

Cellular Signal Strength and Signal Quality

Measurements of Signal Strength and Quality

The following values are approximations and each of these values will vary for different technologies and carriers. BEC does not guarantee adequate performance, regardless of the signal strength and signal quality.

For 4G LTE service mode, there are four relevant measurements:

RSRP - the Reference Signal Received Power is the power of the LTE Reference Signals spread over the full bandwidth and narrowband

RSRQ - Reference Signal Received Quality is a C/I type of measurement and it indicates the quality of the received reference signal

SINR - Signal to Interference plus Noise Ratio. Indicates the throughput capacity of the channel.

RSSI - Received Signal Strength Indicator. RSSI is a negative value, and the closer to 0, the stronger the signal

RSRP

RSRP	Signal strength	Description
≥ -80 dBm	Excellent	Strong signal with maximum data speeds
-80 dBm to -90 dBm	Good	Strong signal with good data speeds
-90 dBm to -100 dBm	Fair to poor	Reliable data speeds may be attained, but marginal data with drop-outs is possible. When this value gets close to -100, performance will drop drastically
≤ -100 dBm	No signal	Disconnection

RSRQ

RSRQ	Signal quality	Description
≥ -10 dB	Excellent	Strong signal with maximum data speeds
-10 dB to -15 dB	Good	Strong signal with good data speeds
-15 dB to -20 dB	Fair to poor	Reliable data speeds may be attained, but marginal data with drop-outs is possible. When this value gets close to -20, performance will drop drastically
≤ -20 dB	No signal	Disconnection

SINR

SINR	Signal strength	Description
≥ 20 dB	Excellent	Strong signal with maximum data speeds
13 dB to 20 dB	Good	Strong signal with good data speeds
0 dB to 13 dB	Fair to poor	Reliable data speeds may be attained, but marginal data with drop-outs is possible. When this value gets close to 0, performance will drop drastically
≤ 0 dB	No signal	Disconnection

RSSI

RSSI	Signal strength	Description
> -65 dBm	Excellent	Strong signal with maximum data speeds
-65 dBm to -75 dBm	Good	Strong signal with good data speeds
-75 dBm to -85 dBm	Fair	Fair but useful, fast and reliable data speeds may be attained, but marginal data with drop-outs is possible
-85 dBm to -95 dBm	Poor	Performance will drop drastically
≤ -95 dBm	No signal	Disconnection

Determining Factors of Signal Values

There are many different factors that influence signal strength and quality, including but not limited to:

- Tower load
- Proximity to the cellular tower
- Signal going through a cellular repeater
- Competing signals
- Physical barriers (mountains, buildings, trains, etc.)
- Weather

Disclaimers

- Both Signal Strength and Signal Quality must be considered for successful cellular data connection
- Measured or reported values vary by modem, carrier, and network environment
- There is no black/white answer to what constitutes a successful connection
- Although signal strength may appear to be adequate, throughput speeds may vary due to dependencies on cellular tower loads

Keep in mind that measurements of signal strength and signal quality for a specific moment do not reflect on the stability of a connection, as these values will vary as conditions change.