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This technical advisory notice describes a rare connectivity issue that can occur when Particle devices attempt to connect to a partner network for the first time.

The following SKUs are affected running Device OS version 4.0.2 or 5.3.0 and below:

- BRN404X - Boron LTE CAT-M1 (NorAm) (BRN404X, BRN404XKIT, and BRN404XTRAY50)
- B404X - B-Series LTE CAT-M1 (NorAm, EtherSIM) (B404XMEA, B404XMTY)
- E404X - E-Series LTE CAT-M1 (NorAm, EtherSIM) (E404XTRAY50)

All devices running Device OS firmware 4.0.3 and above in the 4.x LTS release line, and 5.3.1 and above in the 5.x developer preview line, are not impacted by this advisory note.

Root Cause and Symptoms

Due to a configuration issue occurring in the SIM cards that are embedded within the Particle hardware modules, upon initial connection from a factory fresh state, these devices can struggle to connect to the network depending on operator coverage of where they are initially located.

This issue is only related to the AT&T 4G LTE/CAT-M1 network - if a device can find connectivity on other partner networks, then this issue is not observed and devices operate normally.

The observed impact from a device perspective is that the device is stuck in a loop of repeated network disconnections. When this issue occurs, an affected device will blink green continuously (if the system RGB LED is implemented and enabled, the default configuration when we ship a device to an end customer).

A device stuck in this state will repeatedly try to connect to AT&T. During this period, a stuck device will not connect to the Particle cloud. Devices may eventually connect over a period of a day, but it is not guaranteed without performing the mitigation methods described below.

There are a number of reasons for blinking green, however. Also be sure that:

- The SIM is activated
- Your device has adequate power
- There are available cellular carriers with adequate signal strength where the device is located
- The device is in a supported region (LTE Cat M1 devices can only be used in the United States, Canada, and Mexico)

Mitigation

Particle has implemented a fix within Device OS for this issue. If your devices are impacted by this issue, the recommended mitigation is to upgrade to Device OS => 4.0.3 or >= 5.3.1 via JTAG or USB.

Additionally, you can ensure you have a strong T-Mobile signal to allow your devices to connect to an alternate network other than AT&T. Ways to do this may include:

- Changing the location devices are provisioned at your facility to increase signal strength in general
- Professionally installing a quality 4G cellular repeater if your signal is below -100dBm

Revision history

TAN released April 13, 2023.