



Mobile Signal Analyser

User Guide

Contents

1	Getting set up	
	Product description & spec	3
	Charging	5
	Pairing	6
2	Surveying	
	Starting a survey	7
	Carrying out a single network survey	8
3	Features	
	Menu options	10
	Multi-network	11
	Analytic mode	12
	Generate report	14
	Report summary	16
	External aerial connection	20
4	Site Surveys	
	Perform a site survey and firmware update	21
5	Troubleshooting, support & disposal	
	Troubleshooting guide	22
	Disposal and disclaimer	23
	Glossary of Abbreviations	24
	Support	25



Product description

The Mobile Signal Analyser (MSA), helps you locate the best position to fit a next generation alarm signalling device, by locating the strongest mobile network.

Download the BT Redcare app on your iOS or Android device to get started.

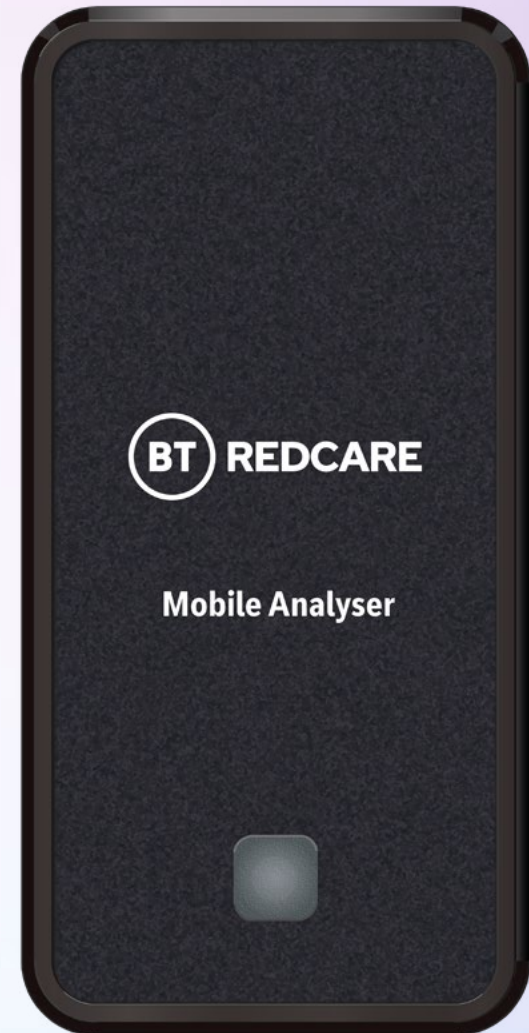


Figure 1 – Mobile Signal Analyser (not to scale)

Specifications

Operating frequencies

- LTE: 700, 800, 900, 1800, 2100 MHz (Bands 1,3,8,20,28)
- GSM/GPRS: 900 and 1800 MHz
- Bluetooth: 2.4GHz to 2.483Ghz
- ISM RF: 868MHz

USB-C powered 5V DC, 500mA

Battery rating 3.7V lithium polymer, 1100mA

Charge device only between 10c and 35C

Store device between 0C and 50C

Equipment model 207456 powered using a power supply/charger (output :5V dc,2A) approved in its country of use

Size: 150mm x 74mm x 18mm

Weight: 73g

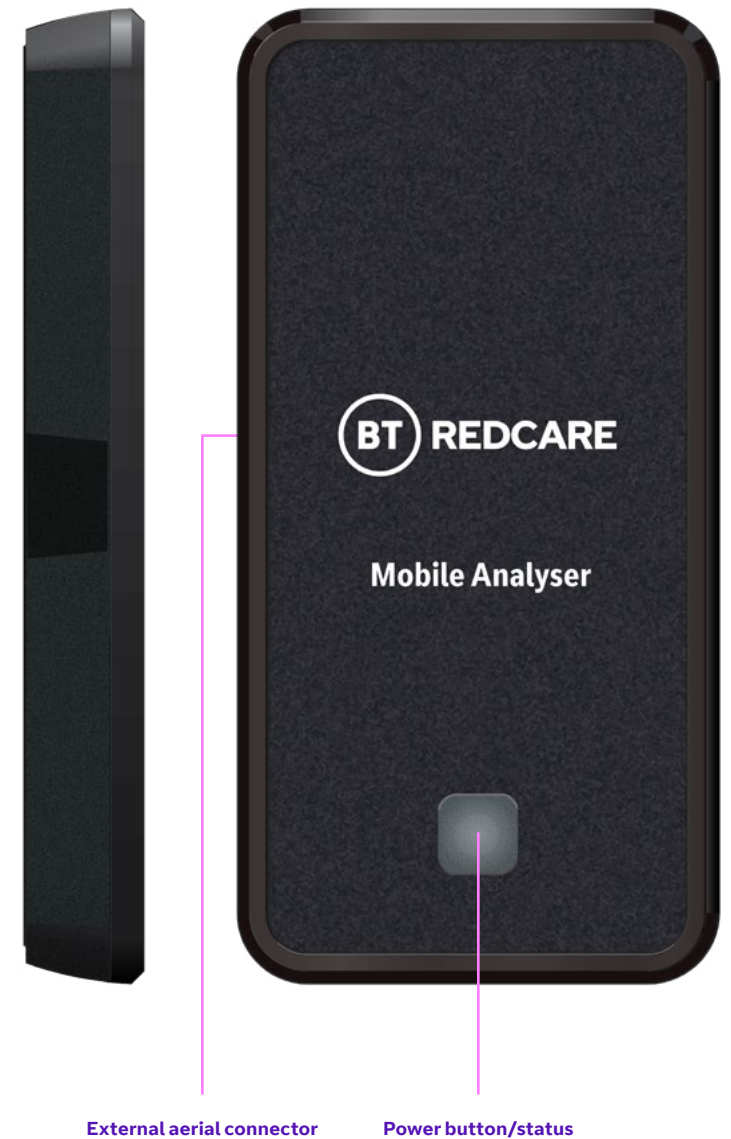
Safety

This product contains a lithium polymer rechargeable battery

- No user serviceable parts inside
- Only use with an approved battery
- Batteries may explode, burn, or cause a fire if misused or mishandled
- DO NOT use if battery or enclosure is damaged in any way
- DO NOT eat or swallow the battery
- DO NOT expose to liquids or high temperatures

Box contents

- Mobile Signal Analyser
- USB-A to USB-C charging cable
- Quick start guide



Charging

You'll need to charge the Mobile Signal Analyser (MSA) before first use.

Plug the charging cable into the USB-C connector on the Mobile Signal Analyser and plug the USB-A end into a suitable charging point. Minimum 5V 500mA.

When plugged in, the power button will flash red.

The power button will glow constantly red when fully charged. This will take approximately 4 hours.

Make sure the MSA has charged before attempting to carry out a survey.

You won't be able to survey with the USB charge cable plugged in.

A 10-minute charge will give you approximately 10 minutes of survey time.

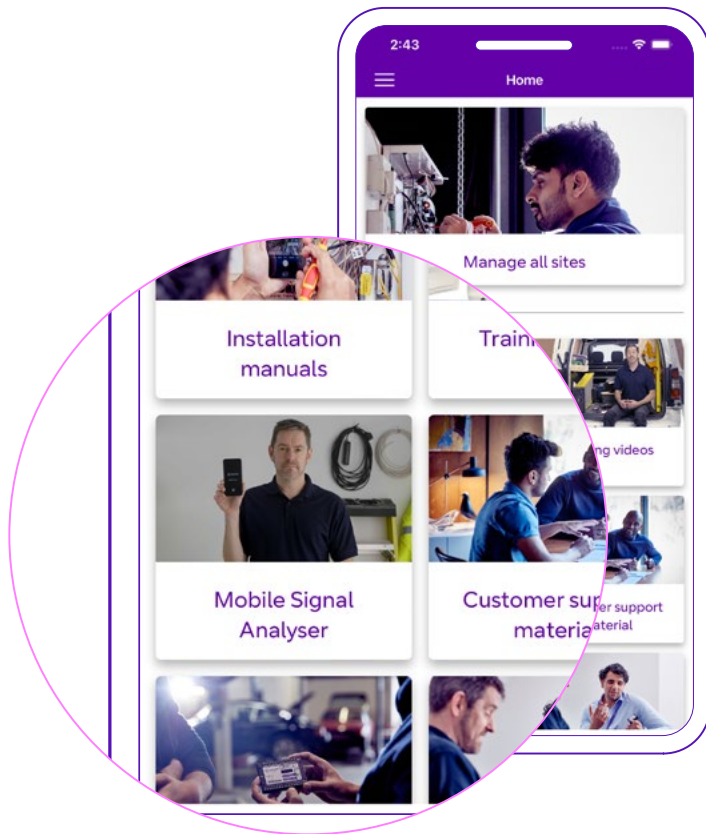
When the MSA is fully-charged and you've downloaded the app, press the MSA power button.

The button will turn green to show that it's on (but not yet paired).

To turn off the MSA, press the power button for 5 seconds. The power button LED switches off.



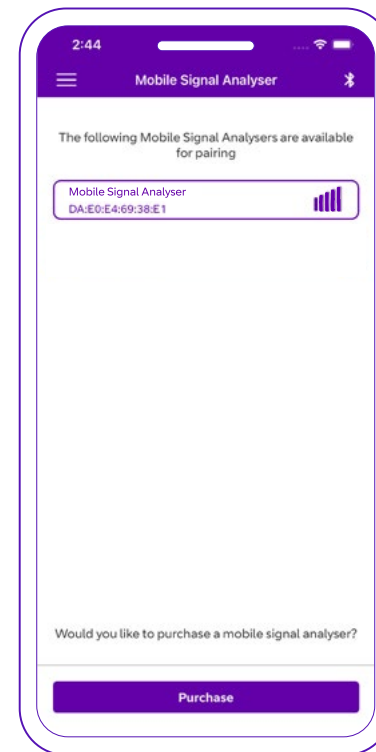
Pairing the MSA with your smart device



Make sure your device's Bluetooth is switched on, then open the BT Redcare app.



If you don't have an MSA select 'purchase'. You'll be automatically redirected to the BT installer shop. If you already have an MSA, your smart device and BT Redcare app will automatically start scanning for the MSA.

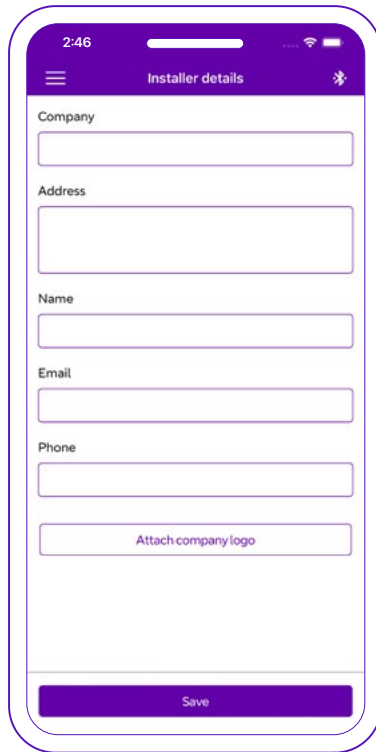


Tap on your MSA to pair with your device. You'll find the serial number on the back of the MSA.



When pairing is complete, the MSA power button will turn purple, and the following app screen will be displayed.

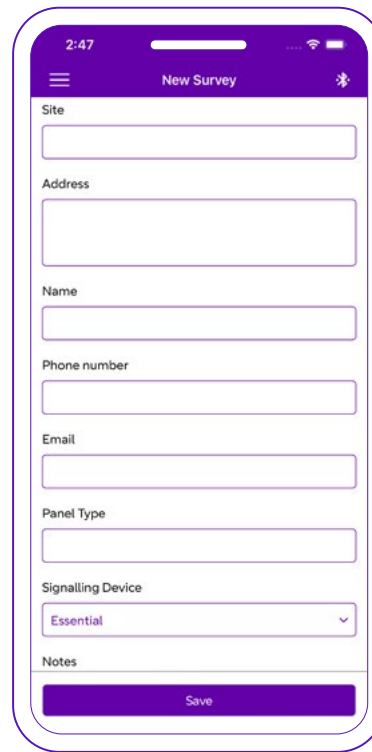
Start a survey



The screenshot shows the 'Installer details' screen. At the top, the time is 2:46. The header is 'Installer details'. Below the header are five text input fields: 'Company', 'Address', 'Name', 'Email', and 'Phone'. Below these fields is a button labeled 'Attach company logo'. At the bottom of the screen is a blue 'Save' button.

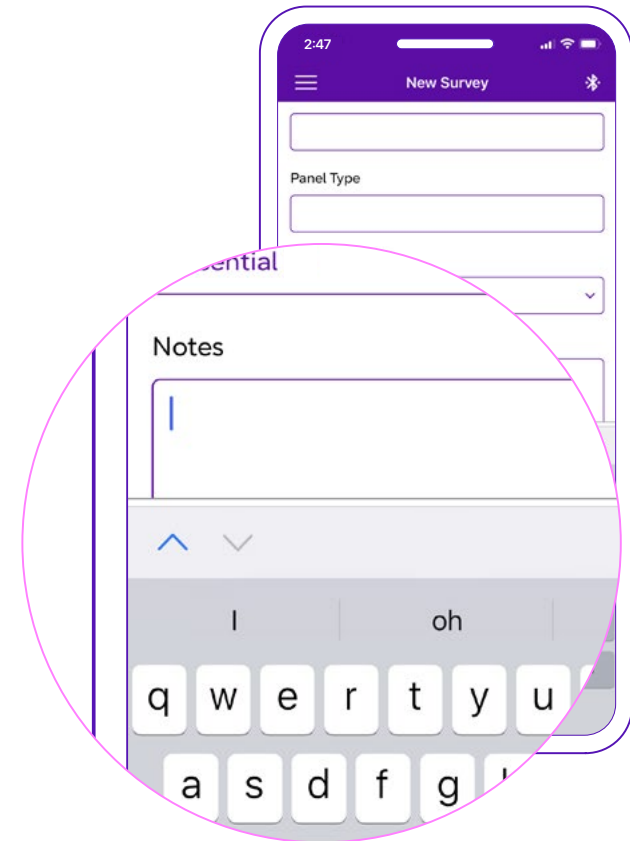
The first time you use the MSA you can enter your company details and attach a company logo (if stored on your device), by selecting the 'attach company' logo.

Tap 'save' and the app will remember these details.



The screenshot shows the 'New Survey' screen. At the top, the time is 2:47. The header is 'New Survey'. Below the header are seven text input fields: 'Site', 'Address', 'Name', 'Phone number', 'Email', 'Panel Type', and 'Signalling Device'. The 'Signalling Device' dropdown menu is open, showing 'Essential' selected. Below these fields is a 'Notes' text area. At the bottom of the screen is a blue 'Save' button.

Next, enter the details of the site you're surveying. Enter the name, address, contact details, panel type and the details of the next generation signalling device you intend to install. Use the notes field to add extra detail.



The screenshot shows the 'New Survey' screen with a keyboard overlay. The keyboard is visible over the 'Notes' text area. A blue circle highlights the 'Save' button at the bottom of the screen. The 'Signalling Device' dropdown menu is still open, showing 'Essential' selected.

Select 'save' to start a survey.

You can select 'save' without entering any of the site details.

You'll be able to add a site name to your report at a later stage.

Your MSA will start scanning.

Carry out a single network survey

Survey individual mobile 4G and 2G networks

The screenshot shows a mobile application interface for conducting a single network survey. The top status bar displays the time 2:50, signal strength, Wi-Fi, and battery icons. The app header is purple with a menu icon, the text 'Single Network', and a Bluetooth icon. Below the header, the selected network is 'Network A' with '4G' technology. The main display features a large green circular signal strength indicator with '-84' in the center and 'EXCELLENT SIGNAL' below it. A dropdown menu shows 'dBm'. At the bottom, there are two toggle switches: 'Enable 4G radio access technology' (checked) and 'Enable 2G radio access technology' (unchecked). Below these is a 'Mobile Network' section with a right arrow. A purple 'Generate Report' button is at the very bottom.

Menu

Network selected – shows mobile network being surveyed

Mobile technology selected 4G or 2G

Signal strength indicator
Green – excellent
Yellow – very good
Orange – good
Red – poor

Signal strength in dBm or %

Switch between dBm or %

Toggle between 4G and 2G

Select mobile network

You can generate a report at any point as long as at least 4 minutes of data has been captured. See the section in this manual entitled 'Generate reports' for more details

For 4G Networks

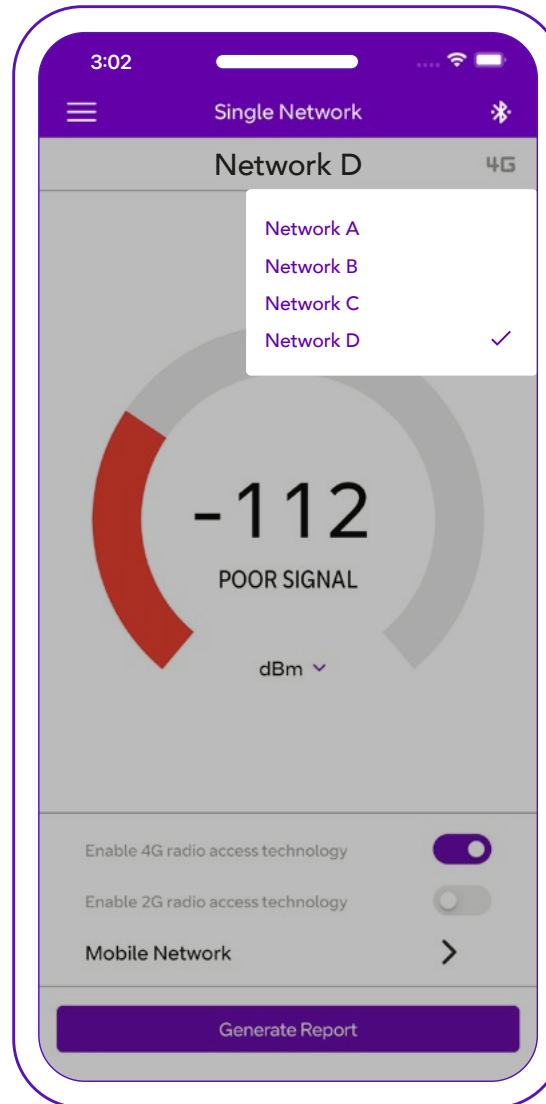
- Excellent > -90dBm: Green
- Very good between -99dBm ↔ -90 dBm: Yellow
- Good between -109dBm ↔ -100 dBm: Orange
- Poor < -110 dBm: Red

For 2G Networks

- Excellent > -75dBm: Green
- Very good between -79dBm ↔ -75dBm: Yellow
- Good between -84dBm ↔ -80 dBm: Orange
- Poor < -85 dBm: Red

Percentage scale

- Excellent >67%
- Very Good >50% to 67%
- Good >33% to 50%
- Poor <=33%



Select 'mobile network'. The network you're connected to will appear with a tick. Select the network you want to check and a scan will start immediately.

Menu options

Click the menu at the top left of your screen to see all options.

Home: returns you to the main BT Redcare app (and closes the MSA app)

Single network: carries out tests on 4G and 2G networks

Multinetwork: carries out checks of main UK networks for recommended criteria

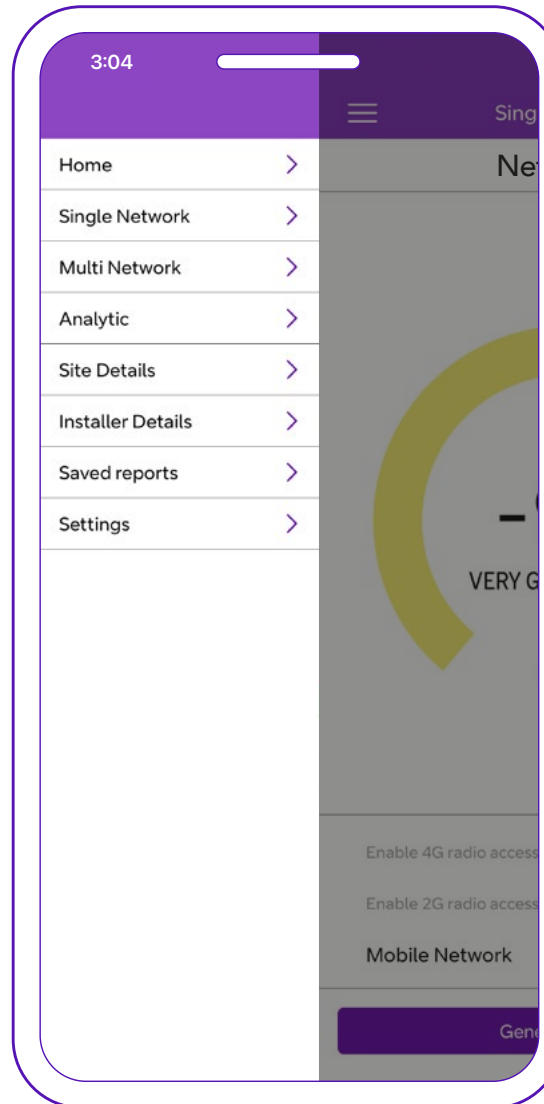
Analytic: checks mobile networks over time to ascertain reference signal received quality (RSRQ) band and local area code

Site details: allows you to add site details

Installer details: amend or add your company details

Saved reports: view previous saved reports

Settings: allows you to switch to an external aerial and update the MSA firmware of an upgrade is available.



Multi network

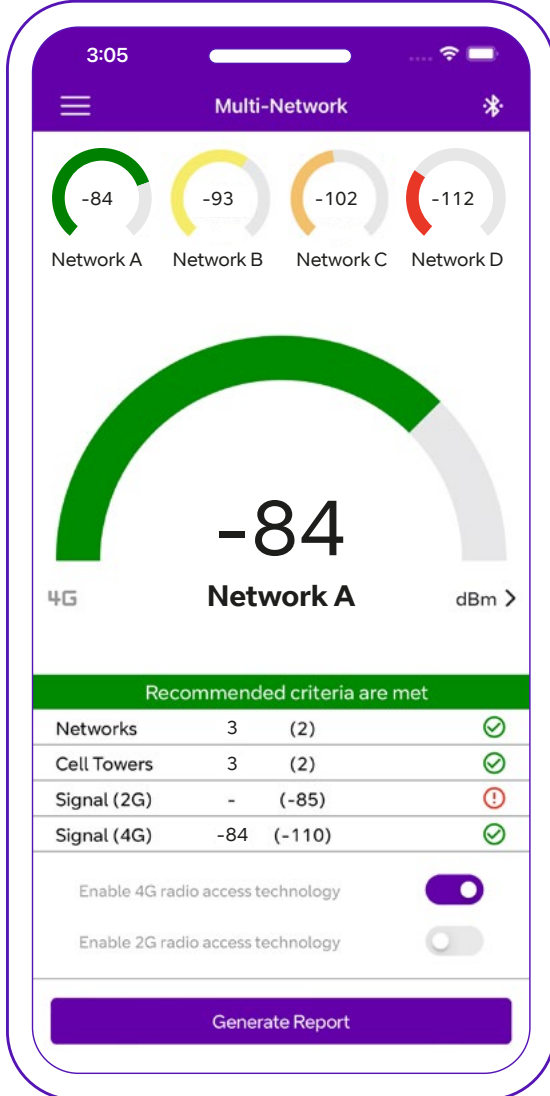
View all available networks on one screen to see whether your chosen site meets recommended criteria.

Available mobile networks, signal strength indicators and signal strength in dBm

Best network available showing network 4G or 2G, signal strength indicator, signal dBm reading

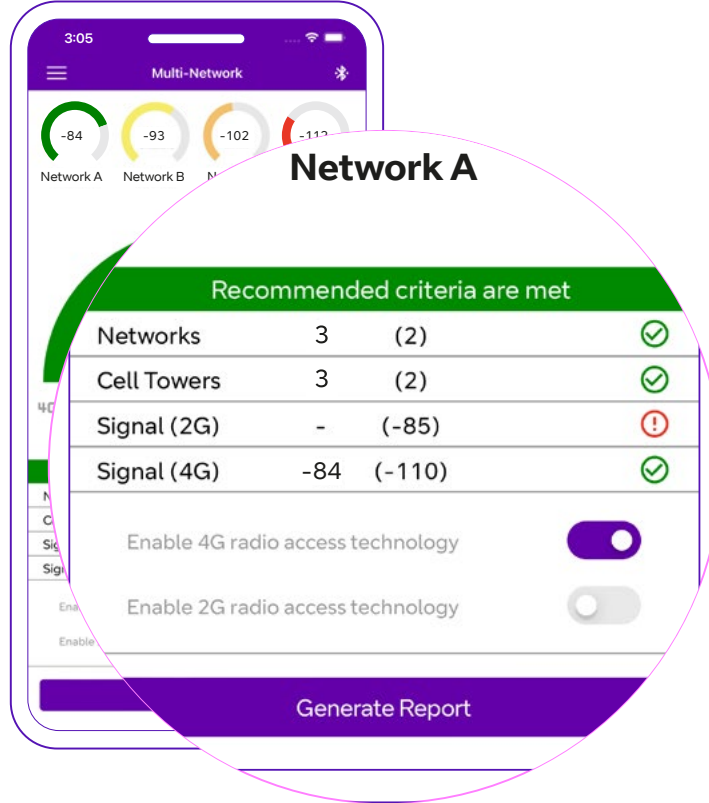
Indicates whether the minimum recommended criteria has been met

Toggle between 4G and 2G



Recommended criteria

Tells you which parameters have been met and whether the chosen location has a strong enough signal for a next generation signalling device.

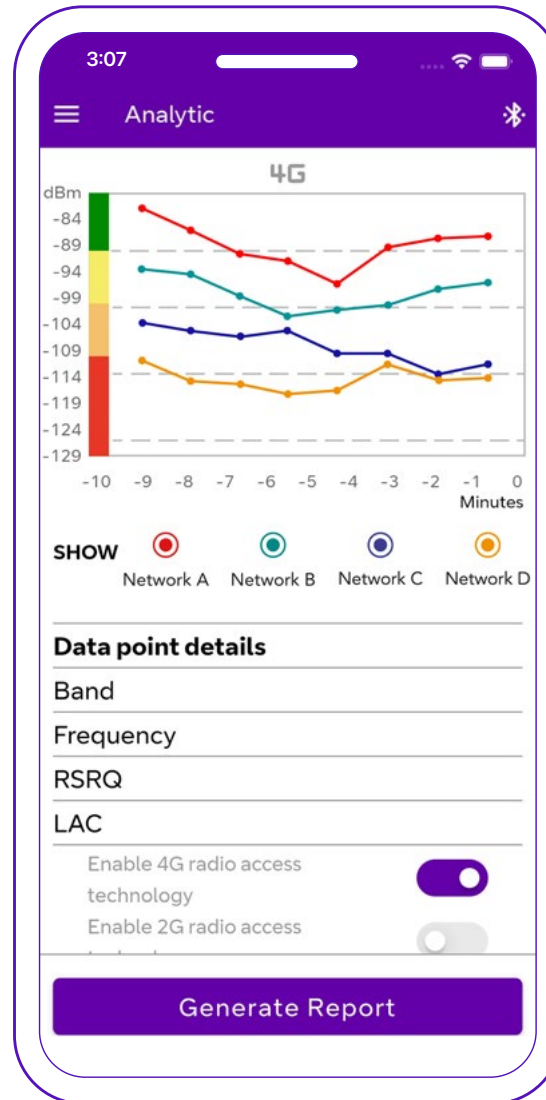


Analytic mode

Check available mobile networks signals over time for more detail.

Coloured dBm scale for signal strength with dBm readings
Green - excellent
Yellow - very good
Orange - good
Red - poor

Select a mobile network button to remove from or add to the data chart.

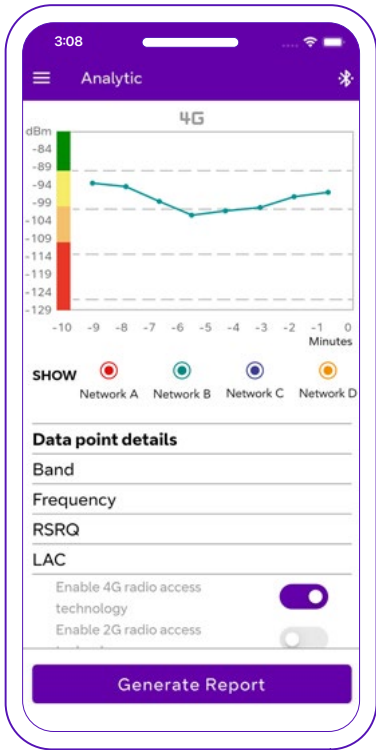


Additional information on a data point

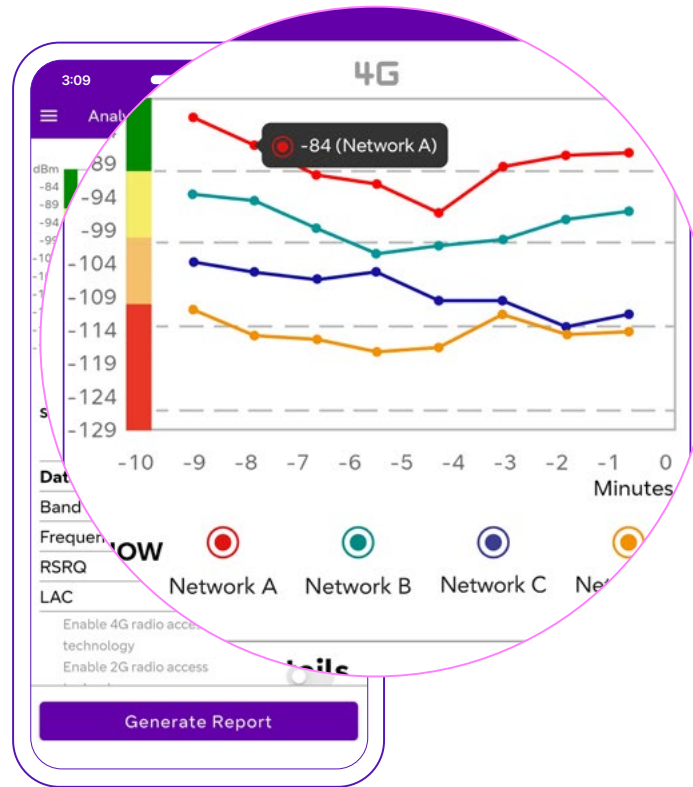
Mobile network signals plotted over a rolling 10-minute time frame

Details of a data point

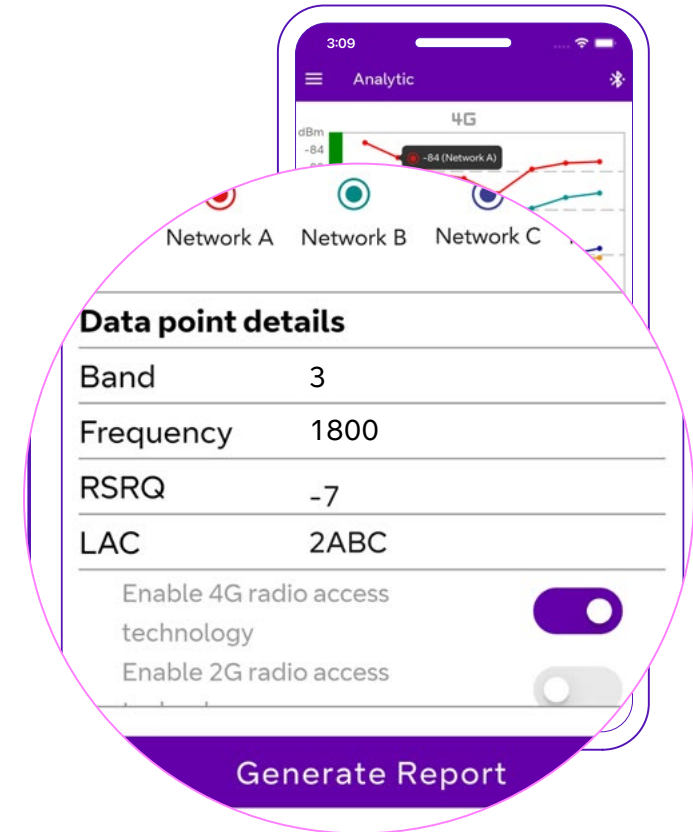
Switch between 4G and 2G



Access the individual network chart by tapping the mobile network buttons.



Tap a mobile network data point to see more information.



Band – shows the network band (4G) or frequency (2G) that the selected mobile network is using.

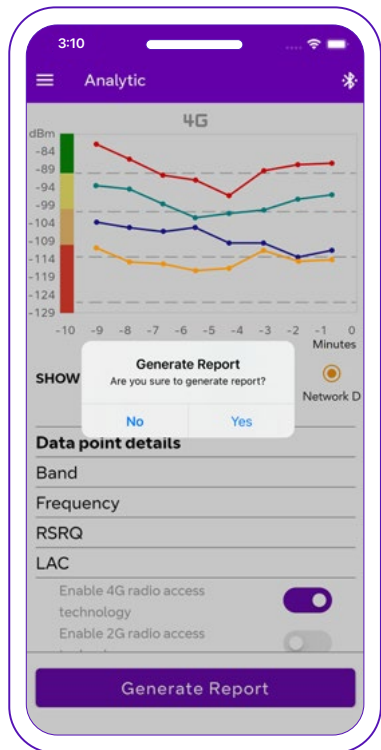
Frequency – shows the frequency 4G or 2G that the selected mobile network is using.

RSRQ – indicates the quality of received signal strength.

LAC – location area code. The area code location of the cell tower for the network.

Generate a report

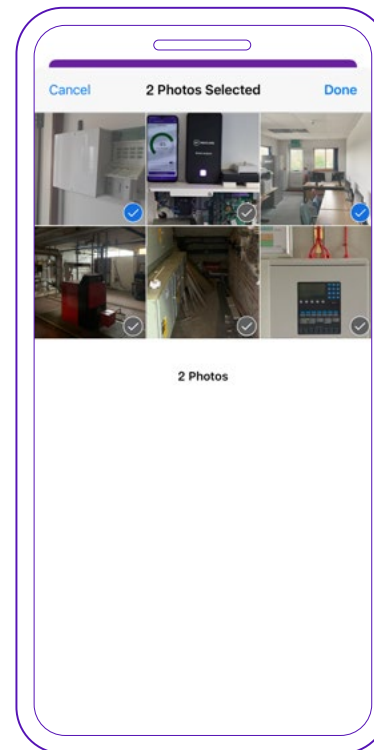
Generate a site survey report by selecting the 'generate report' button at the bottom of any of the survey screens, in single network, multi network or analytic mode. There must be at least four minutes of survey data to be able to generate a report.



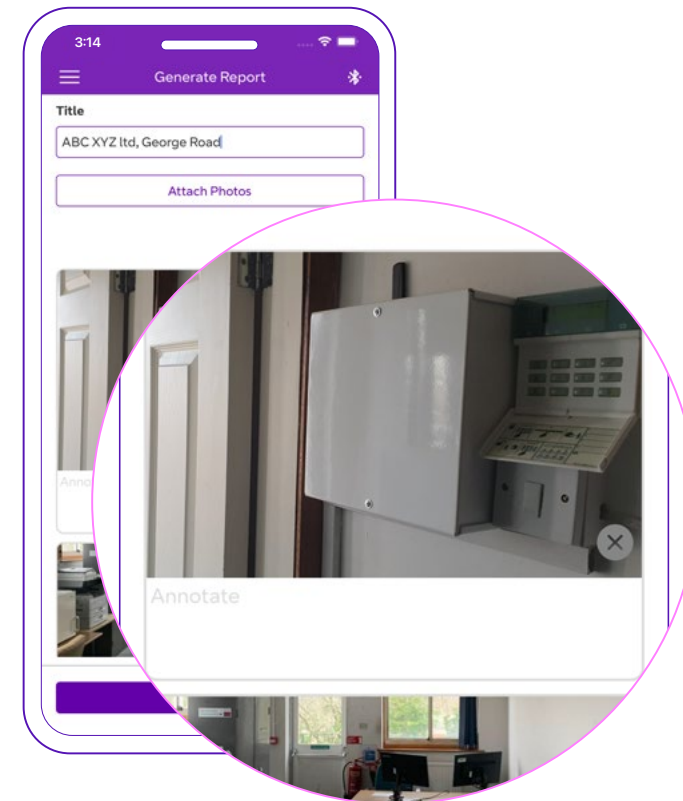
Select 'generate report' then 'yes' to confirm. The app will generate a report.



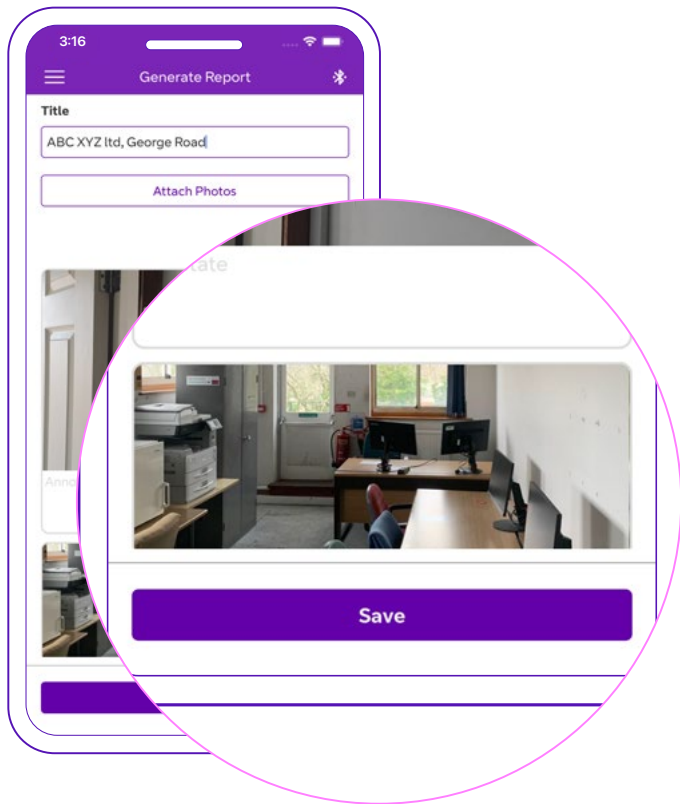
You'll be taken to the report screen. If you haven't already entered a site name, you can do that here.



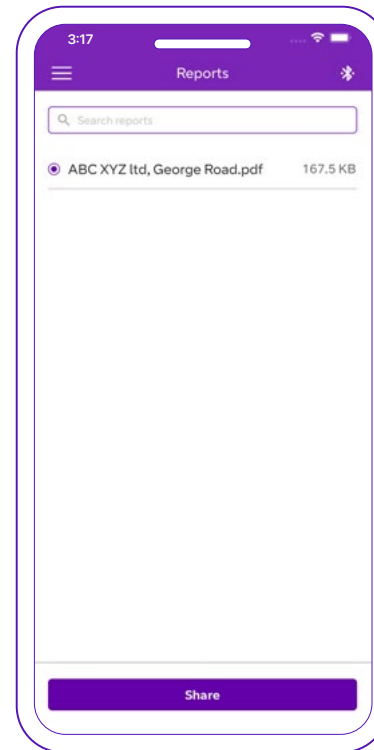
Attach and annotate photos.



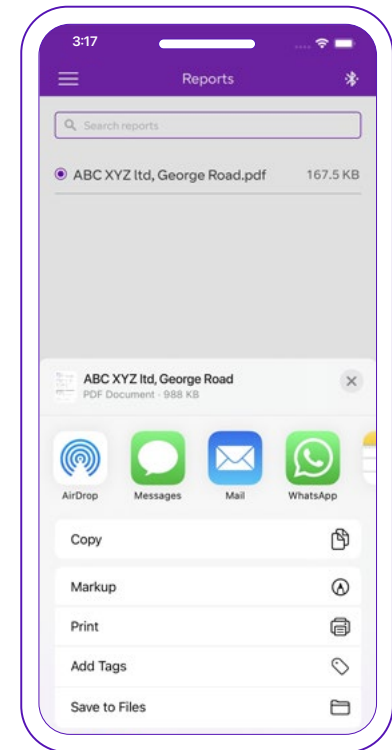
Select 'save' to generate and save the report in PDF format.



The next screen shows a list of reports that have been saved (or a single report, if this is your first). Select 'report' and then 'share'.



Then choose a sharing option (such as 'send via email.')



Report summary

The reports will show your details, as well as the site details you entered on each survey and the survey results.

INSTALLER ABC  Your Logo here

Mobile Signal Analyser Report

Site xyz

7th May 2022

Details of site visit

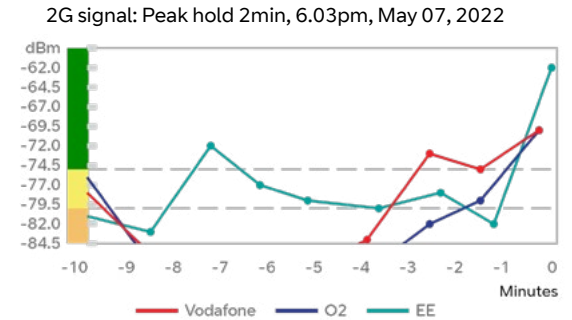
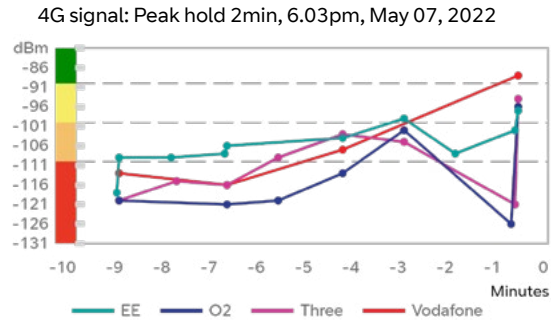
Installer Co	Installer ABC
Contact	John Smith
Phone	01230456789
Email	admin@installerabc.co.uk

Communicator	Essential Extra
Panel	Not provided
Antenna	Internal

Site name	Site xyz
Side address	Unit 3 Lime Street, London XY1 3ZZ
Contact	John Smith
Phone	01234567890
Email	admin@installerabc.com

The report shows the graphs of signal over time.

Analytic Graphs



Next is an averaged network statistics summary for 4G and 2G based on at least 10 minutes of data (if available).

This provides networks available, signal strength in dBm and percentage followed by a conclusion about whether the site meets recommended requirements.

Averaged Statistics Summary*

4G Signal	dBm	%
O2	-112	30
Vodafone	-102	47
Three	-100	50
EE	-107	38

2G Signal	dBm	%
Vodafone	-87	27
EE	-85	33
O2	-84	37

Conclusion*

The site has excellent/very good signal for 4G using two networks (EE, Three) and separate cell towers. Therefore this location meets the recommended requirements for device installation.

Average signal strength in dBm over 10 minutes of data (if available).

Standard deviation of that signal compared to the mean (dBm).

Median signal strength in dBm (the middle signal strength number of the data collected).

A table is displayed, showing where the summary came from, as well as individual cell towers and 4G and 2G statistics.

Site notes

Site notes and photos, if these have been added, will be shown in the report.

Average, standard deviation and median results summary

4G: Average, Standard Deviation, Median

Network	Avg.	SD	M
O2	112	4.9	112
Vodafone	-102	2.3	-102
Three	-100	8.8	-104
EE	-107	11.6	-112

2G: Average, Standard Deviation, Median

Network	Avg.	SD	M
Vodafone	87	2	87
EE	-85	3.6	-86
O2	-84	3.9	-84

Cell tower: signal strength average, standard deviation, median summary*

Cell tower ref.	Network	Avg.	SD	M
1081	4G	-112	4.9	-112
	2G	0	0	0
1478	4G	-99	8.6	-103
	2G	0	0	0
1832	4G	-102	2.3	-102
	2G	0	0	0

Detailed network statistics

Next in the report is a detailed table for 4G, containing:

- Date and time of survey
- Mobile network name
- Location area code (LAC) of the cell tower
- Band frequency
- RSSI - received signal strength indicator (dBm)
- RSRQ - reference signal received quality (4G only) 0dB (highest quality) to 20 dB (lowest quality). This information is associated with RSRQ.

Next in the report you'll see a detailed table for 2G containing:

- Date and time of survey
- Mobile network name
- Location area code (LAC) of the cell tower
- Band frequency
- RSSI -received signal strength indicator (dBm).

4G Detailed network statistics*

Date/Time	Network	LAC	Freq.	RSSI	RSRQ
7/5/22 19:07:09	Three	0864	2100	-115	-10
7/5/22 19:07:09	EE	6221	2100	-123	-11
7/5/22 19:07:22	EE	2ABE	1800	-124	-7
7/5/22 19:07:22	EE	2ABE	1800	-125	-13

2G Detailed network statistics*

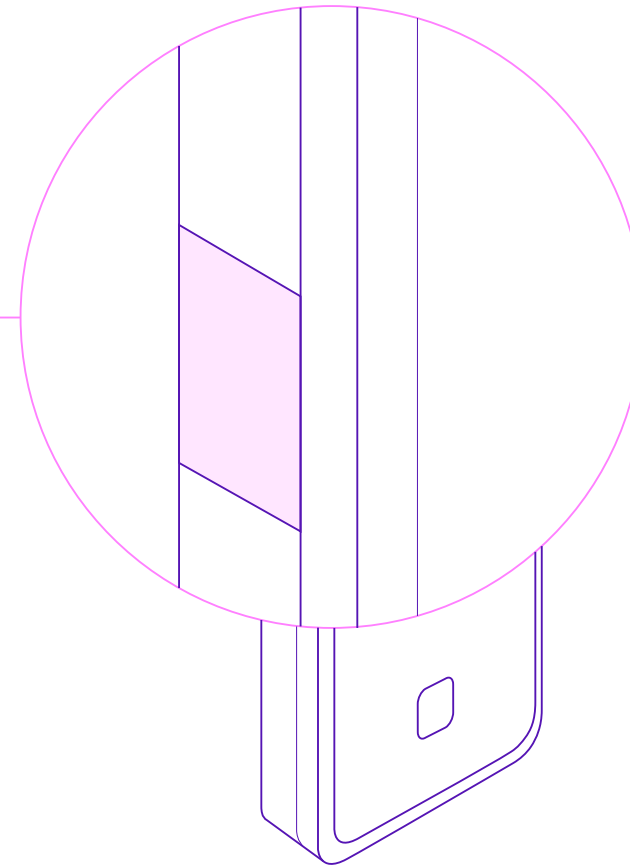
Date/Time	Network	LAC	Freq.	RSSI
7/5/22 19:06:29	O2	5446	900	-78
7/5/22 19:06:29	O2	5446	900	-82
7/5/22 19:06:29	Vodafone	0364	900	-73
7/5/22 19:06:29	Vodafone	0364	900	-78
7/5/22 19:06:29	Vodafone	0364	900	-82
7/5/22 19:06:29	Vodafone	0364	900	-87
7/5/22 19:06:44	EE	09D0	1800	-73
7/5/22 19:06:44	EE	09D0	1800	-78

External aerial connection

Plug an extension or high gain antenna (available from btinstallershop.bt.com) into the MSA to see if the signal can be improved.

Lift the cover on the left-hand side and plug the external aerial into the MMCX jack.

External
aerial
adapter



On the app, go to 'settings' and select 'external aerial'

This will remain selected even after you turn the mobile signal analyser off, so remember to switch it back to internal aerial for your next survey.

Perform a site survey

- Make sure your mobile signal analyser is charged.
- Pair up the analyser with your smart device via Bluetooth.
- Enter the site details on the app.
- Place the MSA where you'd like to install the next generation signalling.
- From the app, use the menu to check a single network or multi networks for signal availability.
- Check multi network to see if the recommended criteria have been met for the location.
- If criteria aren't met, move the MSA to an alternative location.
- Use analytic mode to check the stability and signal of networks over a rolling 10-minute time frame.
- Generate a report after at least 4 minutes of survey. This will capture detailed network information as well as the recommended criteria status. Adding location photos and notes to the report will help installation.
- Share the PDF report via email.

If the recommended criteria has *not* been met, look for an alternate location or plug in a BT Redcare extension/high gain aerial, available from btinstallershop.bt.com

Switch the MSA to use the external aerial and re-do the survey.

Remember to switch back to the internal aerial (in settings) once you've disconnected your external aerial.

To carry out a firmware update

To update the MSA firmware:

- Connect your smart device to the MSA via the app.
- When a firmware update for the MSA becomes available, select 'menu' and then 'settings'.
- The firmware update button will become active.
- Select 'firmware update'.
- This will then start to update the MSA firmware.
- A completed message will inform you that the firmware update has been successful.

Troubleshooting guide

1. What do all the LED colours and flashing states mean?

LED colour	LED state	Meaning
Red	Flashing	Unit needs to be recharged
Red	Constant	Battery is fully charged but still connected to USB
Green	Constant	Unit is unplugged, fully charged and ready to pair
Purple	Constant	Unit is paired via Bluetooth

2. I pressed the button, but no LED came on

Fully charge the unit for four hours using the USB cable, then unplug and try again.

3. No LED came on even when the unit was plugged into USB.

Either the cable is not fully pressed into the socket, or the unit is faulty and needs to be returned for replacement.

4. The LED is red, but the product doesn't pair after pressing the button.

You won't be able to pair the MSA if the USB cable is plugged in. Check it's unplugged before attempting to pair.

5. The purple LED doesn't come on.

Install the app and, press the MSA's Bluetooth ID button within the app to pair it.

6. I can't get past the initial form section of the app to see the dials and results.

Make sure you've entered text into all key fields. Check that email address fields contain an '@'.

7. After the unit has been paired, the dial shows no signal.

The app takes a few minutes to gather data from the surrounding networks. If there is no data after a longer period, try switching networks using the mobile network dropdown menu (bottom right).

8. I want to see results as a percentage, but the app shows decibels

Use the dropdown selector on the right of dB to select %.

9. I can't get out of the single network mode. I want to use multi-network or analytic mode.

Press the menu icon in top left of your screen to select the mode you want from the drop-down menu.

10. I want to use 2G, but it is stuck on 4G.

Use the toggle button below the dial to switch between 4G and 2G.

Disposal

This product is classed as an electrical item, so at the end of its working life must not be disposed of with other household or commercial waste.

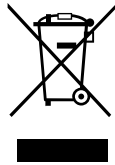
Product disposal instructions:

Please dispose of this product in line with your local authority's recycling processes

To find out more, contact your local authority.

You can return the product to the freepost address below:

BT Supply Chain
Darlington Road,
Northallerton,
North Yorkshire
DL6 2PJ.



Disclaimer

The manufacturer and agents accept no responsibility for any damage, financial loss or injury caused to equipment, property or persons resulting from any use of this equipment. The manufacturer is not liable for any economic loss arising from any use of this equipment. All responsibility and liability in the use of BT Redcare products is assumed by the user.

BT Redcare may make changes to features and specifications at any time without prior notification.

Glossary of abbreviations

MMCX	Micro miniature coaxial connector
RX	Receive
RSRQ	Reference signal received quality
RSSI	Received signal strength indicator
TX	Transmit

Support

For help with your BT Redcare installation,
please contact our helpdesk on
0800 800 628 (option 3).



Offices worldwide

The services described in this publication are subject to availability and may be modified from time to time. Services and equipment are provided subject to British Telecommunications plc's respective standard conditions of contract. Nothing in this publication forms any part of any contract.

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June 2022