



Siretta

Enabling Industrial IoT



SNYPER-LTE+ Family

High performance 4G / LTE network signal
analyser & data logger

User Manual

Rev 1.0



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Introduction

This user manual will cover all the aspects of the features, setup and use of the SNYPER-LTE+ and SNYPER-LTE+ Spectrum. No prior knowledge of the operating principles of the cellular mobile network is required.

This manual will explain how to conduct surveys, identify the cells available at the location of the survey and their signal strengths, and then how to use this information to successfully deploy a cellular connected device.

This document was created using SNYPER-LTE+ Spectrum: firmware version 6.08.34-4.00.



SNYPER-LTE+ Family

What's in the Box?

As standard, the SNYPER-LTE+ Family comes with the following:*

- » SNYPER-LTE+ or SNYPER-LTE+ Spectrum
- » Multi region power supply
- » General purpose direct connect antenna (Blue)
- » 2600MHz (LTE Band 7) direct connect antenna (Light Grey)
- » USB Cable
- » USB Car Charger
- » Hard Carry Case
- » Quick Start Guide

In addition, the SNYPER-LTE+ Spectrum comes with the following:*

- » liveSCAN directional antenna
- » liveSCAN antenna extension cable

General Description

The SNYPER-LTE+ and the SNYPER-LTE+ Spectrum are designed to survey the cellular networks in Europe and Africa used by mobile phones and data terminals. Both models enable the operator to first determine which networks are within coverage range, but in addition the SNYPER-LTE+ Spectrum has option to lock on to a desired cell to monitor its received signal strength (liveSCAN mode). This feature should be used immediately after a survey in the very same location as the survey, rather than sometime later, for integrity of results.

There are many different frequency bands that cellular equipment uses, and they vary region by region and country by country. In general, different regions tend to use common frequency bands, but there are always exceptions. Whilst the SNYPER-LTE+(EU) & the SNYPER-LTE+ Spectrum (EU) are designed for the frequency bands typically found in Europe, in many cases these same bands can be found in other countries and regions around the world.

*For replacement parts, please contact your Siretta representative or call us on +44 (0)118 976 9000



Additionally, just because a frequency band may be used in a country, that does not necessarily mean that an operator has taken out a license to do so. Please check the frequency bands supported by both models (see page 6) with the frequency bands used in the country in which the surveys are being conducted. One way to do this is to search for “List of mobile network operators of Europe” on Wikipedia, another is by directly contacting and asking the local network operators.

Features

- » Reports details of all cells on all networks in coverage range
- » Coverage of 4G/LTE, 3G/UMTS and 2G/GSM European cellular networks
- » SIM free operation
- » Download clear reports in HTML format
- » Download .csv files for import into Excel
- » Store one survey on the SNYPER-LTE+
- » 240 x 320 resolution TFT display
- » Powered by internal battery, or through USB connector
- » Audible notification of events
- » Language support for English, German, French, Italian and Spanish

SNYPER-LTE+ Spectrum Only

- » Store up to 50 surveys
- » liveSCAN feature to watch the received signal strength of a cell over time
- » Use liveSCAN feature to correctly align a directional antenna



Specifications

Table 1. Specifications of SNYPER-LTE+ Family

SNYPER-LTE+ Family	
2G supported bands:	B3 – 1800 MHz (DCS) B8 – 900 MHz (Extended GSM)
3G supported bands:	B1 – 2100 MHz (IMT) B8 – 900 MHz (Extended GSM)
4G supported bands:	B1 – 2100 MHz (IMT) B3 – 1800 MHz (DCS) B7 – 2600 MHz (IMT-E) B8 – 900 MHz (Extended GSM) B20 – 800 MHz (Digital Dividend)
Dimensions:	147mm x 76mm x 36mm
Weight:	200g (excluding antenna)
Operating temperature range:	-10 to +50°C*
Storage temperature range:	-20 to +50°C*
Operating humidity range:	45 to 85% RH non-condensing
Antenna connector:	SMA female
Display:	2.4" QVGA 320 x 240 TFT with LED backlight, 500 cd/m2 brightness
Battery life:	48 hours normal use**
Battery:	2000mAh Lithium Ion
Voltage:	3.7V
IP rating:	30
USB connector:	2.0 Full Speed (12Mbits/s)
Current draw:	500 mA typical (battery on charge) 250 mA typical (battery fully charged, full survey in progress) 160 mA typical (battery fully charged, no survey in progress) 120 mA typical (battery fully charged, unit in standby with display dimmed)

*The battery will only charge when the temperature is between +10 to +45°C for safety and battery life reasons.

**Based on 20 surveys/day at room temperature with automatic power off enabled. Operating at the extremes of the operating temperature range will degrade battery life.



Directional Antenna Characteristics

The directional antenna supplied is a hand-held equivalent to the Siretta Oscar 20.

Version 1

Table 2. Directional antenna characteristics

Band	Return Loss	VSWR
Band 1 2100 to 2140 MHz		
2100 MHz	-16.2 dB	1.37
2140 MHz	-6.92 dB	2.64
Band 3 1800 to 1842 MHz		
1800 MHz	-9.37 dB	2.03
1842.5 MHz	-20.29 dB	1.21
Band 7 2600 to 2655 MHz		
2600 MHz	-6.62 dB	2.75
2639 MHz	-8.05 dB	2.31
2655 MHz	-14.35 dB	1.474
Band 8 900 to 942.5 MHz		
900MHz	-15.7 dB	1.392
942.5 MHz	- 2.67 dB	6.59
Band 20 800 to 806 MHz		
800 MHz	-14.53 dB	1.463
806 MHz	-18.65 dB	1.264



Omnidirectional Antenna Characteristics

General Purpose Antenna (Blue)

This is equivalent to the Siretta Delta 23 antenna.

Table 3. Blue omnidirectional antenna characteristics

Band	Return Loss	VSWR
Band 1 2100 to 2140 MHz		
2100 MHz	-18.98 dB	1.26
2140 MHz	-18.98 dB	1.26
Band 3 1800 to 1842 MHz		
1800 MHz	-3.62 dB	4.9
1842.5 MHz	-3.62 dB	4.9
Band 8 900 to 942.5 MHz		
900 MHz	-24.54 dB	1.126
942.5 MHz	-22.0 dB	1.174
Band 20 800 to 806 MHz		
800 MHz	-7.0 dB	2.6
806 MHz	-7.0 dB	2.6

General Purpose Antenna (Light Grey)

This is equivalent to the Siretta Delta 24 antenna

Table 4. Light grey omnidirectional antenna characteristics

Band	Return Loss	VSWR
Band 7 2600 to 2655 MHz		
2600 MHz	-11.37 dB	1.74
2639 MHz	-8.5 dB	2.2
2655 MHz	-8.0 dB	2.3

Product Images

Figure 1. Front view of the SNYPER-LTE+ / Spectrum





Figure 2. Bottom view of the SNYPER-LTE+ / Spectrum



Figure 3. Top view of the SNYPER-LTE+ / Spectrum





First Time Use of SNYPER-LTE+ Family

- » Your SNYPER-LTE+ / Spectrum needs to be charged for 4 - 6 hours before initial use. To charge your SNYPER, connect to any convenient USB power source - the mains adaptor or a USB port on a device such as a computer using the supplied cable.
- » Ensure the antenna is screwed firmly into place on the device and isn't loose.
- » To power up your SNYPER press the ON/OFF button. A welcome screen will be displayed briefly (as shown below in figure 5) before the main menu is displayed (as shown figure 7.)

Figure 4. Power on



ON/OFF Button

Figure 5. Power on message for SNYPER-LTE+ Spectrum model



- » Set the DATE and TIME for your time zone. See page 23 for more information.

Charging and Battery Status

Approximately 4 - 6 hours are needed to fully charge your SNYPER. The device will be charged when it is plugged into a USB power source - the supplied AC adaptor or the USB host port on a PC or similar. The device's battery provides up to 48 hours use between charges, based on 20 surveys/day.

Battery charging is indicated by a '+' sign on the right of the battery status bar. To maximise the charge rate of the SNYPER-LTE+ Spectrum, turn it off while charging. The LED indication will still operate and will turn off when fully charged.

Figure 6. Charging and battery status



Charging and battery status bar:

A fully charged device is indicated by a green bar extending across the top of the display.

As the device is used and the battery discharges, the battery status bar will shrink to the right of the display and change from green, to yellow, to red.

Recharging is recommended once red bars are displayed on the device battery status bar.

If the device drops below allowable low battery usage the unit will switch off and charging will be required.

Table 5. Charge status indication

Status	LED Indication
Charging in progress	On
Charging off	Off
Temperature fault	Slow blink at 1.5/Sec
Battery fault	Fast blink at 6.1/Sec

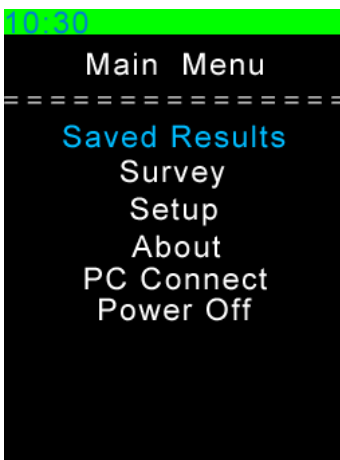
NOTE: To protect the battery from damage, charging is only allowed when the temperature is between +10 and +45°C. If a temperature fault is indicated, allow the battery temperature to settle naturally to the safe charging temperature range. Do not attempt to speed this process up by deliberately heating or cooling the SNYPER-LTE+ Spectrum as this may cause damage. Important: If a battery fault is indicated, please do not continue to charge the SNYPER-LTE+ Spectrum. Please contact Siretta for repair instructions.



Main Menu

Your SNYPER main menu has 6 menus (as shown below in **figure 7**), these can be selected using the UP/DOWN buttons. Once the chosen menu is highlighted, click OK. Press the BACK button to return to the main menu.

Figure 7. 'Main Menu' screen



Saved Results: Reviews previously saved survey.

Survey: Used to perform a new survey.

Setup: Allows personalisation of language, display, sound, reports and auto-power off.

About: Displays information about the device - model number, firmware versions, battery voltage and IMEI number.

PC Connect: Connects device to a PC as a memory stick to allow download of reports.

Power Off: Powers off the device.

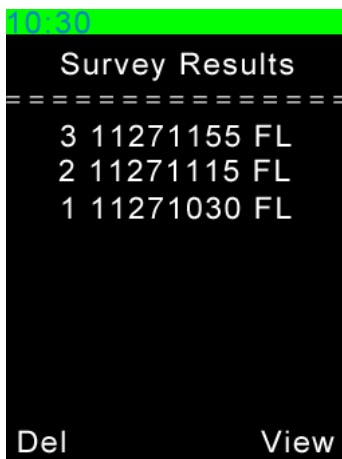


Saved Results

Select 'Saved Results' from the main menu. The saved survey files are displayed and numbered in numerical order with file name and whether the survey was conducted in 2G (GSM), 3G (UMTS), 4G (LTE) or FL (Full Range) modes.

NOTE: Only one survey is saved with the SNYPER LTE+

Figure 8. 'Saved Surveys' screen



Deleting a Saved Survey

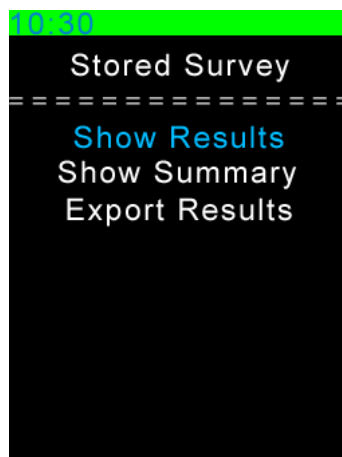
To delete a saved survey, highlight the survey you wish to delete and press the left navigation button. This will delete the survey from the SNYPER-LTE Graphyte.

NOTE: No warning is given prior to deleting a saved survey.

Viewing a Saved Survey

To view a survey, highlight it and press the OK or right navigation button. You will be taken to the 'Stored Survey' menu as shown below in figure 9.

Figure 9. 'Saved Surveys' screen

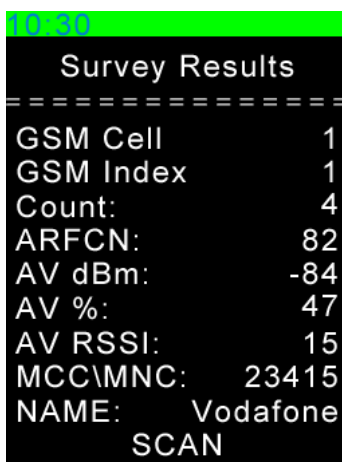




Show Results

Highlight 'Show Results' and press OK. The SNYPER will display all results with numbered cells from strongest to weakest. To switch between all signals found in the survey, use the LEFT/RIGHT buttons.

Figure 10. Displaying survey results



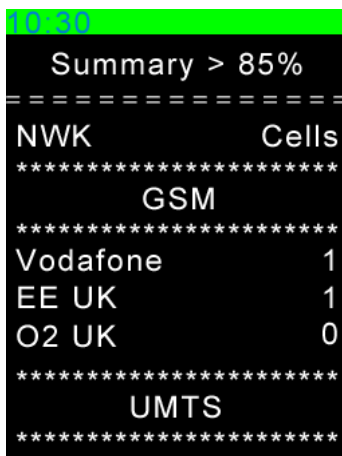
NOTE: With the SNYPER-LTE+ Spectrum ONLY, you are able to perform a liveSCAN on any cell seen within the saved survey results. If performing a liveSCAN using the saved results, be aware that these results are relevant for the location where the survey was performed. If you move to a different location and try to perform a liveSCAN on previously saved results, the liveSCAN might fail as it cannot locate the cell site or channel number in the new location. This is expected behaviour and care should be taken to ensure that liveSCAN logs are only performed using recent survey results in the same vicinity.

Show Summary

Highlight 'Show Summary' and press OK. The SNYPER will display the number of cells by each network in frequency bands. Use the LEFT/ RIGHT buttons to switch between signal strengths received on the device.

Press the DOWN button to view the summary of results in GSM, UMTS and LTE.

Figure 11. Displaying survey results



NOTE: Two listings may be shown for one network operator. This listing is created by the MNC and is two different MNC's both associated with the same network operator.



Survey Menu

The SNYPER-LTE+ Family has 2 operational modes for performing surveys.

- » **Single Survey:** A single, complete survey of the cellular environment as seen by the SNYPER. The survey result is available as a .csv file, with a .htm summary file.
- » **liveSCAN:** (Only available with SNYPER-LTE+ Spectrum) liveSCAN can be performed in two ways, directional or site survey liveSCAN. liveSCAN is a continuous survey where the SNYPER-LTE+ Spectrum is locked onto a user specified channel frequency. The SNYPER-LTE+ Spectrum graphically displays the received signal strength of that channel on a continuously updated rolling display until cancelled.



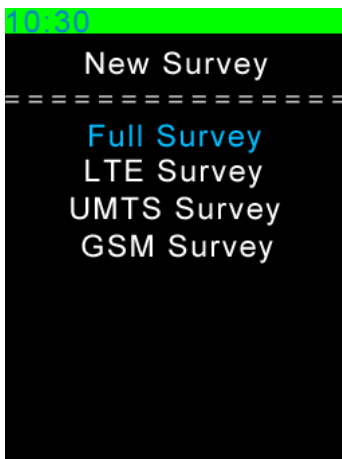
Performing a Single Survey

To perform a single survey on your SNYPER, follow the steps below:

Step 1. Select 'Survey' from the main menu and press OK.

Step 2. Use the UP/DOWN buttons to select what survey you would like to perform and press OK.

Figure 12. Selecting survey to perform



Full Survey: Performs a survey for the LTE, UMTS and GSM networks.

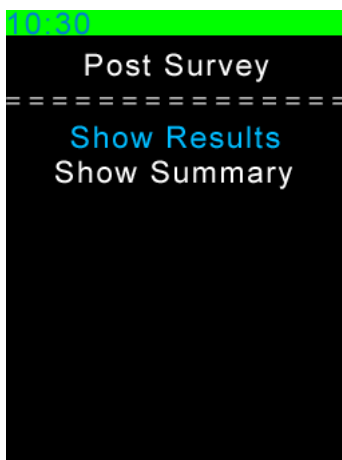
LTE Survey: Performs a survey for the LTE network only.

UMTS Survey: Performs a survey for the UMTS network only.

GSM Survey: Performs a survey for the GSM network only.

Step 3. Press OK to be taken to the post survey menu as shown below in figure 13.

Figure 13. Selecting survey to perform

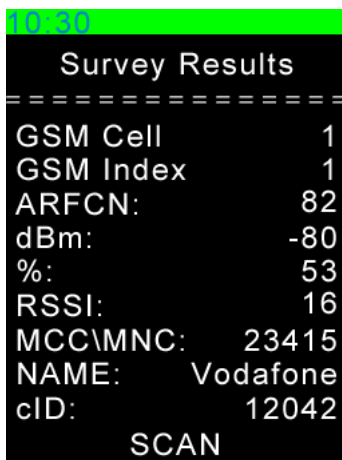




Show Results

Highlight 'Show Results' and press OK. The SNYPER will display all results with numbered cells from strongest to weakest. To switch between all signals found in the survey, use the LEFT/RIGHT buttons.

Figure 14. Displaying survey results

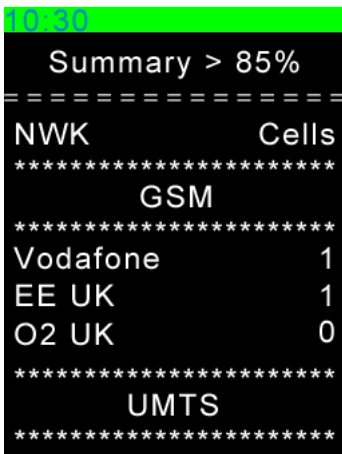


Show Summary

Highlight 'Show Summary' and press OK. The SNYPER will display the number of cells by each network in frequency bands. Use the LEFT/ RIGHT buttons to switch between signal strengths received on the device.

Press the DOWN button to view the summary of results in GSM, UMTS and LTE.

Figure 15. Displaying survey results



NOTE: Two listings may be shown for one network operator. This listing is created by the MNC and is two different MNC's both associated with the same network operator.



Save Results

With default settings, it is not necessary to save the results as this is automatically done at the completion of the survey. However, if you have selected the user option to turn off automatic saving of results, you will need to highlight 'Save Results' and press OK to save results to the SNYPER.

Performing a liveSCAN (Only available with SNYPER-LTE+ Spectrum)

liveSCAN works by locking the SNYPER-LTE+ Spectrum to a selected base station channel and the cell it is operating on. Once the SNYPER-LTE+ Spectrum locks to a channel, a continuous update of the received signal strength of that cell will be reported.

liveSCAN can be used in two modes:

- » **Directional liveSCAN:** When conducting liveSCAN with a directional antenna, moving the antenna horizontally will show the direction with the highest signal strength. A .csv file of each survey taken during the liveSCAN is stored for analysis if required. A directional antenna covering all frequencies is supplied with the SNYPER-LTE+ Spectrum to perform this task
- » **Omnidirectional:** When conducting liveSCAN with an omnidirectional antenna, moving the SNYPER-LTE+ Spectrum to different areas in a building will show "hotspots" with the highest signal strength.

Users are encouraged to use their own antennas when performing a survey or liveSCAN on the SNYPER-LTE+ Spectrum.

Using the antenna which is intended to be used in the proposed installation will give the best indication of how the equipment will perform. Placing the antenna in potential mounting locations and orientations will allow the operator to make an informed choice about what the best antenna placement is for that installation.



To perform a liveSCAN on your SNYPER-LTE+ Spectrum, follow the steps below:

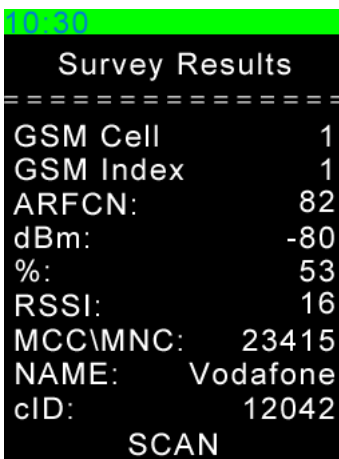
Step 1. Conduct a survey of any type using an omnidirectional antenna.

Step 2. When the survey is complete view the results acquired. Use the LEFT/RIGHT buttons to find the survey results you wish to liveSCAN.

Step 3. Remove the connected omnidirectional antenna and connect a directional antenna, or the intended antenna for your installation (recommended).

Step 4. Press OK to initiate liveSCAN.

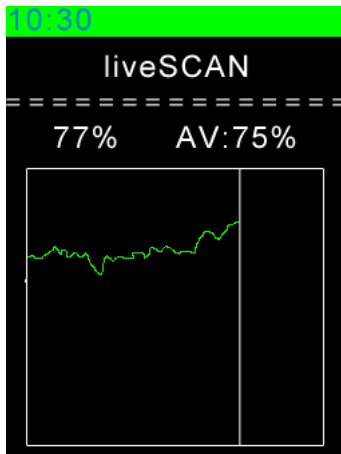
Figure 16. Cell result prior to engaging liveSCAN



Survey Results	
GSM Cell	1
GSM Index	1
ARFCN:	82
dBm:	-80
%:	53
RSSI:	16
MCC\MNC:	23415
NAME:	Vodafone
cID:	12042
SCAN	



Figure 17. liveSCAN in progress



The default liveSCAN view shows the active signal strength as a %, and the average of all readings taken (again as a %).

The vertical white line scrolls from left to right across the screen and indicates the current measurement position. The green line shows the actual and historical liveSCAN measurement data.

Use the UP/DOWN buttons to switch between display modes:

- » Average reading
- » Number of readings
- » Elapsed time
- » Network operator

The active signal strength reading is shown at all times.

IMPORTANT: Starting a liveSCAN from saved results will result in unpredictable behaviour, as the initial survey may have been performed under different circumstances.

Siretta recommends to conducting a survey first and then running liveSCAN from that survey.

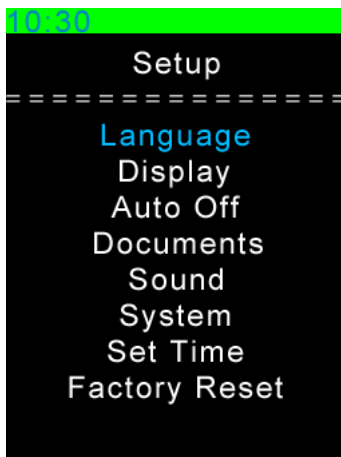
Press the BACK button to abort liveSCAN – the SNYPER-LTE+ Spectrum will return to the Survey Results screen. A further liveSCAN can be conducted by selecting different cells from the survey results



Setup Menu

By selecting 'Setup' from the main menu, the following setup changes can be made (as shown below in **figure 18**). To select a sub menu use the UP/DOWN button until relevant menu is highlighted, then use the LEFT/RIGHT buttons to amend preference. Setup options are automatically saved.

Figure 18. 'Setup' screen



Language: Language selection of your SNYPER product.

There are 5 language settings; ENG (English), DEU (German), FRA (French), ITA (Italian), SPA (Spanish). *Default = ENG*

Display: Determines the brightness, body text and highlighted text colour.

Brightness: 6 settings for display brightness. 0 (low) - 5 (high).

Body Text: 10 colour settings for body text.

Highlighted Text: 10 colour settings for highlighted text.

Default: Brightness = 5, B-Text = White, H-Text = Blue

Auto Off: Power saving mode for the SNYPER.

Auto Off: Auto power off setting, this can be set to ON or OFF.

Delay: Time in minutes SNYPER will stay on after last button press.

Auto Dim: Time in minutes SNYPER will dim the display after last button press.

Default: Auto Off = On, Delay = 2, Auto Dim = 2

Documents: Following every survey, the user can save the survey files on the SNYPER.

HTML: Save files in HTML format, this can be set to ON or OFF.

CSV: Saves file in CSV format, this can be set to ON or OFF.

Auto Save: Auto file save, this can be set to ON or OFF.

Default: HTML = On, CSV = On, Auto Save = On

Sound: SNYPER and keypad sound.

Sound: Notification sound, this can be set to ON or OFF.

Keypad: Keypad sound, this can be set to ON or OFF.

Default: Sound = On, Keypad = On



System: The System function is used to operate the SNYPER in various modes, giving the user more information on the surveys.

Mode: The SNYPER can report results in Standard, Advanced or Engineer mode. See 'Mode' section **below**.

ITU Region: This setting is required in engineering mode to ensure DL and UL frequencies are correctly calculated.

Debug Log: The debug information is used by Siretta Engineering team, this can be turned ON or OFF.

Default: Mode = Standard, ITU Region = EMEA (1), Debug Log = Off

Set Time: Date and time can be set using the UP/DOWN buttons.

Date: YYYY\MM\DD

Time: HH\MM\SS

Factory Reset: Resets the SNYPER to factory settings.

NOTE: Performing factory reset will delete all saved files from the SNYPER's internal memory.

Mode

The 'Mode' option determines the operation mode of your SNYPER when performing a survey. There are 4 options: Standard, Advanced, Engineer or Debug - each will display a different range of results once a survey has been performed.

Standard Mode - Standard mode receives and displays a basic range of results and is the factory default operation mode.

Advanced Mode - Advanced mode receives and displays a more advanced range of results in addition to the results displayed in Standard mode.

Engineer Mode - Engineer mode receives and displays a more advanced range of results in addition to the results displayed in Standard and Advanced mode.

Debug Mode - Debug mode for the SNYPER.

NOTE: ONLY USE THIS MODE WHEN INSTRUCTED BY SIRETTA SUPPORT.

See **table 6** over page for breakdown of information provided.



For full description of survey parameters, see SNYPER Survey Terminology:
<https://www.siretta.com/snyper-survey-terminology>

Table 6. Breakdown of information provided

	Standard (S)	Advanced (A)	Engineer (E)
Index - Base station number assigned by your SNYPER-LTE Graphyte	✓	✓	✓
Network - Name of the network provider	✓	✓	✓
MCC - Mobile Country Code being received	✓	✓	✓
MNC - Mobile Network Code being received	✓	✓	✓
dBm - Signal strength being received. Signal strength ranges from -115dBm to -25dBm (UMTS); -100 to -25dBm (LTE), the larger the number the higher the signal strength.)	✓	✓	✓
RSSI - Received Signal Strength Indicator (Values range from 0 - 31 (GSM); 0 - 91 (UMTS); 0- 76 (LTE), the higher the number the higher the signal strength.)	✓	✓	✓
Signal - Percentage signal received (Values range from 0% - 100%, the higher the number the higher the signal strength.)	✓	✓	✓
Band - Frequency band being received	✓	✓	✓
ARFCN - Absolute Radio Frequency Channel Number being received (GSM)	✓	✓	✓
UARFCN - UTRA Absolute Radio Frequency Channel Number being received (UMTS)	✓	✓	✓
EARFCN - E-UTRA Absolute Radio Frequency Channel Number being received (LTE)	✓	✓	✓
Cell ID - Unique ID of the network cell being received (if available)		✓	✓
SCR - Scrambling Code (UMTS)		✓	✓
LAC - Location Area Code		✓	✓
BSIC - Base Station Identity Code (GSM)		✓	✓



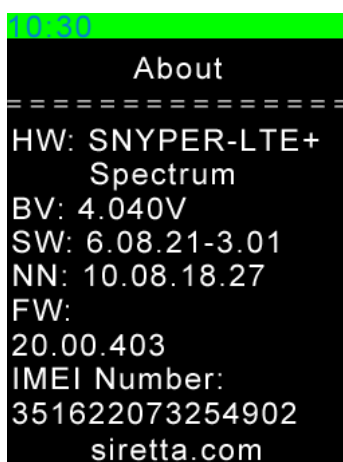
Table 6 (continued). Breakdown of information provided

RSCP - Received Signal Code Power (UMTS)		✓	✓
ECIO - Ratio of Energy Chip / Interference in dB (UMTS)		✓	✓
RSRQ - Reference Signals Received Quality (LTE)		✓	✓
RSRP - Reference Signals Received Power		✓	✓
BW - Downlink Bandwidth in MHz		✓	✓
DL - Signal Download Frequency			✓
UL - Signal Upload Frequency			✓

About Menu

By selecting 'About' from the main menu, information about your SNYPER will be displayed (as shown below in figure 18).

Figure 19. 'About' screen



HW: SNYPER-LTE+ Family model hardware version.

BV: Battery voltage.

SW: Current application and loader software versions running on your SNYPER.

NN: The current list of global network names stored on your SNYPER product as of the displayed date (dd.mm.yy).

FW: SNYPER firmware version

IMEI Number: The unique IMEI number of your SNYPER.



PC Connect

The PC Connect feature allows you to download all stored surveys onto your PC.

The data is downloaded to your PC in CSV and HTML format. The downloaded data will include GSMUMTS/LTE survey results.

To download data from your SNYPER follow the steps below:

Step 1. Connect supplied USB cable to your SNYPER and PC.

Step 2. Select 'PC Connect' from the main menu, and use the RIGHT button to enable PC Connect.

Windows Explorer will open automatically with an identifier for the drive name, for example for the SNYPER-LTE+ Spectrum, this will be 'SPECTRUM'. If Windows explorer does not open automatically, open it by pressing and holding the Windows key and 'e'. In the case of the SNYPER-LTE+ Spectrum, a new drive called 'SPECTRUM' will be visible, containing one directory with the same name as the files saved.

Figure 20. Prepare for data download

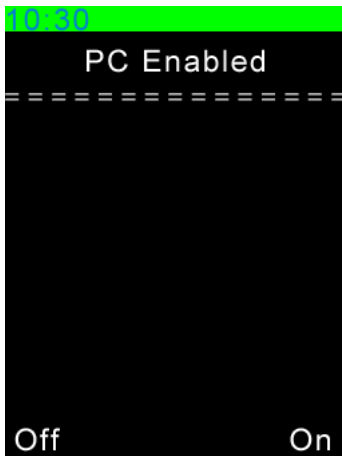
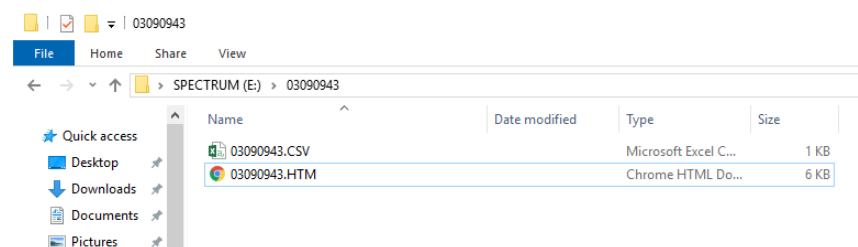


Figure 21. Downloading your SNYPER product data to PC

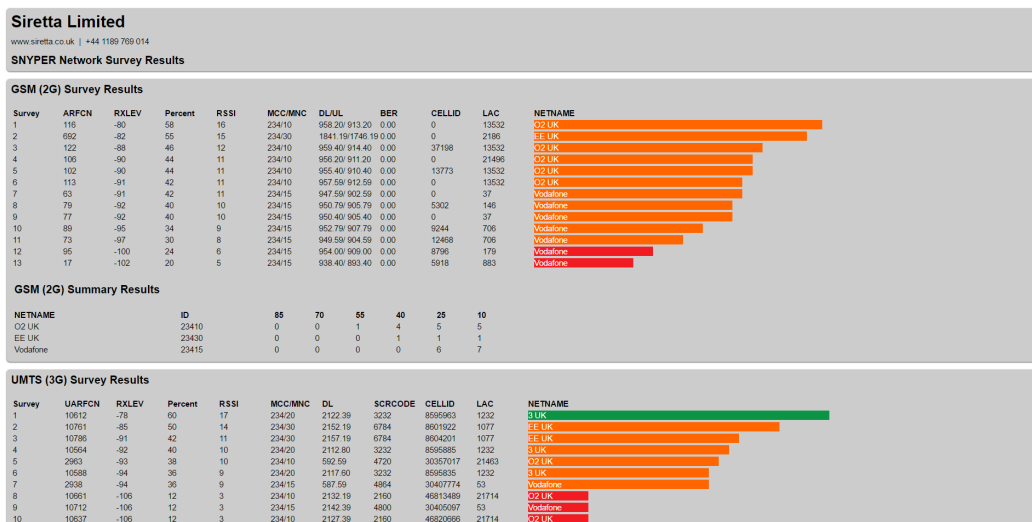


Step 3. Use copy and paste to transfer files from the SNYPER to the desired location on your PC.



Step 4. Double click the .htm file to open it using the default web browser on your PC. Results will be shown like those shown below.

Figure 22. HTML results



Step 5. To disable the PC connection, select 'Disable' on your SNYPER and remove the USB cable.

Your SNYPER will now be back to normal operation.

Press the back button on your SNYPER product to return to the 'Main Menu'.

NOTE: When the SNYPER is connected to the PC, deleting files from PC hard drive will not delete the files from the SNYPER's internal memory.



Selecting GSM/UMTS Results

If you wish to view the GSM/UMTS results stored on your SNYPER product, select the '0-UMTS.csv' (CSV format) or '0-umts.htm' (HTML format) files.

Figure 23. 0-umts.csv data download

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	NUM	ARFCN	BSIC	RXLEV	Percent	RSSI	BER	MCC	MNC	LAC	CELLID	NAME	DL	UL	
7	-1	116	45	-80	58	16	0	234	10	13532	0	O2 UK	958.2	913.2	
9	-2	692	0	-82	55	15	0	234	30	2186	0	EE UK	1841.19	1746.19	
11	-3	122	0	-88	46	12	0	234	10	13532	37198	O2 UK	959.4	914.4	
13	-4	106	0	-90	44	11	0	234	10	21496	0	O2 UK	956.2	911.2	
15	-5	102	0	-90	44	11	0	234	10	13532	13773	O2 UK	955.4	910.4	
17	-6	113	0	-91	42	11	0	234	10	13532	0	O2 UK	957.59	912.59	
19	-7	63	0	-91	42	11	0	234	15	37	0	Vodafone	947.59	902.59	
21	-8	79	0	-92	40	10	0	234	15	146	5302	Vodafone	950.79	905.79	
23	-9	77	0	-92	40	10	0	234	15	37	0	Vodafone	950.4	905.4	
25	-10	89	0	-95	34	9	0	234	15	706	9244	Vodafone	952.79	907.79	
27	-11	73	0	-97	30	8	0	234	15	706	12468	Vodafone	949.59	904.59	
29	-12	95	0	-100	24	6	0	234	15	179	8796	Vodafone	954	909	
31	-13	17	0	-102	20	5	0	234	15	883	5918	Vodafone	938.4	893.4	
33	2G Summary														
35	=====														
37	Name	Type	NETID	> 85%	> 70%	> 55%	> 40%	> 25%	> 10%						
39	#O2 UK	2G	23410	0	0	1	4	5	5						
41	#EE UK	2G	23430	0	0	0	1	1	1						

Figure 24. 0-umts.htm data download

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SNYPER Network Survey Results

GSM (2G) Survey Results

Survey	ARFCN	RXLEV	Percent	RSSI	MCC/MNC	DL/UL	BER	CELLID	LAC	NETNAME
1	116	-81	58	16	234/10	958.2/913.2	0.00	0	13532	O2 UK
2	692	-82	55	15	234/30	1841.19/1746.19	0.00	0	2186	EE UK
3	122	-88	46	12	234/10	959.4/914.4	0.00	37198	13532	O2 UK
4	106	-80	44	11	234/10	956.2/911.2	0.00	0	21496	O2 UK
5	102	-90	44	11	234/10	955.4/910.4	0.00	13773	13532	O2 UK
6	113	-91	42	11	234/10	957.59/912.59	0.00	0	13532	O2 UK
7	63	-91	42	11	234/15	947.59/902.59	0.00	0	37	Vodafone
8	79	-92	40	10	234/15	950.79/905.79	0.00	5302	146	Vodafone
9	77	-92	40	10	234/15	950.4/905.4	0.00	0	37	Vodafone
10	89	-95	34	9	234/15	952.79/907.79	0.00	9244	706	Vodafone
11	73	-97	30	8	234/15	949.59/904.59	0.00	12468	706	Vodafone
12	95	-100	24	6	234/15	954.0/909.0	0.00	8796	179	Vodafone
13	17	-102	20	5	234/15	938.4/893.4	0.00	5918	883	Vodafone

GSM (2G) Summary Results

NETNAME	ID	85	70	55	40	25	10
O2 UK	23410	0	0	1	4	5	5
EE UK	23430	0	0	0	1	1	1
Vodafone	23415	0	0	0	0	6	7

UMTS (3G) Survey Results

Survey	UARFCN	RXLEV	Percent	RSSI	MCC/MNC	DL	SCRCODE	CELLID	LAC	NETNAME
1	10712	-78	60	17	234/20	2122.39	3232	8565963	1232	EE UK
2	10761	-85	50	14	234/30	2152.19	6784	8601922	1077	EE UK
3	10786	-91	42	11	234/30	2157.19	6784	8604201	1077	EE UK
4	10564	-92	40	10	234/20	2112.80	3232	8565985	1232	O2 UK
5	2963	-93	38	10	234/10	562.59	4720	30357017	21463	O2 UK
6	10588	-94	36	9	234/20	2117.60	3232	8565835	1232	O2 UK
7	2938	-94	36	9	234/15	587.59	4864	30407774	53	Vodafone
8	10661	-105	12	3	234/10	2132.19	2160	46813469	21714	O2 UK
9	10712	-106	12	3	234/15	2142.39	4800	30405097	53	Vodafone
10	10637	-106	12	3	234/10	2127.39	2160	46820696	21714	O2 UK



Selecting LTE Results

If you wish to view the LTE results stored on your SNYPER product, select the '0-LTE.csv' (CSV format) or '0-LTE.htm' (HTML format) files.

Figure 25. 0-lte.csv data download

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	LTE Survey Results														
2															
3	=====														
4															
5	NUM	dBm	Percent	RSSI	MCC	MNC	CELLID	TAC	DRX	RSVP	EARFCN	BAND	DL	UL	Network
6															
7	1	-75	65	19	234	30	67	10771	128	-113	1667	3	1851.69	1756.69	EE UK
8															
9	2	-78	60	17	234	15	000014F	24701	64	-113	6300	20	806.0	847.0	Vodafone
10															
11	3	-80	58	16	234	20	68	5088	128	-113	6175	20	793.5	834.5	3 UK
12															
13	4	-86	49	13	234	10	000014F	16448	128	-113	6400	20	816.0	857.0	O2 UK
14															
15															

Figure 26. 0-lte.htm data download

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SNYPER Network Survey Results

LTE (4G) Survey Results

Survey	EARFCN	RXLEV	Percent	RSSI	MCC	MNC	DRX	CELLID	TAC	BAND	NETNAME
0	1667	-75	65	19	234	30	128	0000067	10771	3	EE UK
1	6300	-78	60	17	234	15	64	000014F	24701	20	Vodafone
2	6175	-80	58	16	234	20	128	0000068	5088	20	3 UK
3	6400	-86	49	13	234	10	128	000014F	16448	20	O2 UK

Power Off

After use, remember to power off your SNYPER. The device can be powered off in the following 2 ways:

- » **Method 1:** Selecting the 'Power Off' option from the main menu. The device will display a power off message as shown below in **figure 28**.

Figure 27. Select 'Power Off'

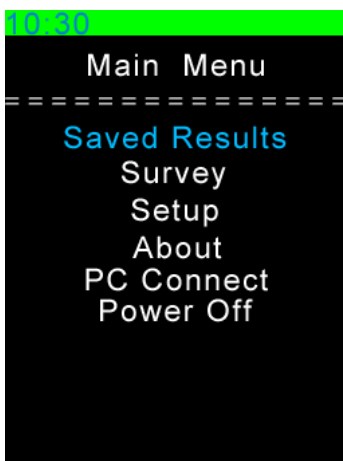


Figure 28. Power off message



- » **Method 2:** Press and hold the ON/OFF button on the device for >2 seconds. The screen will display a power off message as shown below in **figure 30**.

Figure 29. ON/OFF button



ON/OFF Button

Figure 30. Power off message





Updating the SNYPER-LTE+ Family Software

From time to time Siretta may make software updates available for the SNYPER-LTE+ Family. Normally, these software updates will be made available as a complimentary service on the Siretta website. Updated Software may contain improvements and/or new features.

WARNING: The software update procedure does require your SNYPER product to be factory reset. If the settings have been changed from default, make a note of them before starting the firmware upgrade procedure.

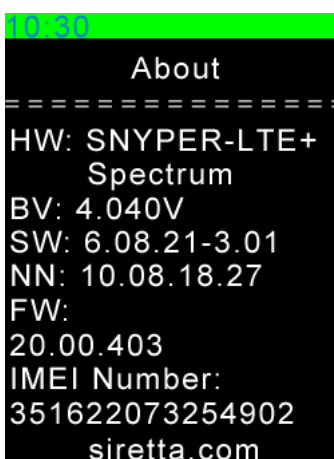
To perform a software update, follow the steps below:

Step 1. Go to <https://www.siretta.com/software-library/> and download and save latest SNYPER software for your product.

The software version is part of the file name. (For example, the file name for version 6.08.23 software is SNYPERV0600823.v6u)

Step 2. Verify that the new software is an update before proceeding further. You can do this by checking the 'About' menu on the SNYPER.

Figure 31. Current software version



Here the software version shown is 6.08.21, therefore 6.08.23 will be an upgrade.

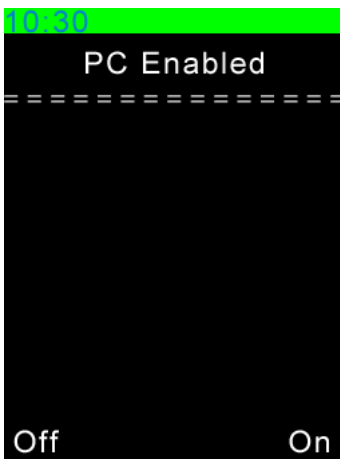


Step 3. Connect supplied USB cable to your SNYPER and PC.

Step 4. Select 'PC Connect' from the main menu, and use the RIGHT button to enable PC Connect.

Windows Explorer will open automatically with an identifier for the drive name, for example for the SNYPER-LTE+ Spectrum, this will be 'SPECTRUM'. If Windows explorer does not open automatically, open it by pressing and holding the Windows key and 'e'.

Figure 32. Enabling PC connect



For example, the SNYPER-LTE+ Spectrum will turn on its serial port and appear as a USB drive named 'SPECTRUM' on the PC.

Step 5. Using Windows, copy the new software file to the SNYPER USB drive.

Step 6. Disconnect the SNYPER from the PC by clicking the LEFT button, this will disable the USB drive connection.

Step 7. Press the back button to initiate software update.



Step 8. You will be prompted to confirm the software update. Click the RIGHT button to confirm performing a software update.

Figure 33. Confirm software update



Once you have confirmed the software update, the process will begin automatically.

Once the software update is complete, the SNYPER will turn off for approximately 70 seconds then power itself on.

On power up, a white spinning symbol will be displayed for approximately a minute and then the SNYPER will display the main menu.

Step 9. Confirm the software has updated by checking the 'About' menu. If successful, your SNYPER is now ready for use.

If the software update was not successful, please contact your Siretta support representative.



Safety and Product Care

General Precautions

- » Do not exceed the environmental and electrical limits as specified.
- » Avoid exposing your SNYPER product to lit cigarettes, naked flames or to extreme hot or cold temperatures.
- » Never try to dismantle your SNYPER product. There are no components on your SNYPER product that can be serviced by the user. If you attempt to dismantle your SNYPER product, you will invalidate the warranty.
- » Do not connect any incompatible component or product to your SNYPER product signal analysers.



Safety Recommendations

PLEASE READ CAREFULLY

Be sure the use of this product is allowed in the country intended and the environment required. The use of this product may be dangerous and has to be used with caution in the following areas:

- » Where it can interfere with other electronic devices in environments such as hospitals, airports, aircrafts, etc
- » Where there is risk of explosion such as gasoline stations, oil refineries, gas works etc

It is responsibility of the user to enforce the country regulation and the specific environment regulation.

Do not disassemble the product, any mark of tampering will compromise the warranty.

Should there be any doubt, please refer to the technical documentation and the regulations in force.



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Please refer to the Siretta Ltd website for the latest firmware and documents.

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Definitions

Term	Definition
2G	2nd Generation Mobile Telecommunications
3G	3rd Generation Mobile Telecommunications
4G	4th Generation Mobile Telecommunications
ARFCN	Absolute Radio Frequency Channel Number
Band	Identifies the frequency band of the cellular signal
BER	Bit Error Rate
BSIC	Base Station Identity Code
CID	Cell Identity
dBm	Measured signal strength of the network in dBm
DL	Downlink
EARFCN	E-UTRA Absolute Radio Frequency Channel Number
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
IMEI	International Mobile Equipment Identity
LAC	Location Area Code
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LTE	Long Term Evolution
MCC	Mobile Country Code
MNC	Mobile Network Code

MNO	Mobile Network Operator
RSSI	Received Signal Strength Indicator
SCR	Basestation Scrambling Code
SIM	Subscriber Identity Module
SMA	Sub Miniature version A
TAC	Tracking Area Code (Assigned by MNO)
UARFCN	UTRA Absolute Radio Frequency Channel Number
UL	Uplink
UMTS	Universal Mobile Telecommunications System (Same as 3G)
USB	Universal Serial Bus

For full list of SNYPER glossary terms see:

<https://www.siretta.com/snyper-glossary>



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