Addendum: Testing Signal Strength, NTC-100 Modems

Important:

This addendum should be read in addition to the manual for PLUS/Multi.

The Plus/MULTI manuals need additional information regarding how to check the signal strength for the NTC-100 modem.

- It only contains information on useful AT commands for non- LTE modems as the AT+CSQ command only reports the RSSI, which is not the most relevant signal strength indicator.
- While we are updating the manuals, this addendum is needed by customers.

Indicators of Signal Strength

For LTE networks **RSRP** (Reference Signals Received Power) can be used as a primary indicator of signal strength.

RSRQ (Reference Signal Received Quality) can be used as a secondary indicator of signal strength / quality in cases when the RSRP indicates poor signal strength.

The NTC-100 modem supports the network service command **AT+QCSQ** to query and report signal strength, including RSRP and RSRQ. See below for usage information.

Visual – LED indicator

The NTC-100 also has a Network LED which visually indicates the RSRP.

The table below details the signal strength relative to the reported value from the network service command.

Signal Strength	Network LED (RSRP)	RSRP	RSRQ
Excellent	GREEN	> -90	> -10
Good	AMBER	-90 to -100	-10 to -15
Fair	RED	-100 to -120	-15 to -20
Poor	Off	< -120	< -20

Network Service Commands

USAGE:

AT+QCSQ

RESPONSE:

+QCSQ: “CAT-M1”,<LTE_RSSI>,<LTE_RSRP>,<LTE_SINR>,<LTE_RSRQ>

LTE_RSRP – An integer indicating the reference signal received power (RSRP).

LTE_RSRQ – An integer indicating the reference signal received quality (RSRQ) in dB.

Example Results:

Test scenario: Antenna 1

+QCSQ: "CAT-M1",-71,-103,79,-16

RSSI -71

RSRP -103 Fair

SINR 79 Poor

RSRQ -16 Fair

Test scenario: Antenna 2

+QCSQ: "CAT-M1",-69,-98,106,-12

RSSI -69

RSRP -98 Good

SINR 106 Fair

RSRQ -12 Good

Probe Upload Rate

In situations with poor signal strength, users may wish to increase the probe upload rate.

This will cover the case where there are missed uploads due to low signal strength and avoid long delays for probe data to be available.