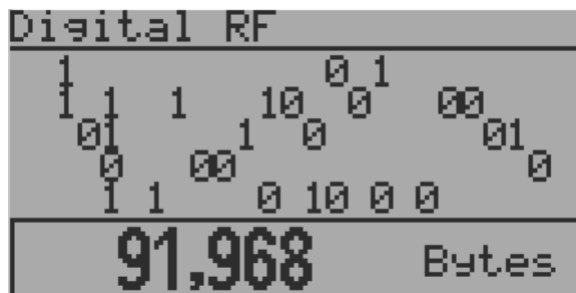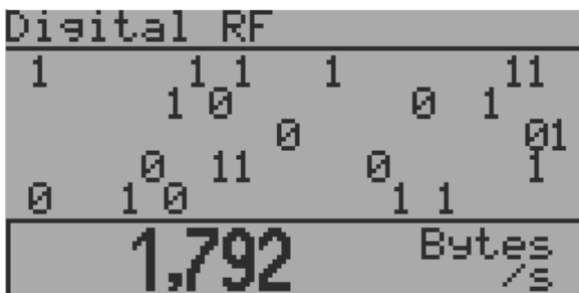The lower PEAK indicates the peak reading since in this mode in both units.

Press S2 to change the graph period


Press S3 to change the format

Digital RF

Digital RF is a utility to estimate the total data in byte has been transmitted during a specific selected period (from 1-12 seconds).

Power Histogram (Time Spectral Power Distribution)

The Power Histogram shows how the RF power distribution is during a specific time period in a statistics graph (Time Spectral Power Distribution). The horizontal axis is the range of the RF power which has been detected. The vertical axis gives an amount of times in different power has been detected.

To start a measurement session, press S2 key.   Press S2 key again will stop the measurement session. Then the static result will show in graph. The top right data shows the most times of power in percentage, as well as in power density.
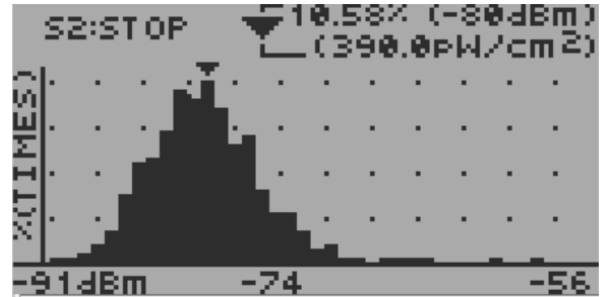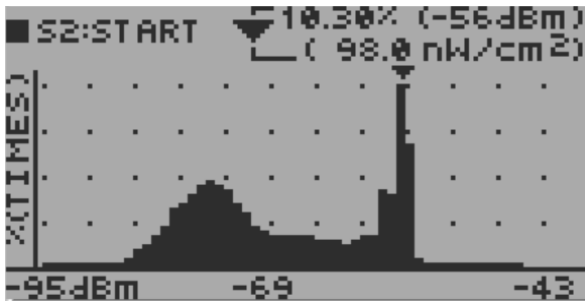
Data Logging/Saving

The EMF-390 model has data logging/saving into internal flash memory feature. User is able to download the history data into .csv format from a Windows PC via USB connection.

Upon the data saving been enabled from menu, the device will automatically save the EMF, EF and RF data into internal flash memory every second.

User is able to configure and check the internal flash memory status from the menu.

The internal flash memory can be set between Circular mode and Stop at 100% mode. The Circular mode enables continually data logging back to the beginning address if the flash memory is full. And the Stop at 100% mode stops data saving when the memory is 100% full.

Memory Used menu shows the current memory status.

Erase Saved Data will erase all the history data in flash memory.

Example of downloaded data:

|	A	B	C	D	E	F
1	GQ EMF-390 Logged Data History					
2		EMF	EF	RF Power Level		
3	Date and Time	mG	V/m	mW/m2	mW/cm2	pW/cm2
4	_2018-09-12 20:13:00	11.9	0	0	0	49.098
5		16.6	0.2	52.992	0.005	5299203.5
6		21.6	0.9	53.521	0.005	5352063
7		19.5	4.7	120.768	0.012	12076799
8		16.1	19.5	151.745	0.015	15174544
9		...				
10	_2018-09-12 20:17:19	33.4	164	979.636	0.098	97963592
11		23.1	184.3	1181.953	0.118	118195288
12		27.3	189.2	163.348	0.016	16334846
13		27.1	166.8	236.845	0.024	23684482
14		27.8	184.9	1.553	0	155261.766
15		22.8	175.7	163.465	0.016	16346513
16		26.6	186	230.217	0.023	23021658
17		21.6	196.4	166.942	0.017	16694154
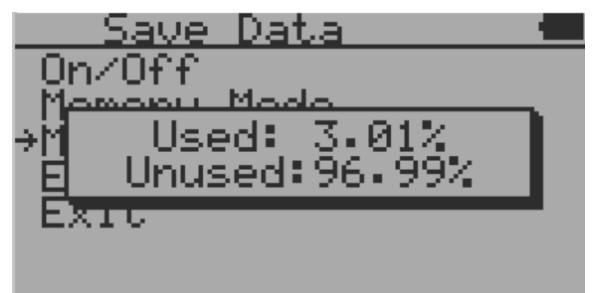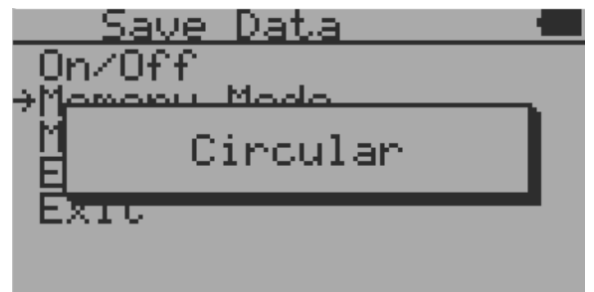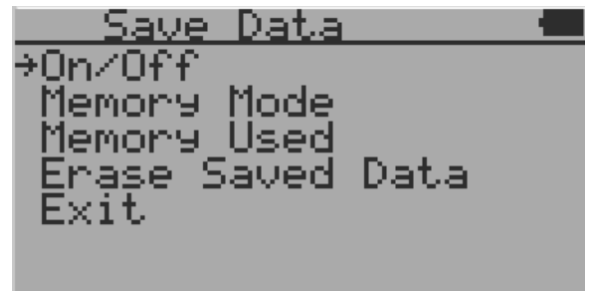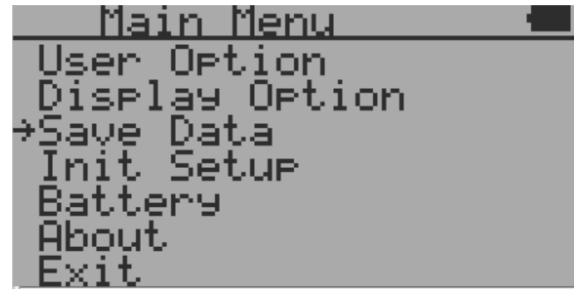
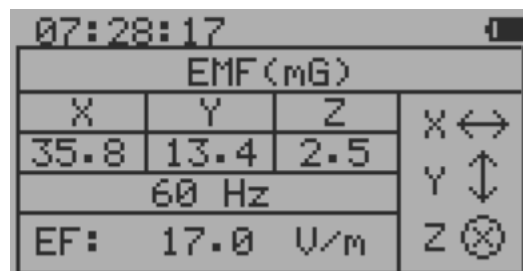## Table Mode (EMF/EF) (EMF-380, EMF390 only)

Navigation keys:

S1: Display mode selector

S2: Toggle between EMF/EF and RF mode

S3: Toggle between EMF/EF and RF mode

S4: Main Menu

X, Y, Z: the EMF value (in mG) in three mutually orthogonal directions, in a X, Y, Z configuration.

Hz: The approximate frequency based on the Y value.

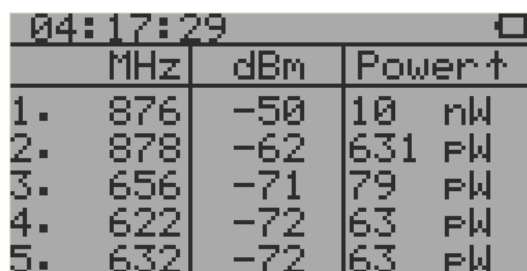EF: the EF value in V/m.

Table Mode (RF)) (Not on EMF-360)

Navigation keys:

S1: Display mode selector

S2: Toggle between EMF/EF and RF mode

S3: Toggle between EMF/EF and RF mode

S4: Main Menu

Displays top 5 values with the highest power at the top in descending order.

EMF Graphs (EMF/EF)

EMF and EF graph displays past 45 seconds changes graph.

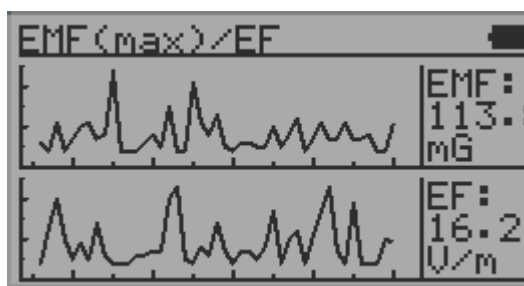The right side of graph displays the current level.

Navigation keys:

S1: Display mode selector

S2: Toggle between EMF/EF and EMF-XYZ mode

S3: Toggle between EMF/EF and EMF-XYZ mode

S4: Main Menu

Displays EMF (unit: mG) and EF (unit: V/m) graph of past 45 seconds.

EMF X-Y-Z Graphs

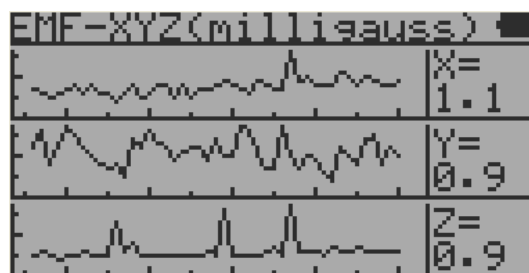The graph displays EMF past 45 seconds level changes in three axis.

Navigation keys:

S1: Display mode selector

S2: Toggle between EMF/EF and EMF-XYZ mode

S3: Toggle between EMF/EF and EMF-XYZ mode

S4: Main Menu

RF Spectrum (Not on EMF-360)

The graph shows the detailed power at specific frequency spectrum.

Example:

Ave:-90dbm

Average signal strength in current range.

Chn:405/812kHz

Chn: (Channel Step) 405 kHz.

Channel Bandwidth: 812 kHz.

2.451GHz▼-91dBm

User cursor (2.451GHz, -91dBm): The user cursor (the solid triangle with vertical line) pointed frequency and the power strength at the specific position/channel.

You can use S2 and S3 to move forward and backward to check the power level at specific channel.

2.463 ↑ -70

**Peak cursor** (2.463GHz, -70dBm): The peak value in the current band.

Start Frequency (2.400GHz): The starting frequency of the current band.

End Frequency (2.504GHz): The ending frequency of the current band.

Minimum value in current band (-93dBm): The minimum value in the current band.

You can always **change the displayed unit** for the power (dbm and Watts). You can change the setting by selecting Main Menu->User Option->RF dBm/Watts.

The right picture shows the graph with **RF unit set to Watts**.
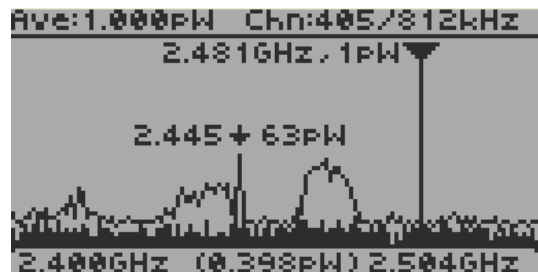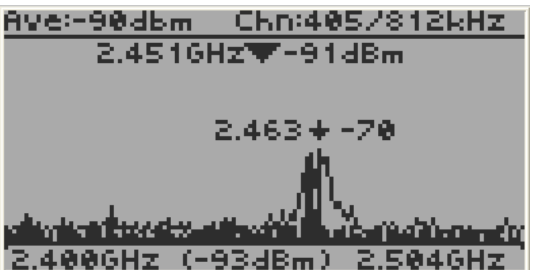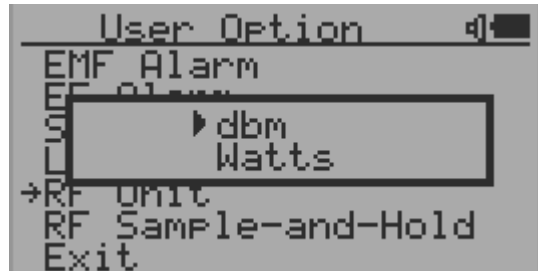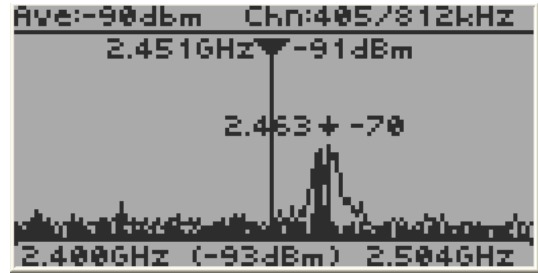
Navigation keys:

S1: Display mode selector.

S3 (Short press): Move the current user cursor ahead for 10 channels.
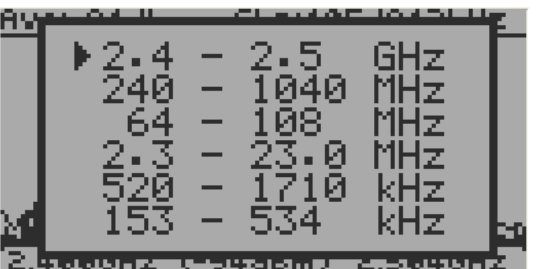
S2 (Short press): Move the current RF cursor backward for 1 channel.

S3 (Hold for 1 sec): Zoom in based on current frequency, 2 zoom levels in total.

S2 (Hold for 1 sec): Zoom out to original selected frequency.

If already zoomed out, you can select the range for the start width and the end width for the window.

S4: Main Menu

By pressing S2 and S3, you can cross the border of the current band window and the RF unit will automatically adjust the current start frequency and the end frequency scope.

Below shows the unit automatically adjusting the bandwidth (from 2.447GHz-2.460GHz to 2.453GHz-2.466GHz) when the user cursor reaches the boundary.
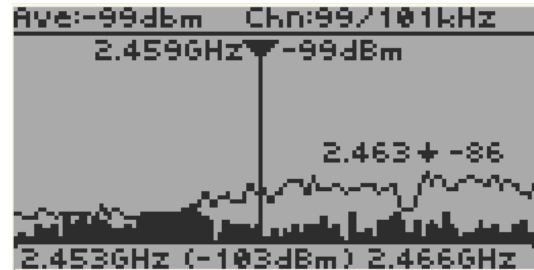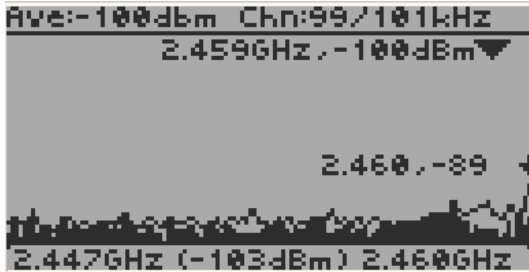
By pressing S3 and hold for 1 second, you can zoom in the current cursor channel for detailed information. Note that there are two zoom levels. To reach zoom 2 level, you have to do zoom 1 first, and press S3 and hold for 1 second again.

Here is an example of ZOOM2.   Under ZOOM1 level, press and hold S3 for one second, the display goes to level 2 zooming. the start and end frequency scope changed from 2.453GHz-2.466GHz to 2.458GHz-2.461GHz, which allows you to see more details of the specific scope.
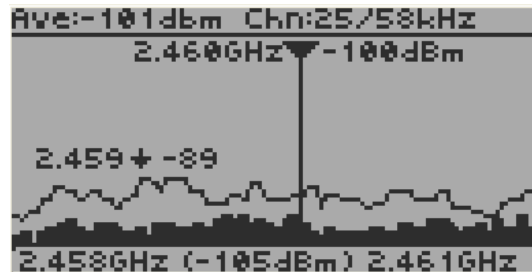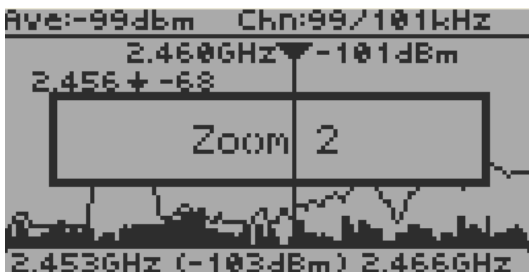
By pressing S2 and hold it for 1 second, you can zoom out from current zooming mode and see the overall band data.

Here is an example for zooming out.   Pressing and hold S2 for one second. The display will back to original bandwidth. The start and end frequency is changed from 2.451GHz-2.464GHz to 2.400GHz-2.504GHz, which allows you to see overall band data.
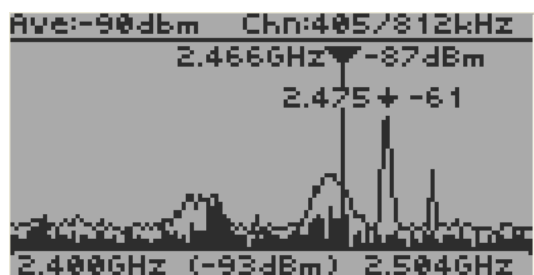
RF Spectrum Example

Select RF Spectrum Analyzer feature from the main feature screen:
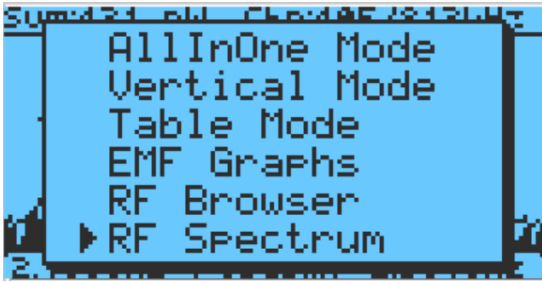
(EMF-380 V2, EMF-390 Models)

(EMF-360+ V2 Model)
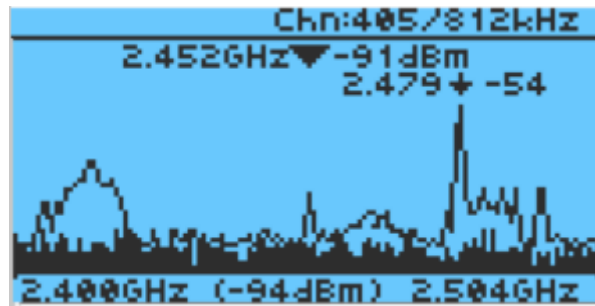
RF Spectrum Analyzer (Except EMF-360)
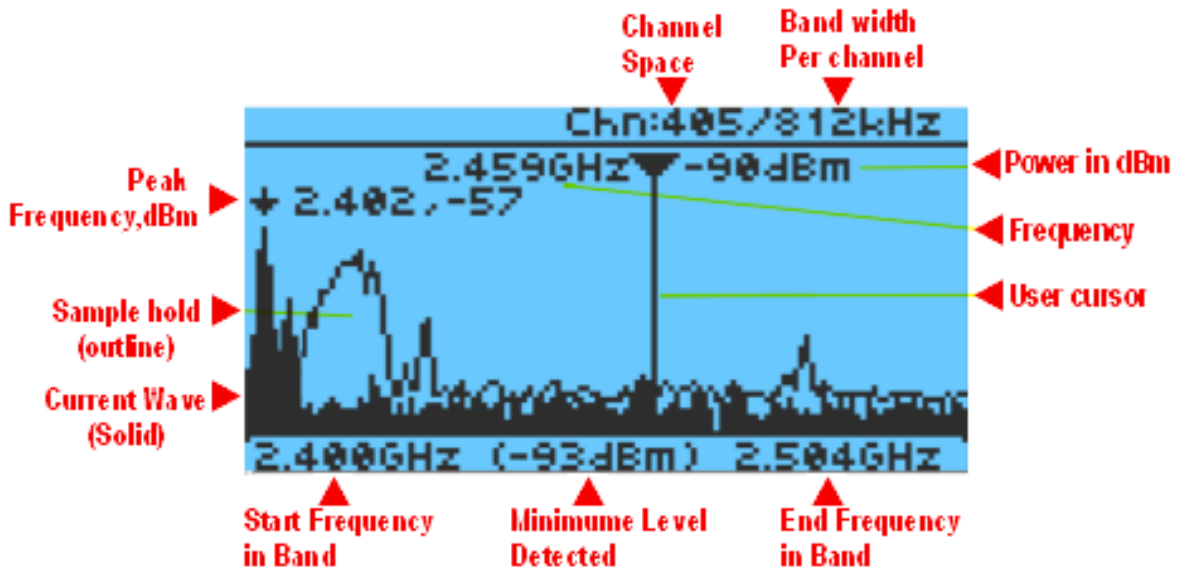
From above screens:

Total power: 458 picowatte
Peak : -57dBm @ 2.402GHz
Minimum: 0.398 picowatte
Frequency checked scope: 2.400GHz – 2.504GHz
Channel step: 405 KHz
Channel bandwidth: 812KHz
At user cursor location: -90dBm @ 2.459GHz
Lowest power detected @ -93dBm

USB Driver

1. The EMF-390 needs a USB driver in order to communicate with Windows software. Most of Win8 or later Windows does not need to install the USB driver. For other Windows version you need to download and install the Windows USB driver. You can download the USB driver from GQ Electronics website download page. OR from following link:
http://www.gqelectronicsllc.com/download/CH341SER.EXE

2. Connect the EMF-390 to computer and you make sure your Windows has loaded USB driver correctly. You can verify the USB driver has been loaded correctly by Auto button to scan the EMF-390 from software to see if the EMF-Pro software is able to detect the EMF-390 or from device manager. See:
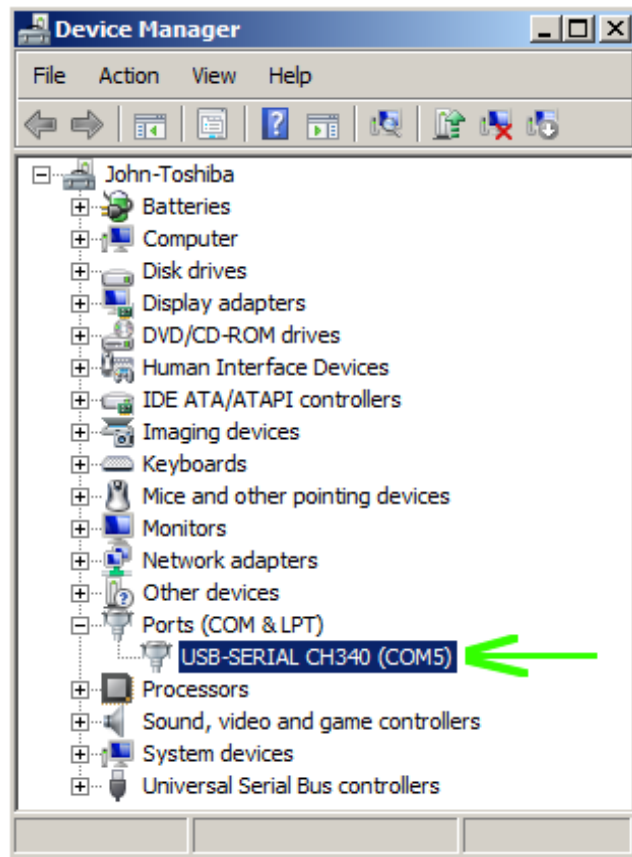
3.

GQ EMF Pro Software
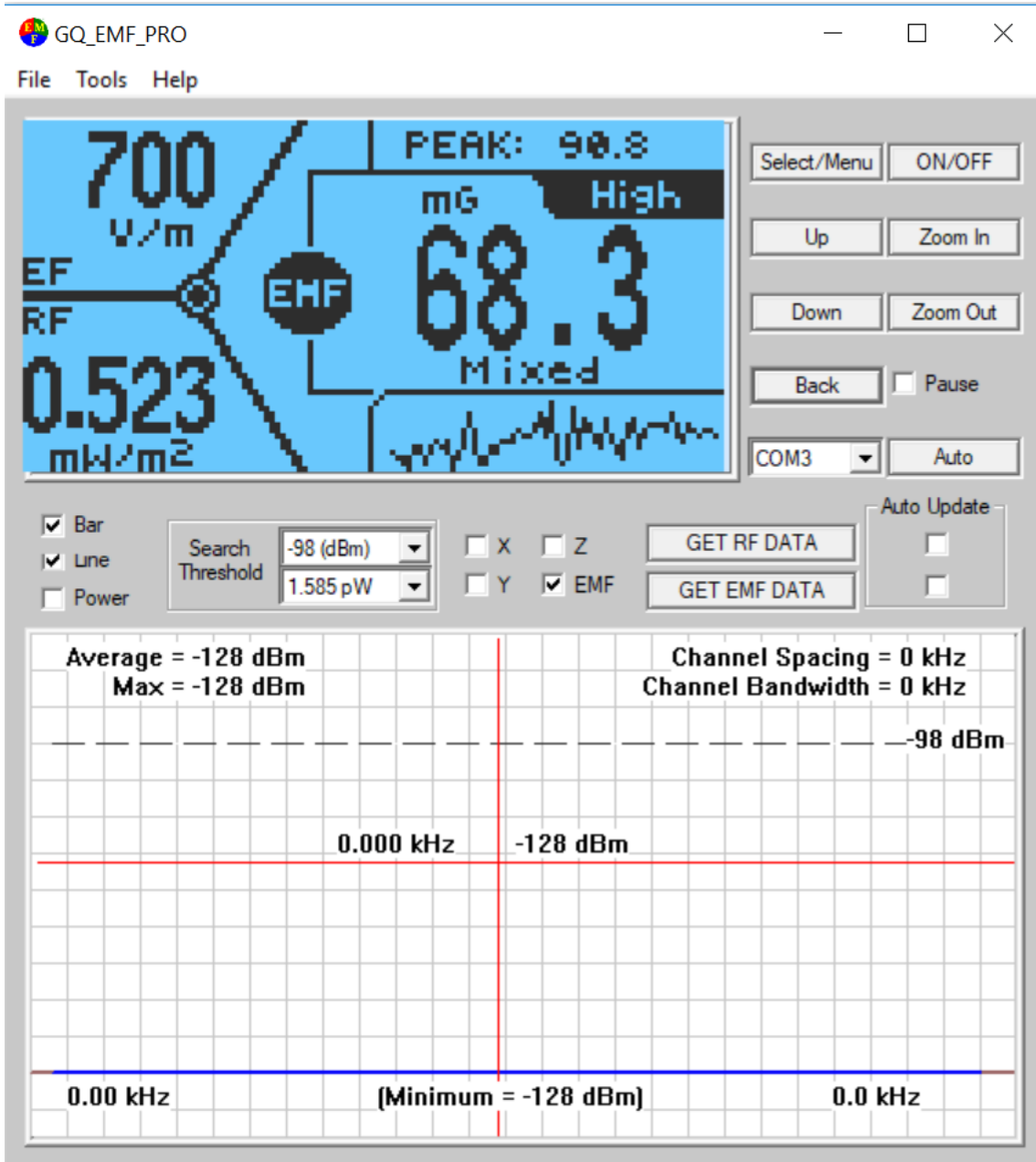
The GQ EMF-Pro Data Viewer software is utility software comes with the EMF device package.

You are able to use software request the real-time data from device and then log it into a data file in .csv format.

You can plug in the EMF unit and press the "Auto" button to scan the COM port and connect automatically.

Main features:

- Download the history data from EMF-390; Save the history data in.csv MS Excel format.
- Real time monitoring (60 seconds) with different graphic mode (bar and line) and different unit (dBm and pWatt) when it connected with GQ EMF meter.
- Search the threshold data.
- Simulated keys (same as the key settings on the unit).

You can use the EMF-Pro software to get EMF data and RF data.
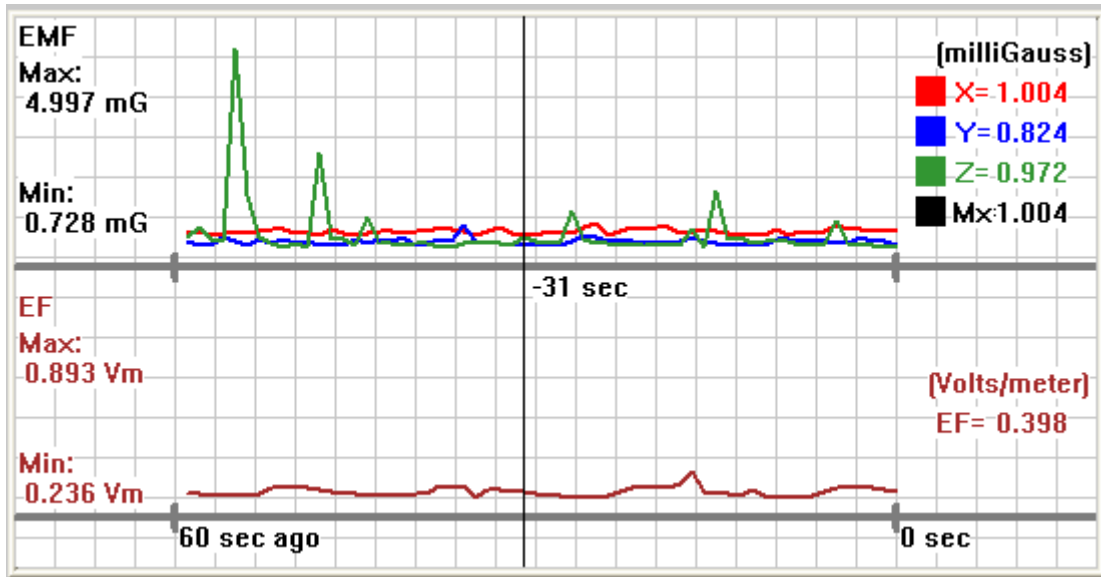
EF/EMF real-time graph for 60 seconds
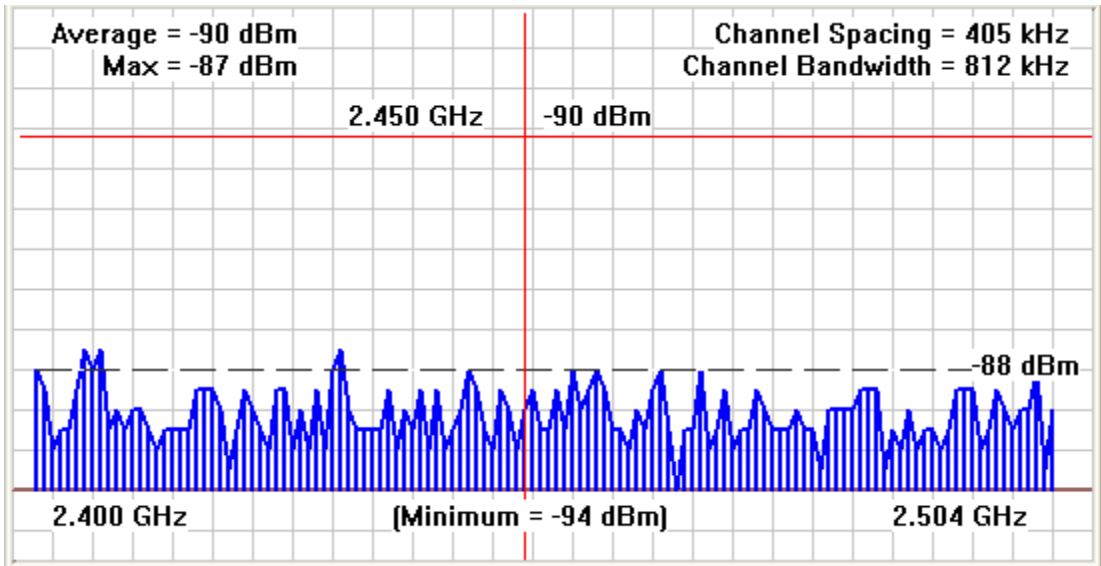
RF real-time graph for 60 seconds

Troubleshooting

1. Remember to press the Auto button to ⟦COM3 ▼⟧ ⟦Auto⟧ make sure the COM port is opened and connected.

2. If you want to get the EF/EMF or RF graph ⟦GET RF DATA⟧ or ⟦GET EMF DATA⟧, remember to turn on the unit and change the mode to EF/EMF or RF mode, otherwise you cannot get the real time graph and the graph will not change until you switch to the correct mode.

3. Auto update check box to let software update the live data itself from the GQ EMF meter.
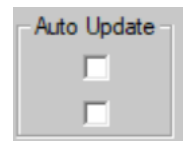
Download History Data

1. Turn on the Save Data feature on the EMF-390 and wait for a while to save enough data to be downloaded.
2. Run the EMF-PRO from Windows. The software will automatically scan and detect the EMF-390. The Auto button is used to detect the EMF-390 again. If the EMF-PRO does not detect the EMF-390, make sure the USB driver is installed and loaded correctly after connect the EMF-390 to a Windows.
3. You should be able to see the EMF-390 screen from EMF-PRO.
4. Select Download history from File menu and let software know where to save the .csv file, then click on the Download button to start download.
5. The progress bar shows how much data been downloaded. The whole data history takes about 3 to 5 minutes to complete the download.

| Date and Time	EMF mG	EF V/m	RF Power Level mW/m2	mW/cm2	pW/cm2
_2018-09-12 20:13:00	11.9	0	0	0	49.098
	16.6	0.2	52.992	0.005	5299203.5
	21.6	0.9	53.521	0.005	5352063
	19.5	4.7	120.768	0.012	12076799
	16.1	19.5	151.745	0.015	15174544
...					
_2018-09-12 20:17:19	33.4	164	979.636	0.098	97963592
	23.1	184.3	1181.953	0.118	118195288
	27.3	189.2	163.348	0.016	16334846
	27.1	166.8	236.845	0.024	23684482
	27.8	184.9	1.553	0	155261.766
	22.8	175.7	163.465	0.016	16346513
	26.6	186	230.217	0.023	23021658
	21.6	196.4	166.942	0.017	16694154

GQ EMF Communication Protocol

*Note: The updated protocol **GQ-RFC1701** document can be found from GQ Electronics website download page.*

Serial Port configuration

Baud: 115200
Data bit: 8
Parity: None
Stop bit: 1
Control: None

Command format

A valid command start with ASCII '<' and ended with ASCII '>>'. Both command and parameters are in between '<' and '>>'.
Command is a ASCII string. All parameters of command are true value in hexadecimal.
Direction: All commands are initiated from computer(HOST).
Firmware supported: GQ-EMF380, GQ-EMF360+, GQ-EMF360 (except some other commands that EMF360 can't support)

Commands

1. Get hardware model and version
Command: <GETVER>>
Return: total 18 bytes ASCII chars from GQ EMF unit. It includes 9 bytes hardware model and 7 bytes firmware version.

    e.g.: GQ-EMF380Re 1.00\r\n

2. Key Commands that simmulates a key press from the unit
Commands: <KEY0>> (back key)   Represents Key S0 from the unit
                <KEY1>> (down key)   Represents Key S0 from the unit
                <KEY2>> (up key)   Represents Key S0 from the unit
                <KEY3>> (select/power key)   Represents Key S0 from the unit
Return: none

3. To simmulate a KeyHold (for zooming and power) just like pressing and holding a key from the unit
Commands: <KEYHOLD0>> (back key)   nothing special same as <KEY0>>
                <KEYHOLD1>> (down key)   change RF band or Zoom out on RF Graphs
                <KEYHOLD2>> (up key)   zoom in on RF Graphs
                <KEYHOLD3>> (select/power key)   Turn unit on or off

4. Get an emf reading

Command: <GETEMF>>

Return: Gets the current max EMF reading from x,y,z,and high frequency emf sensors in ascii 9 bytes

e.g. : EMF = 3.5

5. Get an EF reading

Command: <GETEF>>

Return: Gets the current ef reading in ascii 9 bytes

          e.g.: EF = 33.9

6. Get the current RF band data (Used in RF Graphs mode)

Command: <GETBANDDATA>>

Return: Returns all the 128 channels dBm in text/string/ascii separated by commas

        -88,-88,-89,-88,-89,-87,-87,-89,-88,-87,-87,-86,-87,-87,-87,-86,

        -87,-88,-88,-86,-87,-87,-87,-92,-88,-86,-87,-87,-87,-87,-85,-87,

        -85,-86,-86,-87,-87,-86,-87,-93,-86,-88,-87,-87,-86,-87,-89,-87,

        -87,-87,-88,-89,-89,-87,-89,-92,-89,-90,-89,-88,-88,-86,-91,-86,

        -89,-90,-86,-86,-87,-89,-86,-87,-87,-89,-90,-88,-86,-90,-88,-88,

        -87,-87,-86,-86,-86,-87,-89,-92,-90,-89,-88,-86,-86,-85,-87,-86,

        -87,-88,-89,-89,-87,-87,-86,-78,-88,-87,-88,-87,-88,-88,-86,-85,

        -87,-87,-90,-88,-86,-86,-89,-90,-88,-88,-88,-90,-90,-88,-88,-88,

7. Get the current mode

Command: <GETMODE>>

Return: Current Mode in text

        e.g.: 64 - 108 MHz

        e.g2: EMF/EF

8. Gets the display screen in bitmap

Command: <GETSCREEN>>

Return: Returns 1024 bytes of screen data(bitmap of the lcd screen 128x64) PLUS 0xAA

        total of 1025 bytes

        8E 51 59 95 53 51 8E FF 00 ...

9. Get configuration data

Command: <GETCFG>>

Return: The configuration data. Total 256 bytes will be returned.

10. Erase all configuration data

Command: <ECFG>>

Return: 0xAA

11. Write configuration data

Command: <WCFG[A0][D0]>>

      A0 is the address and the D0 is the data byte(hex).

Return: 0xAA

12. send a key

Command: <key[D0]>>

      D0 is the key value from 0 to 3. It represents software key S1~S4.

Return: none

13. get serial number
Command: <GETSERIAL>>
Return: serial number in 7 bytes.

14. Power OFF
Command: <POWEROFF>>
Return: none

15. Reload/Update/Refresh Configuration
Command: <CFGUPDATE>>
Return: 0xAA

16. Set realtime clock year
command: <SETDATEYY[D0]>>
      D0 is the year value in hexdecimal
      Return: 0xAA

17. Set realtime clock month
command: <SETDATEMM[D0]>>
      D0 is the month value in hexdecimal
      Return: 0xAA

18. Set realtime clock day
command: <SETDATEDD[D0]>>
      D0 is the day of the month value in hexdecimal
      Return: 0xAA

19. Set realtime clock hour
command: <SETTIMEHH[D0]>>
      D0 is the hourvalue in hexdecimal
      Return: 0xAA

20. Set realtime clock minute
command: <SETTIMEMM[D0]>>
      D0 is the minute value in hexdecimal
      Return: 0xAA

21. Set realtime clock second
command: <SETTIMESS[D0]>>
      D0 is the second value in hexdecimal
      Return: 0xAA

22. Reset unit to factory default
command: <FACTORYRESET>>
Return: 0xAA

23. Reboot unit
command: <REBOOT>>
Return: None

24. Set year date and time
command: <SETDATETIME[YYMMDDHHMMSS]>>
Return: 0xAA

25. Get year date and time
command: <GETDATETIME>>
Return: Seven bytes data: YY MM DD HH MM SS 0xAA

26. Get gyroscope data
command: <GETGYRO>>
Return: Seven bytes gyroscope data in hexdecimal: BYTE1,BYTE2,BYTE3,BYTE4,BYTE5,BYTE6,BYTE7
        Here: BYTE1,BYTE2 are the X position data in 16 bits value. The first byte is MSB byte data and second byte is LSB byte data.
        BYTE3,BYTE4 are the Y position data in 16 bits value. The first byte is MSB byte data and second byte is LSB byte data.
        BYTE5,BYTE6 are the Z position data in 16 bits value. The first byte is MSB byte data and second byte is LSB byte data.
        BYTE7 always 0xAA

27. Power ON
Command: <POWERON>>
Return: none