



User manual

VER 4.10

Spectrum Compact 10-3000 MHz, 0.3-3GHz v.2

(FW V5.2.12.3)

Spectrum Compact 2-8 GHz, 6-20 GHz v.2

(FW V5.4.7.2)

Spectrum Compact 16-26.5 GHz, 20-40 GHz, 20-43 GHz v.2

(FW V5.3.10.2)

FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and the receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.



Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Spectrum Compact does not contain serviceable parts. Warranty will not be applicable in the event Spectrum Compact has been opened.

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To get up-to-date information about accessories and their availability, please contact a sales representative.

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1 OVERVIEW

1.1 Appearance & features



Figure 1-1 Spectrum Compact

Spectrum Compact analyzer is an ultra-light and easy-to-use measurement solution. This battery-powered device does not require external down-converters and is a must-have tool for any field engineer performing equipment installation, link troubleshooting, site planning, and maintenance. The instrument utilizes a resistive touch screen for ease of use in the field, allowing the engineer to wear gloves when using the device. Furthermore, its high sensitivity and low noise floor make it possible to detect even exceptionally weak signals. The Spectrum Compact can also be used for high-precision detection of existing interference on installed paths or available radio channels. Data logging of all spectrum scans is available on the Spectrum Compact device, and enhanced data processing and analysis are provided by SAF Tehnika designed PC software (included in the price of Spectrum Compact).

- Ultra-compact form factor
- Leading sensitivity
- Resistive LCD touchscreen
- Weatherproof - IP marking 54
- Stand-alone functionality
- USB Type-C for charging and data access
- PC software included in the price

1.2 Technical specification

Table 1

P/N	JOSSAP31	JOSSAP33	JOSSAP55	JOSSAP52	JOSSAP53	JOSSAP74	JOSSAP54
Frequency range	10 – 3000 MHz	0.300 – 3.000 GHz	2.000 – 8.000 GHz	5.925 – 20.000 GHz	16.000 – 26.500 GHz	24.000 – 40.000 GHz	24.000 – 43.000 GHz
Displayed Average Noise Level	10-30 MHz -123 dBm @ RBW=10 kHz	-125 dBm @ RBW=10 kHz	-118 dBm @ RBW=30 kHz	-116 dBm @ RBW=30 kHz	-106 dBm @ RBW=100 kHz	-101 dBm @ RBW=100 kHz	
	30-3000 MHz -125 dBm @ RBW=10 kHz						
Max input power	+25 dBm					0 dBm	
RBW (Resolution bandwidth)	10, 30, 100, 300 kHz		30, 100, 300, 1000 kHz		100, 300, 1000 kHz		
VBW (Video bandwidth)	1, 3, 10, 30 kHz		1, 3, 10, 30, 100 kHz				
Min span	0.5 MHz		1.5 MHz		5 MHz		
Max span	Full bandwidth						
Sweep speed (RBW, VBW: Auto)	0.13 s @ 15 MHz Span		0.072 s @ 50 MHz Span	0.075 s @ 50 MHz Span	0.07 s @ 50 MHz Span	0.066 s @ 50 MHz Span	
Accuracy*	+/- 1 dB						
Mass memory	8 GB						
Input	50 Ω, SMA (f)			50 Ω, 2.92mm (f)			
Interface	USB Type-C						
Battery life	up to 4 h						
Operating temperature	-15 °C to +55 °C/ 5 °F to 131 °F						
Dimensions	135 x 83 x 34 mm/ 5.31 x 3.27 x 1.34 in						
Weight	0.57 kg/ 20.11 oz						

*Guaranteed at 21°C/70°F CW signal

1.3 Accessories

0.01-3/0.3-3/2-8/6-20/16-26.5/24-40/24-43 GHz Spectrum Compact has these accessories available:

- 1 SMA(F) to N(M) adapter (P/N: U0ACNM01)
- 2 SMA (F) to RP-SMA (F) (P/N: JOASFF01)
- 3 SMA (F) to RP-SMA (M) (P/N: JOASFM01)
- 4 N-type adapter female-female (P/N: U0ACNN02)
- 5 Waveguide adapter UDR70 to SMA, 5.38-8.2 GHz, WR137 (P/N: J0S06WA001)
- 6 Waveguide adapter UBR84 to SMA, 5.9-10 GHz, WR112 (P/N: J0S07WA004)
- 7 Waveguide adapter UBR100 to SMA, 8.2-12 GHz, WR90 (P/N: J0S10WA003)
- 8 Waveguide adapter UBR140 to SMA, 12-17 GHz, WR62 (P/N: J0S15WA003)
- 9 Waveguide adapter UBR220 to SMA, 17-24.3 GHz, WR42 (P/N: J0S22WA003)
- 10 Waveguide adapter UBR260 to 2.92, 22-33 GHz, WR34 (P/N: J0S26WA001)
- 11 Waveguide adapter UBR320 to 2.92, 26-40 GHz, WR28 (P/N: J0S38WA001)
- 12 RF cable (P/N: J0ACRF02)
- 13 AC/DC USB-C charger (P/N: J0AB452Ci3)
- 14 AC/DC USB-C charger for USA (P/N: J0AB451Ci2)
- 15 Leather bag (P/N: J0APAC11)
- 16 USB-C – USB-C Cable (P/N: J0ACUB05)
- 17 USB-C – USB-A adapter (P/N: J0ACUA31)
- 18 Lanyard (P/N: J0APAC21)
- 19 Omni-directional antenna 0.6-6 GHz (P/N: J0AA4LTE01)
- 20 Omni-directional antenna 0.3-1.1 GHz (P/N: C01AT0STS001)
- 21 Log-periodic directional antenna 0.65-6 GHz with handle and pocket for SC v.2 (P/N: J0AA0606LPH1)
- 22 Horn antenna 3-5 GHz (P/N: J0AA0305HG02)
- 23 Horn antenna 5-7.5 GHz (P/N: J0AA0507HG02)
- 24 Horn antenna 6-11 GHz (P/N: J0AA0610HG02)
- 25 Horn antenna 11-17 GHz (P/N: J0AA1115HG01)
- 26 Horn antenna 17-26 GHz (P/N: J0AA1724HG01)
- 27 Horn antenna 26-43 GHz (P/N: J0AA2640HG03)
- 28 Handle for YAGI-type antenna (P/N: J0SAYAGIRC01)
- 29 Handle and Spectrum Compact v.2 bracket for 3-5 GHz antenna (P/N: J0AA0305RK04)
- 30 Handle and Spectrum Compact v.2 bracket for 5-7.5 GHz antenna (P/N: J0AA0575RK04)
- 31 Handle and Spectrum Compact v.2 bracket for 6-10 GHz or 11-17 GHz antenna (P/N: J0AA0615RK04)
- 32 Handle and Spectrum Compact v.2 bracket for 17-26 GHz antenna (P/N: J0AA1726RK04)
- 33 Handle and Spectrum Compact v.2 bracket for 26-43 GHz antenna (P/N: J0AA2640RK04)
- 34 Protective case for one Spectrum Compact v.2 unit (P/N: J0SPAC14)
- 35 Protective case for two Spectrum Compact v.2 units (P/N: J0SPAC17)
- 36 Protective case for five Spectrum Compact v.2 units (P/N: J0SPAC15)

2 OPERATION

2.1 Basic operation



Figure 2-1

To turn on Spectrum Compact, press and hold the power button on the left side for about 1.5 seconds. To turn the device off, press and hold the button again for about 1.5 seconds. The guaranteed operation time with a fully charged battery is 4 h. The small battery in the upper right corner indicates the current battery level. When there are about 15 minutes of active sweeping time left, a red warning "BATTERY LOW" will be displayed on the screen above the graph.



Turning off the continuous sweeping of the spectrum (SWEEP CONT.), when it is not monitored, and decreasing the screen background brightness (Main screen → TOOLS & SETTINGS → SETTINGS → BRIGHT) prolongs the operation time.

Spectrum Compact charges through the USB type-C port. The device can sweep the spectrum continuously if attached to a power source that can supply 2 A at DC=5V.



SAF Tehnika cannot guarantee that any charger, besides the one supplied with the unit, will ensure continuous sweep.

When Spectrum Compact is connected to a power source, a quick press of the power button allows checking the battery status without turning on the device. While charging, the LED

located under the transparent button will **glow red**. If the device is attached to a power source, but the battery is not charging (e.g. the power source does not provide enough current for charging), the LED will **flash red**. When the battery is fully charged, the LED will **glow green**.



It is recommended to fully charge and discharge a new device a few times to ensure that the battery indication is completely accurate.

The screen of the spectrum analyzer is divided into two parts: the graph and the buttons, which represent the available menus and options.

The horizontal axis of the graph represents the linear frequency range in megahertz (MHz). The frequency value increases from left to right. The displayed frequency range can be selected in the [FREQ](#) menu. 1 pane represents 1/10th of the currently selected [SPAN](#).

The vertical axis of the graph represents the logarithmic input power range in decibels referenced to one milliwatt “dBm” by default (see [UNITS](#)). The input power level increases from bottom to top. The displayed input power range can be adjusted in the [SCALE](#) menu. Above the graph, the input power level at the CENTER frequency is displayed (except for CUMULATIVE trace mode, see [TRACE](#)).

Tapping the clock in the upper right corner swaps the displayed time/date format.

To save a spectrum curve for later review, use the [SAVE](#) button. The files are saved in Spectrum Compact Curve file format (.scc). They can be reviewed in the [FILES](#) menu and are accessible when the device is connected to a computer from the folder CURVES.

Tapping the SAF logo in the upper left corner takes a screenshot. The screenshots are saved as bitmap (.bmp) images. The screenshots are available only when Spectrum Compact is connected to a computer in the folder SCREENS.

The essential functions of the spectrum analyzer are accessible from the main screen. All the menus and options are described in detail in the following chapters.



If the detected signal power is higher than the reference level (see [REF](#)), a red warning “OVERLOAD” will be displayed on the screen. Initially perform a scan at full (default) span to detect overload presence since a signal outside of the displayed frequency range also contributes to overload!



For All Spectrum Compact models exceeding the critical input power level mentioned in [Table 2](#) may irreversibly damage equipment!

Table 2: Maximum allowed signal level

Max Input power	10-3000 MHz*	0.3-3 GHz*	2-8 GHz*	6-20 GHz*	16-26.5 GHz*	24-40 GHz	24-43 GHz
Max input power with LNA OFF	+25 dBm				N/A	N/A	N/A
Max input power with LNA ON	+25 dBm					0 dBm	0 dBm

* Attenuation is set to 30 dB.

2.2 SWEEP CONT.

Tapping the SWEEP CONT. button starts and stops a continuous sweep of the selected spectrum range and registering of a spectrum curve.

If a sweeping-related parameter (frequency, level, or trace setting) is modified, the sweep is restarted from the beginning.

When SWEEP CONT. is enabled, the SWEEP CONT. button is green and a small white bar is moving under the graph, indicating how far the selected span has been swept. SWEEP CONT. is enabled by default.

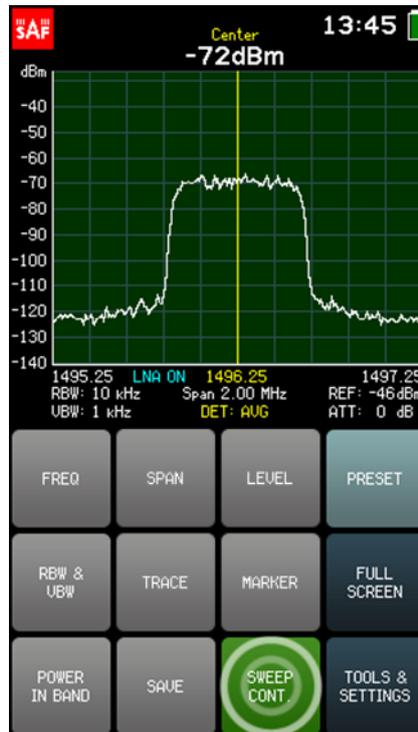


Figure 2-2 The SWEEP CONT. button

2.3 FREQ

The FREQ menu allows selecting START (left limit of the horizontal axis), CENTER (center value of the horizontal axis), and STOP (right limit of the horizontal axis) frequencies of the spectrum range in megahertz (MHz).



While at the FREQ menu, tapping the right part of the graph decreases SPAN (zooms in), and tapping the left part of the graph increases SPAN (zooms out). Sliding the graph to the right or the left modifies START and STOP frequencies by equal amounts, keeping the SPAN constant.

Modifying the START or STOP frequency will alter the CENTER frequency and SPAN but will preserve the STOP or START frequency, respectively. Modifying the CENTER frequency will alter both START and STOP frequencies but will preserve SPAN, if possible (it may not be possible due to limits of supported frequency range).

The currently selected parameter (START/ STOP/ CENTER) is displayed in white. To select a different parameter, tap on it once. The color of the keypad buttons shows which numbers can be entered at the current digit position to obtain a valid parameter value – the numbers on the green buttons can be entered, but the numbers on the red buttons cannot be entered. If the currently entered value is valid, it is displayed in green (also the OK button is green). If the value is not valid, it is displayed in red (also the OK button is red). To confirm a valid value, tap the OK button or tap the parameter's box.

The frequency value can be entered with a precision of 0.01 MHz (10 kHz) by using the "." on the keypad. To enter a value with decimal digits, first, enter the full MHz's, then tap the "." button and enter the rest of the digits. Until the value is confirmed, the digits after the point are displayed larger. If there are no digits displayed after the point, it means that they are zeroes.

To exit the FREQ menu and return to the main screen, tap BACK.

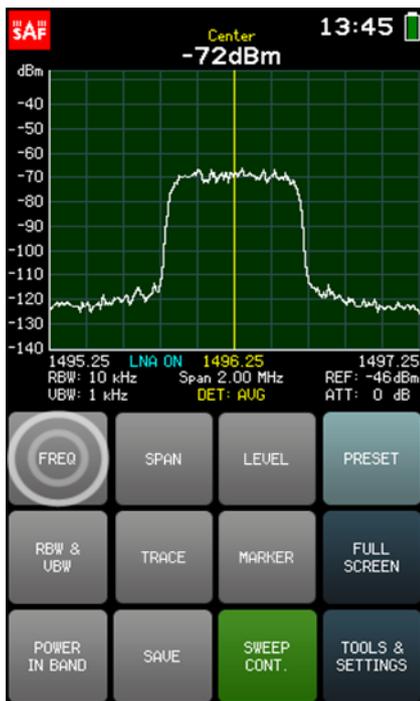


Figure 2-3 Entering the FREQ menu

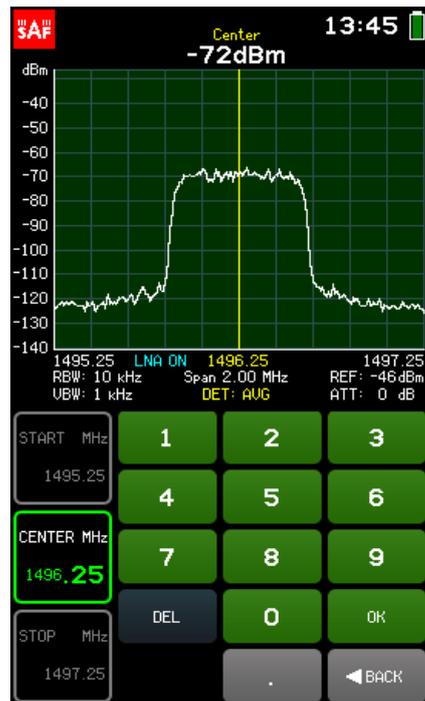


Figure 2-4 The FREQ menu

2.4 SPAN

The SPAN menu allows selecting the range of the horizontal axis (difference between START and STOP frequencies) i.e. span, in megahertz (MHz).



While at the SPAN menu, tapping the right part of the graph decreases SPAN (zooms in), and tapping the left part of the graph increases SPAN (zooms out). Sliding the graph to the right or the left modifies START and STOP frequencies by equal amounts, keeping the SPAN constant.

Modifying SPAN preserves CENTER frequency, if possible, but alters START and STOP frequencies. Tapping the MIN SPAN or FULL SPAN button instantly sets SPAN to respectively minimum or maximum allowed value. If the current SPAN value is the actual minimum or maximum, the corresponding button will be green. FULL SPAN is enabled by default.



The AUTO function at the [RBW & VBW](#) menu automatically adjusts resolution and video bandwidths depending on the selected SPAN. AUTO ensures the optimum use of the filters. AUTO is enabled by default.



The minimum allowed SPAN differs for each of the resolution bandwidths – 0.5 MHz for 10 kHz RBW, 1.5 MHz for 30 kHz RBW, 5 MHz for 100 kHz RBW, 15 MHz for 300 kHz RBW, and 50 MHz for 1 MHz RBW.

Table 3: The maximum allowed SPAN for MIN/MAXHOLD trace

Spectrum Compact Frequency range	10-3000 MHz	0.3-3 GHz	2-8 GHz	6-20 GHz	16-26.5 GHz	24-40 GHz	24-43 GHz
Resolution bandwidth setting							
RBW 10 kHz	200 MHz	200 MHz	N/A	N/A	N/A	N/A	N/A
RBW 30 kHz	900 MHz	900 MHz	200 MHz	200 MHz	200 MHz	200 MHz	200 MHz
RBW 100 kHz	N/A	N/A	900 MHz	3000 MHz	3000 MHz	3000 MHz	3000 MHz
RBW 300 kHz	N/A	N/A	N/A	N/A	9000 MHz	9000 MHz	9000 MHz

The current SPAN is displayed in white. The color of the keypad buttons shows which numbers can be entered at the current digit position to obtain a valid parameter value – the numbers on the green buttons can be entered, but the numbers on the red buttons cannot be entered. If the currently entered value is valid, it is displayed in green (also the OK button is green). If the value is not valid, it is displayed in red (also the OK button is red). To confirm a valid value, tap the OK button or tap the parameter's box.

The frequency value can be entered with a precision of 0.01 MHz (10 kHz) by using the "." on the keypad. To enter a value with decimal digits, first, enter the full MHz's, then tap the "." button and enter the rest of the digits. Until the value is confirmed, the digits after the point are displayed larger. If there are no digits displayed after the point, it means that they are zeroes.

To exit the SPAN menu and return to the main screen, tap BACK.

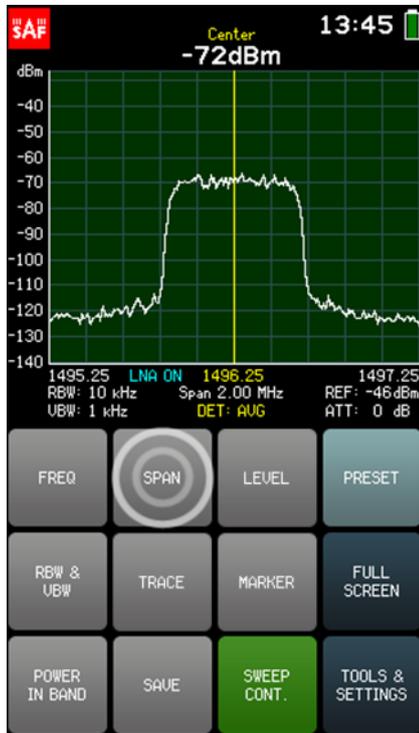


Figure 2-5 Entering the SPAN menu

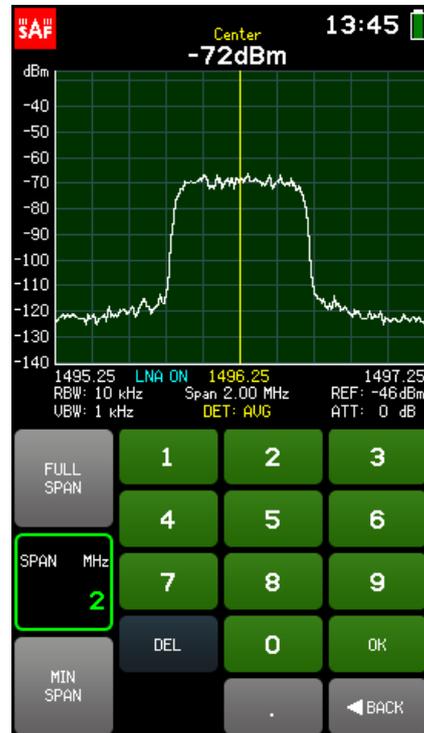


Figure 2-6 The SPAN menu

2.5 LEVEL

The options regarding the displayed input power levels are accessible at the LEVEL menu. To exit the LEVEL menu and return to the main screen, tap BACK.

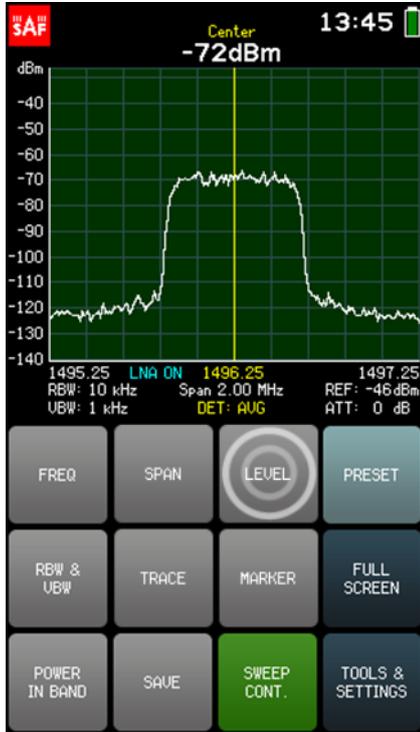


Figure 2-7 Entering the LEVEL menu

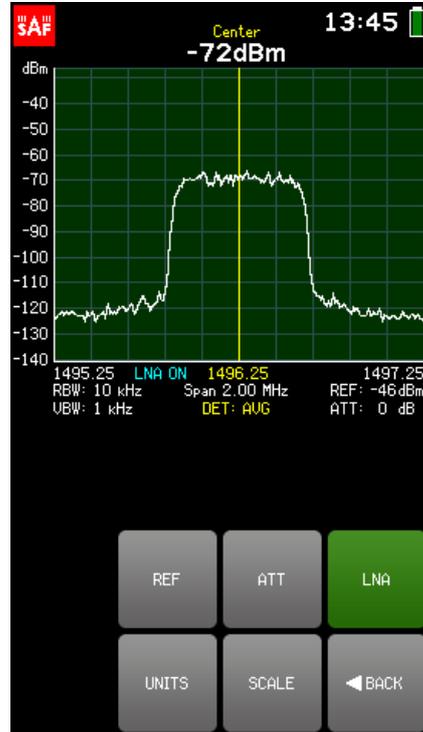


Figure 2-8 The LEVEL menu

2.5.1 REF

The REF submenu is available for Spectrum Compact 10-3000 MHz/0.3-3 GHz for all its RBW and also REF submenu is available for Spectrum Compact 2-8 GHz/6-20 GHz when selecting 30 kHz or 100 kHz RBW. It allows changing the gain and thus the reference level of the spectrum analyzer. The current reference level is displayed on this menu and on the right side under the graph. The reference level can be raised or lowered by 6 or 12 dB by using the buttons. Tapping the DEFAULT button sets the default reference level.



The reference level indicates the maximum input power level that Spectrum Compact can display without distortions. By adjusting it, the usable input power range is tuned: a higher reference level allows for viewing stronger signals, lower reference level has a lower noise floor thus allowing for viewing weaker signals.

The reference level is also raised by turning off the LNA and increasing the attenuation – either by increasing internal attenuation (Main screen → LEVEL → ATT) or by adding external attenuators and then correcting the displayed levels with an offset (Main screen → LEVEL → SCALE).



The displayed input power range is automatically adjusted for different reference levels to ensure optimal use of the display, but it can be manually changed at the SCALE menu.

To exit the REF submenu and return to the LEVEL menu, tap BACK.

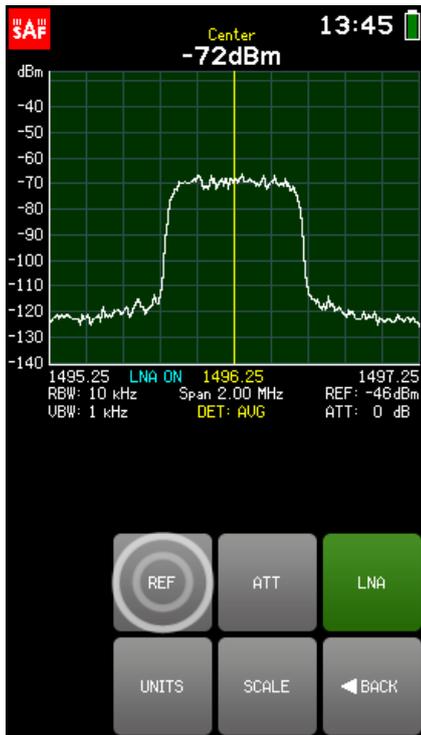


Figure 2-9 Entering the REF menu

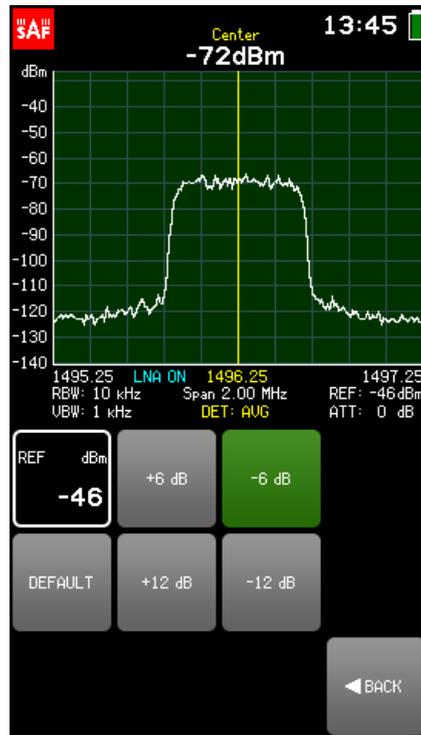


Figure 2-10 The REF menu

2.5.2 ATT*

The ATT submenu allows selecting the internal attenuators. Current internal attenuation is displayed on this menu and on the right side under the graph. Any additional attenuation raises the noise floor but allows stronger signals on the input (i.e. raises the reference level).

To exit the ATT submenu and return to the LEVEL menu, tap BACK.

The internal attenuation is 0 by default.

Table 4: Internal attenuation steps

10-3000 MHz, 0.3-3 GHz						
0 dB	5 dB	10 dB	15 dB	20 dB	25 dB	30 dB
2-8 GHz, 6-20 GHz, 16-26.5 GHz						
0 dB	6 dB	10 dB	16 dB	20 dB	26 dB	30 dB

* Only Spectrum Compact 10-3000 MHz, 0.3-3 GHz, 2-8 GHz, 6-20 GHz, 16-26.5 GHz

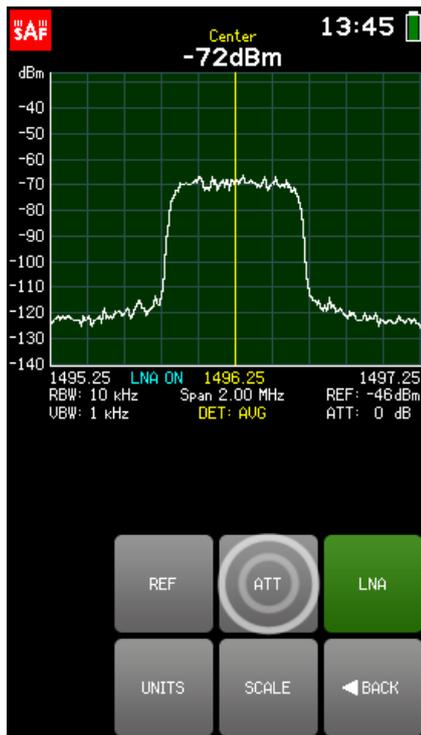


Figure 2-11 Entering the ATT menu

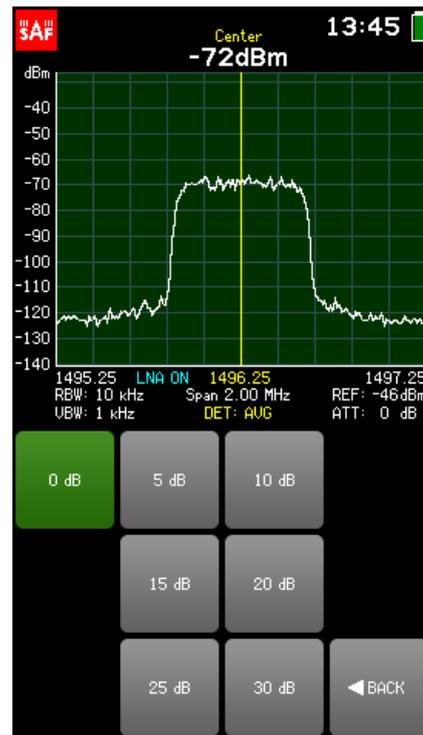


Figure 2-12 The ATT menu

2.5.3 LNA*

Tapping the LNA button turns on and off the “Low Noise Amplification”. LNA lowers the noise floor and allows viewing of very weak signals, but the reference (overload) level is considerably lowered.

* Only Spectrum Compact 10-3000 MHz, 0.3-3 GHz, 2-8 GHz, 6-20 GHz

When LNA is enabled, the LNA button is **green**, and an indication is displayed under the graph. LNA is disabled by default.



To get the best results with the LNA, set the internal attenuation ATT to zero and lower the reference level at the REF menu.

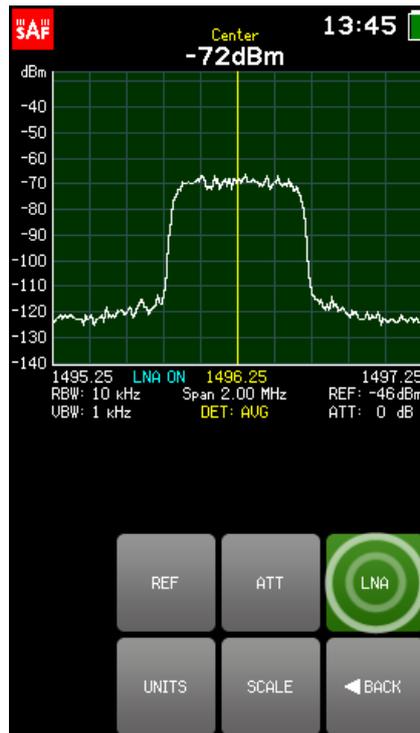


Figure 2-13 The LNA button

2.5.4 UNITS

The UNITS submenu allows changing the displayed units of the spectrum analyzer. There are 6 logarithmic units available.

Power units:

- dBm (the default units) – decibels referenced to one milliwatt
- dBuW – decibels referenced to one microwatt

Voltage units:

- dBmV – decibels referenced to one millivolt
- dBuV – decibels referenced to one microvolt

Current units:

- dBmA – decibels referenced to one milliampere
- dBuA – decibels referenced to one microampere

The input power values are converted for the vertical axis, reference level REF indication, and Center, MARKER, and POWER IN BAND readouts.



Only the displayed units on the Spectrum Compact are changed, the power values are still detected and stored in dBm.

- dBuV/m

The “dBuV/m” submenu allows placing a special marker, which shows the electric field strength at the specified frequency in decibels referenced to one microvolt per meter. The

electric field strength is calculated from the detected input power level value at the specified frequency.



The “dBuV/m” marker is not compatible with the regular MARKER and POWER IN BAND and with non-default units – the input power values for the vertical axis and reference level REF indication will be displayed in dBm.

The parameters required for the calculation are:

- gain of the receiver antenna GAIN, in dBi;
- the MARKER frequency;
- (optional) LOSSES value to account for any known additional losses e.g. cables, rain, obstacles, in dB.

The currently selected parameter (GAIN/ MARKER/ LOSSES) is displayed in white. To select a different parameter, tap on it once. The color of the keypad buttons shows which numbers can be entered at the current digit position to obtain a valid parameter value – the numbers on the **green** buttons can be entered, but the numbers on the **red** buttons cannot be entered. If the currently entered value is valid, it is displayed in **green** (also the OK button is **green**). If the value is not valid, it is displayed in **red** (also the OK button is **red**). To confirm a valid value, tap the OK button or tap the selected parameter's box.

The frequency value can be entered with a precision of 0.01 MHz (10 kHz) by using the “.” on the keypad. To enter a value with decimal digits, first, enter the full MHz's, then tap the “.” button and enter the rest of the digits. Until the value is confirmed, the digits after the point are displayed larger. If there are no digits displayed after the point, it means that they are zeroes.



While in the dBuV/m menu, tapping the graph will place the dBuV/m marker there. dBuV/m marker can be moved also by dragging it.



If the dBuV/m marker frequency is outside of the currently displayed frequency range, arrows on the graph will indicate beyond which side of the graph the marker is positioned.

To exit the “dBuV/m” submenu, tap BACK. When “dBuV/m” is enabled, the button is **green** at the UNITS submenu. Tapping the “dBuV/m” button when it is active, disables the “dBuV/m” marker.

To exit the UNITS submenu and return to the LEVEL menu, tap BACK.

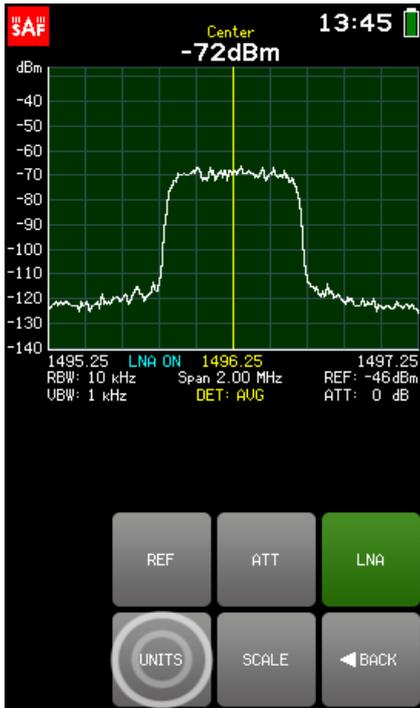


Figure 2-14 Entering the UNITS menu

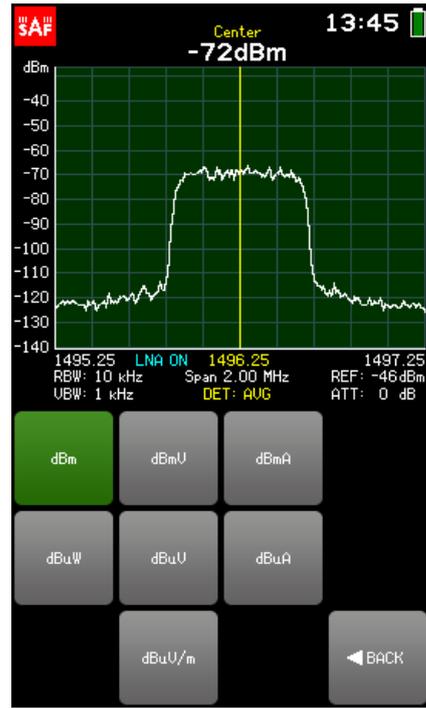


Figure 2-15 The UNITS menu

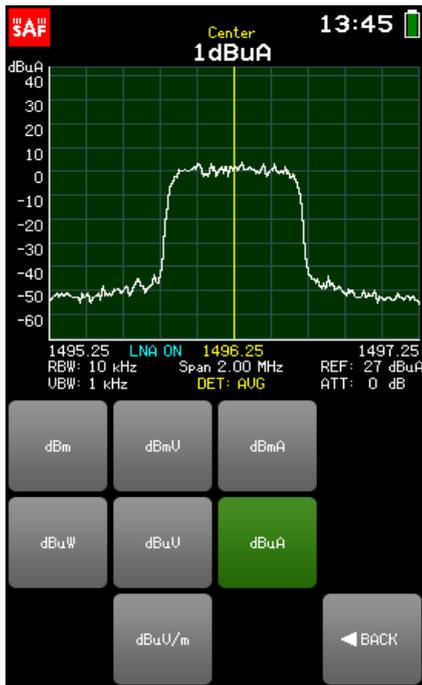


Figure 2-16 The UNITS menu

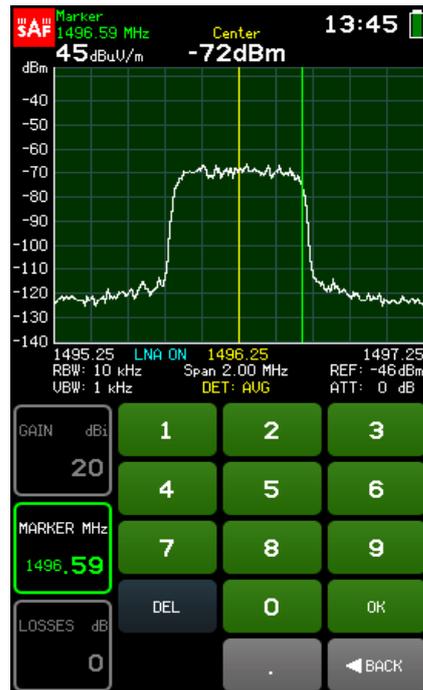


Figure 2-17 The "dBuV/m" menu



SCALE menu is available only for default units "dBm". Adjust the scale before selecting non-default units!

2.5.5 SCALE

The SCALE menu allows selecting the MAX (highest limit of the vertical axis) and MIN (lowest limit of the vertical axis) values of the displayed input power range in dBm, and an input power level OFFSET value (e.g. if an external attenuator is being used) in decibels dB.



SCALE menu is only available for default units "dBm". See [UNITS](#).



While at the SCALE menu, tapping the upper part of the graph decreases the displayed input power range (zooms in), and tapping the lower part of the graph increases the displayed input power range (zooms out). If the input power range allows it, sliding the graph up or down modifies the MAX and MIN values by equal amounts.

The currently selected parameter (MAX/ MIN/ OFFSET) is displayed in white. To select a different parameter, tap on it once. The color of the keypad buttons shows which numbers can be entered at the current digit position to obtain a valid parameter value – the numbers on the **green** buttons can be entered, but the numbers on the **red** buttons cannot be entered. If the currently entered value is valid, it is displayed in **green** (also the OK button is **green**). If the value is not valid, it is displayed in **red** (also the OK button is **red**). To confirm a valid value, tap the OK button or tap the selected parameter' box.

To exit the SCALE menu and return to the LEVEL menu, tap BACK.

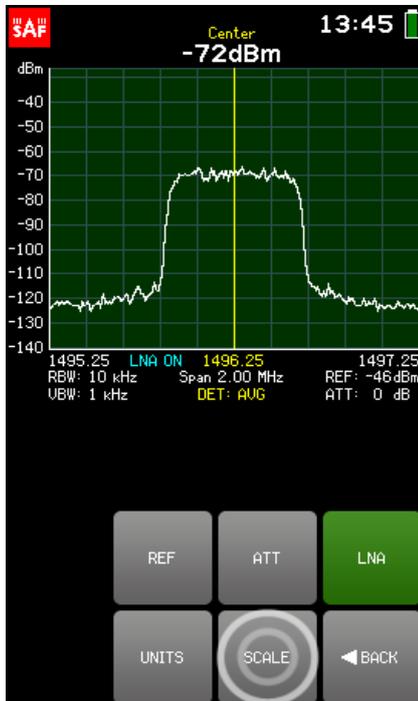


Figure 2-18 Entering the SCALE menu

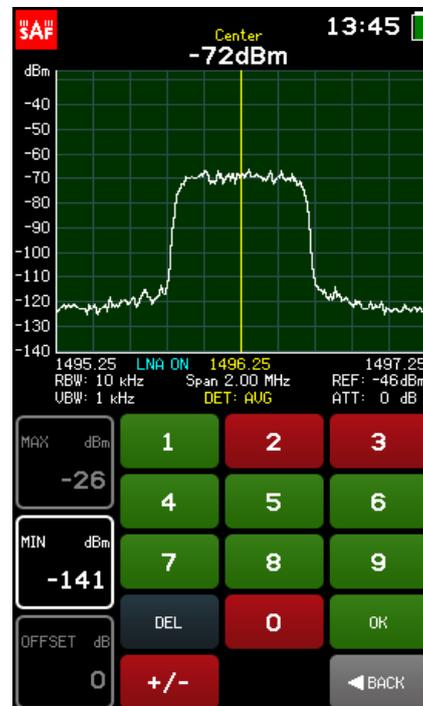


Figure 2-19 The SCALE menu

2.6 RBW & VBW

The RBW & VBW menu allows selecting the resolution bandwidth (RBW) and video bandwidth (VBW) of the spectrum analyzer. The available RBW values are:

- 10 kHz*
- 30 kHz
- 100 kHz
- 300 kHz
- 1 MHz**

* Only Spectrum Compact 10-3000 MHz and 0.3-3 GHz

** Only Spectrum Compact 2-8 GHz, 6-20 GHz, 16-26.5 GHz, 24-40 GHz, and 24-43 GHz



Narrower RBW allows to distinguish closer signals, but the span is swept considerably slower.



The 10 kHz RBW for Spectrum Compact 10-3000 MHz/0.3-3 GHz, 30 kHz for Spectrum Compact 2-8 GHz, and 30 kHz RBW for Spectrum Compact 6-20 GHz are most effectively utilized together with a lower reference level (see [REF](#)).

The available VBW values are:

- 1 kHz
- 3 kHz
- 10 kHz
- 30 kHz
- 100 kHz*

* Only Spectrum Compact 2-8 GHz, 6-20 GHz, 16-26.5 GHz, 24-40 GHz, and 24-43 GHz



A narrower VBW stabilizes the displayed trace (i.e. smooths the noise) and allows to see weaker signals better, but for pulsating signals, a wider VBW should be used.



For the most accurate power measurements, AVG detector (see [TRACE](#)) is recommended. If utilizing the MAX or MIN detector, please note that a narrower VBW must be used. In case the manually selected VBW is too wide for the current RBW, there is a warning displayed on the screen, the VBW indication under the graph is **red** and the indication "UNCAL" is put under the battery symbol.

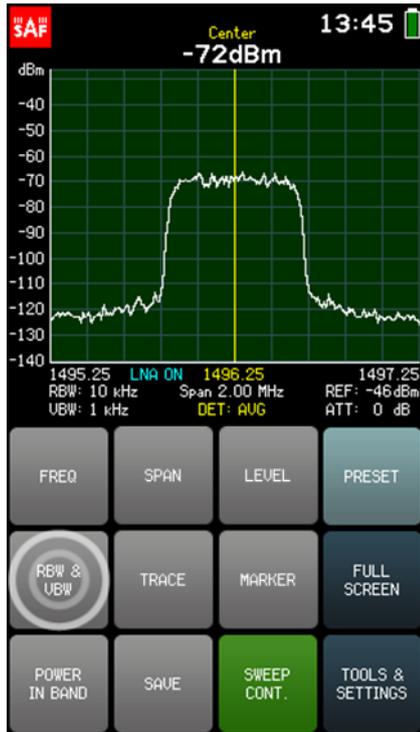


Figure 2-20 Entering the RBW & VBW menu

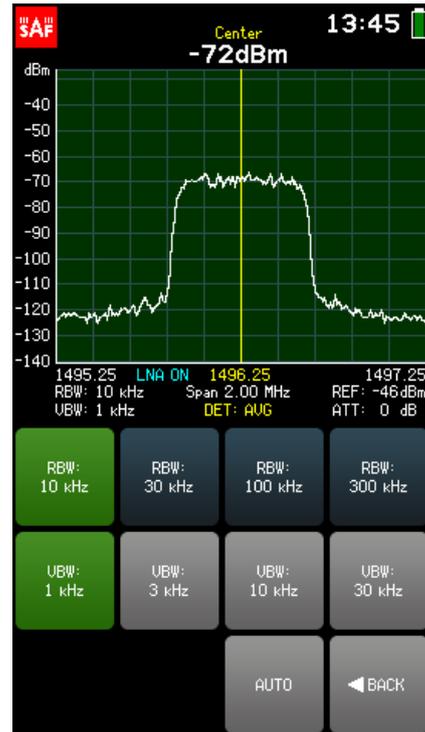


Figure 2-21 The RBW & VBW menu

Tapping the AUTO button enables and disables automatic adjustment of RBW and VBW depending on the selected SPAN. AUTO ensures the optimum use of the filters. AUTO is enabled by default. When AUTO is enabled, the AUTO button is **green** in the RBW & VBW menu. AUTO is disabled instantly if a different RBW or VBW is selected manually. To exit the RBW & VBW menu and return to the main screen, tap BACK.

2.7 TRACE

The TRACE menu allows adjusting the swept spectrum curve by selecting the most suitable DETECTOR and trace type.

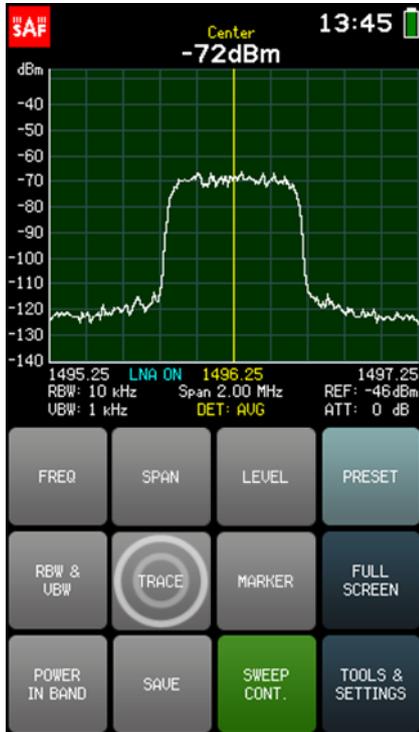


Figure 2-22 Entering the TRACE menu

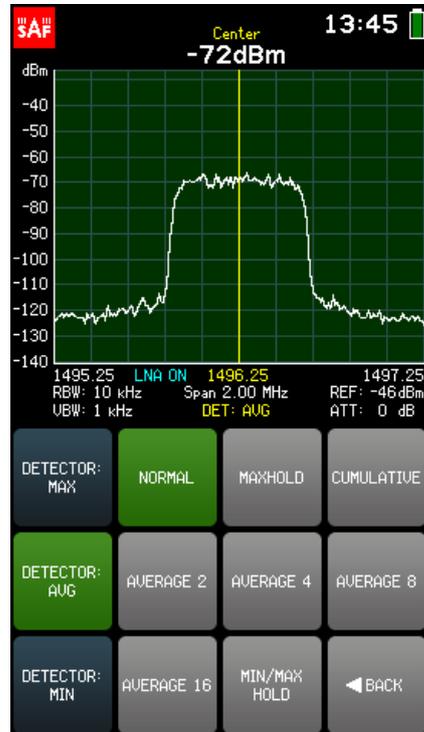


Figure 2-23 The TRACE menu

The DETECTOR determines which of the detected input power levels are displayed on the screen since the Spectrum Compact does several measurements of the same frequency range during each sweep.

The available detectors are:

- DETECTOR: AVG
Displays the averaged value over the values detected (the default detector).
- DETECTOR: MAX
Displays the highest detected input power level values.
- DETECTOR: MIN
Displays the lowest detected input power level values.



For the most accurate power measurements, AVG detector is recommended. If utilizing the MAX or MIN detector, please note that a narrower VBW must be used (see [RBW & VBW](#)). In case the manually selected VBW is too wide for the current RBW, there is a warning displayed on the screen, the VBW indication under the graph is red and the indication "UNCAL" is put under the battery symbol.

The currently used detector is indicated in yellow under the graph.

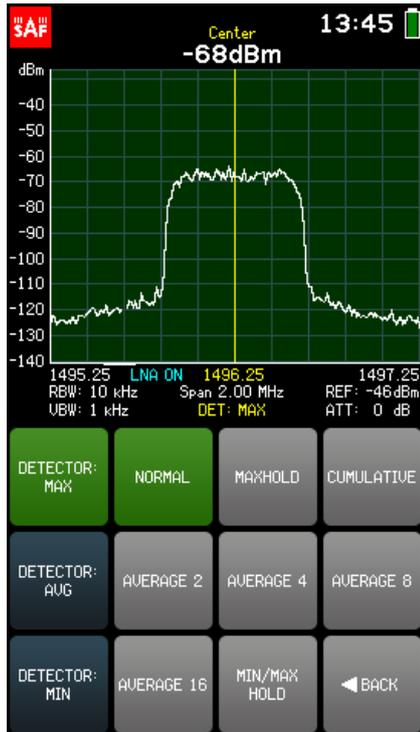


Figure 2-24 DETECTOR: MAX

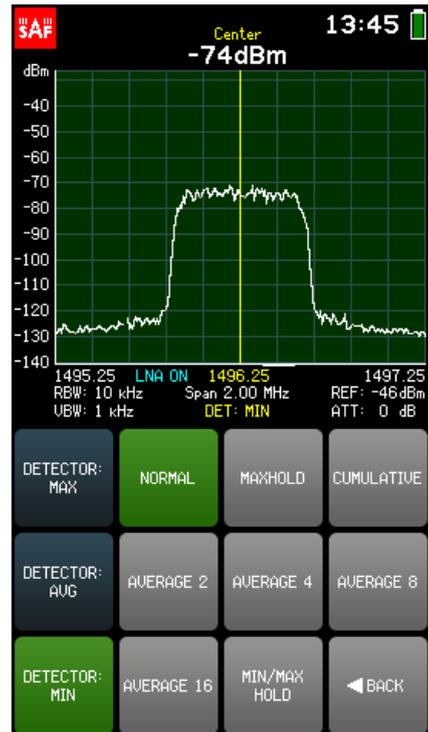


Figure 2-25 DETECTOR: MIN

The available trace types are:

- **NORMAL**
Normal trace mode (the default trace mode). The power level values after the detector are displayed on the screen in real-time without additional processing.
- **MAXHOLD**
Shows in **blue** the highest power levels registered since the sweeping with this trace mode commenced, in addition to the NORMAL (actual real-time) trace. The number in **blue** under the graph shows how many sweeps the MAXHOLD trace has been plotted. The input power value on center frequency is displayed for the **blue** MAXHOLD trace. If MARKER is activated with MAXHOLD trace mode, the input power value is shown with larger digits for the NORMAL trace and with smaller digits for the **blue** MAXHOLD trace. If POWER IN BAND is activated with MAXHOLD trace mode, the input power value is shown with larger digits for the NORMAL trace and with smaller digits for the **blue** MAXHOLD trace.



When a spectrum curve is saved with MAXHOLD trace mode, only the MAXHOLD trace is preserved.



Use MAXHOLD trace mode for antenna adjustments. It can also be used to detect intermittent signals or to measure the maximum power of fluctuating signals.

- CUMULATIVE
Shows in **green** all detected input power levels in range since the sweeping with this trace mode began. The number in **green** under the graph shows how many sweeps the CUMULATIVE trace has been plotted.



The CUMULATIVE trace shows how the signal energy is divided within the spectrum.



MARKER, POWER IN BAND, FULL SCREEN, RECORD, and MASK MODE are not available for CUMULATIVE trace mode. CUMULATIVE traces cannot be set as masks.

- AVERAGE 2/4/8/16
The displayed trace is an average over the last two, four, eight, or sixteen sweeps. The number in cyan below the graph indicates how many sweeps the trace is averaged.



AVERAGE trace mode is used to smooth out the noise effects which helps to stabilize the input power level reading.

- MIN/MAXHOLD
Shows in **blue** the highest and in **green** the lowest power levels registered since the sweeping with this trace mode commenced, in addition to the NORMAL (actual real-time) trace. The number in **blue** under the graph shows how many sweeps the MIN/MAXHOLD trace has been plotted. When a spectrum curve is saved, all three traces are preserved. The input power value on center frequency can be displayed for the NORMAL, **green** MINHOLD and **blue** MAXHOLD traces (it is possible to switch between the displayed values by pressing on it). If MARKER is activated with MAXHOLD trace mode, the input power value is shown with larger digits for the NORMAL trace and with smaller digits for the **blue** MAXHOLD and **green** MINHOLD traces. If POWER IN BAND is activated with MAXHOLD trace mode, the input power value is shown with larger digits for the NORMAL trace and with smaller digits for the **blue** MAXHOLD and **green** MINHOLD traces.



MIN/MAXHOLD trace mode shows which signals are intermittent and what their maximum and minimum input power levels are.



MASK MODE and RECORD are not available for MIN/MAXHOLD trace mode. Record using NORMAL or AVERAGE trace mode and use SHOW MIN/MAX (see [RECORD](#)). If a MIN/MAXHOLD trace is set as a mask, the MAXHOLD trace is used.

For the maximum allowed SPAN for MIN/MAXHOLD trace please see [Table 3](#).

To exit the TRACE menu and return to the main screen, tap BACK.

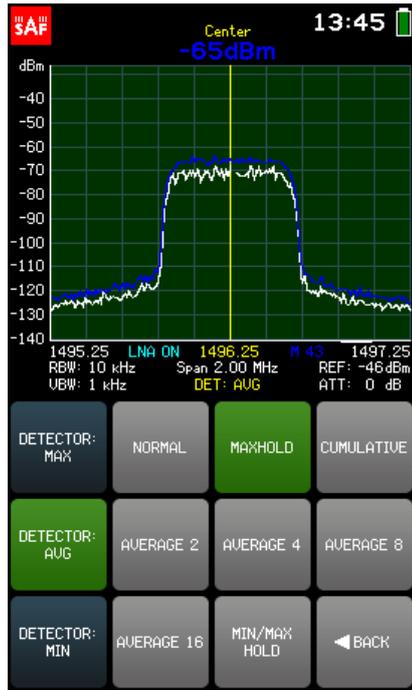


Figure 2-26 MAXHOLD trace mode

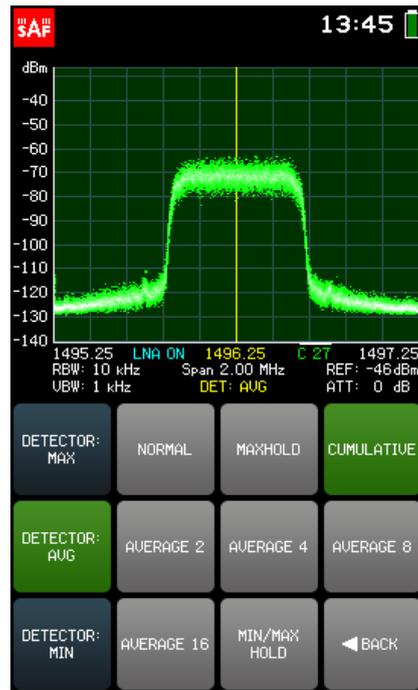


Figure 2-27 CUMULATIVE trace mode

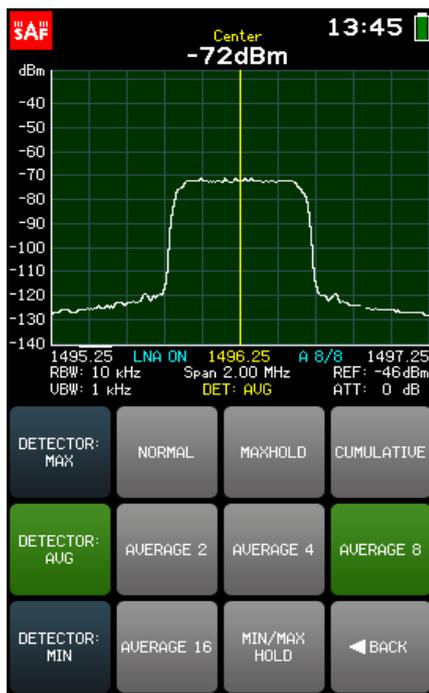


Figure 2-28 AVERAGE trace mode

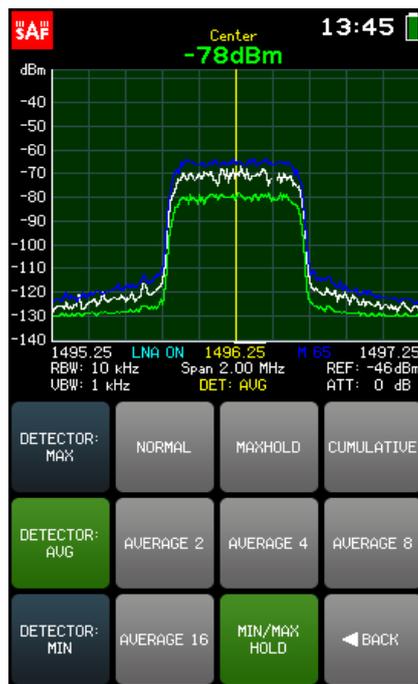


Figure 2-29 MIN/MAX HOLD trace mode

2.8 MARKER

The MARKER menu allows placing a marker, which shows the input power level at the specified frequency.



MARKER and POWER IN BAND cannot be activated at the same time.

Tapping the PEAK button turns on and off the automatic search for the highest input power level in the displayed frequency range and places the MARKER there. Tapping the CENTER TO MARKER button changes the CENTER frequency to the current MARKER frequency (while preserving SPAN, if possible), i.e. centers the graph on the MARKER.

The current MARKER frequency is displayed in white. The color of the keypad buttons shows which numbers can be entered at the current digit position to obtain a valid parameter value – the numbers on the **green** buttons can be entered, but the numbers on the **red** buttons cannot be entered. If the currently entered value is valid, it is displayed in **green** (also the OK button is **green**). If the value is not valid, it is displayed in **red** (also the OK button is **red**). To confirm a valid value, tap the OK button or tap the parameter's box.

The frequency value can be entered with a precision of 0.01 MHz (10 kHz) by using the "." on the keypad. To enter a value with decimal digits, first, enter the full MHz's, then tap the "." button and enter the rest of the digits. Until the value is confirmed, the digits after the point are displayed larger. If there are no digits displayed after the point, it means that they are zeroes.



While in the MARKER menu, tapping the graph will place the MARKER there. MARKER can be moved also by dragging it.



If the MARKER frequency is outside of the currently displayed frequency range, arrows on the graph will indicate beyond which side of the graph the MARKER is positioned.

Tapping the ZERO SPAN button opens the ZERO SPAN mode (please refer to chapter [2.13.7 ZERO SPAN](#) on page [42](#)).

To exit the MARKER menu and return to the main screen, tap BACK. When MARKER is enabled, the MARKER button is **green** on the main screen. Tapping the MARKER button when it is active, disables the MARKER. MARKER is disabled by default.

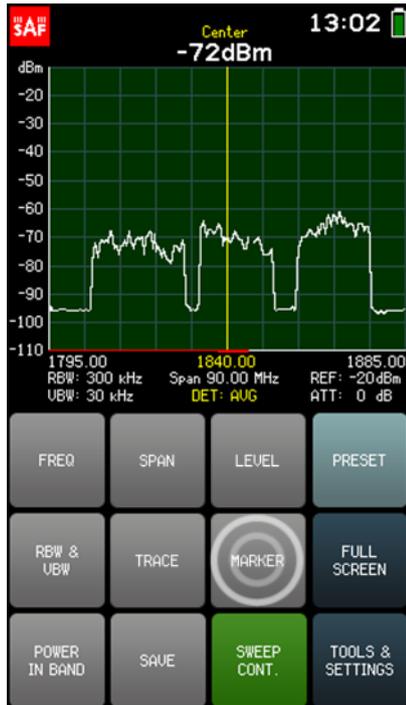


Figure 2-30 Entering the MARKER menu

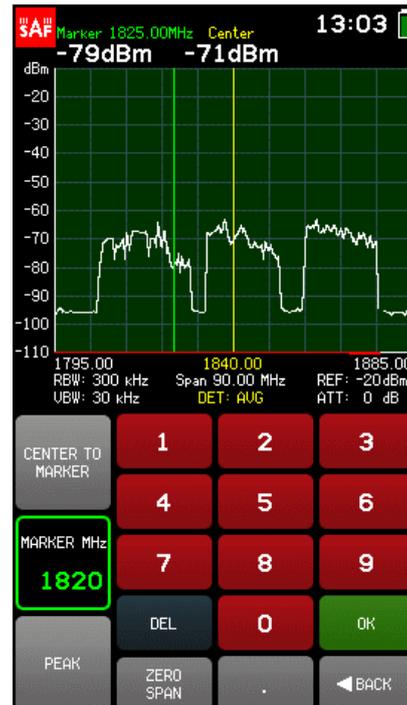


Figure 2-31 The MARKER menu

2.9 POWER IN BAND

The POWER IN BAND menu allows measuring the input power in a specified bandwidth BW i.e. over a range of frequencies, with a center frequency CENTER specified at this menu.



The POWER IN BAND feature also can be used to measure the channel width or channel separation by adjusting the BW to fit.



MARKER and POWER IN BAND cannot be activated at the same time.

Tapping the SET TO CENTER button centers POWER IN BAND on the CENTER frequency of the currently selected SPAN.



To increase the accuracy of input power level measurements, select DETECTOR: AVG and one of the AVERAGE traces at the [TRACE](#) menu.

The currently selected parameter (BW/ CENTER) is displayed in white. The color of the keypad buttons shows which numbers can be entered at the current digit position to obtain

a valid parameter value – the numbers on the **green** buttons can be entered, but the numbers on the **red** buttons cannot be entered. If the currently entered value is valid, it is displayed in **green** (also the OK button is **green**). If the value is not valid, it is displayed in **red** (also the OK button is **red**). To confirm a valid value, tap the OK button or tap the selected parameter's box.



The BW of POWER IN BAND cannot be narrower than the currently selected RBW (see [RBW & VBW](#)).

The frequency value can be entered with a precision of 0.01 MHz (10 kHz) by using the "." on the keypad. To enter a value with decimal digits, first, enter the full MHz's, then tap the "." button and enter the rest of the digits. Until the value is confirmed, the digits after the point are displayed larger. If there are no digits displayed after the point, it means that they are zeroes.



While in the POWER IN BAND menu, tapping the graph will place the POWER IN BAND area there. POWER IN BAND area can be moved also by dragging it.



If the POWER IN BAND area frequency is outside of the currently displayed frequency range, arrows on the graph will indicate beyond which side of the graph the POWER IN BAND area is positioned.

To exit the POWER IN BAND menu and return to the main screen, tap BACK. When POWER IN BAND is enabled, the POWER IN BAND button is **green** on the main screen. Tapping the POWER IN BAND button when it is active, disables the POWER IN BAND. POWER IN BAND is disabled by default.

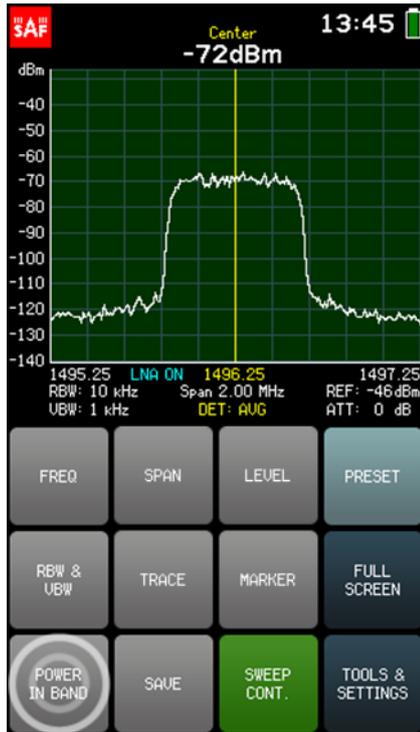


Figure 2-32 Entering the POWER IN BAND menu

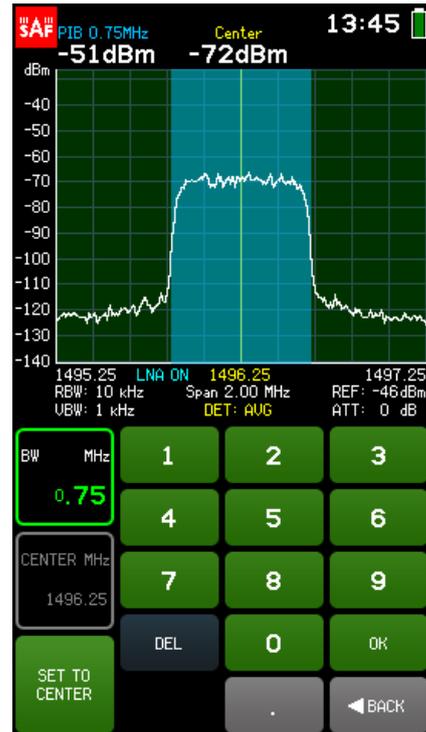


Figure 2-33 The POWER IN BAND menu

2.10 SAVE

Tapping the SAVE button instantly saves the spectrum curve with an automatically generated file name: the first letter indicates the trace mode ("C" corresponds to NORMAL, "M" to MAXHOLD, "W" to CUMULATIVE, "A" to AVERAGE 2/4/8/16 and "N" to MIN/MAXHOLD) and the remaining digits are the file order number.



SAVE button is not available if at least one full sweep has not been done with the current sweep settings.

Holding the SAVE button for a few seconds allows for saving the current spectrum curve with a custom file name. The name can be up to 8 characters long.



When assigning a custom file name, it is checked whether the name does not match with an already existing one. In that case, it is not possible to confirm.

When saving, the continuous sweep is stopped and the saved curve is displayed on the graph, with the assigned filename in the upper right corner. From the submenu, the displayed input power range (see [2.5.5 SCALE](#)) and frequency range can be adjusted (zooming in on the frequency axis could be done, if the record was done with SPAN greater than MIN SPAN for the file's RBW, see [2.3 FREQ](#)), and the MARKER (see [2.8 MARKER](#)) or POWER IN BAND

(see [2.9 POWER IN BAND](#)) can be enabled or adjusted. Also, recording can be SET AS PROFILE (see [2.13.2 PROFILES](#)) and mask can be enabled (see [2.13.3 MASK MODE](#)). To close the file and resume real-time sweep, tap SWEEP CONT. If no buttons are pressed, the real-time sweep is automatically resumed after 3 seconds. The saved spectrum curves can be reviewed at any time at TOOLS & SETTINGS → [FILES](#).

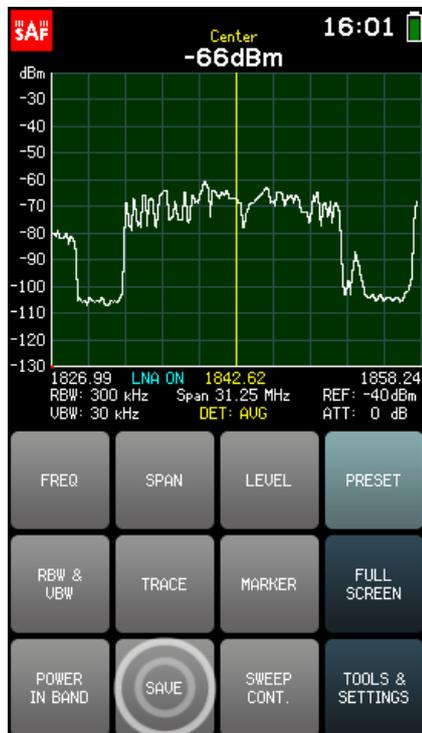


Figure 2-34 The SAVE button

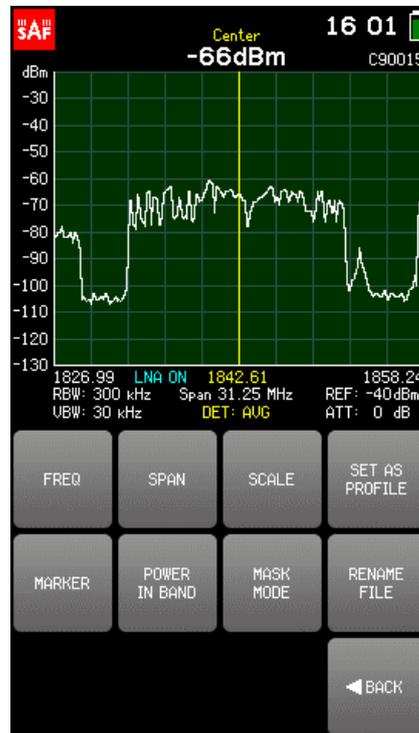


Figure 2-35 File with automatically assigned name

2.11 PRESET

The PRESET menu allows resetting the Spectrum Compact to the factory defaults.

To confirm tap the PRESET button once more.



Use PRESET to quickly default settings and clear enabled features. Use PROFILES to save a configuration before using PRESET and to restore it afterwards.



PRESET will not format the internal storage disk of the Spectrum Compact.



PRESET and a reboot are mandatory after a firmware upgrade.

To exit the PRESET menu and return to the TOOLS menu tap BACK.

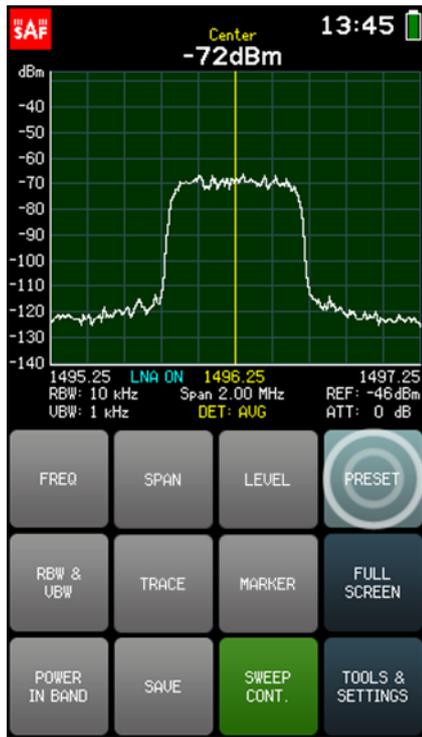


Figure 2-36 Entering the PRESET menu

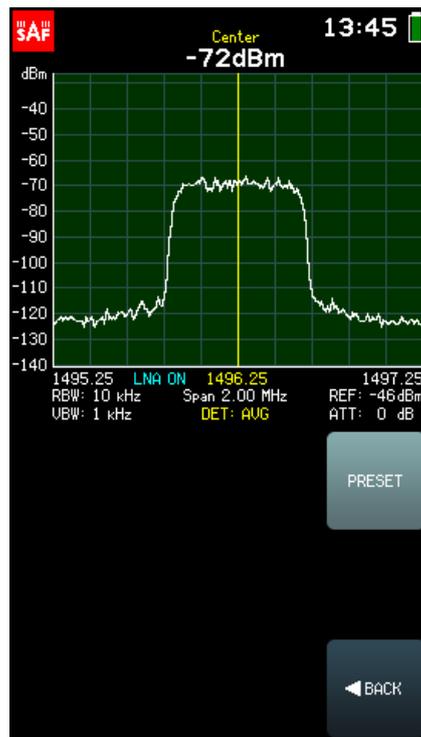


Figure 2-37 The PRESET menu

2.12 FULL SCREEN

Tapping the FULL SCREEN button expands the graph. In FULL SCREEN mode, there are only buttons LOCK SCREEN, SAVE, and SWEEP CONT. accessible.

The LOCK SCREEN button allows locking the screen of the Spectrum Compact so that no button on the screen can be accidentally pressed and the graph stays as it is configured. The screen is unlocked by pressing the power button shortly.

To exit the FULL SCREEN mode and return to the main screen, tap BACK.

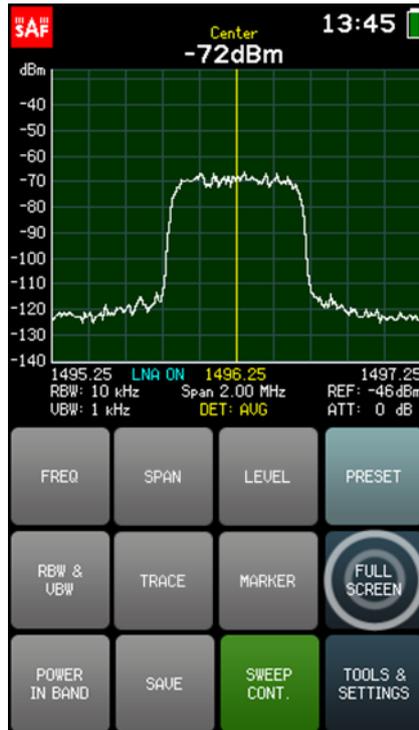


Figure 2-38 Entering FULL SCREEN mode

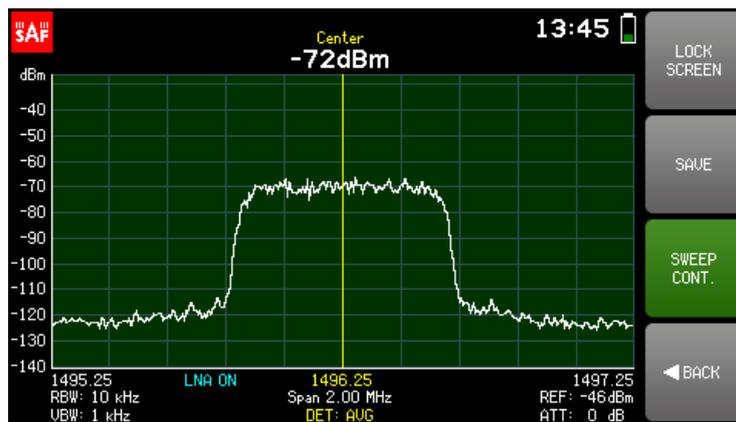


Figure 2-39 Horizontal FULL SCREEN

2.13 TOOLS

Additional functions of the spectrum analyzer are accessible in the TOOLS menu. To access the TOOLS menu, tap the TOOLS & SETTINGS button from the main screen.

To exit the TOOLS menu and return to the main screen, tap BACK.

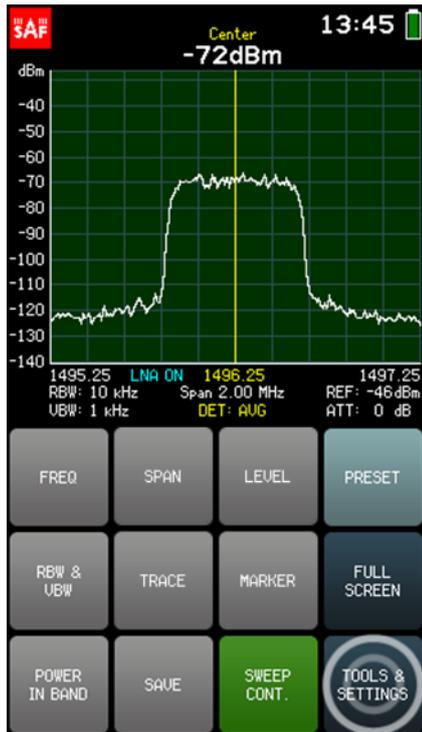


Figure 2-40 Entering the TOOLS menu

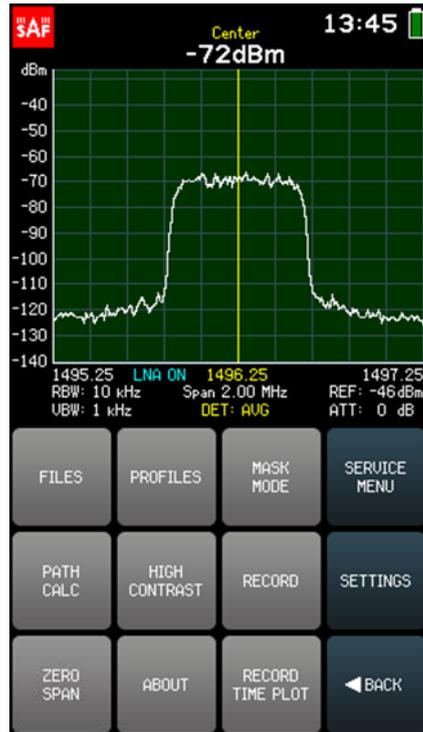


Figure 2-41 The TOOLS menu

2.13.1 FILES

The FILES menu allows operating with previously saved spectrum curves.

Files are sorted by the time they were created, and the latest file is on top of the list. The time when the spectrum curve was saved, and its trace mode is given under the filename. Navigate the files using the arrows or the slider. Tap on the file to select it – the selected spectrum curve will be previewed at once. To get more options, tap OPEN. Then the main screen with the selected file on the screen is opened. From the main screen, the displayed input power range (see [2.5.5 SCALE](#)) and frequency range can be adjusted (zooming in on the frequency axis could be done, if the file was saved with SPAN greater than MIN SPAN for the file's RBW, see [2.3 FREQ](#)), and the MARKER (see [2.8 MARKER](#)) or POWER IN BAND (see [2.9 POWER IN BAND](#)) can be enabled or adjusted. Also, a mask can be enabled (see [2.13.3 MASK MODE](#)).



SPAN, LEVEL, MARKER, and POWER IN BAND menus are not available for spectrum curves saved with CUMULATIVE trace mode.

To close the file and resume the real-time sweep, tap SWEEP CONT. To view a different file, go to the FILES menu again.

A saved spectrum curve can be deleted with DELETE from the FILES menu or the folder "CURVES" when Spectrum Compact is connected to a computer.

To exit the FILES menu and return to the TOOLS menu, tap BACK.

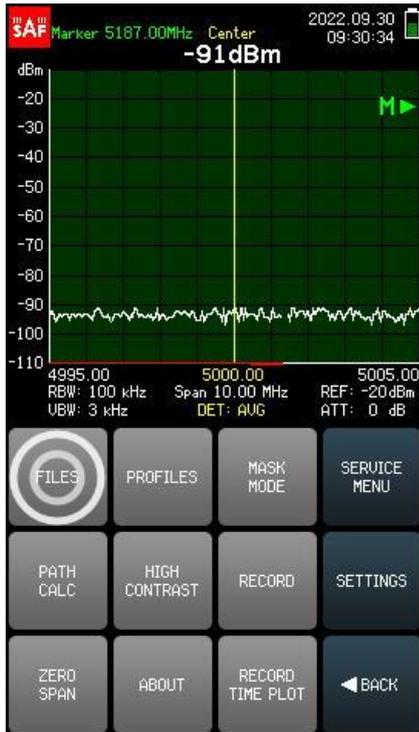


Figure 2-42 Entering the FILES menu

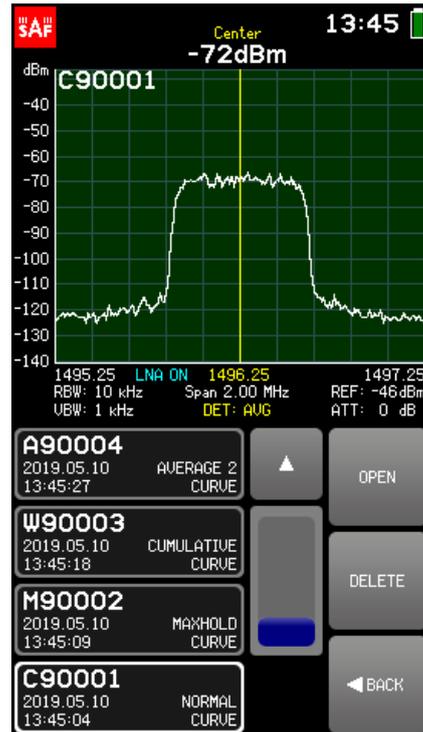


Figure 2-43 The FILES menu

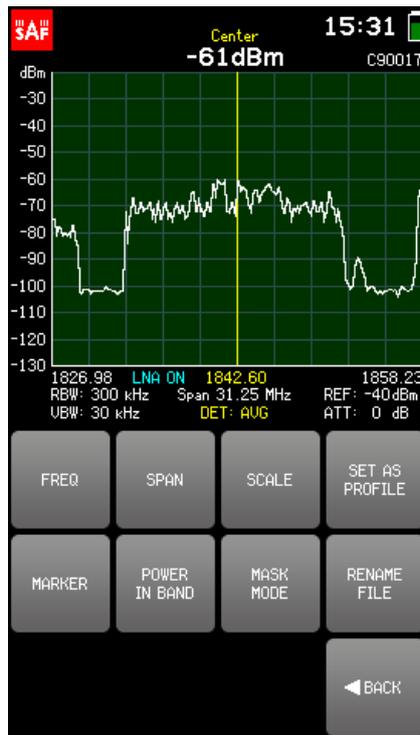


Figure 2-44 The OPEN submenu

2.13.2 PROFILES

The PROFILES menu allows saving and afterwards restoring Spectrum Compact's configuration – frequency, level, trace and screen settings, a mask, etc.

To save the current configuration as a profile, tap SAVE PROFILE. The profile name can be up to 8 characters long.



When assigning a custom file name, it is checked whether the name does not match with an already existing one. In that case, it is not possible to confirm it.

Profiles are sorted alphabetically. The time when the profile was created is given under the filename. Navigate the saved profiles list using the arrows or the slider. To preview a saved profile, tap on it to select it, then tap VIEW PROFILE. Restore a profile by tapping the SET PROFILE button.



To see how the current spectrum looks with a selected profile, make sure the SWEEP CONT. button is active on the main screen.

A profile can be deleted with a DELETE PROFILE at the VIEW PROFILE menu or from the folder "PROFILES" when Spectrum Compact is connected to a computer.

To exit the VIEW PROFILE submenu, tap BACK. To exit the PROFILES menu and return to the TOOLS menu, tap BACK.

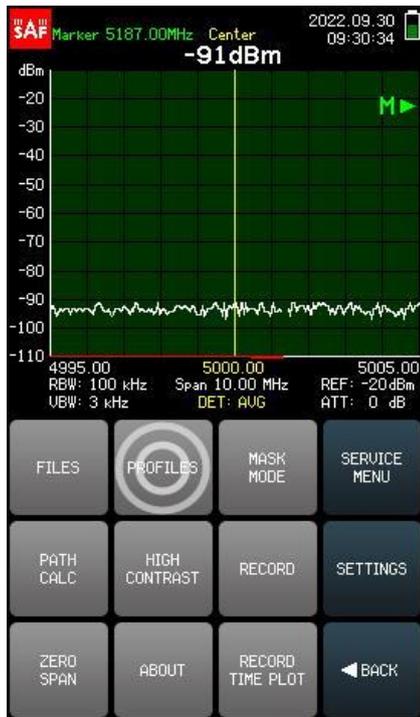


Figure 2-45 Entering the PROFILES menu

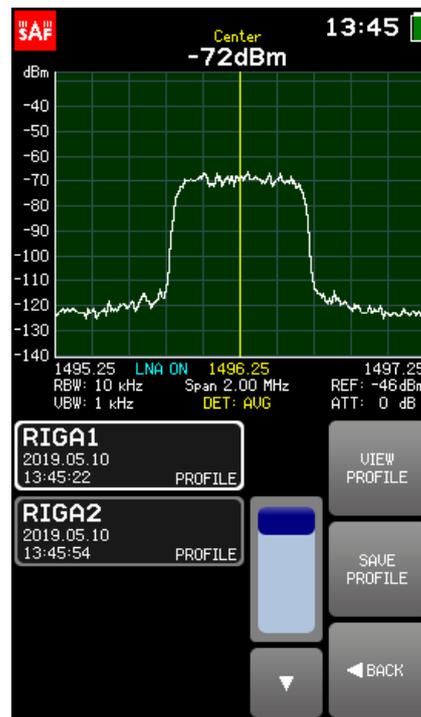


Figure 2-46 The PROFILES menu

2.13.3 MASK MODE

The MASK MODE menu allows setting a file as a spectrum mask and thus visually comparing the currently displayed spectrum curve with another one.



MASK MODE is not available for CUMULATIVE and MIN/MAXHOLD trace modes. CUMULATIVE traces cannot be used as masks. The MAXHOLD trace is set as a mask from a MIN/MAXHOLD file.

To enter the file system, tap SELECT FILE. Navigate the files using arrows or the slider, tap on the file to select it, and then tap the SET AS MASK button (to exit the SELECT FILE submenu without selecting a mask, tap BACK). This selected mask curve is put on the graph, and it is displayed in red. Tapping the RELATIVE MASK button turns on and off the centering of the mask. If the RELATIVE MASK button is active (green), the mask is centered on the current CENTER frequency. If the RELATIVE MASK button is inactive, the spectrum curve used as the mask is positioned in its actual frequency range with which it was saved. The vertical position of the mask – the MASK OFFSET – can be adjusted upwards or downwards in 1 dB steps by using the buttons. To quickly set the MASK OFFSET to 0, tap CLEAR OFFSET. MASK OFFSET is 0 by default i.e. the vertical position of the curve used for the mask is as it was when the file was saved.

To exit the MASK MODE menu and return to the TOOLS menu, tap BACK. When MASK MODE is activated, the MASK MODE button is green at the TOOLS menu. Tapping the MASK MODE button when it is active disables the MASK MODE. MASK MODE is disabled by default.

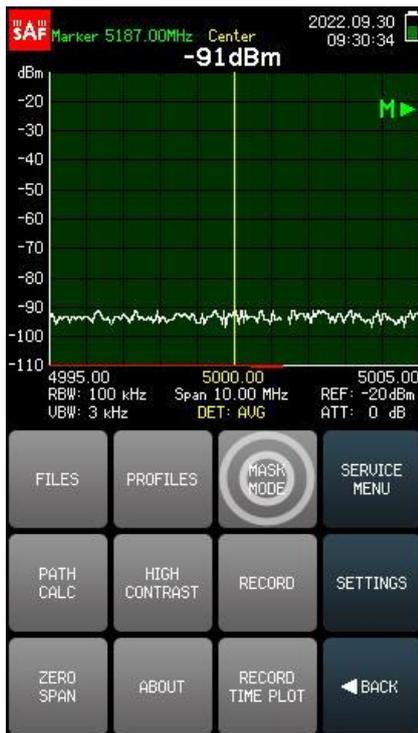


Figure 2-47 Entering the MASK MODE menu

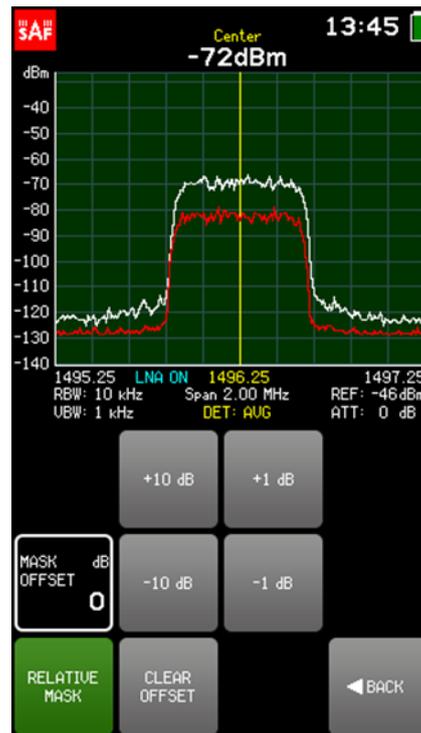


Figure 2-48 The MASK MODE menu

2.13.4 PATH CALC

The PATH CALC menu allows for evaluating the received signal level (RSL) in dBm. The calculator is adapted for the 10 – 3000 MHz frequency range in the Spectrum Compact 10-3000 MHz, for the 300 – 3000 MHz in the Spectrum Compact 0.3-3GHz, for the 2000 – 8000 MHz in the Spectrum Compact 2-8 GHz, for the 5925 – 20000 MHz in the Spectrum

Compact 6-20 GHz, for the 16000 – 26500 MHz in the Spectrum Compact 16-26.5 GHz, for the 24000 – 40000 MHz in the Spectrum Compact 24-40 GHz, for the 24000 – 43000 MHz in the Spectrum Compact 24-43 GHz.



The calculated value is an estimation. For more credible results, use a professional link planning tool.

The parameters required for the calculation are:

- transmitter frequency **FREQ**, in MHz;
- transmitter power **TX PWR**, in dBm;
- distance between the transmitter and receiver **DIST**, either in kilometers or miles;
- gain of the transmitter antenna **TX GAIN**, in dBi;
- gain of the receiver antenna **RX GAIN**, in dBi;
- (optional) **LOSSES** value to account for any known additional losses e.g. cables, rain, obstacles, in dB.

The **RX LEVEL** is recalculated instantly when a parameter's value is modified.

To select a parameter, tap on it once. The color of the keypad buttons shows which numbers can be entered at the current digit position to obtain a valid parameter value – the numbers on the **green** buttons can be entered, but the numbers on the **red** buttons cannot be entered. If the currently entered value is valid, it is displayed in **green** (also the OK button is **green**). If the value is not valid, it is displayed in **red** (also the OK button is **red**). To confirm a valid value, tap the OK button or tap the selected parameter's box. If the currently selected parameter is already correct, the next/previous parameter can be selected by using the arrow buttons.

The frequency value can be entered with a precision of 0.01 MHz (10 kHz) by using the "." on the keypad. To enter a value with decimal digits, first, enter the full MHz's, then tap the "." button and enter the rest of the digits. Until the value is confirmed, the digits after the point are displayed larger. If there are no digits displayed after the point, it means that they are zeroes.

To exit the parameter submenus, tap **BACK**. To exit the **PATH CALC** menu and return to the **TOOLS** menu, tap **BACK**.

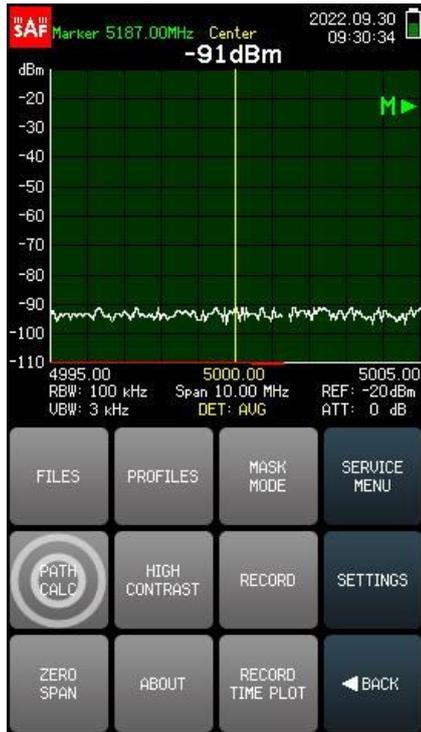


Figure 2-49 Entering the PATH CALC menu

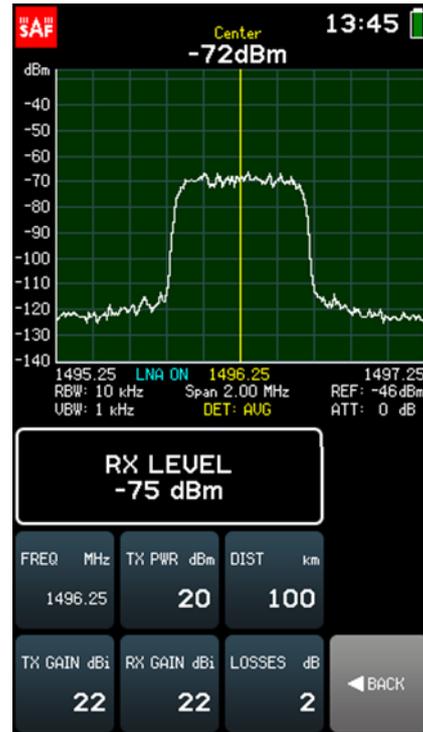


Figure 2-50 The PATH CALC menu

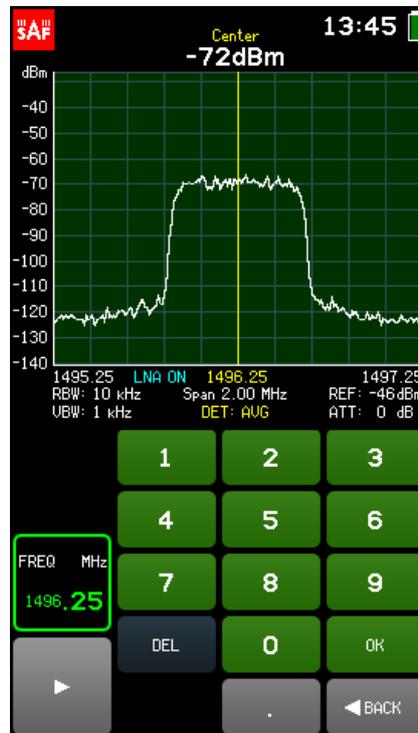


Figure 2-51 The PATH CALC menu

2.13.5 HIGH CONTRAST

Tapping the HIGH CONTRAST button swaps the interface color scheme and sets the screen background brightness to maximum. HIGH CONTRAST mode is designed to improve visibility in direct sunlight. In HIGH CONTRAST mode, the active buttons are indicated by a narrower shape instead of green color.

To exit the HIGH CONTRAST mode, tap the HIGH CONTRAST button again.

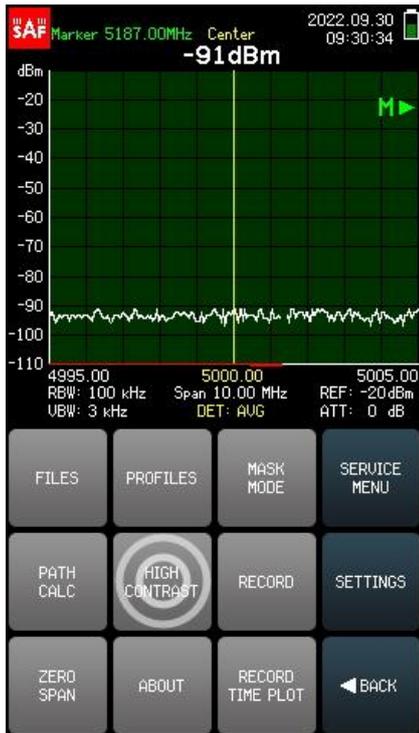


Figure 2-52 Entering HIGH CONTRAST mode

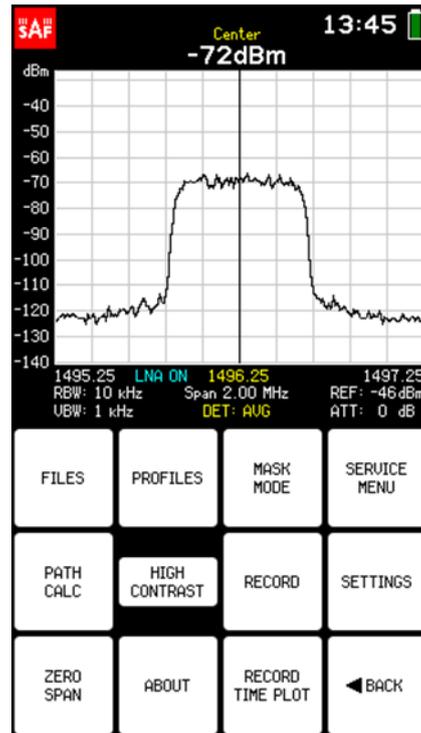


Figure 2-53 HIGH CONTRAST mode

2.13.6 RECORD

The RECORD menu allows for creating a record of a continuous spectrum sweep.

To start a new record with the currently selected sweep settings, tap NEW RECORD (the NEW RECORD button turns on continuous sweep). The filename is assigned automatically, but it can be changed afterwards when the file is open with the button RENAME RECORD. The maximum length of a record is 30 minutes. If the recording is not manually stopped earlier either by tapping the NEW RECORD button again (thus disabling it) or by tapping the OPEN RECORD or BACK buttons, a new consequent record will be started automatically.



Spectrum Compact can be left at a site with the NEW RECORD button active and the created records can be examined later. While charging with the supplied power source, Spectrum Compact can record files continuously.



NEW RECORD is not available for CUMULATIVE trace mode.
NEW RECORD is not available for MAXHOLD and MIN/MAXHOLD trace modes (use button SHOW MIN/MAX LEVELS to see the final maximum and minimum input power values for a NORMAL or AVERAGE 2/4/8/16 trace modes instead).

Records are sorted by the time they were created, and the latest record is on top of the list. The start time of the record and the number of frames (sweeps) recorded is given under the filename. Navigate the records list by using the slider and the arrows. To view a record, tap on it to select it, then tap OPEN RECORD. The displayed frame's number and the number of frames recorded altogether are indicated under the slider. Also, the time and how long before the end of the recording the displayed frame was captured is indicated in brackets under the slider. By tapping PLAY the playback is started from the currently displayed frame. The frame can be selected using the slider and the arrows. The record can be played back also in FULL SCREEN mode. The MIN/MAX LEVELS button allows seeing the highest and lowest input power levels detected during the recording. The trace in the currently displayed frame can be saved as a separate spectrum curve with the button SAVE CURVE.



If the SHOW MIN/MAX LEVELS button is active (green), the curve saved from the record will be a MIN/MAXHOLD curve with all 3 traces.

From the MORE OPTIONS submenu, the displayed input power range (see [2.5.5 SCALE](#)) and frequency range can be adjusted (zooming in on the frequency axis could be done, if the record was done with SPAN greater than MIN SPAN for the file's RBW, see [2.3 FREQ](#)), and the MARKER (see [2.8 MARKER](#)) or POWER IN BAND (see [2.9 POWER IN BAND](#)) can be enabled or adjusted. Also, recording can be SET AS PROFILE (see [2.13.2 PROFILES](#)) and mask can be enabled (see [2.13.3 MASK MODE](#)). To exit the MORE OPTIONS submenu, tap BACK.

A record can be deleted with a DELETE RECORD or from the folder "RECORDS" when Spectrum Compact is connected to a computer.

Tapping the OPEN TIME PLOT button opens the record with a different visualization, see [2.13.9 RECORD TIME PLOT](#). To then return to regular visualization, tap the button RECORD OPTIONS.



If deleting a record manually from the "RECORDS" folder (when Spectrum Compact is connected to a computer), delete also the time plot file – it has the same filename as the record file that has the extension ".RSC".

To close the record and exit the OPEN RECORD submenu, tap BACK. To exit the RECORD menu and return to the TOOLS menu tap BACK.

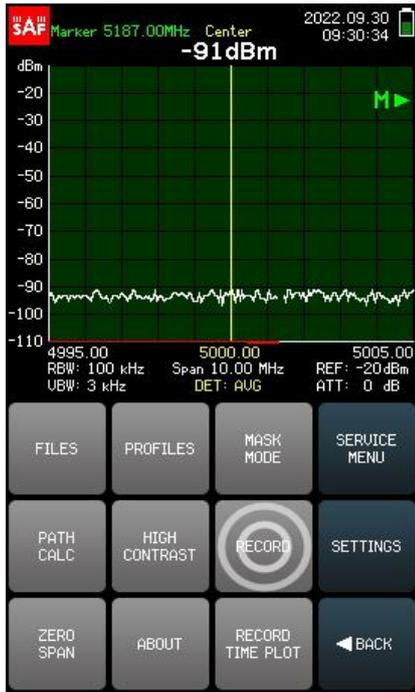


Figure 2-54 Entering the RECORD menu

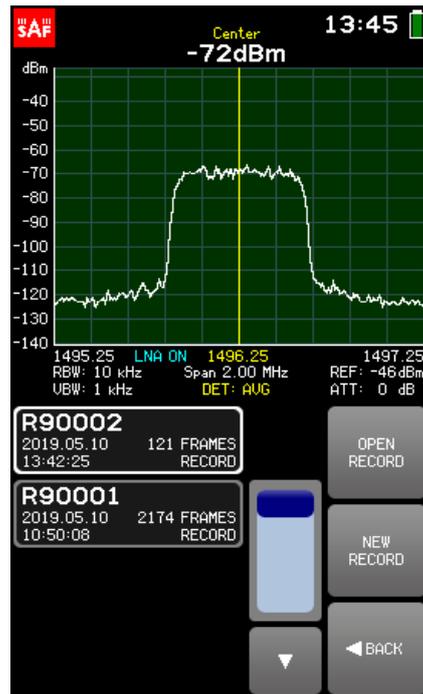


Figure 2-55 The RECORD menu

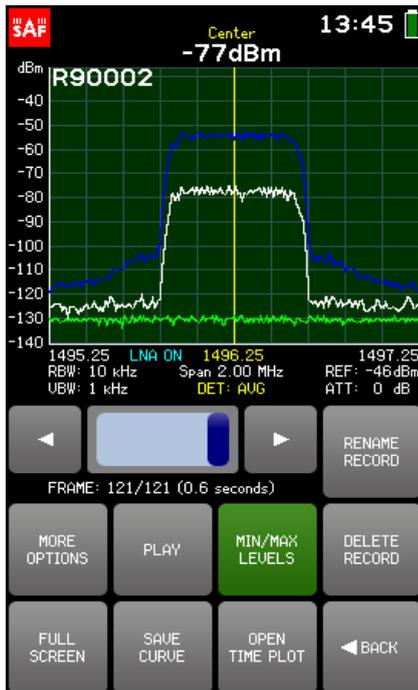


Figure 2-56 The OPEN RECORD submenu

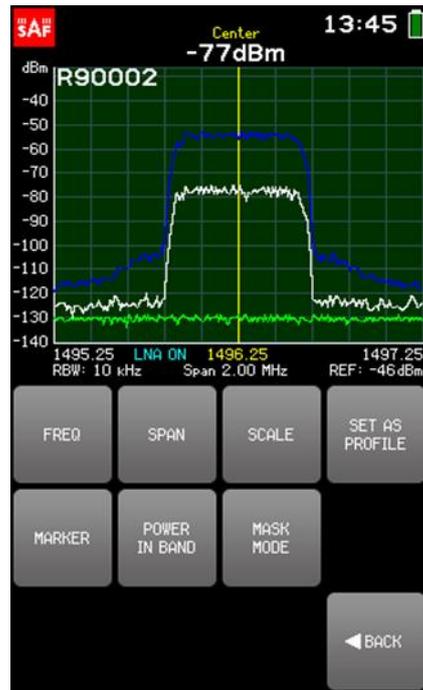


Figure 2-57 The MORE OPTIONS submenu

2.13.7 ZERO SPAN

The ZERO SPAN mode allows measuring signal at a fixed frequency, displaying signal amplitude variations in a time domain. The bandwidth of the receiver aligns with the resolution bandwidth (please refer to chapter [2.6 RBW & VBW](#) on page 20).

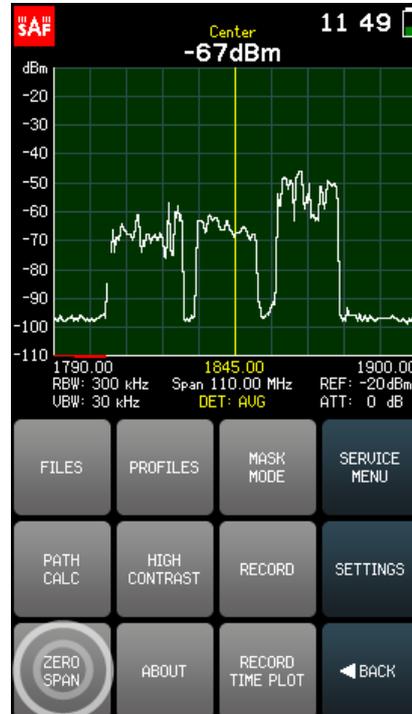


Figure 2-58 Entering the ZERO SPAN menu

The time interval could be set between 0.1sec to 420sec in 0.1sec increments.

By pressing the TIME button, you can adjust span time, by pressing the FREQ button you can set center frequency. The resolution bandwidth remains as set in *RBW & VBW* menu (please refer to chapter [2.6 RBW & VBW](#) on page 20).

To start the display SWEEP CONT. must be pressed.

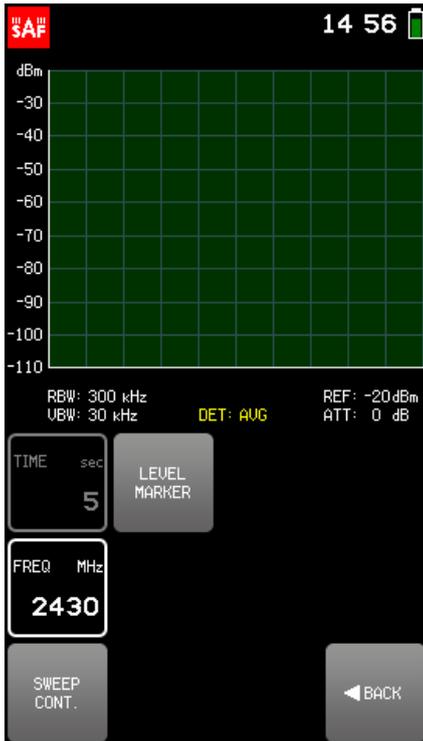


Figure 2-59 The ZERO SPAN menu

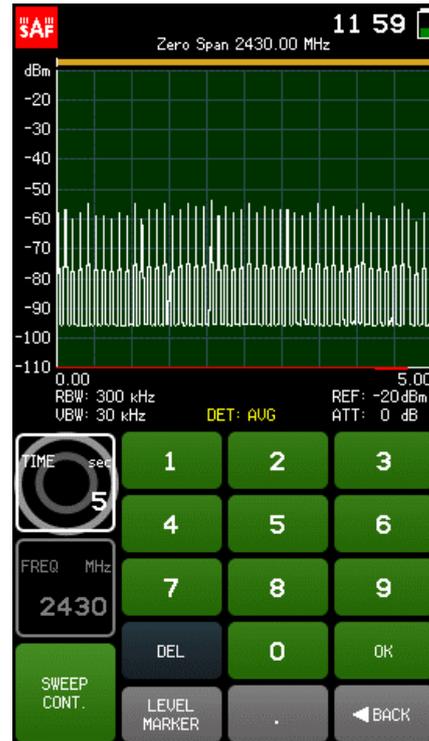


Figure 2-60 Setting span time

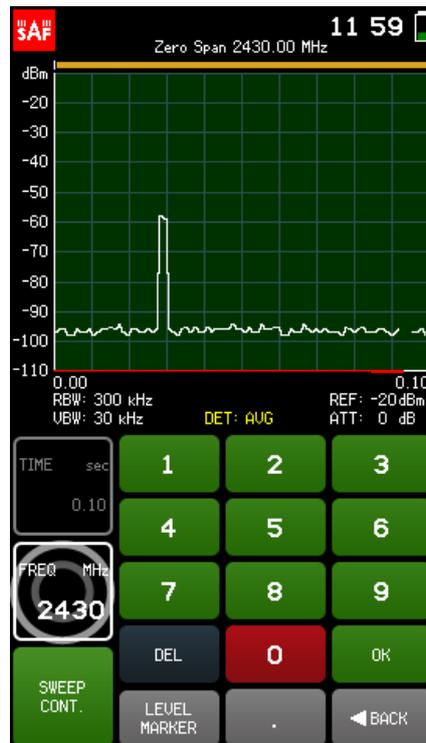


Figure 2-61 Setting center frequency

By pressing the LEVEL MARKER button is possible to define marker level. By sliding up or down on the axis, you can simultaneously move the MIN and MAX LEVEL markers.

If an audio accessory is connected (please refer to [2.13.11.7](#) on page 57) and if the signal level is below the MIN LEVEL, a low-pitched sound will be heard. On the other hand, if the signal is approaching the MAX LEVEL, a high-pitched sound will be heard.

While using the zero-span mode, adjustment of level scaling can be switched quickly by 20/10/5 dB/div. steps.

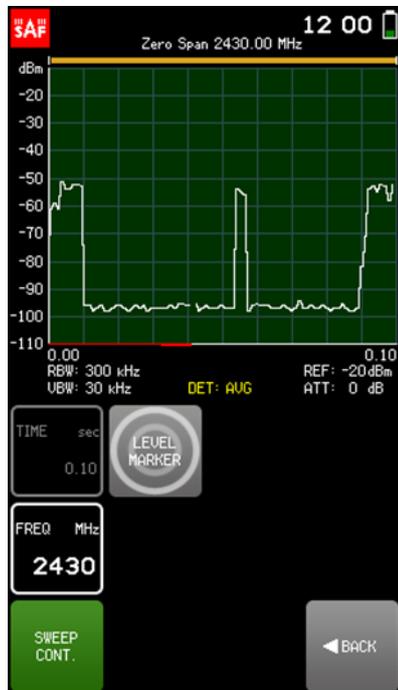


Figure 2-62 Entering LEVEL MARKER settings

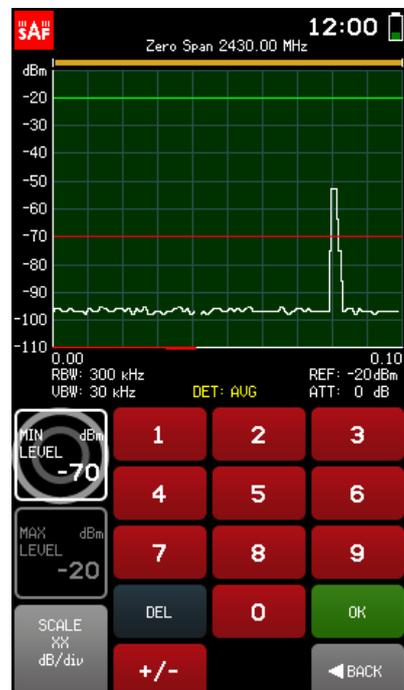


Figure 2-63 Setting MARKER MIN LEVEL

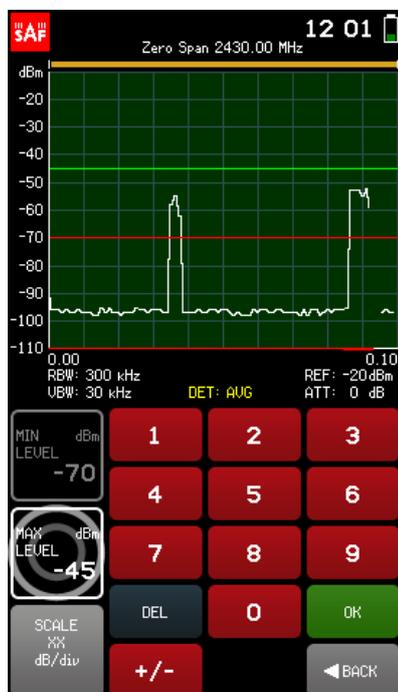


Figure 2-64 Setting MARKER MAX LEVEL

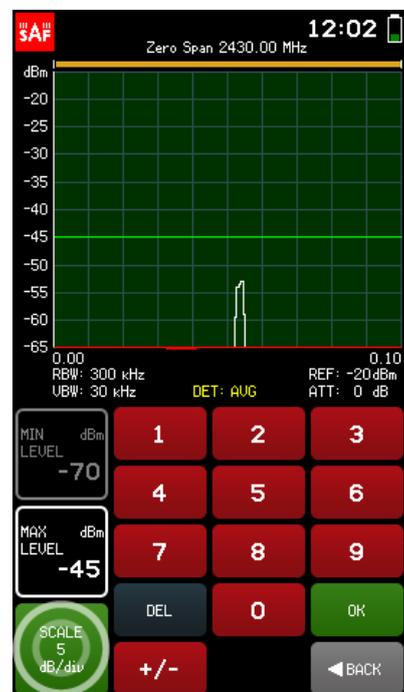


Figure 2-65 Setting the LEVEL SCALE

The yellow line at the top of the screen represents display zoom status. To zoom to a certain area, you must stop the SWEEP CONT. and tap the right side of the screen. By sliding left or right, you can move the time axis.

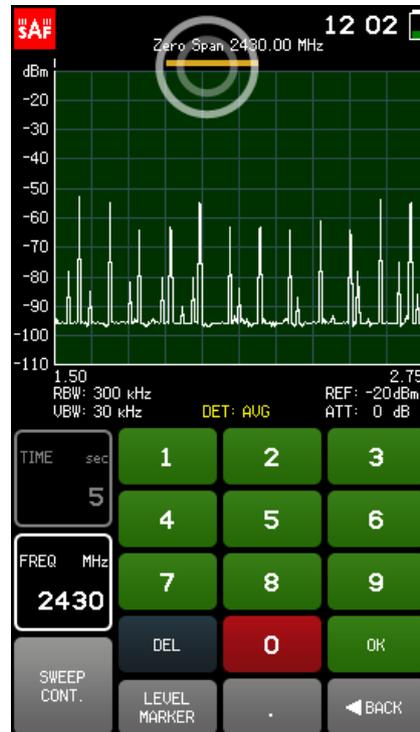


Figure 2-66 Time axis zoom indication

2.13.8 ABOUT

The ABOUT menu contains information about the Spectrum Compact unit: supported frequency range, product number, serial number, hardware version, and firmware version with its date. To exit the ABOUT menu and return to the TOOLS menu, tap BACK.

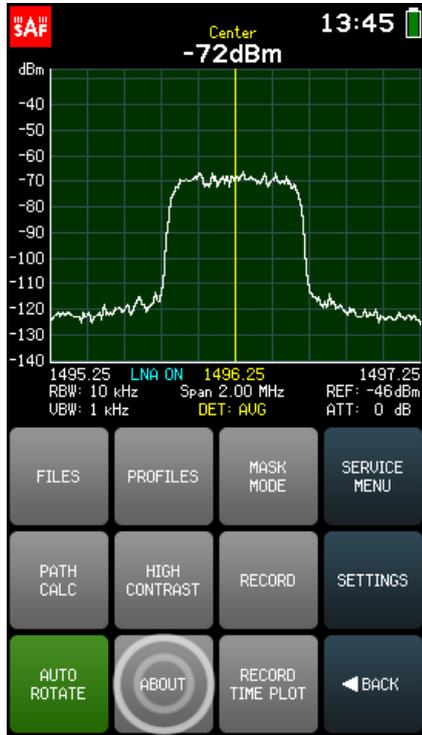


Figure 2-67 Entering the ABOUT menu

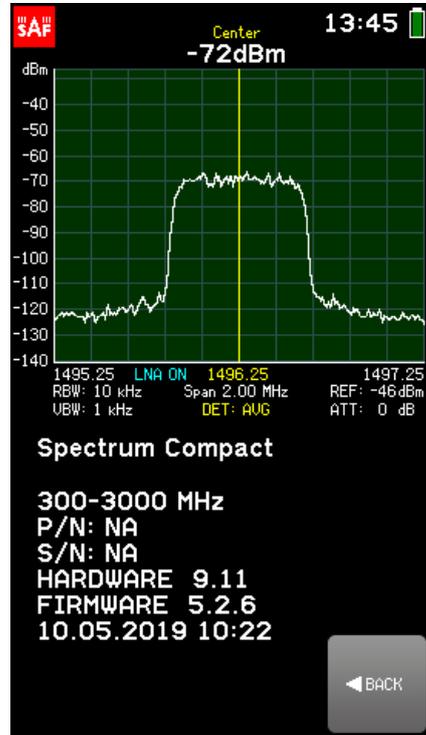


Figure 2-68 The ABOUT menu

2.13.9 RECORD TIME PLOT

The RECORD TIME PLOT menu allows visualizing the detected power values over time during a record. The vertical axis is transformed into a time axis – the bottommost row of a time plot corresponds to the newest sweep and the uppermost row corresponds to the first recorded sweep. Input power levels are indicated with different colors. The color legend is displayed above the graph.



The color legend is generated based on the currently selected MAX (highest limit of the vertical axis) and MIN (lowest limit of the vertical axis) values of the displayed input power range. Adjust them at the SCALE menu before starting a new record.



TIME PLOT is not applicable for MAXHOLD, MIN/MAXHOLD, and CUMULATIVE trace modes, thus NEW RECORD button is not available when these trace modes are selected.

To start a new record with the currently selected sweep settings, tap NEW RECORD (NEW RECORD button turns on continuous sweep). The filename is assigned automatically, but it can be changed afterwards when the file is opened with the button RENAME RECORD. The maximum length of a record is 30 minutes. If the recording is not manually stopped earlier

either by tapping the NEW RECORD button again (thus disabling it) or by tapping the OPEN TIME PLOT or BACK buttons, a new consequent record will be started automatically.



Spectrum Compact can be left at a site with the NEW RECORD button active and the created records can be examined later. While charging with the supplied power source, Spectrum Compact can record files continuously.

Records are sorted by the time they were created, and the latest record is on top of the list. The start time of the record and the number of frames (sweeps) recorded is given under the filename. Navigate the records list by using the slider and the arrows. To view a record using the time plot visualization, tap on it to select it, then tap OPEN TIME PLOT. Tap on the upper part of the graph to view older sweeps that go beyond the currently displayed plot. Tap on the bottom part of the graph to get back to newer sweeps.

Tapping the RECORD OPTIONS button opens the record with the regular visualization, see [RECORD](#). To then return to the time plot visualization, tap the button OPEN TIME PLOT.

A record can be deleted with a DELETE RECORD or from the folder "RECORDS" when Spectrum Compact is connected to a computer.



If deleting a record manually from the "RECORDS" folder (when Spectrum Compact is connected to a computer), delete also the time plot file – it has the same filename as the record file that has the extension ".RSC".

To exit the OPEN TIME PLOT submenu, tap BACK. To exit the RECORD TIME PLOT menu and return to the TOOLS menu, tap BACK.

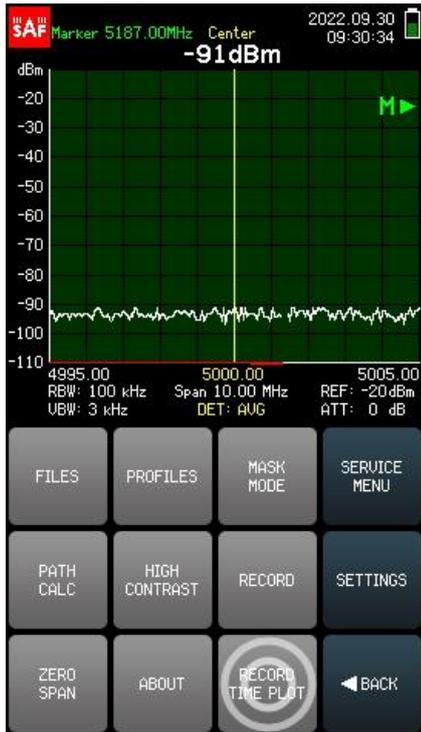


Figure 2-69 Entering RECORD TIME PLOT menu



Figure 2-70 The RECORD TIME PLOT menu

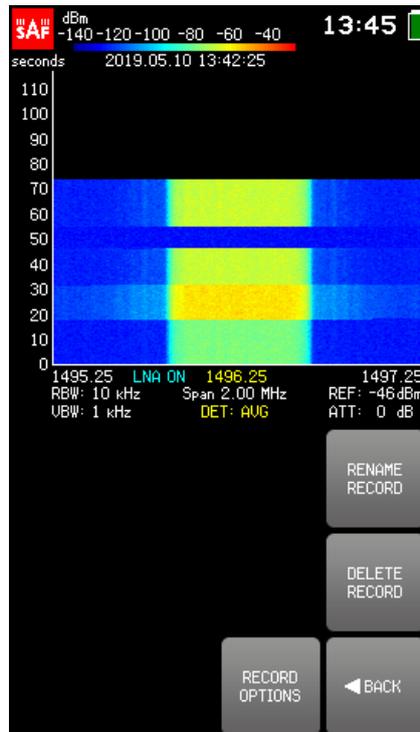


Figure 2-71 The OPEN TIME PLOT submenu

2.13.10 SERVICE MENU

SERVICE MENU allows determining how the Spectrum Compact behaves when connected to a computer.

- **DISABLE CHARGING**
Tapping the DISABLE CHARGING button disables the current draw from a power source, e.g., a laptop computer. It is still possible to sweep the spectrum or work with files but only the Spectrum Compact's battery power is used.
When DISABLE CHARGING is enabled, the button is **green**. To allow charging of the device, disable the button by tapping it again. DISABLE CHARGING is automatically deactivated when the device is turned off.
- **USB MODE**
The submenu USB MODE allows setting the Spectrum Compact to either Mass Storage Device (MSD) mode or Virtual COM Port (VCP) mode. The MSD mode allows obtaining files saved on the Spectrum Compact.



When Spectrum Compact is connected to a computer in MSD mode, it is not possible to save, rename or delete spectrum curves, records, and profiles, or to take screenshots on the device.

The VCP mode allows opening a serial connection with the computer and accessing CLI.



Before changing the USB mode from MSD to VCP, stop any ongoing file transfer to or from Spectrum Compact and close files opened directly from Spectrum Compact's drive.

The serial connection is required to use the Spectrum Compact to monitor the spectrum on a PC (see [Realtime mode with Spectrum Manager](#) and user manual for Spectrum Manager).

By default, Spectrum Compact is in MSD mode, and it is recommended to keep it so for file access and firmware upgrade.

To exit the USB MODE submenu, tap BACK. To exit the SERVICE MENU and return to the TOOLS menu tap BACK.

To exit the SERVICE MENU, tap BACK.

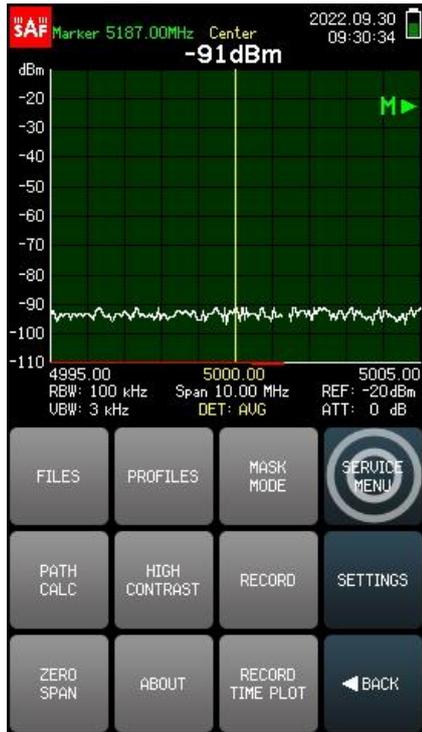


Figure 2-72 Entering the SERVICE MENU

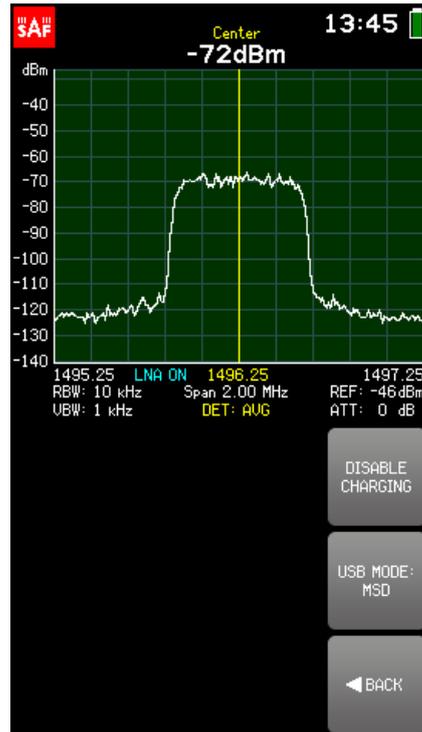


Figure 2-73 The SERVICE MENU

2.13.11 SETTINGS

All the other settings of the spectrum analyzer are accessible from the SETTINGS menu. To access the SETTING menu, from the main screen go to TOOLS & SETTINGS → SETTINGS. To exit the SETTINGS menu and return to the TOOLS menu, tap BACK. To return to the main screen, tap MAIN MENU.

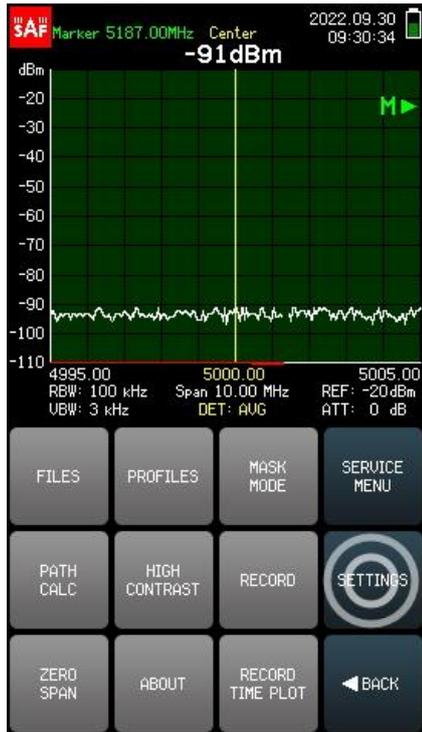


Figure 2-74 Entering the SETTINGS menu

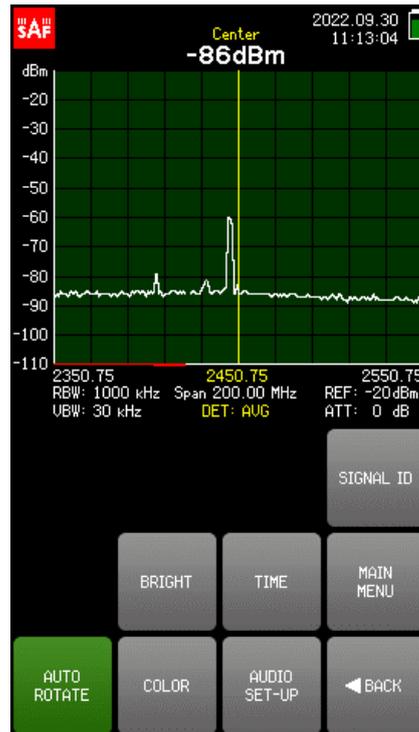


Figure 2-75 The SETTINGS menu

2.13.11.1 SIGNAL ID



SIGNAL ID is available for all Spectrum Compact models on which is possible to set 1 MHz RBW. These Spectrum Compact models are 2-8 GHz, 6-20 GHz, 16-26.5 GHz, 24-40 GHz, and 24-43 GHz.

Tapping the SIGNAL ID button turns on and off a filter algorithm that reduces the power levels of the harmonic signals. These artificial signals may become visible on screen if the input power is high, and the span is comparatively large.

Enabling the SIGNAL ID slows down the sweeping. To observe the operation of SIGNAL ID, enable and disable it repeatedly and compare the displayed power levels.

When SIGNAL ID is enabled, the SIGNAL ID button is green in the SETTINGS menu and an indication "ID" is shown under the graph slightly to the right of the center. SIGNAL ID is disabled by default.

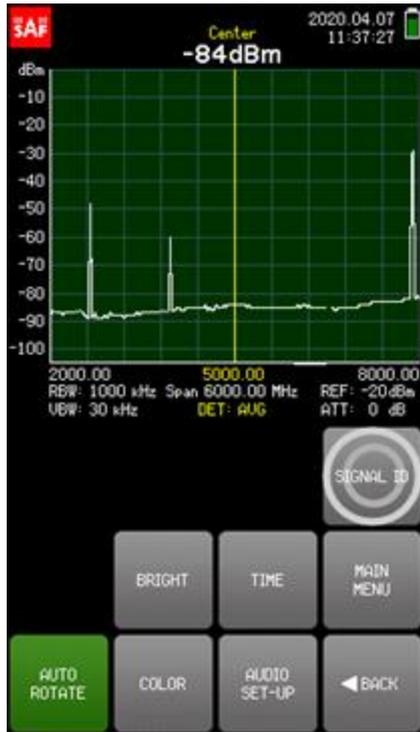


Figure 2-76 The SIGNAL ID button

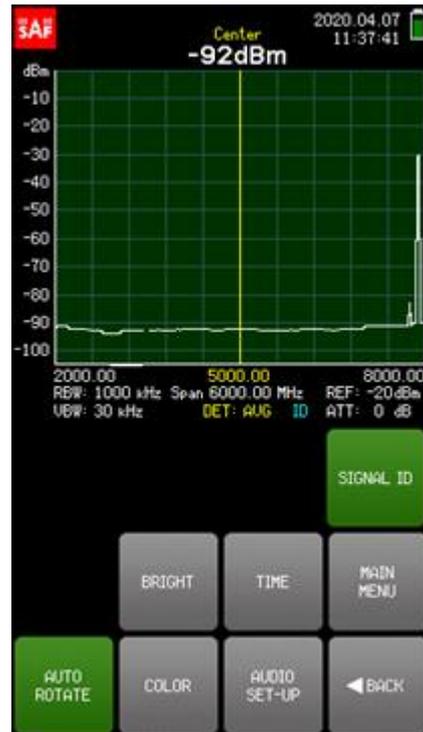


Figure 2-77 Operation of SIGNAL ID

2.13.11.2 BRIGHT

The BRIGHT menu allows setting the background brightness of the screen.

Tapping the "+" button or moving the slider up, increases the brightness, tapping the "-" button or moving the slider down, decreases the brightness. To exit the BRIGHT menu and return to the SETTINGS menu, tap BACK.



Enabling HIGH CONTRAST mode automatically sets the brightness to maximum.



Figure 2-78 Entering the BRIGH menu

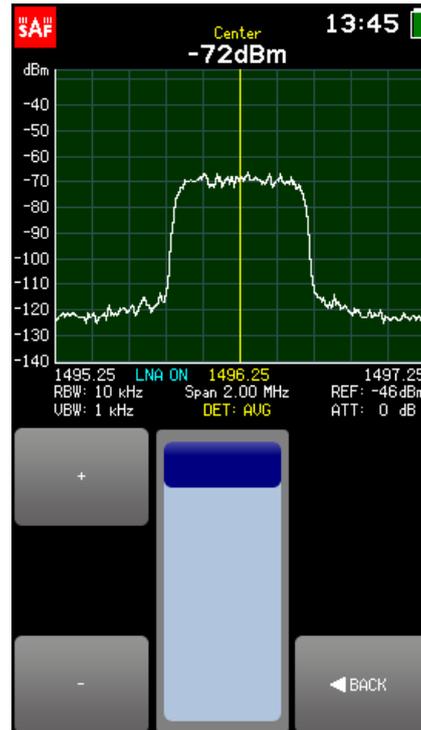


Figure 2-79 The BRIGH menu

2.13.11.3 TIME

The TIME menu allows setting the time/date format of the Spectrum Compact.

The currently selected parameter (YEAR/ MONTH/ DATE/ HOUR/ MIN) is displayed in white. To select a different parameter, tap on it once. The color of the keypad buttons shows which numbers can be entered at the current digit position to obtain a valid value – the numbers on the green buttons can be entered, but the numbers on the red buttons cannot be entered. If the currently entered value is valid, it is displayed in green (also OK button is green). If the value is not valid, it is displayed in red (also OK button is red). To confirm a valid value, tap the OK button or tap the selected parameter's box.



If the battery of Spectrum Compact was fully discharged or removed and the clock was stopped, before using the analyzer there is a prompt to set time to ensure the correct timestamp for files.

To exit the TIME menu and return to the SETTINGS menu, tap BACK.



Figure 2-80 Entering the TIME menu

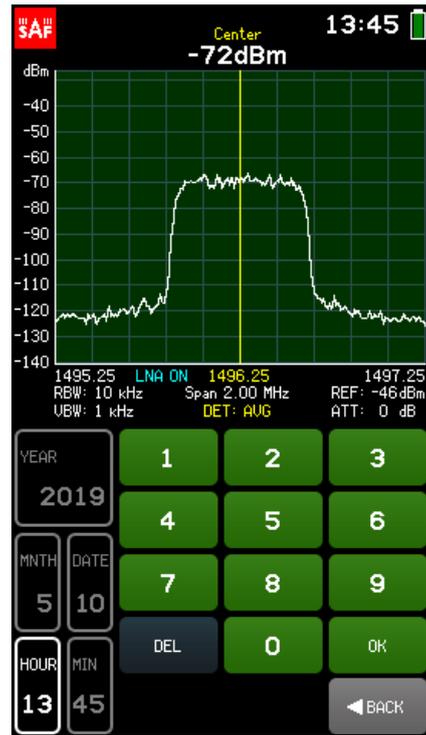


Figure 2-81 The TIME menu

2.13.11.4 MAIN MENU

Press the MAIN MENU button to switch back to the main menu.



Figure 2-82 Main menu button

2.13.11.5 AUTO ROTATE

Tapping the AUTO ROTATE button turns on and off the automatic rotation of the screen if the device is turned by 90, 180, or 270 degrees.

When AUTO ROTATE is enabled, the button is **green**. Disabling the AUTO ROTATE locks the screen position as it is at that moment. AUTO ROTATE is enabled by default.



Figure 2-83 The AUTO ROTATE button

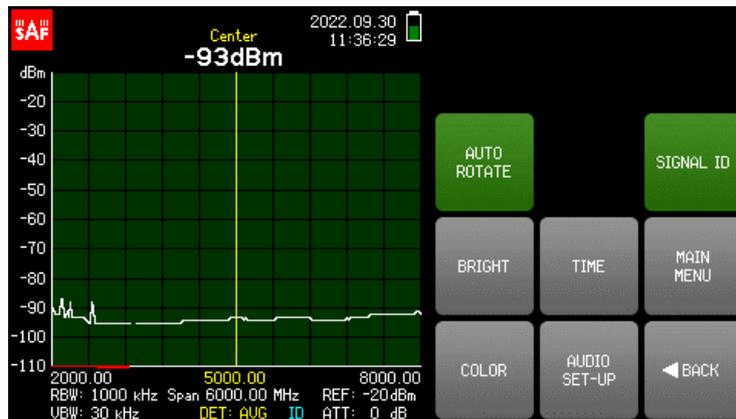


Figure 2-84 Horizontal version of the screen

2.13.11.6 COLOR

The COLOR menu allows setting a custom color scheme for the graph.

Tap the button GROUND, GRID, or LINE to set the color for the background, the grid, or the spectrum curve (NORMAL and AVERAGE traces), respectively. The color is defined by moving the sliders for red (R), green (G), and blue (B) channels. To restore the default color scheme, tap DEFAULT. To exit the COLOR menu and return to the SETTINGS menu, tap BACK.



Figure 2-85 Entering the COLOR menu

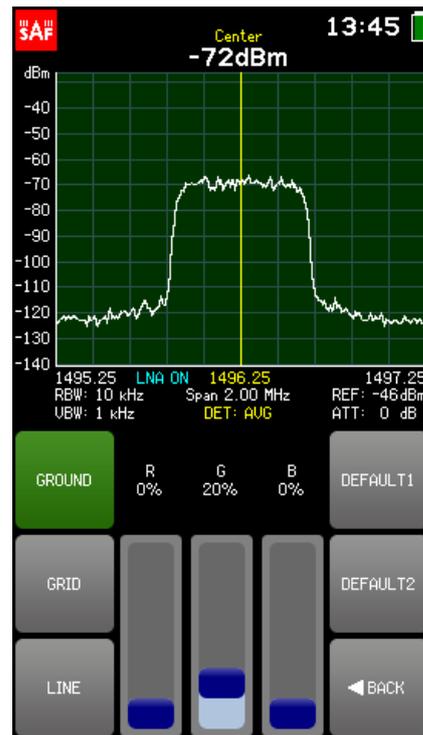


Figure 2-86 The COLOR menu

2.13.11.7 AUDIO SET-UP

The AUDIO SET-UP menu allows setting up the Spectrum Compact for using it with a USB type C to 3.5 mm adapter with headphones. The adapter must support analog signal delivery.

In the AUDIO SET-UP menu, you should tap CONNECT ACCESSORY button to start operating the USB to 3.5 mm adapter.

By using the slider, you set the volume of the audio signal. You can set the volume of the audio output. By pressing the AUDIO TEST button, you can check whether the audio frequency changes with the measured power. Audio frequency increases if the measured power increases.

By pressing the LEVEL MARKER button, you can set the measured power reference level. Audio can be heard, if SWEEP CONT. is enabled together with either the MARKER or the POWER IN BAND, and the micro-USB to 3.5 mm adapter with headphones is connected. To exit the AUDIO LEVEL menu and return to the SETTINGS menu, tap BACK.



Figure 2-87 Entering AUDIO SET-UP menu



Figure 2-88 Connecting the USB adapter



Figure 2-89 AUDIO TEST menu

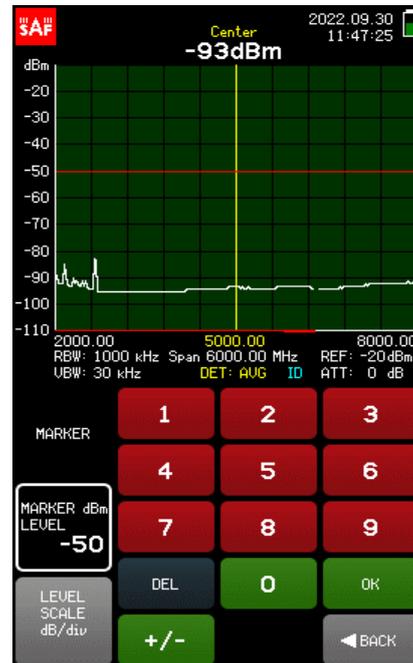


Figure 2-90 LEVEL MARKER setting menu

2.14 Firmware upgrade



Make sure that the firmware file is for the correct Spectrum Compact product! Also please avoid downgrading to older firmware versions!

1. Turn Spectrum Compact on.
2. From the main screen tap TOOLS & SETTINGS, then tap SERVICE MENU. Tap USB MODE.
3. If the USB mode is already set to MASS STORAGE DEVICE, do nothing. If the USB mode is set to VIRTUAL COM PORT, set it to MASS STORAGE DEVICE by tapping OK. (Alternatively, from the main menu tap PRESET once and then again.)
4. Connect the device to a computer.
5. Copy both – the firmware file (with extension ".fw") and the initialization file (with the extension ".ini").
6. Open the Spectrum Compact drive and paste the two files into the FIRMWARE folder.
7. Turn Spectrum Compact off and back on. The text "FIRMWARE UPGRADE" should be shown.
8. From the main screen tap the PRESET button. Confirm by tapping PRESET once more.
9. Turn Spectrum Compact off and back on.
10. Check the firmware version by tapping TOOLS & SETTINGS and then ABOUT.



PRESET restores Spectrum Compact's configuration to factory defaults. To preserve the current configuration, before tapping PRESET, save it as a PROFILE, and after the firmware upgrade process restore it.

2.15 Realtime mode with Spectrum Manager

To use Spectrum Compact with Spectrum Manager in Realtime mode, follow these steps:

1. Turn Spectrum Compact on.
2. From the main screen tap TOOLS & SETTINGS, then tap SERVICE MENU. Tap USB MODE.
3. If the USB mode is already set to VIRTUAL COM PORT, do nothing. If the USB mode is set to MASS STORAGE DEVICE, set it to VIRTUAL COM PORT by tapping OK.
4. Connect the device to a PC with installed Spectrum Manager software.
5. Launch Spectrum Manager.
6. Either select "Start Realtime" (if there is only one Spectrum Compact device connected to the PC) or wait for the Spectrum Manager to detect all connected devices and then choose the desired one from a drop-down list. The real-time sweep should be now shown on the graph. See the Spectrum Manager user manual for further details.

3 CONTACTS

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