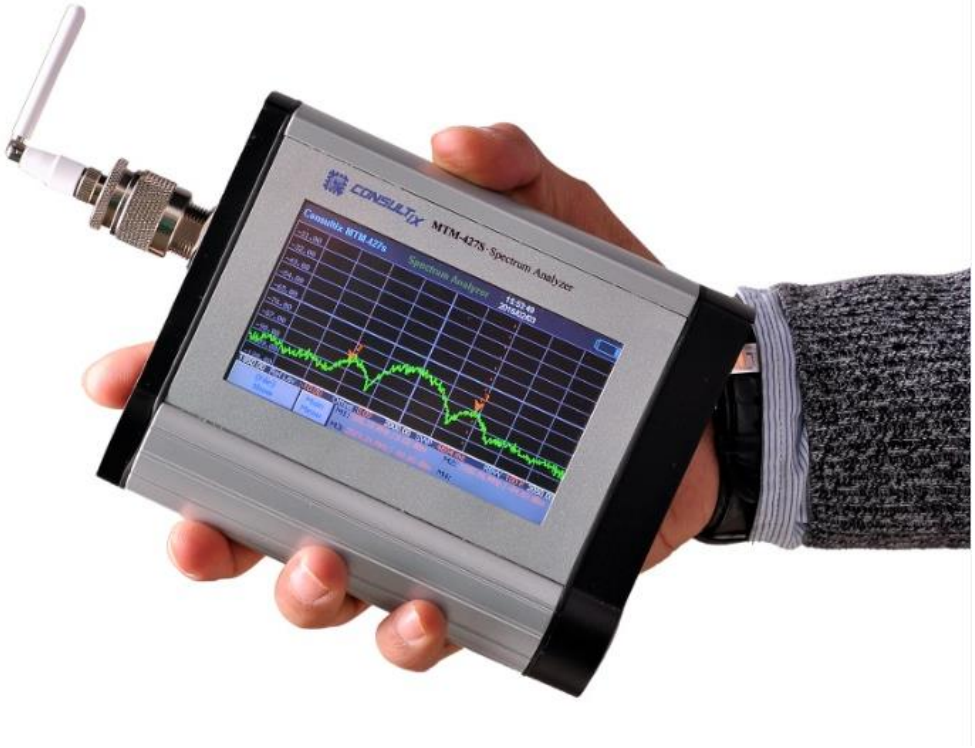
MTM-427s
Handheld Spectrum Analyzer

User Manual



Ver. 2 February 2019

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Introduction

MTM-427s Overview

Consultix provides engineers & technicians with a state-of-the-art, cost-effective, and compact spectrum analyzer; the MTM-427s. Combining features required for signal measurements and interference analysis, this model is magnificently convenient for labs as well as field use.

The MTM-427s handheld spectrum analyzer is addressing the need for a tool that is engineered for field use and taking into consideration the different use-cases and conditions associated with this mission; I.E. an RF spectrum analyzer that is durable and convenient. Here, durability means maximum RF protection, and ruggedized construction, while convenience involves ease of use, intuitive user interface, flexible test accessibility, and the compactness.

Maintaining comparable performance and accuracy of conventional spectrum analyzers, the MTM-427s is enabled to serve in several laboratory applications that don't necessitate the whole capabilities of benchtop spectrum analyzer. The highly compact size of the MTM-427s spectrum analyzer paves the way for testing scenarios that have been hard to realize such as inbuilding sites I.E. DAS (Distributed Antenna Systems) and small cells. Furthermore, it allows testing with minimum connection setup in some cases.

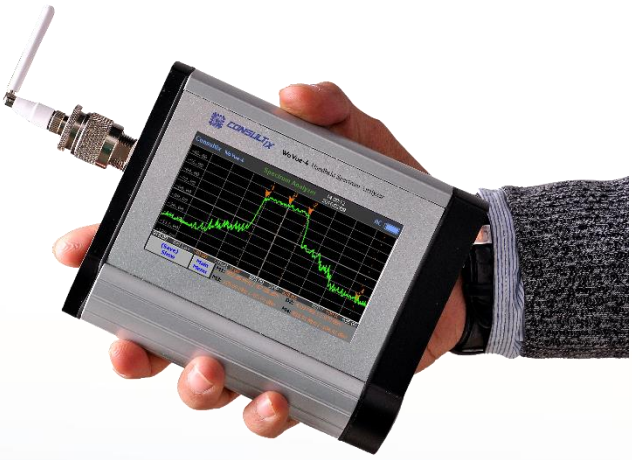
MTM-427s Highlights

Key Features

- DANL Performance: -115 dBm (100KHz RBW)
- Interference Hunting Mode (Optional)
- Spectrogram / Waterfall Display
- Beeper Mode for Interference Location
- Long-term Spectrum Logger
- User Friendly Touch Interface
- RF Accessories available
- Lightweight: 765g (1.7 Pounds)
- Heavy Duty Construction
- Industrial 4.3" Touch Screen
- RF & Shock Protection
- Industrial RF Ports
- Global Stock Delivery
- Quick Service Programs

Applications

- Wireless spectrum measurements & analysis
- Laboratory measurements
- Interference detection & analysis
- Radio equipment maintenance & testing
- Wireless network planning
- Wireless network troubleshooting
- Base line measurements
- EMC pre-compliance tests
- Antenna measurement labs
- Wireless education laboratories
- Radio research



Safety Compliances &Precautions

In order to use MTM-427s in a correct, efficient, safe way, and to avoid damage caused by improper operations, we mandate the following:

1. Use only the original accessories to prevent any damage to the device
2. Don't let water or other liquids flow into the device
3. Prohibit approaching the device to flammable or explosive items
4. Don't open the device outside company maintenance branches
5. For the first time usage of the device, battery should be charged continuously 7hours before usage.
6. Don’t disassemble the parts of the instrument; it may cause instrument damage
7. Consultix doesn’t take any repair responsibility for the damage or malfunction of the instrument caused by an unauthorized disassembly even in the warranty period
8. Do not apply RF power more than 20dBm to the instrument’s RF port; that will damage the instrument
9. Do not use solvents or abrasive cleaners to avoid damage to the display or the case
10. Use the touch pin included in the package to avoid scratching the display screen

Unpacking MTM-427s

Unpack and inspect the shipping package to ensure that nothing was damaged during shipment. If the contents are damaged or defective, contact your nearest Consultix service office or agent. Verify that all the parts were included in the shipping container as shown in ***table 1***.

MTM-427s			
Touch Pin		**Shoulder strap with shock absorbers**	
Manual CD		**AC Adapter**	
N Type-SMA Adapter		**2G/3G Duck Antenna**	
Carrying Case			

Table 1*:* MTM-427s *Packing list*

Operating MTM-427s

User Interface

Figure 1, depicts the MTM-427s user interface

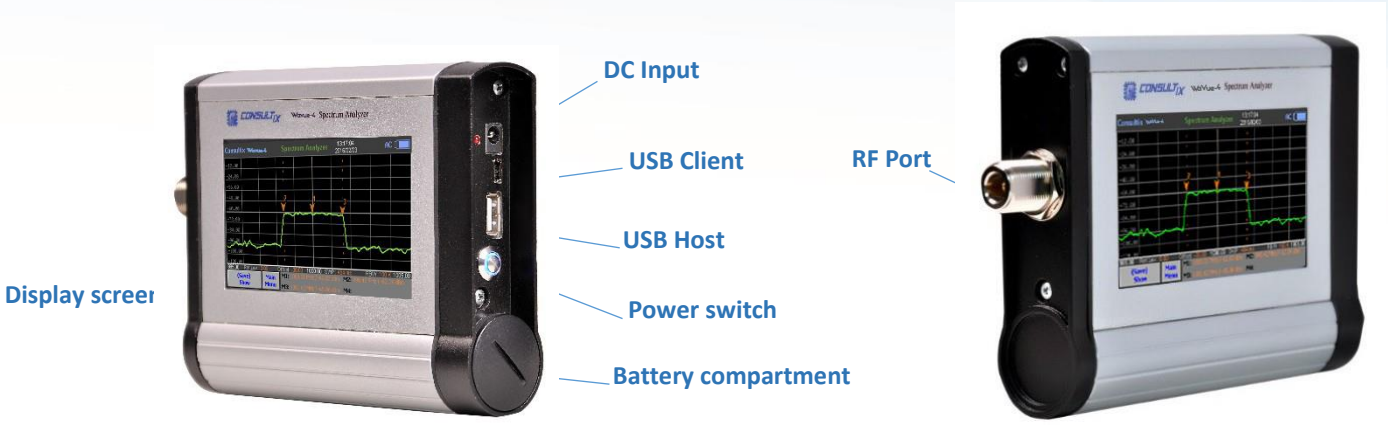


Figure 1: MTM-427s User interface

- **RF Port:** N-Type female 50Ω connector with 33 dBm maximum input power
- **DC Input:** DC input port 12 V, 2 A
- **USB Client:** USB port for PC interfacing to upgrade the instrument's firmware, if needed
- **USB Host:** USB port to export/import measurement data to/from an external memory
- **Power switch:** Push button to power on/off the MTM-427s by one click
- **Display screen:** TFT touch screen for configuration of displaying measurements
- **Battery compartment:** Battery cover for replacing the battery, if needed, just rotate it counterclockwise and plug the battery into its socket as shown in figure 2

Figure 2: Battery replacement

Display Screen

Figure 3, depicts the MTM-427s display screen.

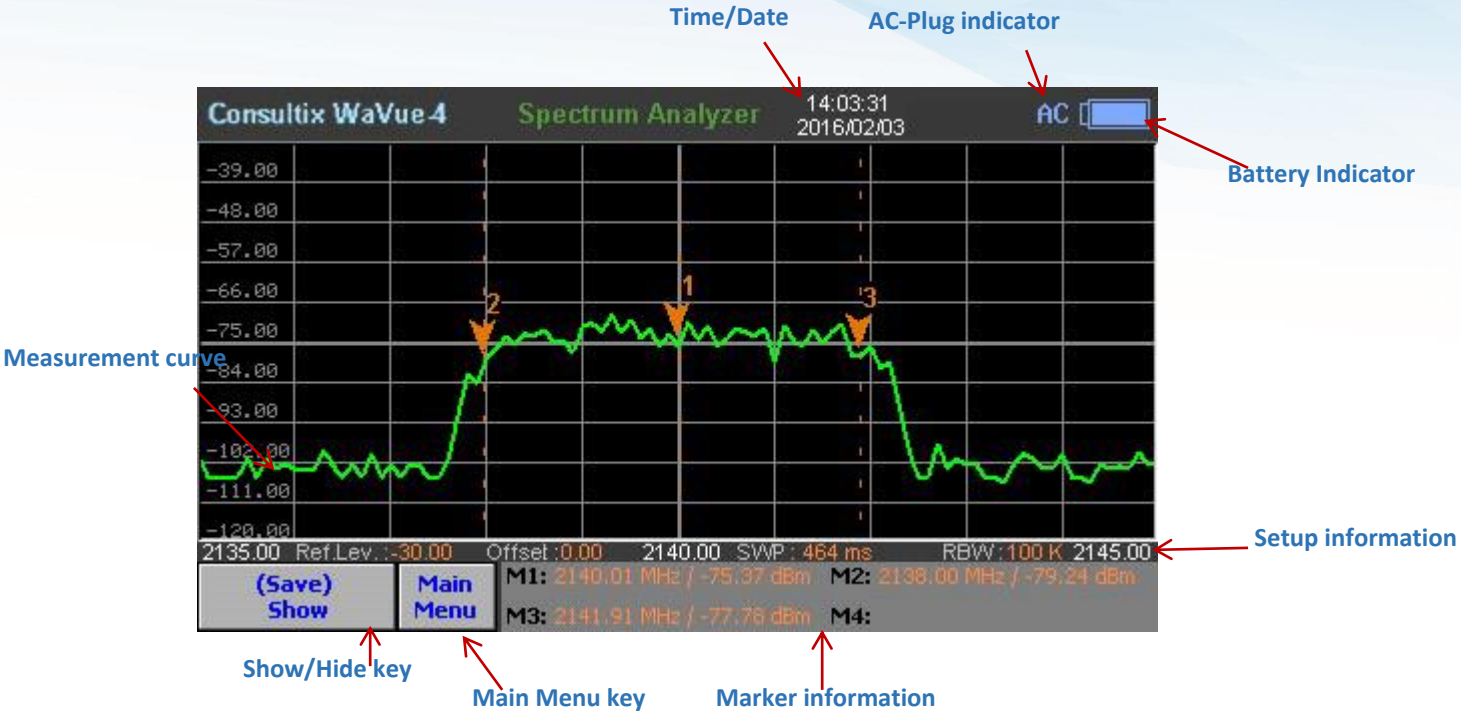


Figure 3: MTM-427s Display screen

- **Measurement curve:** displays the current measurement curve, users can add markers & limit lines, adjust scale and so on
- **Show/Hide key:** shows/hides the menu to enable viewing full screen measurements
- **Main Menu key:** a shortcut button to jump to the main menu when touched
- **Marker information:** displays the marker values; frequency (in MHz), and amplitude (in dBm)
- **Setup information:** displays current configuration parameters like reference amplitude level “Ref. Lev.”, reference attenuation offset "Offset", sweep time "SWP”, and resolution bandwidth “RBW”
- **Battery Indicator:** indicates the battery status.
- **AC-Plug indicator:** indicates if the instrument is connected to its AC/DC adapter
- **Time/Date:** indicates the system clock/date information

Presetting MTM-427s

There are two types of resetting the instrument; resetting the current user configurations and factory resetting.

On **Main Menu > Shortcuts**, press "**Reset**" button to restore current configurations to a default state as shown in figure 4.

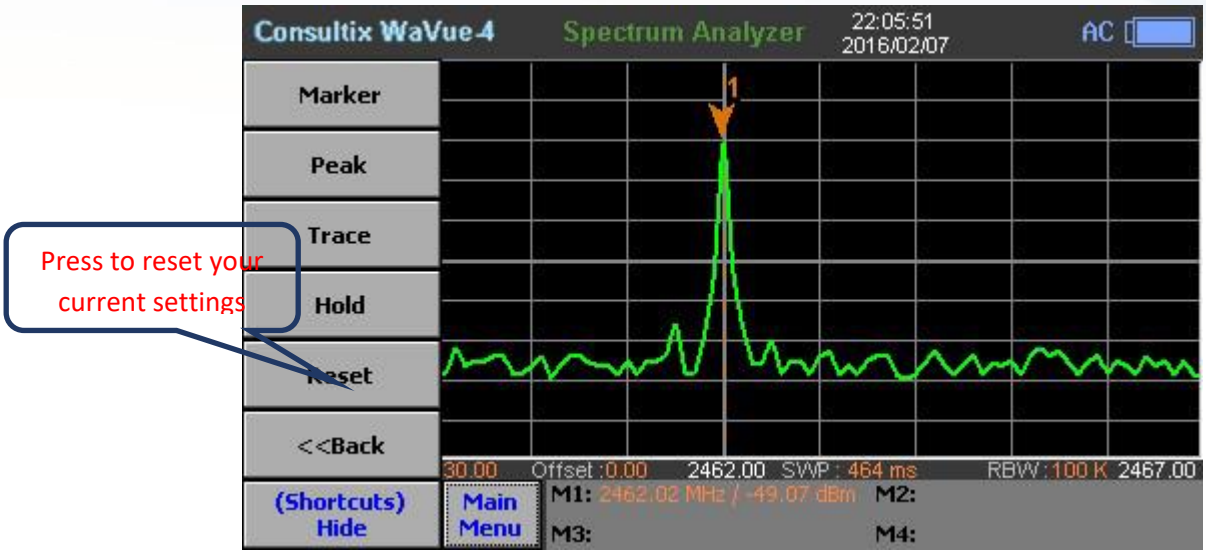


Figure 4: MTM-427s Configuration Resetting

On **Main Menu > System**, press "**Factory Reset**" button in order to restore MTM-427s to the original manufacturer settings as shown in figure 5.

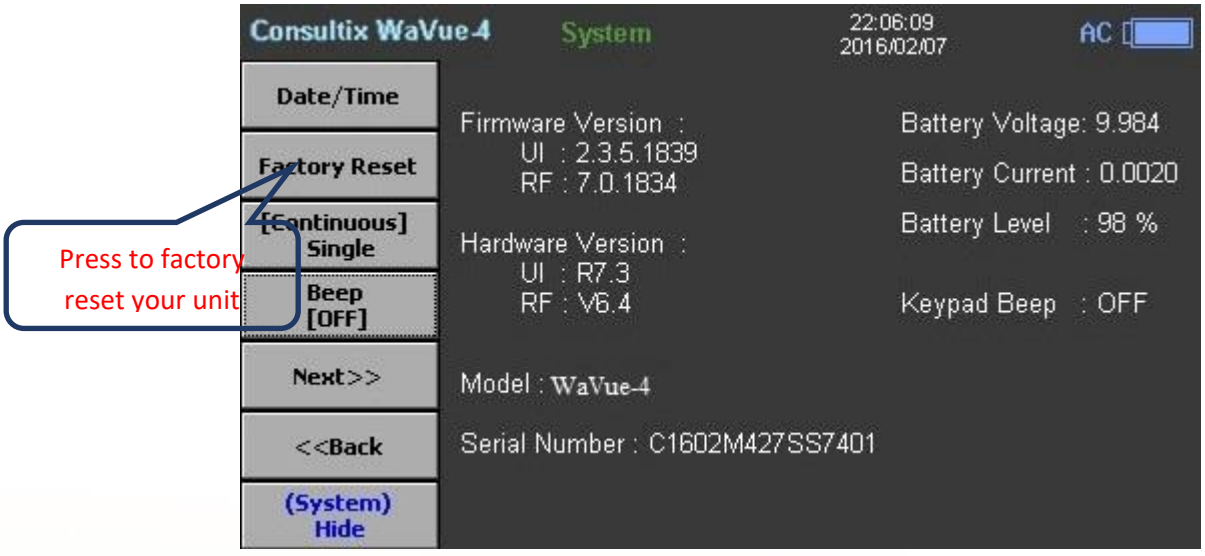


Figure 5: MTM-427s Factory Resetting

Saving & Loading Measurements

For site acceptance and reporting measurements, MTM-427s exports & imports two file formats; BMP image files and CSV trace files to/from external storage (USB memory or SD card) or using the internal memory of the instrument.

On **Main Menu > File > Save**, do the following steps to save measurements as shown in figure 6.

1. Press "**Save to**" button to switch between internal storage "**Internal**" or external storage "**USB"**
2. Press "**Save Screen**" to save an image file or press "**Save Trace**" to save a trace file
3. A pop-up menu "**Save menu**" appears, give your file a suitable name
4. Press "**Done**" button to save your file successfully, a pop-up message should appear to indicate saving status.

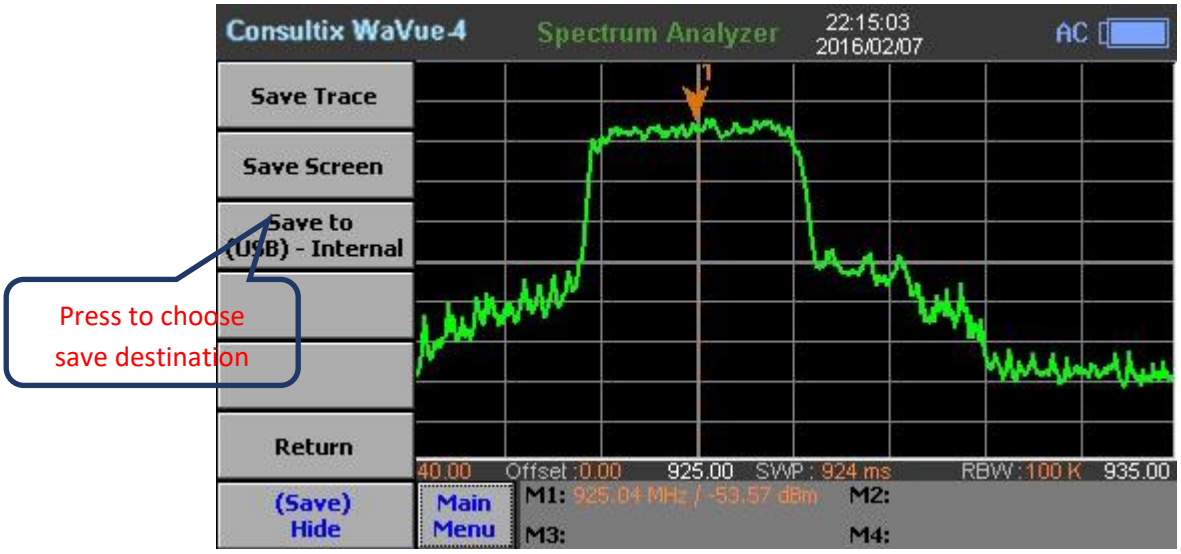


Figure 6: MTM-427s Save Menu

On **Main Menu > File > Load**, do the following steps to load measurement as shown in figure 7.

1. Press "**Load from to**" button to switch between internal or external storage
2. Press "**Load Screen**" to load an image file or press "**Load Trace**" to load a trace file
3. A pop-up menu appears containing all saved images or traces
4. Choose a file and press "**Select**" button to load your file successfully, a pop-up message should appear to indicate loading status.

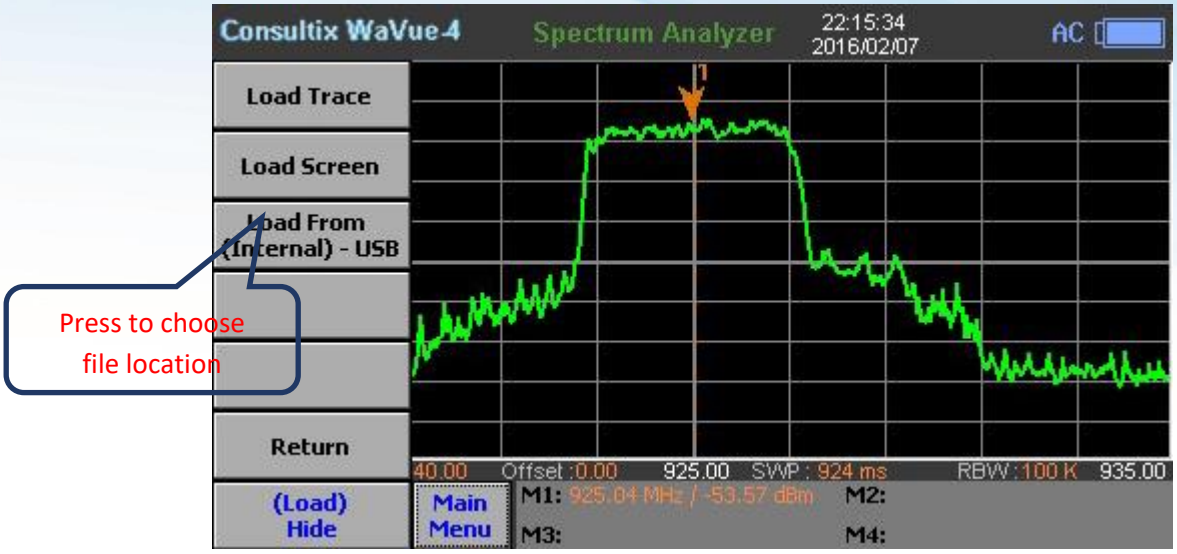


Figure 7: MTM-427s Load Menu

User can delete file(s) stored in the internal memory or in external USB memory or even copy measurements to USB memory. By pressing "**File Manag.**" button as shown in figure 8

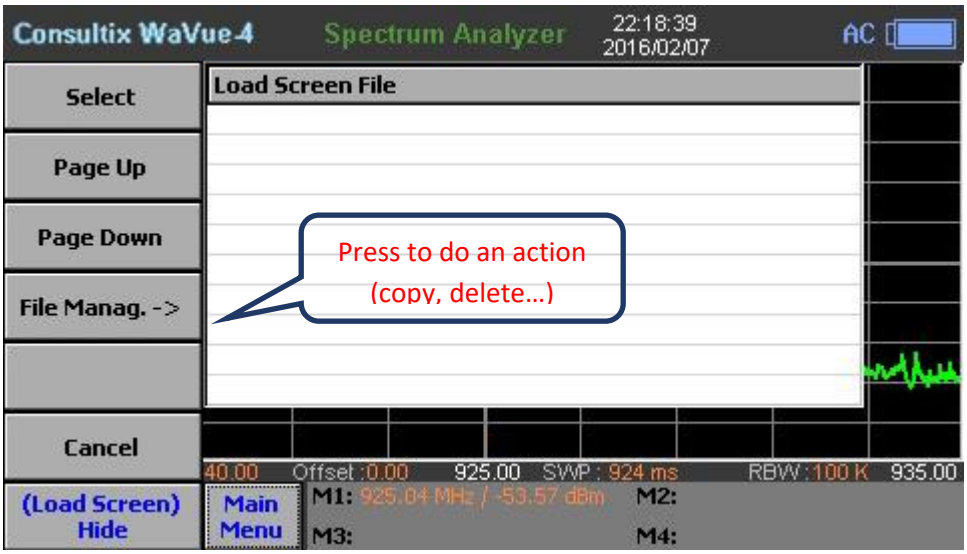


Figure 8: MTM-427s File Management

Firmware Upgrade

MTM-427s is firmware upgradeable; according to our customer reviews and customization needs, Consultix provides users with latest firmware versions of latest added features for MTM-427s Spectrum Analyzer.

For latest firmware versions and how to upgrade your instrument's firmware, please contact us support@consultixwireless.com

Menus

Frequency Settings

On **Main Menu > Measurements > Frequency**, user can configure measurement frequencies in two ways; either using "**Start Frequency**" & "**Stop Frequency**" or using "**Center Freq**." & "**Span**" as shown in figure 9.

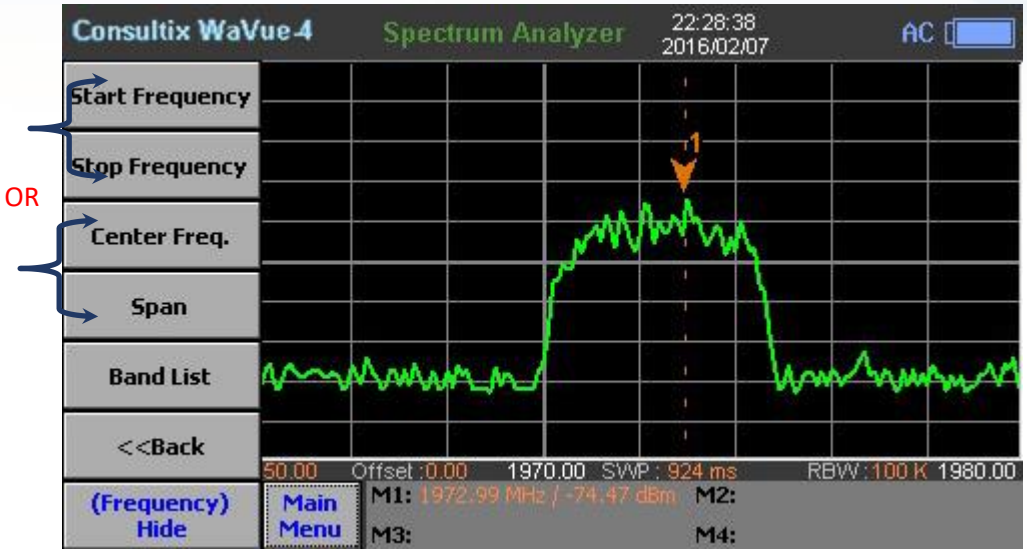


Figure 9: MTM-427s Frequency Menu

For quick frequency configuration, user can select a frequency band from ready-made band list made according to frequency band standard as shown in figure 10.

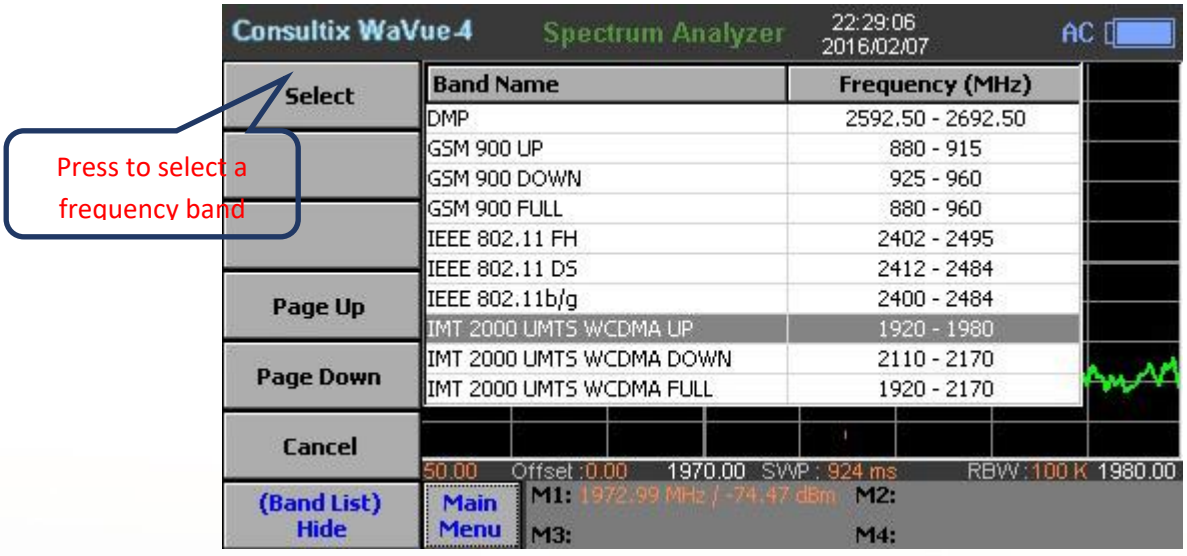


Figure 10: MTM-427s Frequency Band List

Amplitude Settings

On **Main Menu > Measurements > Amplitude**, you can adjust scale settings according to the received signal level through using "**Max (TOP)**", "**Min (BOTTOM)**", and setting a "**Ref. Offset**" as shown in figure 11.

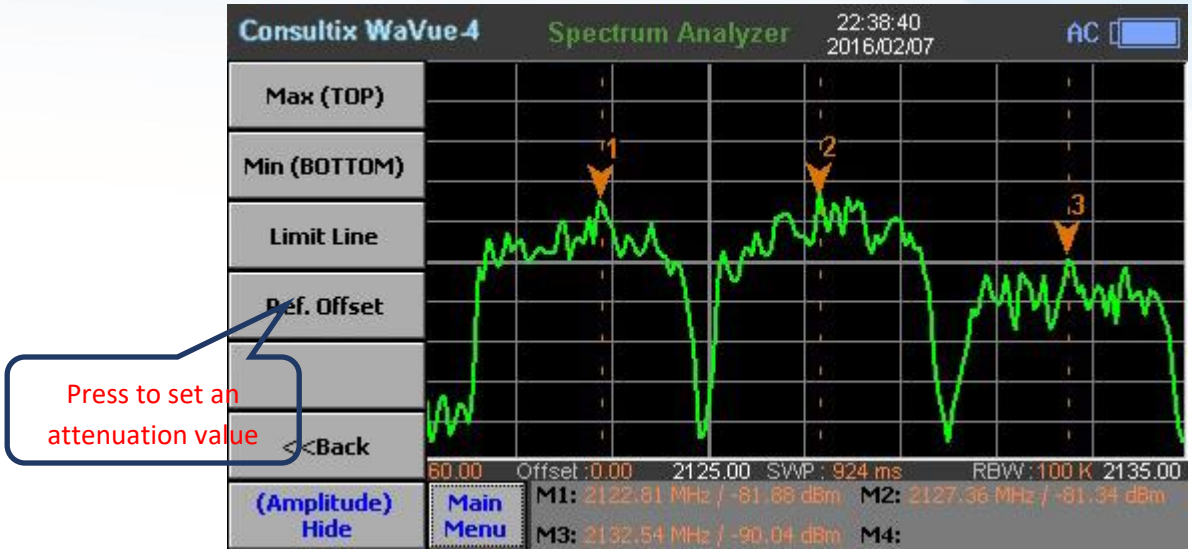


Figure 11: MTM-427s Amplitude Menu

Resolution Bandwidth

On **Main Menu > Measurements > RBW,** select the suitable resolution bandwidth (RBW) for your displayed graph (I.e. select a wide RBW for modulated signals regarding its side bands) as shown in figure 12.

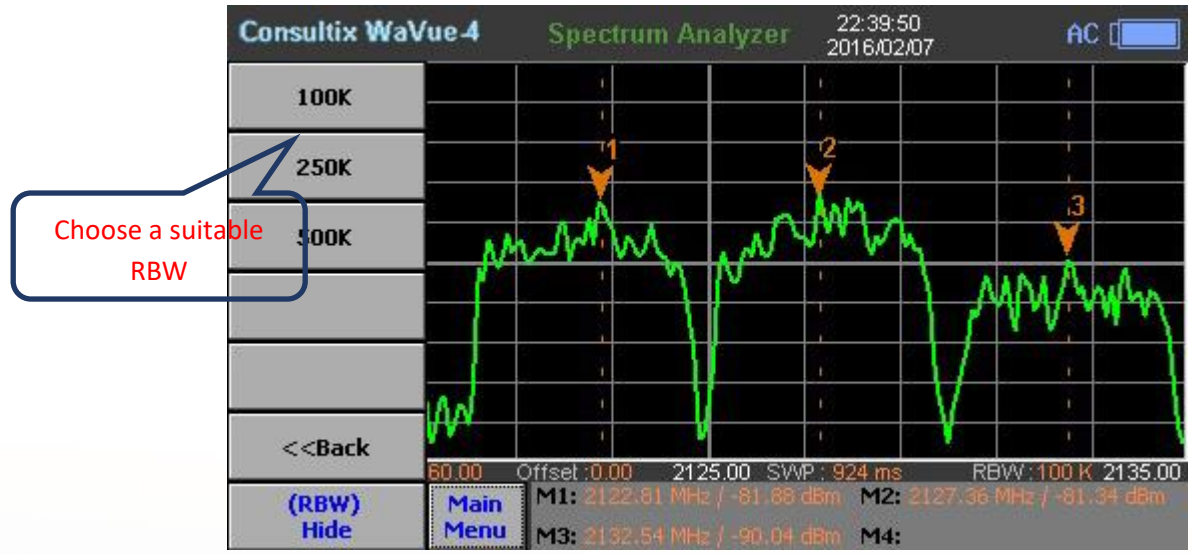


Figure 12: MTM-427s RBW selection Menu

Traces

On **Main Menu > Measurements > Trace**, you can control three traces; select, capture, Max. Hold, Min. Hold, and delete traces as shown in figure 13.

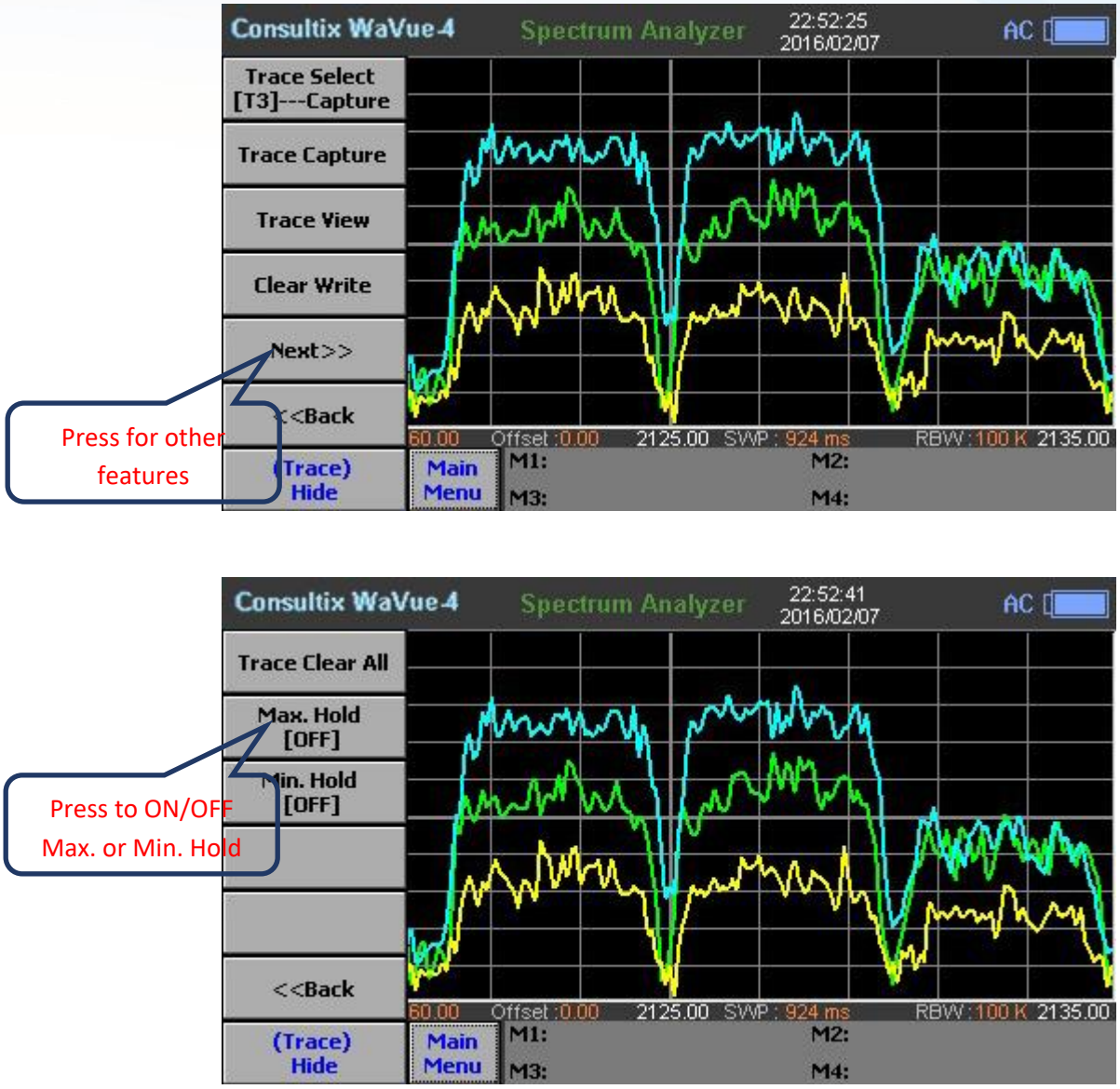


Figure 13: MTM-427s Trace Menu

Limit Lines

On Main **Menu > Measurements > Amplitude > Limit Line**, set two limit lines to monitor if signal exceeds certain limits as shown in figure 14.

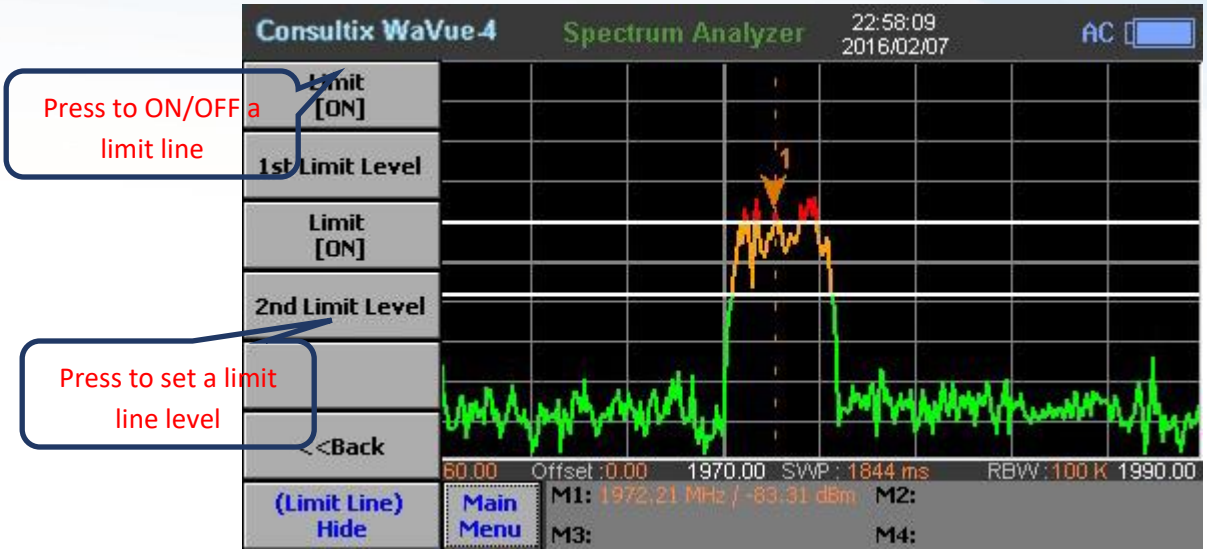


Figure 14: MTM-427s Limit Lines

With limit line capability, on **Main Menu > System > Next**, user can enable pass/fail indication of the current signal level by switching on "**Pass Ind**." button;

Also, a fail beep is required to indicate failed measurements through switching on "**Fail Beep**" button as shown in figure 15.

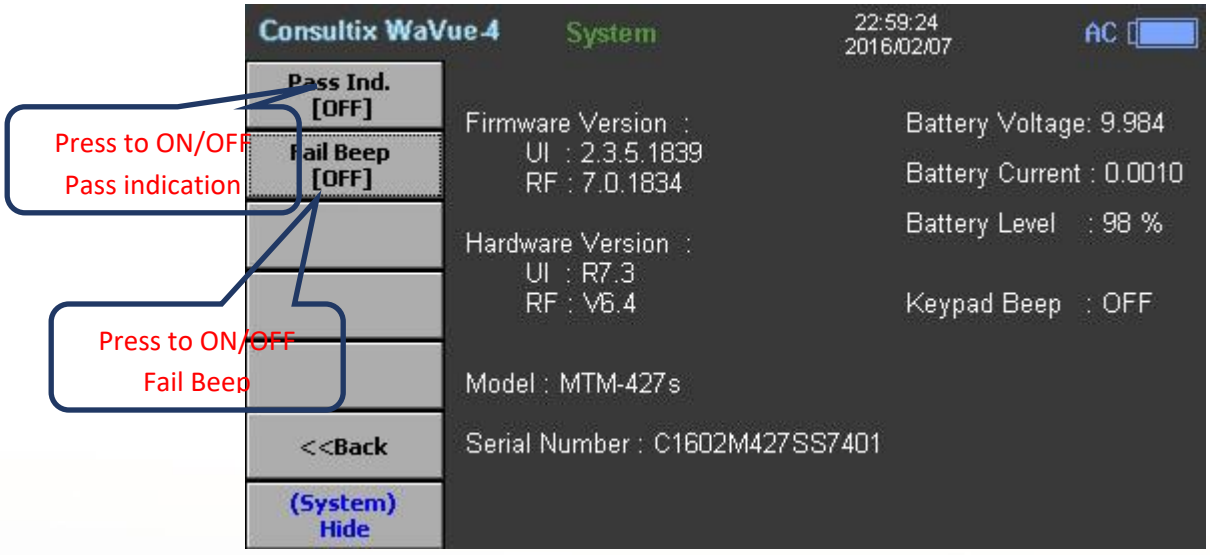


Figure 15: MTM-427s activating Pass indication & Fail Beep

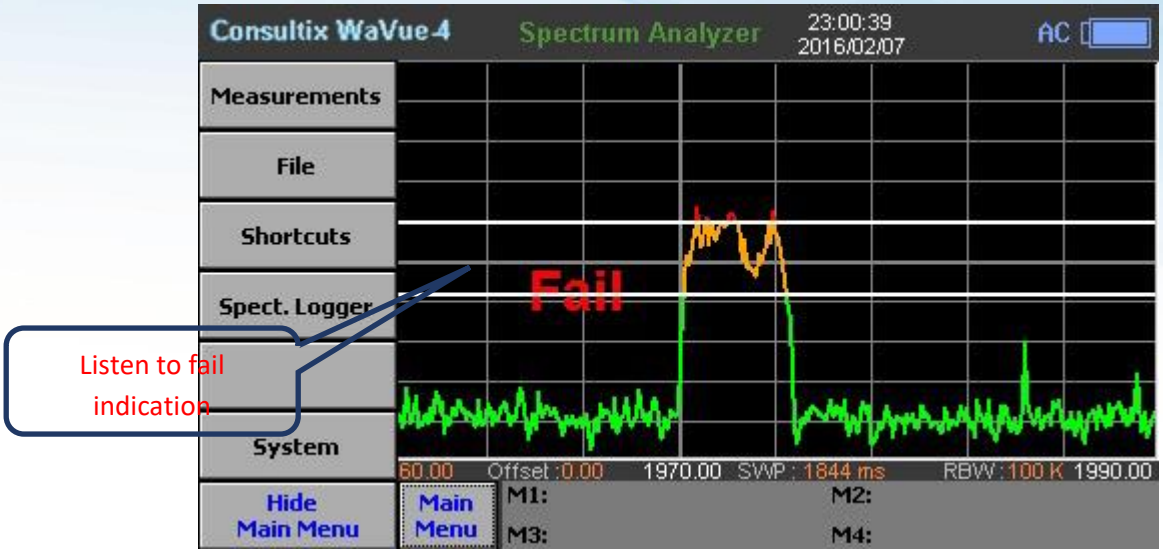


Figure 15: MTM-427s Fail Indication

Markers

On **Main Menu > Measurements > Next > Marker**, you can set, edit, and clear up to 4 markers (& Delta Marker) as shown in figure 16.

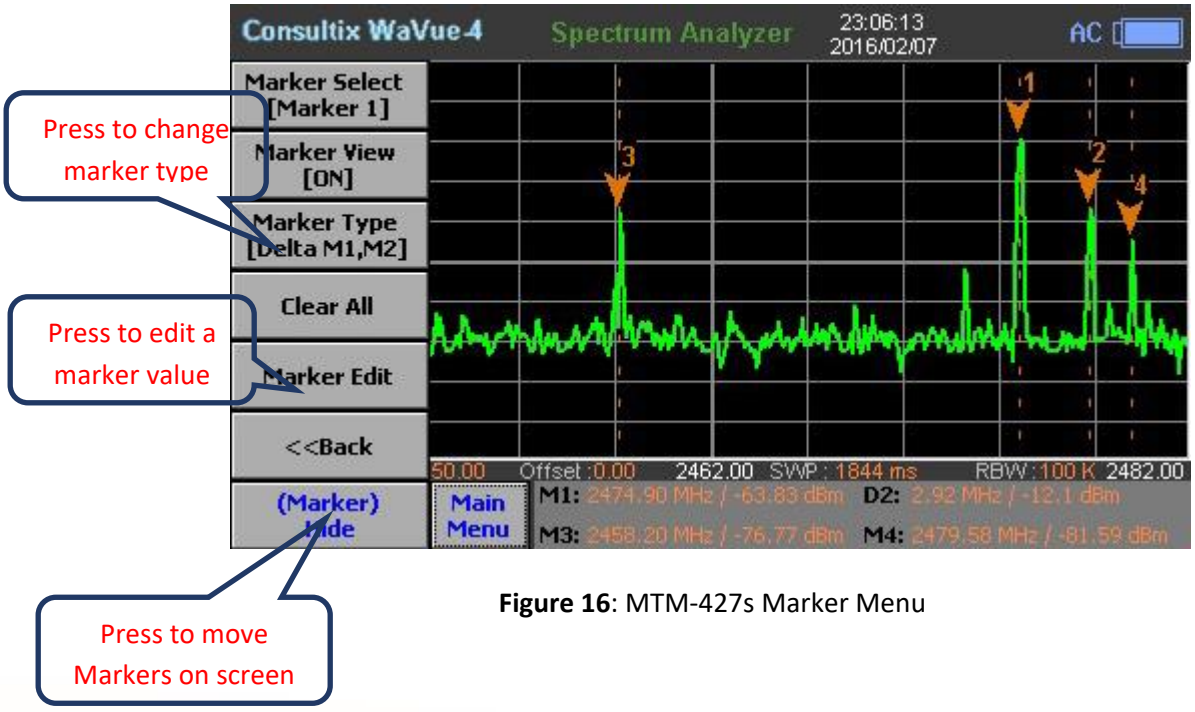


Figure 16: MTM-427s Marker Menu

Figure 16: MTM-427s Marker editing

On **Main Menu > Measurements > Next > Peak**, you can set a marker to the peak value, to the maximum search point or to the minimum search point on your current trace as shown in figure 17.

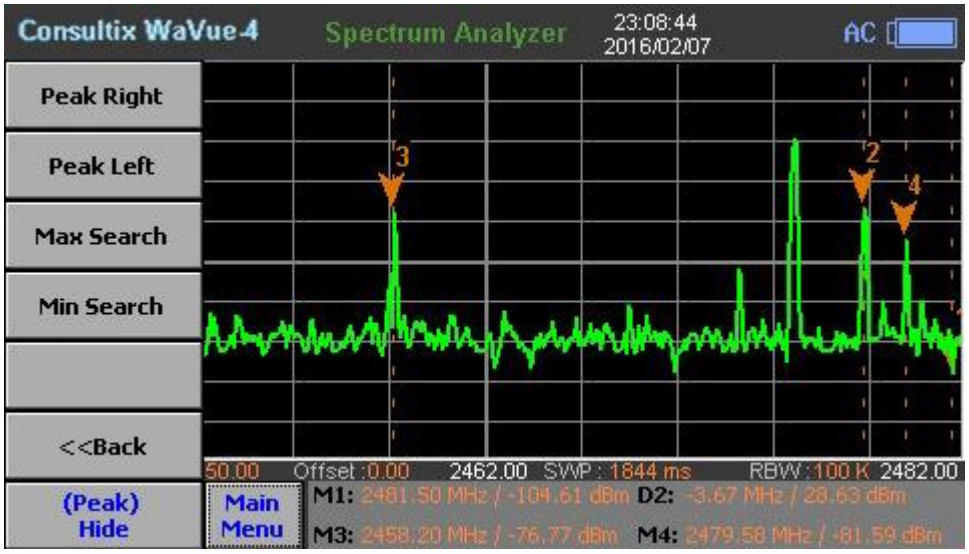


Figure 17: MTM-427s Peak Menu

Shortcuts

On **Main Menu > Shortcuts**, users can do the common functions; like setting markers & traces, holding measurement, and resetting current configuration as shown in figure 18.

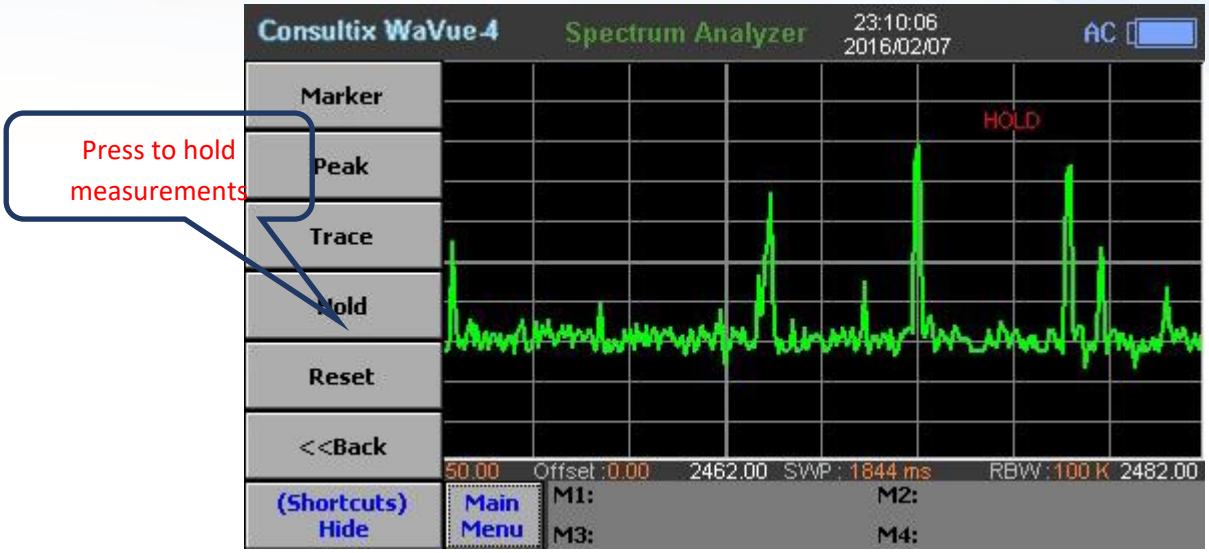


Figure 18: MTM-427s Shortcuts Menu

Spectrum Logger

The need for data logging feature is coming to tackle filed measurements through a long period of time without the need for real-time site monitoring by dedicated persons.

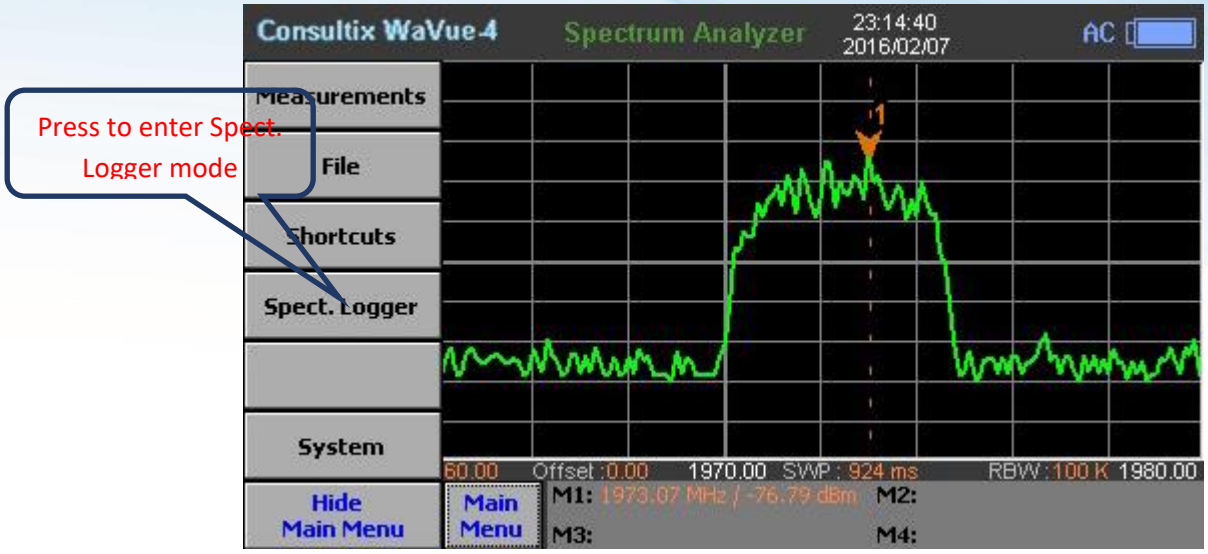
On **Main Menu > Spect. Logger**, do the following steps,

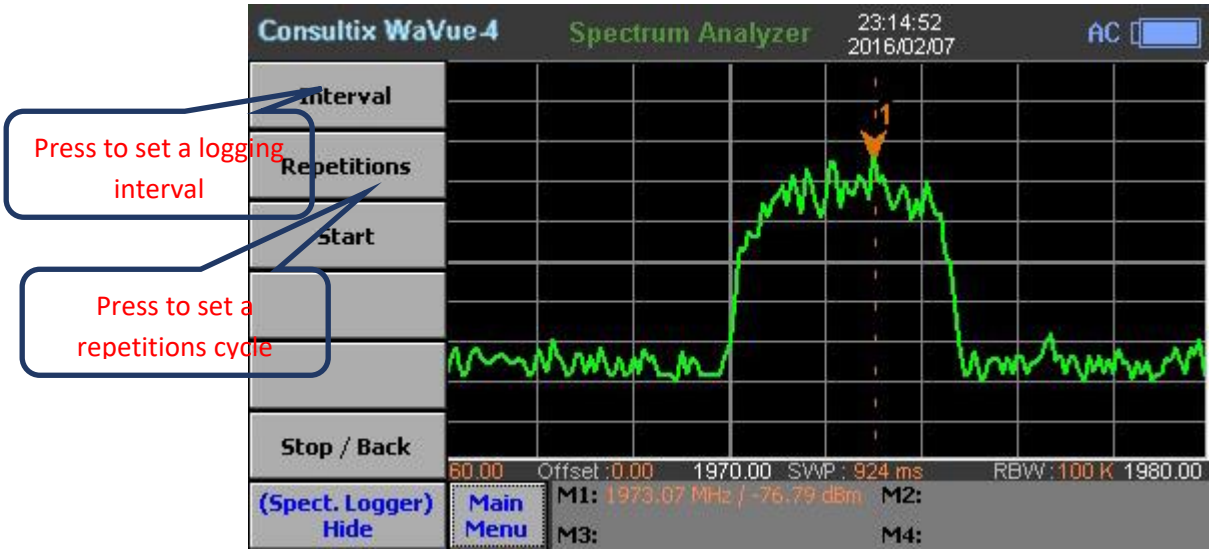
1. Press "**Interval**" button to set the logging interval.
2. Write your required interval time and press "**Ok**".
   (Minimum settable interval is 1 minute and the maximum is 10080 minutes)
3. Set the required number of repetitions by pressing "**Repetitions**" button, and press "**Ok**"
   (Minimum number of repetitions is 1 cycle and the maximum is 65534 repetitions cycles)
4. After setting the spectrum logger configuration, press "**Start**" button to start data logging.

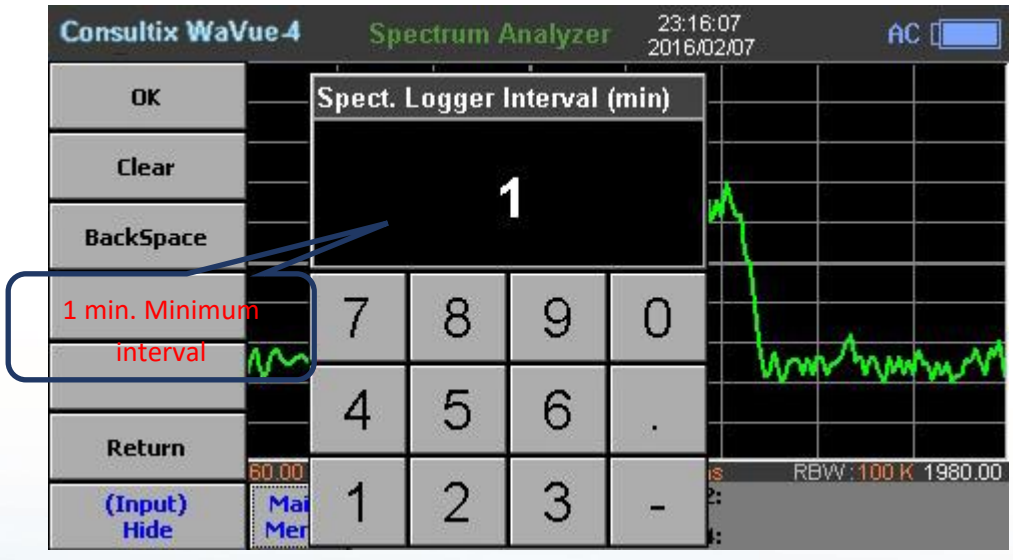
You can stop and return to your measurements by pressing "**Stop / Back**" button, once data logging session is over, a pop-up message of saving successfully the data set to the instrument's internal memory appears.

Users can export the logging data from the internal memory to a USB memory using "Load" feature, and use these data for analysis and troubleshooting.

A complete spectrum logging session is shown in figure 19


Consultix WaVue 4
Spectrum Analyzer
23:14:40
2016/02/07
AC
Measurements
File
Shortcuts
Spect. Logger
System
Hide Main Menu
Main Menu
Offset :0.00
1970.00
SWP : 924 ms
RBW : 100 K
1980.00
M1:
M2:
M3:
M4:
Press to enter Spect. Logger mode


Consultix WaVue 4
Spectrum Analyzer
23:14:52
2016/02/07
AC
Interval
Repetitions
Start
Stop / Back
(Spect. Logger) Hide
Main Menu
Offset :0.00
1970.00
SWP : 924 ms
RBW : 100 K
1980.00
M1:
M2:
M3:
M4:
Press to set a logging interval
Press to set a repetitions cycle


Consultix WaVue 4
Spectrum Analyzer
23:16:07
2016/02/07
AC
OK
Clear
BackSpace
Return
(Input) Hide
Spect. Logger Interval (min)
1
7
8
9
0
4
5
6
.
1
2
3
-
RBW : 100 K
1980.00
1 min. Minimum interval

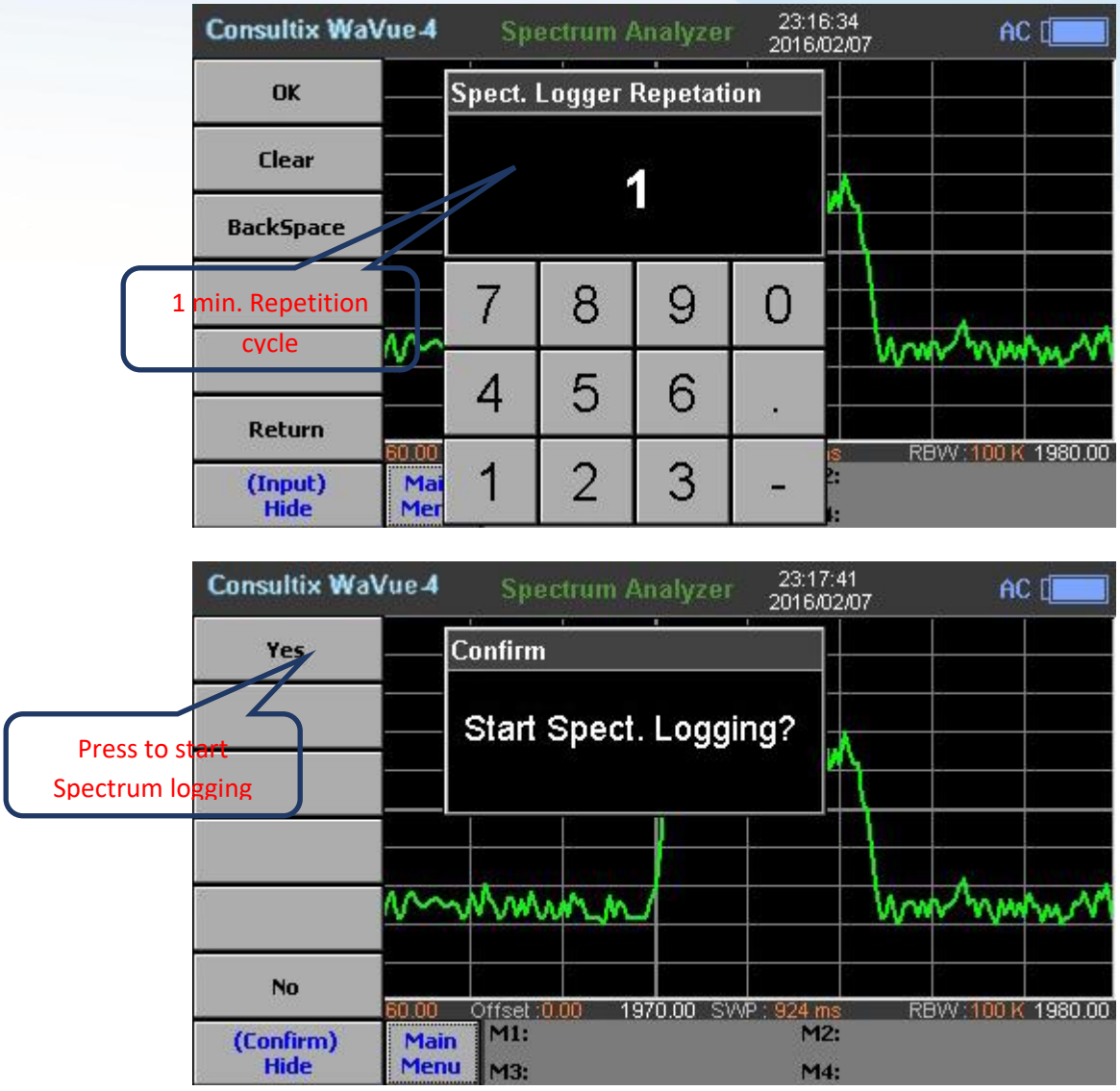
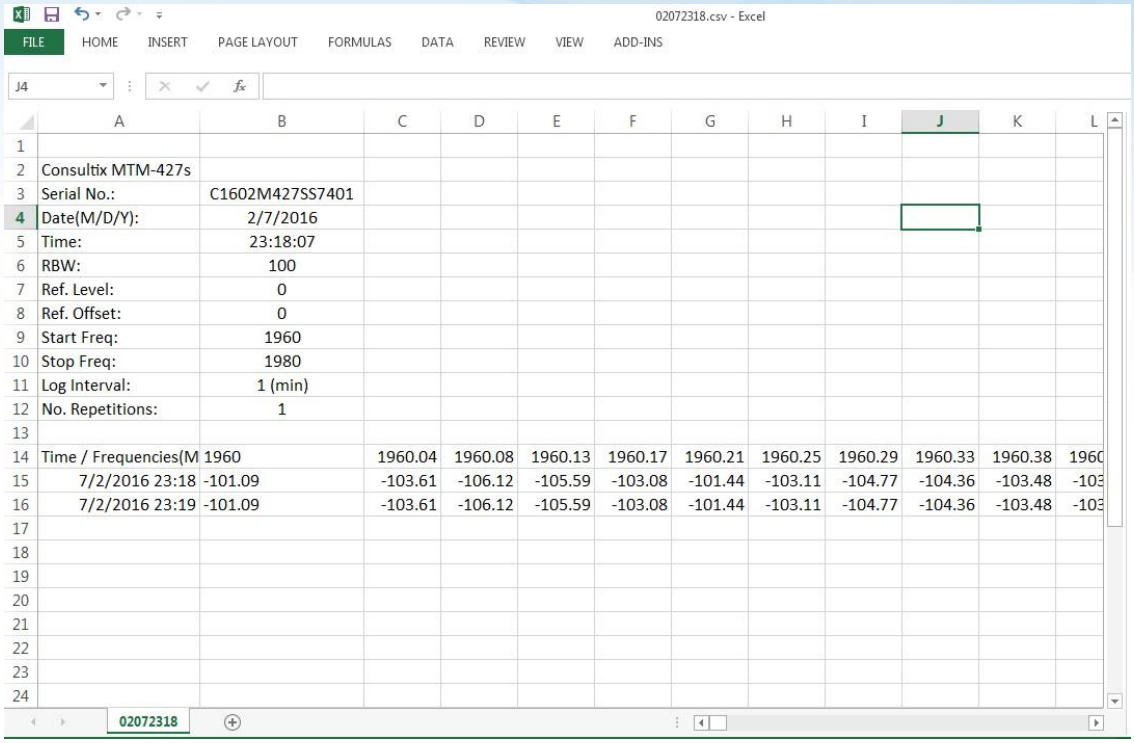


Figure 19: MTM-427s Spectrum Logger

After a spectrum logging session is completed successfully, it saves a CSV file of logging measurements to the internal memory; the CSV file name format indicates the starting date and time of the logging session as depicted below,

02	07	23	18
Month	Day	Hour	Min.

5. Attach a USB Memory stick to MTM-427s, on **Main Menu > File > Load**, choose your CSV file and copy it to the USB using file management capability.
   A spectrum logger with 1 min. Interval & 1 Repetition cycle is shown in figure 20.



02072318.csv - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW ADD-INS

J4

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2	Consultix MTM-427s											
3	Serial No.:	C1602M427SS7401										
4	Date(M/D/Y):	2/7/2016										
5	Time:	23:18:07										
6	RBW:	100										
7	Ref. Level:	0										
8	Ref. Offset:	0										
9	Start Freq:	1960										
10	Stop Freq:	1980										
11	Log Interval:	1 (min)										
12	No. Repetitions:	1										
13												
14	Time / Frequencies(M	1960	1960.04	1960.08	1960.13	1960.17	1960.21	1960.25	1960.29	1960.33	1960.38	1960
15	7/2/2016 23:18	-101.09	-103.61	-106.12	-105.59	-103.08	-101.44	-103.11	-104.77	-104.36	-103.48	-103
16	7/2/2016 23:19	-101.09	-103.61	-106.12	-105.59	-103.08	-101.44	-103.11	-104.77	-104.36	-103.48	-103
17												
18												
19												
20												
21												
22												
23												
24												

02072318

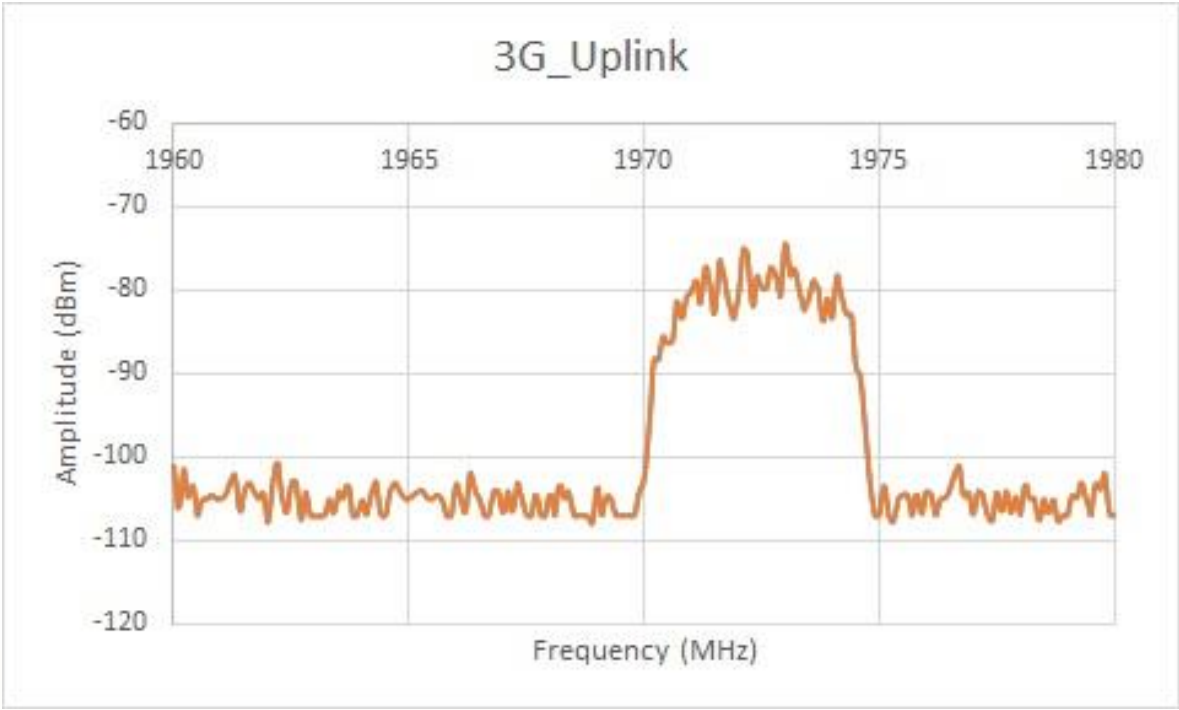
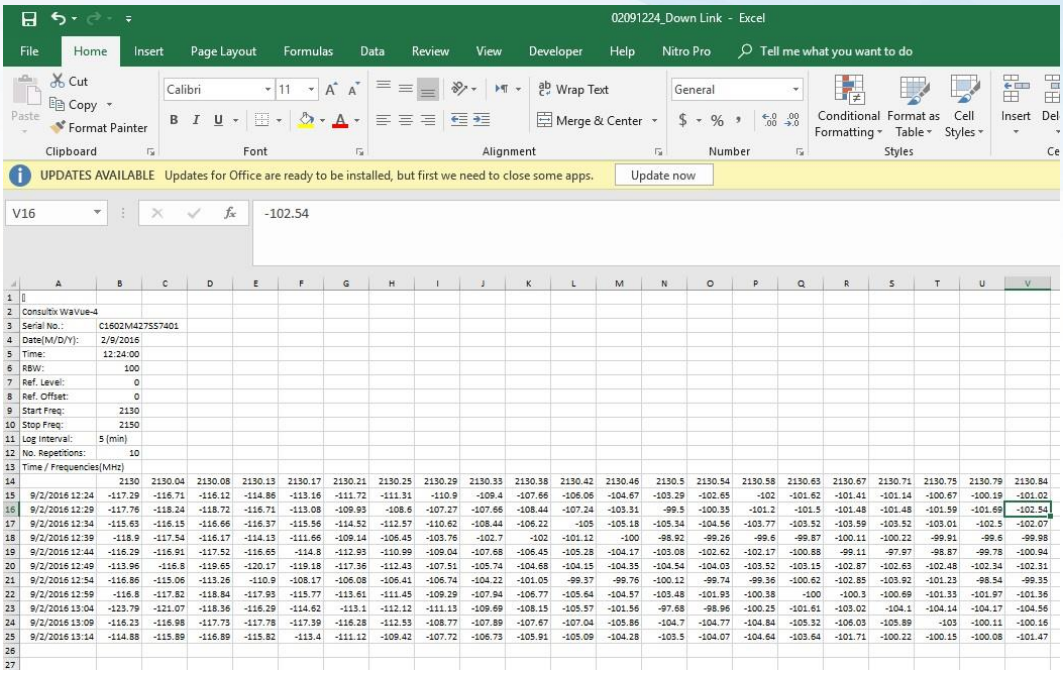


Figure 20: MTM-427s Spectrum Logger results (2-dimension Plot)

Users can configure spectrum logger to its maximum interval time and maximum repetitions cycles. As an example, a spectrum logger with 5 min interval & 10 repetition cycles is shown in figure 21.



02091224_Down Link - Excel

UPDATES AVAILABLE Updates for Office are ready to be installed, but first we need to close some apps. Update now

V16 -102.54

1	[]																					
2	Consultix WaVue-4																					
3	Serial No.:	C1602M427557401																				
4	Date(M/D/Y):	2/9/2016																				
5	Time:	12:24:00																				
6	RBW:	100																				
7	Ref. Level:	0																				
8	Ref. Offset:	0																				
9	Start Freq:	2130																				
10	Stop Freq:	2150																				
11	Log Interval:	5 (min)																				
12	No. Repetitions:	10																				
13	Time / Frequencies(MHz)																					
14		2130	2130.04	2130.08	2130.13	2130.17	2130.21	2130.25	2130.29	2130.33	2130.38	2130.42	2130.46	2130.5	2130.54	2130.58	2130.63	2130.67	2130.71	2130.75	2130.79	2130.84
15	9/2/2016 12:24	-117.29	-116.71	-116.12	-114.86	-113.16	-111.72	-111.31	-110.9	-109.4	-107.66	-106.06	-104.67	-103.29	-102.65	-102	-101.62	-101.41	-101.14	-100.67	-100.19	-101.02
16	9/2/2016 12:29	-117.76	-118.24	-118.72	-116.71	-113.08	-109.93	-108.6	-107.27	-107.66	-108.44	-107.24	-103.31	-99.5	-100.35	-101.2	-101.5	-101.48	-101.48	-101.59	-101.69	-102.54
17	9/2/2016 12:34	-115.63	-116.15	-116.66	-116.37	-115.56	-114.52	-112.57	-110.62	-108.44	-106.22	-105	-105.18	-105.34	-104.56	-103.77	-103.52	-103.59	-103.52	-103.01	-102.5	-102.07
18	9/2/2016 12:39	-118.9	-117.54	-116.17	-114.13	-111.66	-109.14	-106.45	-103.76	-102.7	-102	-101.12	-100	-98.92	-99.26	-99.6	-99.87	-100.11	-100.22	-99.91	-99.6	-99.98
19	9/2/2016 12:44	-116.29	-116.91	-117.52	-116.65	-114.8	-112.93	-110.99	-109.04	-107.68	-106.45	-105.28	-104.17	-103.08	-102.62	-102.17	-100.88	-99.11	-97.97	-98.87	-99.78	-100.94
20	9/2/2016 12:49	-113.96	-116.8	-119.65	-120.17	-119.18	-117.36	-112.43	-107.51	-105.74	-104.68	-104.15	-104.35	-104.54	-104.03	-103.52	-103.15	-102.87	-102.63	-102.48	-102.34	-102.31
21	9/2/2016 12:54	-116.86	-115.06	-113.26	-110.9	-108.17	-106.08	-106.41	-106.74	-104.22	-101.05	-99.37	-99.76	-100.12	-99.74	-99.36	-100.62	-102.85	-103.92	-101.23	-98.54	-99.35
22	9/2/2016 12:59	-116.8	-117.82	-118.84	-117.93	-115.77	-113.61	-111.45	-109.29	-107.94	-106.77	-105.64	-104.57	-103.48	-101.93	-100.38	-100	-100.3	-100.69	-101.33	-101.97	-101.36
23	9/2/2016 13:04	-123.79	-121.07	-118.36	-116.29	-114.62	-113.1	-112.12	-111.13	-109.69	-108.15	-105.57	-101.56	-97.68	-98.96	-100.25	-101.61	-103.02	-104.1	-104.14	-104.17	-104.56
24	9/2/2016 13:09	-116.23	-116.98	-117.73	-117.78	-117.39	-116.28	-112.53	-108.77	-107.89	-107.67	-107.04	-105.86	-104.7	-104.77	-104.84	-105.32	-106.03	-105.89	-103	-100.11	-100.16
25	9/2/2016 13:14	-114.88	-115.89	-116.89	-115.82	-113.4	-111.12	-109.42	-107.72	-106.73	-105.91	-105.09	-104.28	-103.5	-104.07	-104.64	-103.64	-101.71	-100.22	-100.15	-100.08	-101.47
26																						
27																						

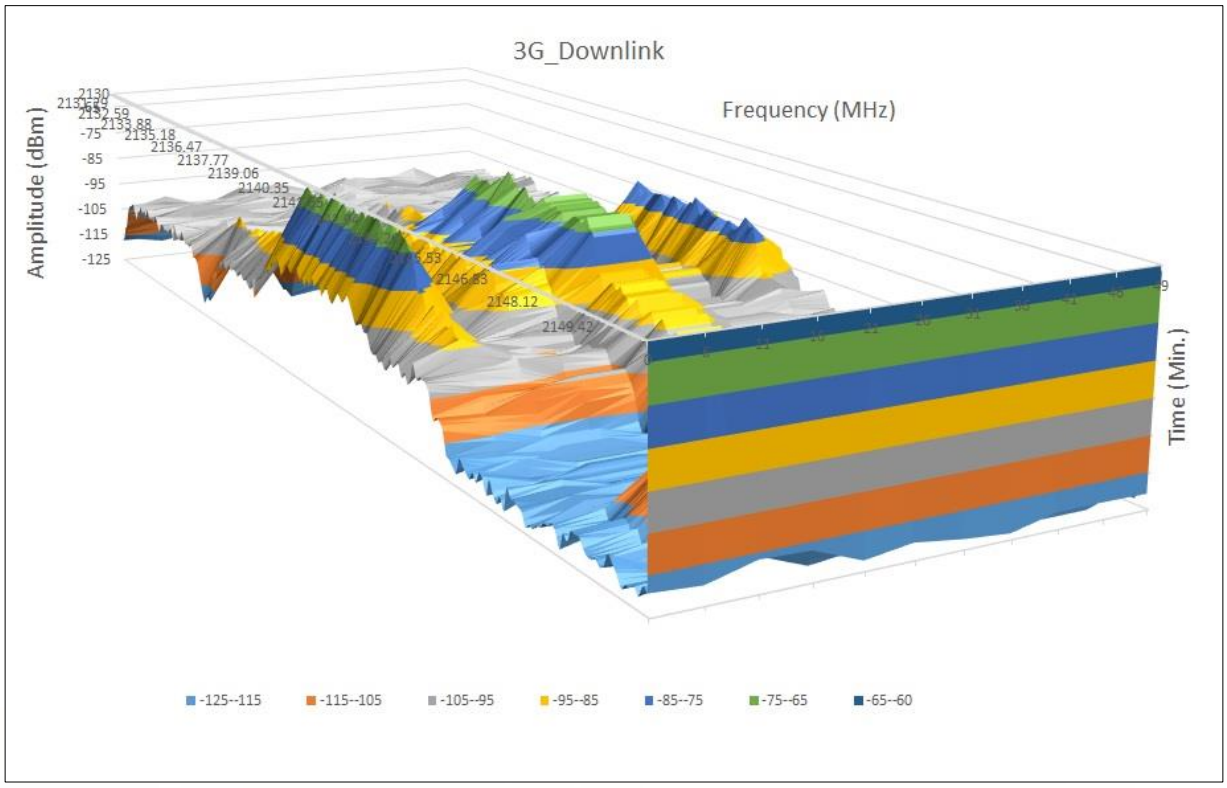


Figure 21: MTM-427s Spectrum Logger results (3-dimension Plot)

Spectrogram

Spectrogram or Waterfall display is a nice feature in MTM-427s spectrum analyzer. The data collected from the spectrum analyzer is represented by a graphical color-based display to visualize the RF signal levels over time and to troubleshoot and detect the RF interferers. The users will easily monitor signal levels increasing or decreasing for specific frequencies or frequency ranges.

In order to do Spectrogram/Waterfall display, do the following,

1. Configure frequency range, RBW, and Reference level on MTM-427s
2. Go to Main Menu > Start, then monitor the waterfall display.
3. If you need to change the settings, press “Stop” to stop waterfall and go back to adjust your settings

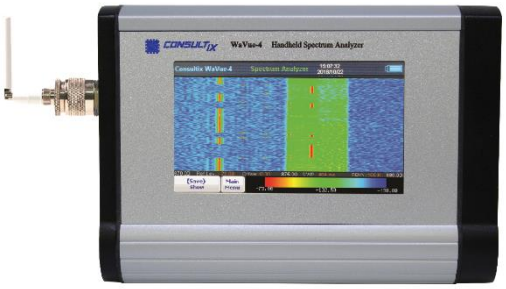
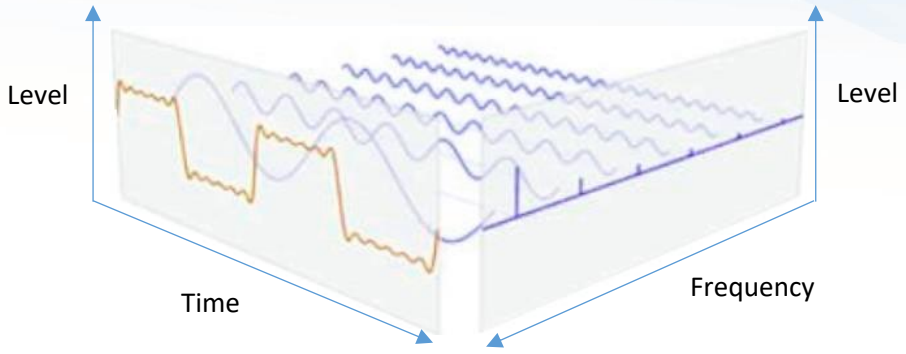


Figure 22: MTM-427s Spectrogram

Appendix A: Technical Background

Spectrum Analyzer is a measurement instrument that measures the amplitude (strength) of an input signal varied by frequency over the full frequency range of the instrument to reveal the frequency and power contents of the input signal based on Fourier transform theory as shown below,



Time Domain ⟷ Frequency Domain

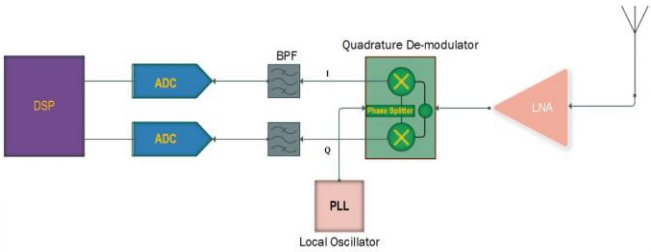
$f(x)$ $F(X)$

$$F(X) = \int_{-\infty}^{\infty} f(x)e^{-j\omega x}dx$$

In frequency domain, spectrum analyzer can detect complex RF signals, separate its frequency components into a fundamental frequency and other harmonics and the signal amplitude at each frequency is displayed.

There are two main types of spectrum analyzers a fast Fourier transform (FFT) analyzer or a swept-tuned analyzer. The FFT analyzer detects the signal with period T in time domain, samples it with a frequency f_s equal or more than twice the signal bandwidth (based on Nyquist Limit), and applies the Fourier transform mathematics to convert to the frequency domain where all frequency components are displayed from zero to $\frac{f_s}{2}$, this requires analog to digital converters and high processing power making the FFT analyzers limited in frequency range.

The swept-tuned analyzer is the most common type of spectrum analyzer; it down-converts a portion of the input signal spectrum to the center frequency of a band-pass filter by sweeping the voltage-controlled oscillator through a range of frequencies across the displayed frequency range, and detects all the frequency components. This enables to perform measurements over a large dynamic range. Both types of spectrum analyzers can be used for a wide range of measurements in most of field applications spectrum monitoring, spurious emissions, and interference hunting.



The below block diagram simply illustrates the employed technique in MTM-427s.

Appendix B: Band list

Band Name	Start Freq.(MHz)	Stop.Freq.(MHz)	Band Name	Start Freq.(MHz)	Stop.Freq.(MHz)
Bluetooth USA & Europe	2,400	2,484	NMT 411 FULL	411	430
Bluetooth JAPAN	2,472	2,497	NMT 451 UP	450	460
C450 P UP	453	464	NMT 451 DOWN	460	470
C450 P DOWN	463	474	NMT 451 FULL	450	470
C450 P FULL	453	474	NMT 451 20kHz CDMA2k UP	451	484
C450 SA UP	465	470	NMT 451 20kHz CDMA2k DOWN	461	494
C450 SA DOWN	455	460	NMT 451 20kHz CDMA2k FULL	451	494
C450 SA FULL	455	470	NMT 450 20kHz CDMA2k UP	411	458
CDMA CHINA UP	872	915	NMT 450 20kHz CDMA2k DOWN	421	468
CDMA CHINA DOWN	917	960	NMT 450 20kHz CDMA2k FULL	411	468
CDMA CHINA FULL	872	960	NMT 900 UP	890	915
CELLULAR UP	824	849	NMT 900 DOWN	935	960
CELLULAR DOWN	869	894	NMT 900 FULL	890	960
CELLULAR FULL	824	894	PCS GSM 1900 UP	1,850	1,910
CELLULAR 700 UP	776	794	PCS GSM 1900 DOWN	1,930	1,990
CELLULAR 700 DOWN	746	764	PCS GSM 1900 FULL	1,850	1,990
CELLULAR 700 FULL	746	794	PCS KOREA UP	1,750	1,780
DCS GSM 1800 UP	1,710	1,785	PCS KOREA DOWN	1,840	1,870
DCS GSM 1800 DOWN	1,805	1,880	PCS KOREA FULL	1,750	1,870
DCS GSM 1800 FULL	1,710	1,880	PDC 800 UP	898	940
DMB	2,593	2,693	PDC 800 DOWN	843	885
GSM 900 UP	880	915	PDC 800 FULL	843	940
GSM 900 DOWN	925	960	PDC 1500 UP	1,525	1,549
GSM 900 FULL	880	960	PDC 1500 DOWN	1,477	1,501
IEEE 802.11 FH	2,402	2,495	PDC 1500 FULL	1,477	1,549
IEEE 802.11 DS	2,412	2,484	PHS	1,895	1,918
IEEE 802.11b/g	2,400	2,484	SMR 800 UP	806	821
IMT2000 UMTS WCDMA UP	1,920	1,980	SMR 800 DOWN	851	866
IMT2000 UMTS WCDMA DOWN	2,110	2,170	SMR 800 FULL	806	866
IMT2000 UMTS WCDMA FULL	1,920	2,170	SMR 1500 UP	1,453	1,465
ISM 2.4GHz	2,400	2,484	SMR 1500 DOWN	1,501	1,513
JTACS/NTAC JPN ARIB UP	887	925	SMR 1500 FULL	1,453	1,513
JTACS/NTAC JPN ARIB DOWN	832	870	TACS/ETACS UP	872	915
JTACS/NTAC JPN ARIB FULL	832	925	TACS/ETACS DOWN	917	960
NMT 411 UP	411	420	TACS/ETACS FULL	872	960
NMT 411 DOWN	421	430	Tetra	380	430

***Table 2**: Standard band list*

Appendix C: MTM-427s Specifications

Specification	
Frequency	
Frequency Band	400 MHz to 2700 MHz
Frequency Accuracy	2.5 ppm
Resolution Bandwidth (RBW)	100 KHz, 250 KHz and 500 KHz
Frequency Span	100 KHz to full span (2.3 GHz)
Sweep Time	924 ms / 100 MHz Span @ RBW = 500 KHz
Amplitude	
RF Input Impedance	50 Ω
Maximum RF Input Level without damage	30 dBm
Sensitivity	-120 dBm (DANL @ 2 GHz and 100 KHz RBW)
Maximum Measured RF Input	-30 dBm
Overall Amplitude Accuracy	± 2 dB
IF Rejection	Zero IF Technique
Image Rejection	>40dBc
Setup	
Simultaneous Traces	Up to 3
Markers	4 Markers & Delta Markers, Peak & Minimum Search
Interference Location Tone	Proportional beep
Monitoring mode	Automatic Interference Logger for extended period
Others	Pre-set regional bands list and Limit Line
Memory	
Type	Internal (1000 traces) and External USB storage
Save/Recall	Measurements and screenshots
Battery and Power Supply	
Battery	Li-ion 3400 mAh
Battery operation time	3 Hour Continuous Operation
AC Charger	Input: 100-240 VAC , 50-60 Hz / Output: 12 VDC, 2 A
Physical and Environmental	
Enclosure	Industrial and Heavy-Duty
Display	4.3” TFT, LCD Touch Screen
Ports and Interface	N Type Female, 2 x USB and DC input
External Dimensions	L160 x W117 x H36mm
Weight	<700 gm. Including battery (1.5 lbs)
Operating Temperature	-10 to +50 C
Standard package	Analyzer, Hard Carrying Case, AC Charger, Whip Antenna, Stylus Pen, Shoulder Strap with Shock Absorbers, Calibration Certificate and User Manual

***Table 3**:* MTM-427s *Specifications*

Further Help

- For any support inquiry, kindly contact:

  Support: support@consultixwireless.com

  Or contact our distributor covering your region (check www.consultixwireless.com)

- For any information about prices, specifications, future developments, recommendations, customizations, or general question, kindly contact:

  Sales: sales@consultixwireless.com