CSL

Signal Analyser

QUICK GUIDE & INSTRUCTION MANUAL

CONNECTED • SECURE • LIVE

FAQs

Do I need to use a SIM?

A SIM is not needed for surveys it is only required when using monitor mode. The SIM used must be at least the same RAT (ie 2G/3G/4G) that you are looking to monitor, however it does not need to be on the same network.

Can I use my own SIM?

Yes, any SIM can be used as long as the pin code function has been removed. If you wish to use a micro or nano SIM, the SIM carrier provided must be used to make it the required size and ensure it fits into the device correctly.

I am running a survey but want to cancel?

While a survey is running you cannot cancel or complete any other actions, you must wait for the survey to complete or power off the device.

What is the difference between battery saver and auto turn off?

Battery saver puts the radio module into sleep mode and dims the brightness off the screen to save battery power. Auto turn off enables you to select a time that if the unit is not in use it will automatically power off to conserve battery power (as standard this is set to 5 minutes).

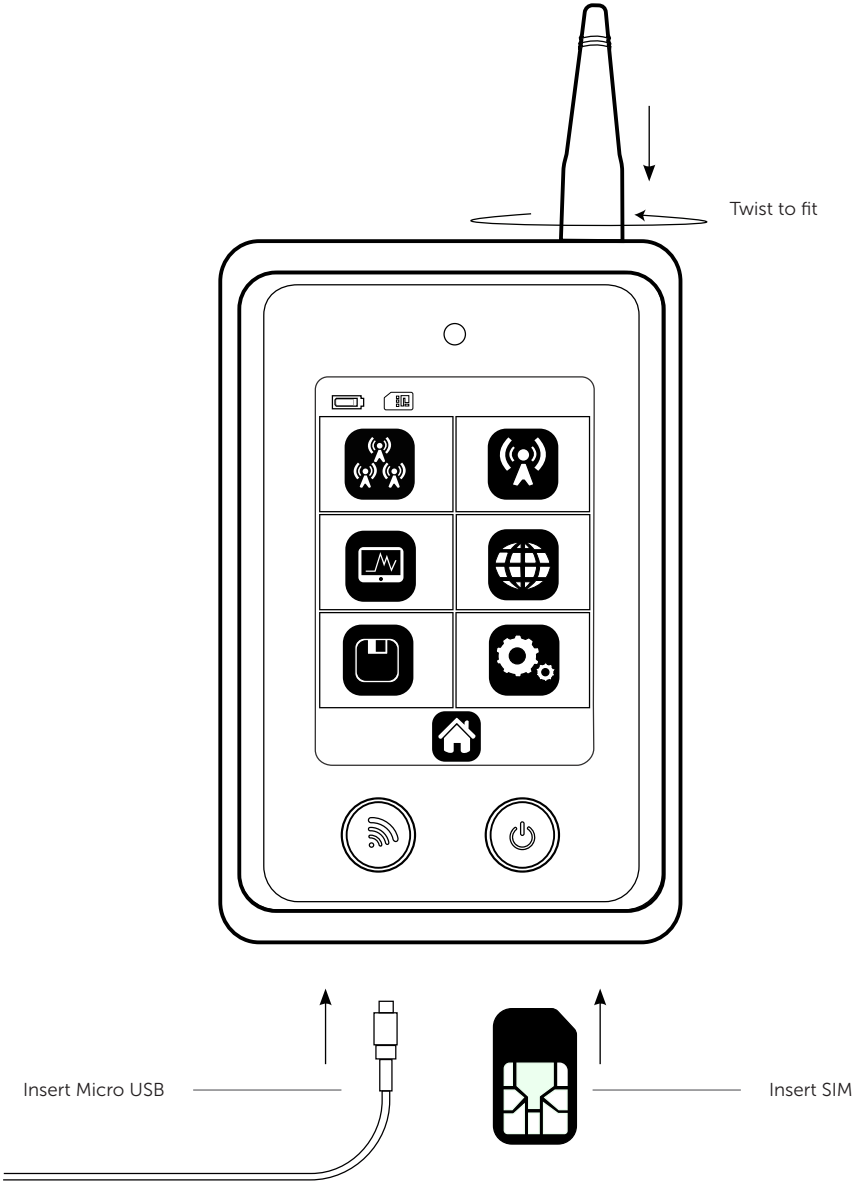
Why can't I see all the networks? (in single network or monitor mode)

If you can't see your preferred network try refreshing the network. After this refresh the networks available in your location will be displayed, if you still can't see your chosen network it may be that it is not available in that area.

What do the icons mean?

If you are unsure what the function of an icon is you can use the self help function to display a description (press and hold the icon for 3 seconds).

Figure 1 - Signal Analyser Diagram



QUICK GUIDE

This section provides basic information to enable you to set up your Signal Analyser quickly.

AERIAL

1. Connect the aerial on top of the device

POWERING UP YOUR DEVICE

1. Make sure the battery is fully charged using the Micro USB port on the bottom of the device (this typically takes 2 hours)

2. Once power is connected the device will turn on

   Please note: The first ever power up may take 2-3 minutes as the unit will be doing a background network search to establish the available networks in your location

FITTING A SIM

A SIM is only required when using monitor mode and not when performing single or multiple network surveys

1. Ensure your device is powered down and insert the SIM into the SIM slot on the bottom right hand side of your Signal Analyser. To remove the SIM, use a pen to depress before detaching

   Please note: If you wish to use a Micro/Nano SIM you will need to use the SIM carrier supplied

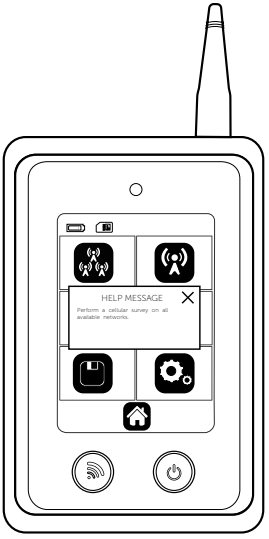
2. Place the SIM inside the carrier and push this into the SIM slot on the bottom right hand side of your Signal Analyser. To release use a pen to depress the SIM carrier and then detach

SELF HELP

1. Press and hold (for 3 seconds) the icon you would like explaining. A pop up box will then show with the description

2. To close the pop up box press the X in the top right hand corner

Figure 2 - Self Help



PERFORMING A SITE SURVEY

MULTI CELLULAR SURVEY

1. Select the multi cellular icon 

2. Choose either 2G, 3G, 4G or all technologies (for the 2G variant the technology will be limited to 2G only)

3. Select the start icon for the survey to begin. If you wish to name the survey before you start select the name survey icon, name your survey, press go then select the play icon

4. A survey process bar will then display showing the progress of the survey. The survey should take 2-3 minutes

5. Once the survey has been completed the results will be available

SINGLE NETWORK SURVEY

1. Select the single network icon 

2. Choose either 2G, 3G, 4G or all technologies (for the 2G variant the technology will be limited to 2G only)

3. Select the required network (if you can't see your preferred network press refresh so that the unit locates all available networks in the area)

   Please note: Refreshing networks may take 2-3 minutes

4. Select the start icon for the survey to begin. If you wish to name the survey before you start select the name survey icon, name your survey, press go then select the play icon

5. A survey process bar will then display showing the progress of the survey. The survey should take 2-3 minutes

6. Once the survey has been completed the results will be available

RESULTS

TOP NETWORKS

Shows the highest signal strength readings for each available network in your location; up to 5 networks will be displayed (if available). Press the right arrow to enter the best cells section

BEST CELLS

Shows the highest signal readings across all technologies and networks in your location; up to 5 networks will be displayed (if available). Press the right arrow to enter the cell properties section

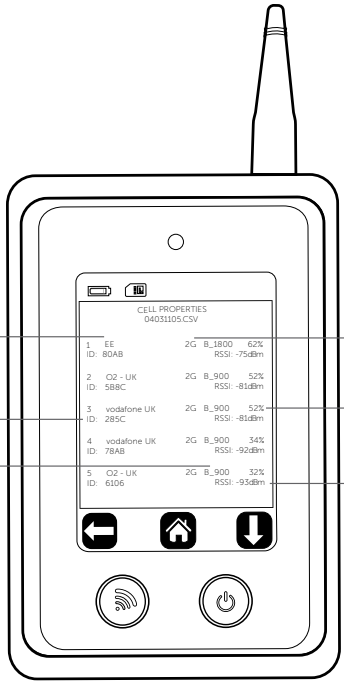
CELL PROPERTIES

Shows basic information for each cell. To view advanced information press the screen in the appropriate area. See below for more information. If further results are available use the down arrow to view these

ADVANCED CELL PROPERTIES

PARAMETER	DESCRIPTION	TECHNOLOGY
Network	The network to which the cell belongs	2G, 3G, 4G
Type	The radio technology	2G, 3G, 4G
Cell Number	The cell number you are investigating	2G, 3G, 4G
ARFCN	The cell carrier assigned radio channel (BCCH - Broadcast Control Channel)	2G
BSIC	Base station identification code	2G
RSSI (RxLev)	Reception level (in dBm)	2G, 3G, 4G
BER	Bit error rate (in %)	2G
MCC	Mobile country code	2G, 3G, 4G
MNC	Mobile netowrk code	2G, 3G, 4G
LAC	Location area code	2G, 3G
CELLID	Call Identifier	2G, 3G
Cell Status	Cell status ; Outputs [suitable, low priority based on the received system information, forbidden, barred based on the received system information, low level, unknown]	2G, 3G, 4G
NUMARFCN	Number of valid channels in the Cell Channel Description	2G
ARFCNN	ARFCN of a valid channel in the Cell Channel Description	2G
NUM CHANNELS	Number of valid channels in the BCCH Allocation list	2G
BAN	The ARFCN of a valid channel in the BA list	2G
SCR CODE	Scrambling Code	3G
RSCP	Received signal code power - RSCP level (in dBm)	3G, 4G
ECIO	EC/IO ratio level (in dB)	3G
BW	Bandwidth (in MHz)	4G
TAC	Tracking area code	4G

Figure 3 - Cell Properties



NETWORK
The mobile operator will be displayed here

CELL ID
Cell ID number

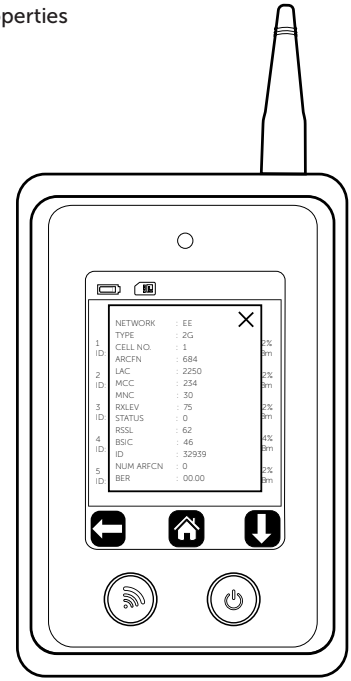
FREQUENCY BAND

TECHNOLOGY
The technology will be displayed either 2G (GSM), 3G (UMTS), 4G (LTE)

SIGNAL STRENGTH (RSSL)
Each base station will give the signal strength available at the present time. See 'RSSL EXPLANATION' section

RSSI
Received signal strength indicator in dBm

Figure 4 - Advanced Cell Properties



MONITOR MODE

1. Ensure SIM card is inserted as per the 'FITTING A SIM' section. The SIM card used must be the technology required or higher e.g. 4G is capable to perform monitor mode for 4G, 3G and 2G. The SIM does not need to be for the same network provider you wish to perform the survey on

2. Select the monitor icon 

3. Choose either 2G, 3G, 4G or all technologies (for the 2G variant the technology will be limited to 2G only)

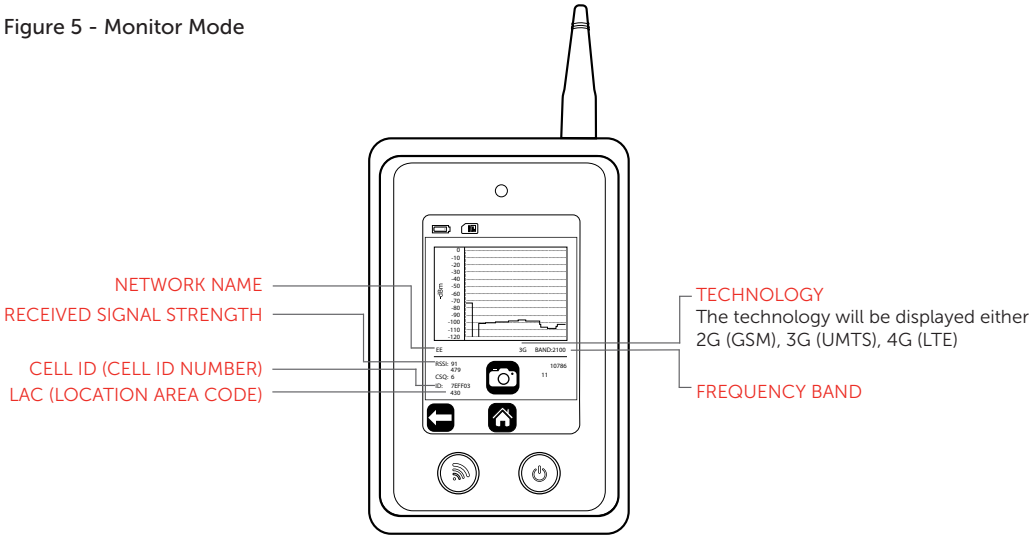
4. Select the required network (to ensure all available networks are displayed press refresh)

   Please note: Refreshing networks may take 2-3 minutes

5. Live monitor mode will now run

MONITOR MODE RESULTS

Figure 5 - Monitor Mode



MONITOR MODE SNAPSHOT

1. Ensure monitor mode is running

2. Press the snapshot icon 

3. The rename survey option will automatically display, name the survey then press go to save. A file will now be created, but can only be viewed in a table format on your laptop/PC (you will not see a graph)

SAVED FILES

1. Select the saved results icon. Results will be shown in descending order by time
2. Select the file you wish to view. Results will now be shown in the same format as per the 'RESULTS' section

SAVED FILE DOWNLOAD

1. Ensure the Signal Analyser is switched on

   Please note: If the device is switched off and connected to the USB port on a PC/Laptop this will charge the device only
2. Connect Signal Analyser via a USB lead to your PC/Laptop
3. Once connected click on start then select Computer. The Signal Analyser files will be shown under devices with removable storage
4. Select Analyser
5. A list of your saved surveys will now be displayed as a Microsoft Excel Comma Separated Values File (.CSV)
6. These files can now be moved to your required folder or displayed as a Microsoft Excel Document

   Please note: You cannot read/write files and run a survey while the Signal Analyser is connected to the USB port, this will cause the unit to crash

SETTINGS

Enter the settings menu

ICON	DESCRIPTION	FUNCTION
Brightness Icon	Adjust Brightness	Increase / decrease brightness
Languages Icon	Change device language	Select language
Time Icon	Set time	Set time
Auto-Off Icon	Define how long the device stays powered on with no action	Set auto-off time
Default Survey Icon	Define what survey the quick survey button on the front of the device does	Select survey
Sounder Icon	Turn sound on/off	Turn sound on/off
Power Save Icon	Battery saver to send radio module to sleep	Turn power save on/off
Firmware Icon	View firmware version	View firmware version, Radio module, Radio firmware, IMEI, SIM status
Factory Reset Icon	Restore factory defaults	Complete a factory reset back to default settings

RSSL EXPLANATION

To ensure that a consistent approach is used to all Radio Access Technologies (RAT) - such as 2G, 3G and 4G - a new, more accurate method for calculating percentage of the signal strength has been introduced. The RSSL is not based on CSQ readings alone provided by the radio module, but is calculated from the raw data received from the network readings. The value is mapped through the whole range and is independent for each RAT. The value calculation includes both signal strength and signal quality measurements.

The example of such mapping for a 3G cell is:

RSCP: -80 dBm
RSRQ: -4 dB
CSQ: 19
RSSL: 67%

SPECIFICATIONS

Model	CS2369 2G/GSM CS2389 2G/GSM, 3G/UMTS, 4G/LTE
Dimensions	122cm (h) 72cm (w) 20cm (d)
Weight	149g including aerial
Temperature	-20°C to + 60°C transit, -4°C to +40°C operating
Humidity	0-80% non-condensing
Warranty	2 years
Radio Path	GSM, UMTS, LTE (depending on version)
Battery	9.0v - 30.0v DC
Charger	5 Vdc micro USB plug-top charger or equivalent
Battery Life	3.7 volt, 1000Ma/h Solid Electrolyte Lithium Ion

CERTIFICATIONS

International Radio Approval

The CS2369/CS2389 Signal Analyser incorporates an independently tested and approved 4G/3G/2G radio module that meets the requirements of European radio communication standards.

Approval Authority: CE1909

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SUPPORT

For more information on the Signal Analyser or other CSL products please contact CSL Technical Support:

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Ireland Tel:	1800 855 695
Email:	support@csldual.com
Hours:	08.30 to 18.00 weekdays, 10.00 to 16.00 Saturday

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