

Industrial Modems: Signal Strength Factors

What You Will Learn

- What factors are important when analyzing cellular modem connectivity.
- How to interpret signal strength values.
- Accessing those values through the Flight mobile app.



SEE IT IN ACTION



Signal Strength Metrics

Signal strength is a critical factor in the performance of cellular modems because it directly impacts the reliability, speed, and stability of data transmission. A strong signal ensures that the modem can maintain a consistent connection to the cellular network, reducing latency and minimizing the risk of dropped connections. Conversely, weak signal strength can lead to slower data rates and frequent interruptions, the modem works harder to stay connected.



There are four primary metrics that should be considered when evaluating modem performance:

METRIC	LONG NAME	DESCRIPTION
RSRP*	Reference Signal Received Power	Signal strength metric. Indicates how strong the connection is between the modem and cell tower.
RSRQ*	Reference Signal Received Quality	Quality of the reference signal received by the modem from the tower.
SINR*	Signal to Interference & Noise Ratio	Indicates the clarity and usability of the received signal.
RSSI	Received Signal Strength Indicator	Measurement of the power present in a received radio signal.

*Metrics primarily used for troubleshooting.

Signal Strength Metrics can be viewed in your Flight account. [Login here.](#)



Why It Matters

RSRP:

Vital for modem performance because it determines whether the device can maintain a stable link with the network. Poor RSRP often leads to slow data rates or dropped connections. For troubleshooting, RSRP is used alongside RSRQ (quality) and SINR (clarity) to get a full picture of network health.

SINR:

Even if RSRP (signal strength) is strong, low SINR means interference dominates. This can cause reduced data rates, higher latency and frequent retransmissions.

RSRQ:

Determines whether the modem can maintain a stable and high-quality connection. Even if RSRP (signal strength) is strong, poor RSRQ means heavy interference, which can cause slow data rates, dropped sessions, and unreliable connectivity. It reflects network health and interference levels, making it essential for troubleshooting and optimizing modem performance.

RSSI:

Represents the aggregate received power, including the desired signal, interference from other cells and background noise. Higher (less negative) values generally mean stronger over signal, but RSSI alone doesn't distinguish between useful signal and associated interference.

Measurement Guides

RSRP	Signal Strength
≥ -80 dBm	Excellent
-80 dBm to -90 dBm	Good
-90 dBm to -100 dBm	Fair to poor
≤ -100 dBm	No signal

RSRQ	Signal Quality
≥ -10 dB	Excellent
-10 dB to -15 dB	Good
-15 dB to -20 dB	Fair to poor
≤ -20 dB	No signal

SINR	Signal Strength
> 20 dB	Excellent
13 dB to 20 dB	Good
0 dB to 13 dB	Fair to poor
≤ 0 dB	No signal

RSSI	Signal Strength
> -65 dBm	Excellent
-65 dBm to -75 dBm	Good
-75 dBm to -85 dBm	Fair to poor
-85 dBm to -95 dBm	Poor

FLIGHT: Accessing Signal Quality Metrics

The Flight mobile app provides current and historical signal quality data. To view a video that shows where this information is located as well as a few commonly used signal strength features, visit flightmodem.aquaphoenixsci.com.

You must be a Flight customer to log into the mobile app. The Teltonika RMS app can be downloaded for Android and iOS.