

CSurv Spectrum Scan -

BCCH shows as a blue bar.

Barred / Forbidden cells

The network operator may decide not to allow MSs to camp on certain cells. (These cells may, for example, only be used for hand over traffic, i.e. calls which need to be handed over to other cells).

Barred cell information is broadcast as system information to instruct MSs not to camp on these cells. The barred cell status may in fact change dynamically; hence the MS needs to regularly check the system information for this parameter.

The barred status of a cell depends on the parameters CELL_BAR_ACCESS and CELL_BAR_QUALIFY

If a cell is barred this applies both for cell selection and reselection.

Use of the cell is set by the network and transmitted to the MS within the BCCH data, CELL_BAR_ACCESS & CELL_BAR_QUALIFY determine the use or not of the cell associated with the decoded BCCH data.

See Table Below:

Access control

Due to problems in certain areas, Network Operators may decide to restrict access from some MSs (e.g., in case of congestion on the AGCH), and for this reason the access control mechanism is provided.

At subscription one or more access control classes are allocated to the subscriber and stored in the SIM. The information providing all authorized classes is broadcast as system information (together with a bit indicating whether emergency calls may be made). This information is modified dynamically and therefore the MS has to check the system information before each attempt to access.

The MS ignores the Access Control information when selecting a cell to camp on, i.e. it shall not reject a cell for camping on because access on that cell is not allowed.

Radio constraints

The MS uses a "path loss criterion" parameter C1 to determine whether a cell is suitable to camp on. C1 depends on 4 parameters:

- i) The received signal level (suitably averaged);
- ii) The parameter RXLEV_ACCESS_MIN, which is broadcast as system information, and is related to the minimum signal that the operator wants the network to receive when being initially accessed by an MS;

iii) The parameter `MS_TXPWR_MAX_CCH`, which is also broadcast as system information, and is the maximum power that an MS may use when initially accessing the network;

iv) The maximum power of the MS.

The formula for determining C1 is given in GSM 05.08.

Use of the parameter C1 enables the MS to determine whether communication is possible with the network in the absence of interference. However because of the possibility of interference degrading the communications, an additional safeguard is used. This is to monitor the success rate of the MS in decoding signalling blocks of the paging subchannel. If there is a downlink signalling failure, i.e. the success rate drops too low, this indicates probable interference on the downlink, and the MS attempts to find another suitable cell. Downlink signalling failure monitoring is specified in GSM 05.08.

Radio Link Control parameters

Table 1: Radio sub-system link control parameters

Parameter name	Description	Range	Bits	Channel
BSIC	Base station Identification Code	0-63	6	SCH D/L
BA	BCCH Allocation	-	-	BCCH D/L
BA_IND	Sequence number of BA	0/1	1	BCCH D/L
MS_TXPWR_MAX_CCH	The maximum TX power level an MS may use when accessing the system until otherwise commanded.	0/31	5	BCCH D/L
POWER OFFSET	The power offset will be used in conjunction with the MS TXPWR MAX CCH parameter by the class 3 DCS 1 800 MS: 0 = 0 dB 1 = 2 dB 2 = 4 dB 3 = 6 dB	0-3	2	BCCH D/L
RXLEV_ACCESS_MIN	Minimum received signal level at the MS required for access to the system.	0-63	6	BCCH D/L
RADIO_LINK_TIMEOUT	The maximum value of the radio link counter 4-64 SACCH blocks, 15 steps of 4 SACCH blocks	-	4	BCCH D/L SACCH D/L
CELL_RESELECT_HYSTERESIS	RXLEV hysteresis for required cell re-selection. 0-14 dB, 2 dB steps, i.e. 0 = 0 dB, 1 = 2 dB, etc.	0-7	3	BCCH D/L
NCC_PERMITTED	Bit map of NCCs for which the MS is permitted to report measurement results. Bit map relates to NCC part of BSIC.	-	8	BCCH D/L SACCH D/L
CELL_BAR_ACCESS	See table 1a.	0/1	1	BCCH D/L
CELL_BAR_QUALIFY	See table 1a	0/1	1	BCCH D/L
CELL_RESELECT_OFFSET	Applies an offset to the C2 reselection criterion. 0 - 126 dB, 2 dB steps, i.e. 0 = 0 dB, 1 = 2 dB, etc.	0-63	6	BCCH D/L
TEMPORARY_OFFSET	Applies a negative offset to C2 for the duration of PENALTY_TIME. 0 - 60 dB, 10 dB steps i.e. 0 = 0 dB, 1 = 10 dB, etc. and 7 = infinity	0-7	3	BCCH D/L
PENALTY_TIME	Gives the duration for which the temporary offset is applied. 20 to 620 s, 20 s steps, i.e. 0 = 20 s, 1 = 40 s, etc. 31 is reserved to indicate that CELL_RESELECT_OFFSET is Subtracted from C2 and TEMPORARY_OFFSET is ignored.	0-31	5	BCCH D/L
LSA_OFFSET	Applies an offset to be used for LSA cell re-selection between cells with the same LSA priorities. 0 = 0 dB, 1 = 4 dB, 2 = 8 dB, 3 = 16 dB, 4 = 24 dB, 5 = 32 dB, 6 = 48 dB, 7 = 64 dB	0-7	3	BCCH D/L
PRIO_THR	The PRIO signal strength threshold is related to RXLEV_ACCESS_MIN. 0 = 0 dB, 1 = 6 dB, 2 = 12 dB, 3 = 18 dB 4 = 24 dB, 5 = 30 dB, 6 = 36 dB, 7 = ∞ dB	0-7	3	BCCH D/L
LSA ID	The LSA identities for the cell			BCCH D/L
Qsearch_I	Search for 3G cells if signal level is below (0-7) or above (8-15) threshold 0 = - 98 dBm, 1 = - 94 dBm, ... , 6 = - 74 dBm, 7 = ∞ (always) 8 = - 78 dBm, 9 = - 74 dBm, ... ,	0-15	4	BCCH D/L

	14 = - 54 dBm, 15 = ∞ (never). Default value = ∞ (never).			
Qsearch_C_Initial	Indicates the Qsearch value to be used in connected mode before Qsearch_C is received, 0 = use Qsearch_I, 1 = ∞ (always). Default value = use Qsearch_I.	0/1	1	BCCH D/L
XXX_Qoffset	Applies an offset to RLA_C for cell re-selection to access technology/mode XXX (one or more) 0 = - ∞ (always select a cell if acceptable), 1 = -28 dB, 2 = -24 dB, ... , 15 = 28 dB. Default value = 0 dB.	0-15	4	BCCH D/L
FDD_Qmin	A minimum threshold for Ec/No for UTRAN FDD cell re-selection, 0= -20dB, 1= -6dB, 2= -18dB, 3= -8dB, 4= -16dB, 5= -10dB, 6= -14dB, 7= -12dB. Default value= -12dB.	0-7	3	BCCH D/L

Table 1a: Parameters affecting cell priority for cell selection

CELL_BAR QUALIFY	CELL_BAR ACCESS	Cell selection priority	Status for cell reselection
0	0	normal	normal
0	1	barred	barred
1	0	low	normal (see note 2)
1	1	low	normal (see note 2)

If all the following conditions are met, then the "Cell selection priority" and the "Status for cell reselection" shall be set to normal:

- the cell belongs to the MS HPLMN;
- the MS is in cell test operation mode;
- the CELL_BAR_ACCESS is set to "1";
- the CELL_BAR_QUALIFY is set to "0";
- the Access Control class 15 is barred.

NOTE 1: A low priority cell is only selected if there are no suitable cells of normal priority (see 3GPP TS 03.22).

NOTE 2: Two identical semantics are used for cross phase compatibility reasons. This allows an operator to declare a cell always as a low priority one for a phase 2 MS, but keeps the opportunity for an operator to decide whether a phase 1 MS is permitted to camp on such a cell or not.