

SNYPER Survey Terminology

The information obtained from the SNYPER about the cellular environment is both comprehensive but also probably very daunting for many users. Different users will want to use different depths of the information provided. Whether viewed only on the SNYPER itself, or on the files produced by the SNYPER, the information presented is consistent. The following explains the measured parameters found in the logs (sorted in the order in which they will be encountered).

While many of the terms used are common to 2G, 3G and 4G networks, in many cases the range of values returned for any parameter can be different dependent on the generator of technology surveyed.

2G Survey Terms

Terms presented in the order in which they appear in the survey.

Cell

All cells discovered in the survey are ranked by signal strength, where cell number 1 is the cell with the strongest signal, 2 is the next strongest, and so on.

Index

This is a unique index number used by the SNYPER to identify a cell. Where the survey is a single survey, the cell number and index number are the same. With multiple surveys that the Index and the Cell numbers can be different as the order of strength of the cells can differ between surveys.

Seen (Graphyte ONLY)

Applicable to all surveys where logging has been used. It is the count of how many times that the cell was seen, and (in brackets) what percentage of the surveys made that represents. There is usually (but not always) a good correlation between received signal strength and how many times that a cell is seen.

ARFCN

This number defines the exact uplink and downlink frequencies used by the cell. It may be any number between 0 and 1023. This number may be looked up in the GSM standard to determine the exact radio frequencies used.

dBm or AV dBm

The measured signal strength of the network in dBm. AV dBm is the average dBm of a multi-cycle survey.

% or AV %

This measurement is derived from the dBm measurement. It is the measured signal strength expressed as a percentage of the maximum possible signal strength which could be obtained. AV % is the average percentage of a multi-cycle survey.

RSSI or AV RSSI

This measurement is derived from the dBm measurement. It is the Received Signal Strength Indication which is obtained by looking up the dBm measurement in a table in the GSM standard. AV RSSI is the average RSSI of a multi-cycle survey.

MCC

Mobile Country Code. It identifies the country from which the network is originating. This should mean the country in which the base station is located. Unfortunately, there are some exceptions to this so it cannot always be used as a positive country indication. Typically used with the MNC to uniquely identify the network discovered.

MNC

Mobile Network Code. This identifies the network operator in conjunction with the MCC. Some network operators such as Vodafone operate in many countries. It cannot be assumed that such network operators will have the same MNC in all countries in which they operate.

CellID

This is a number assigned to a base station cell by its operator. It may be any number between 0 and 65535. Within a survey this is likely to be a unique number, but nationally there is likely to be more than 65535 base stations meaning that the Cell ID number is not likely to be unique at the national level. However, when combined with the LAC a base station may be uniquely identified.

LAC

Location Area Code. It may be any number between 1 and 65535, excluding 65534. It is assigned by the network operator and may be changed periodically for performance reasons (so beware if using it in a database). As implied by the name, the LAC is assigned to a specific geographical area and will be assigned to all base stations in the defined area.

Band

Channel number and designation of the surveyed channel. Derived from the received ARFCN.

BSIC

Visible when using Advanced mode and Engineer mode. This number between 0 and 63 is used to differentiate between cells operating on the same frequency.

DL (MHz)

Visible when using Engineer mode. This is the downlink frequency in MHz of the channel. This is derived from the received ARFCN.

UL (MHz)

Visible when using Engineer mode. This is the uplink frequency in MHz of the channel. This is derived from the received ARFCN.

Network Signal

This bar graph shows the relative strengths of the networks. The bars show percentage strength measurement. They are colour coded:

55 - 100 = green

25 - 54 = amber

0 - 24 = red

The thresholds for the colours are arbitrary and assigned by Siretta as a quick visual cue to network quality. The network operator listed is a look-up of the MCC and MNC codes. If a network operator is new or changes their name it is possible that this lookup could be incorrect. Due to it being impossible for Siretta to monitor every network in every country continuously, please report any inaccuracies so that they can be corrected in a firmware update.

3G Survey Terms

Terms presented in the order in which they appear in the survey.

Cell

All cells discovered in the survey are ranked by signal strength, where cell number 1 is the cell with the strongest signal, 2 is the next strongest, and so on.

Index

This is a unique index number used by the SNYPER to identify a cell. Where the survey is a single survey, the cell number and index number are the same. With multiple surveys that the Index and the Cell numbers can be different as the order of strength of the cells can differ between surveys.

Seen (Graphyte ONLY)

Applicable to all surveys where logging has been used. It is the count of how many times that the cell was seen, and (in brackets) what percentage of the surveys made that represents. There is usually (but not always) a good correlation between received signal strength and how many times that a cell is seen.

UARFCN

This number defines the exact uplink and downlink frequencies used by the cell. It may be any number between 0 and 65535, although in practice on the SNYPER the user will only see numbers in the range 2937 to 10838. This number may be looked up in the UMTS standard to determine the exact radio frequencies used.

dBm or AV dBm

The measured signal strength of the network in dBm. AV dBm is the average dBm of a multi-cycle survey.

% or AV %

This measurement is derived from the dBm measurement. It is the measured signal strength expressed as a percentage of the maximum possible signal strength which could be obtained. AV % is the average percentage of a multi-cycle survey.

RSSI or AV RSSI

This measurement is derived from the dBm measurement. It is the Received Signal Strength Indication which is obtained by looking up the dBm measurement in a table in the GSM standard. AV RSSI is the average RSSI of a multi-cycle survey.

MCC

Mobile Country Code. It identifies the country from which the network is originating. This should mean the country in which the base station is located. Unfortunately, there are some exceptions to this so it cannot always be used as a positive country indication. Typically used with the MNC to uniquely identify the network discovered.

MNC

Mobile Network Code. This identifies the network operator in conjunction with the MCC. Some network operators such as Vodafone operate in many countries. It cannot be assumed that such network operators will have the same MNC in all countries in which they operate.

CellID

This is a number assigned to a cell by its operator. It may be any number between 0 and 268435455. For a 3G network, this field is really called the LCID (Long Cell ID) and comprises the 12-bit RNC-ID concatenated with the 16-bit Cell ID. When combined with the LAC a base station may be uniquely identified.

LAC

Location Area Code. It may be any number between 1 and 65535, excluding 65534. It is assigned by the network operator and may be changed periodically for performance reasons (so beware if using it in a database). As implied by the name, the LAC is assigned to a specific geographical area and will be assigned to all base stations in the defined area.

Band

Channel number and designation of the surveyed channel. Derived from the received UARFCN.

SCR

Visible when using Advanced mode and Engineer mode. It may be any number between 1 and 512. This is the scrambling code used by the channel. Scrambling is used to reduce inter-base-station interference. The value reported by the SNYPER is no indication of performance or cell location.

RSCP

Visible when using Advanced mode and Engineer mode. Received Signal Code Power, reported in dBm. Valid ranges of power measurement are -115 dBm through -25 dBm. This signal power measurement takes no account of interference.

ECIO

Visible when using Advanced mode and Engineer mode. This is the EC/IO ratio in dB. This is a measure of interference in the received signal and may be a number between 0 and 24 dB. A measurement of 0 dB means that the channel is free from interference. The more negative the measurement, the greater the noise. Cells are considered undetectable if EC/IO drops below -20 dB.

DL (MHz)

Visible when using Engineer mode. This is the downlink frequency in MHz of the channel. This is derived from the received UARFCN.

UL (MHz)

Visible when using Engineer mode. This is the uplink frequency in MHz of the channel. This is

derived from the received UARFCN.

Network Signal

This bar graph shows the relative strengths of the networks. The bars show percentage strength measurement. They are colour coded:

55 - 100 = green

25 - 54 = amber

0-24 = red

The thresholds for the colours are arbitrary and assigned by Siretta as a quick visual cue to network quality.

The network operator listed is a look-up of the MCC and MNC codes. If a network operator is new or changes their name it is possible that this lookup could be incorrect. Due to it being impossible for Siretta to monitor every network in every country continuously, please report any inaccuracies so that they can be corrected in a firmware update.

4G Survey Terms

Terms presented in the order in which they appear in the survey.

Cell

All cells discovered in the survey are ranked by signal strength, where cell number 1 is the cell with the strongest signal, 2 is the next strongest, and so on.

Index

This is a unique index number used by the SNYPER to identify a cell. Where the survey is a single survey, the cell number and index number are the same. With multiple surveys that the Index and the Cell numbers can be different as the order of strength of the cells can differ between surveys.

Seen (Graphyte ONLY)

Applicable to all surveys where logging has been used. It is the count of how many times that the cell was seen, and (in brackets) what percentage of the surveys made that represents. There is usually (but not always) a good correlation between received signal strength and how many times that a cell is seen.

EARFCN

This number defines the exact uplink and downlink frequencies used by the cell. The standard allows for any number between 0 and 262143, although in practice on the SNYPER the user will only see numbers in the range 0 to 6449. This number may be looked up in the LTE standard to determine the exact radio frequencies used.

dBm or AV dBm

The measured signal strength of the network in dBm. AV dBm is the average dBm of a multi-cycle survey.

dBm

Signal Strength
Excellent

Description
Provides fast and reliable
download/upload rates

-80 dBm or lower	Good	Medium download/upload rates with good reliability
-80 dBm to -90 dBm	Moderate	Low download/update rates with occasional dropouts
-90 dBm to -100 dBm	Unusable	Undetermined download/update rates with regular dropouts
-100 dBm or higher		

% or AV %

This measurement is derived from the dBm measurement. It is the measured signal strength expressed as a percentage of the maximum possible signal strength which could be obtained. AV % is the average percentage of a multi-cycle survey.

RSSI or AV RSSI

This measurement is derived from the dBm measurement. It is the Received Signal Strength Indication which is obtained by looking up the dBm measurement in a table in the GSM standard. AV RSSI is the average RSSI of a multi-cycle survey.

MCC

Mobile Country Code. It identifies the country from which the network is originating. This should mean the country in which the base station is located. Unfortunately, there are some exceptions to this so it cannot always be used as a positive country indication. Typically used with the MNC to uniquely identify the network discovered.

MNC

Mobile Network Code. This identifies the network operator in conjunction with the MCC. Some network operators such as Vodafone operate in many countries. It cannot be assumed that such network operators will have the same MNC in all countries in which they operate.

CellID

This is the Cell Identifier number assigned to a cell by its operator. It may be any number between 0 and 268435455. For a 4G network, this field is really called the LCID (Long Cell ID) and comprises the 12-bit RNC-ID concatenated with the 16-bit Cell ID. When combined with the TAC a base station may be uniquely identified.

TAC

Tracking Area Code. It may be any number between 1 and 65535, excluding 65534. It is assigned by the network operator and may be changed periodically for performance reasons (so beware if using it in a database). The TAC is assigned to a specific geographical area and will be assigned to all base stations in the defined area.

Band

Channel number and designation of the surveyed channel. Derived from the received EARFCN.

PhyCellID

Visible when using Advanced mode and Engineer mode. This is the Physical layer Cell Identity

(PCI). It may be any number between 0 and 503. The PCI determines how the signalling works on the radio interface and has some similarity to the way that scrambling codes are used on UMTS networks. It is not used as an identity within the network.

RSRP

Reference Signal Received Power. This is like an RSSI measurement, and like RSSI is measured in dBm. RSSI indicates the total power in the channel passband which includes noise signals and other interference. The less negative, the stronger the signal. RSRP differs in that it measures only the power of the LTE reference signals and is therefore a better indication of the signal strength of an active connection. RSRP and/or RSRQ are used by the network to determine cell selection.

RSRQ

Reference Signal Received Quality. This is the ratio of the RSRP measurement to the RSSI measurement measured in dB. The less negative, the better the quality of the signal. RSRP and/or RSRQ are used by the network to determine cell selection, although RSRP is usually chosen as the primary selection method.

BW

Visible when using Advanced mode and Engineer mode. This is the downlink bandwidth in MHz.

DL (MHz)

Visible when using Engineer mode. This is the downlink frequency in MHz of the channel. This is derived from the received EARFCN.

UL (MHz)

Visible when using Engineer mode. This is the uplink frequency in MHz of the channel. This is derived from the received EARFCN.

Network Signal

This bar graph shows the relative strengths of the networks. The bars show percentage strength measurement. They are colour coded:

55 - 100 = green

25 - 54 = amber

0-24 = red

The thresholds for the colours are arbitrary and assigned by Siretta as a quick visual cue to network quality.

The network operator listed is a look-up of the MCC and MNC codes. If a network operator is new or changes their name it is possible that this lookup could be incorrect. Due to it being impossible for Siretta to monitor every network in every country continuously, please report any inaccuracies so that they can be corrected in a firmware update.