NS003

Hardware and Connectivity Troubleshooting guide

Date	**2021/12/08**
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Revision	**2**

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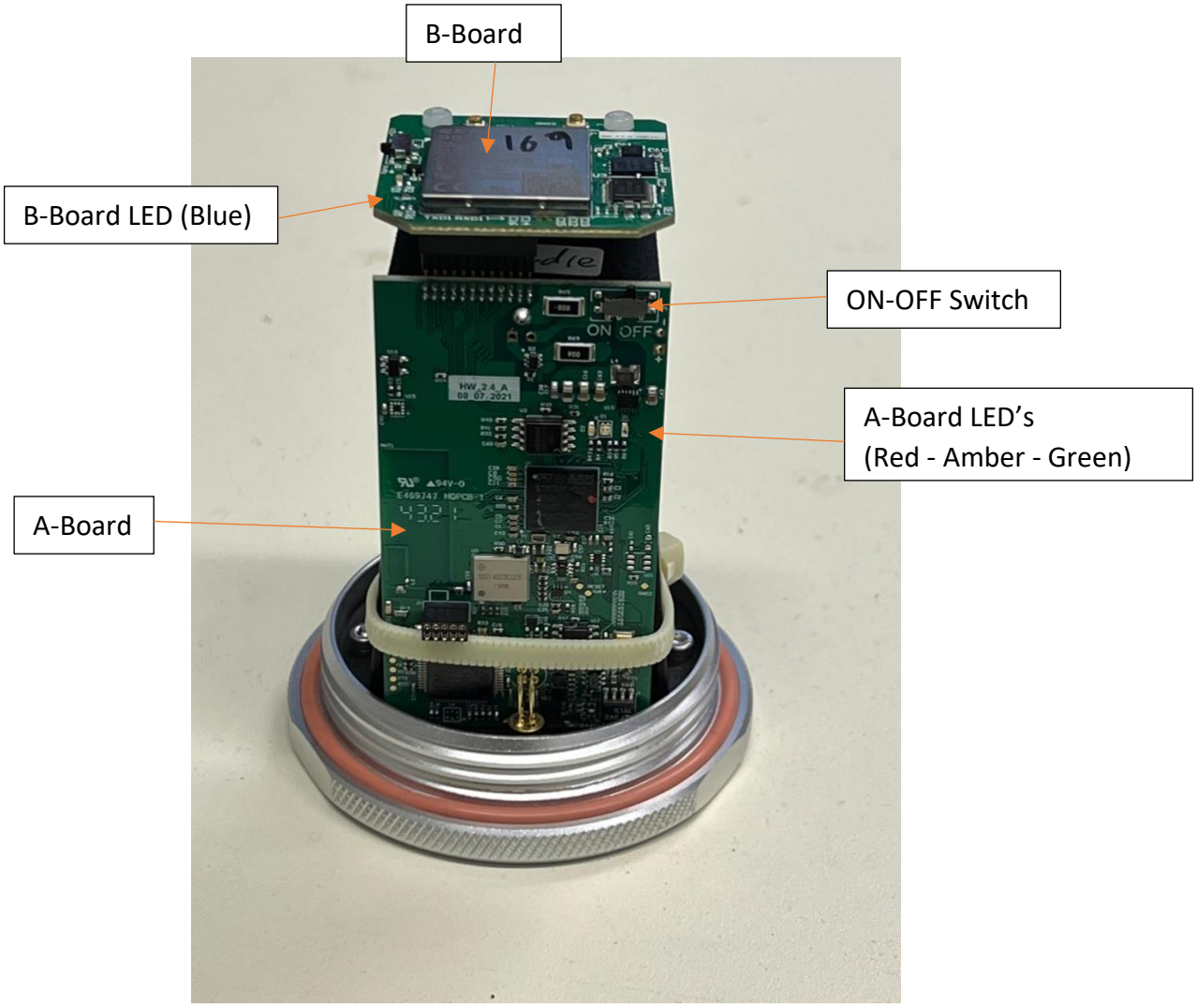
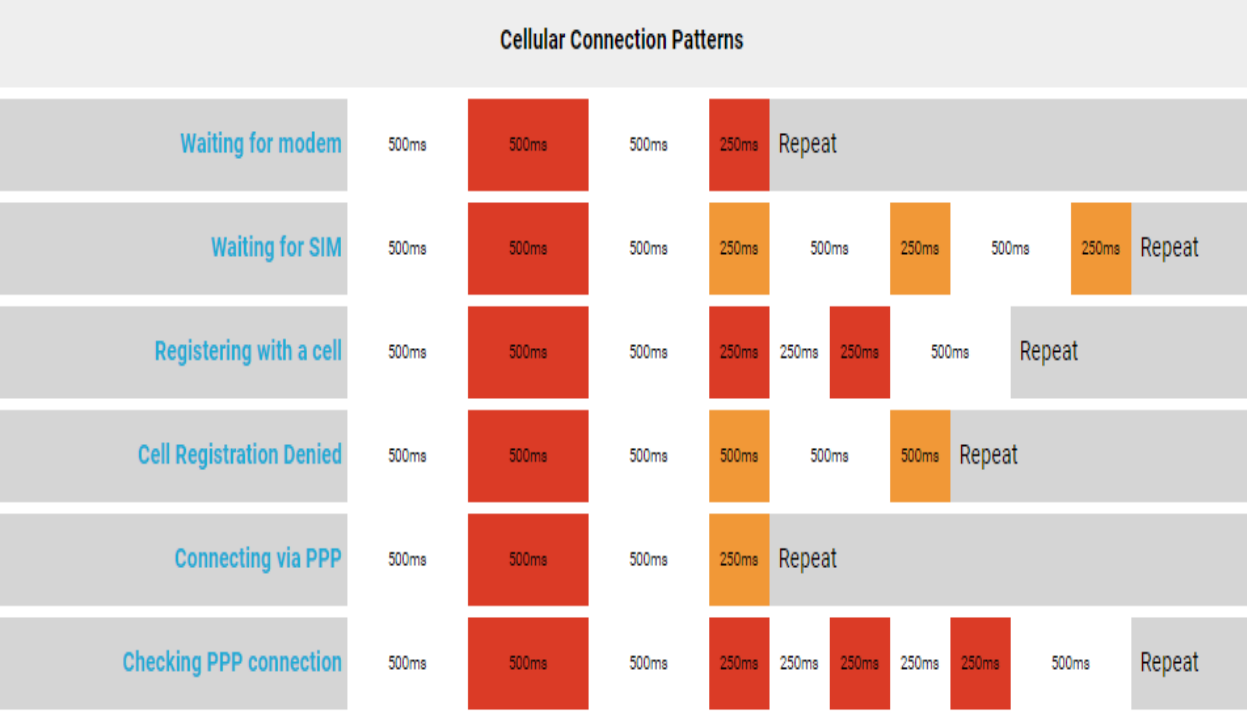
2. Hardware overview



3. Cellular Connectivity troubleshooting

3.1. A-Board LED Blinking pattern



3.1.1. Waiting for modem.

The modem on the device is initialising and preparing to ask for a cellular signal.

3.1.2. Waiting for sim.

The modem is ready to connect to a network, and the sim is instructed to start looking for anearby signal.

3.1.3. Registering with a cell.

The sim card has found a cell network and is attempting to register sim information as wellas cellular connectivity information, such as data plans and data provider.

3.1.4. Cell registration is denied.

If cell registration is denied, this indicates that either the sim card was not configured properly, or that the cellular network in the area is not accepting data transfers from the sim card. Please check that sim card information has been entered properly and that the correctcellular network information has been chosen for the specified region.

3.1.5. Connecting via PPP (Point to Point protocol).

Point-to-Point Protocol (PPP) is a data link layer (layer 2) communication protocol between two routers directly without any host or any other networking in between. It can provide

connection authentication, transmission encryption, and data compression. Since IP packets cannotbe transmitted over a modem line on their own without some data link protocol that can identify where the transmitted frame starts and where it ends, Internet service providers (ISPs) have used PPP for customer dial-up access to the Internet.

3.1.6. Checking PPP connection.

Once connected to a PPP, the sim will proceed to check that the PPP connection is strong, secure, and capable of transmitting and receiving data packets.

3.2. B-Board LED Blinking pattern

The LED on the B board will blink blue in various patterns, indicating various connectivity stages:

3.2.1. LED not blinking

This indicates that the B board is off and not attempting a cellular connection. Please ensure that the Bboard is attached correctly, and that the sensor is blinked up to cellular.

3.2.2. LED blinking long off short on.

This indicates that the board is searching for a network and attempting to connect to a tower.

3.2.3. LED blinking long on short off.

This indicates that the board has found a network and is securing a cellular connection.

3.2.4. LED blinking quickly.

This indicates that the board is transferring data to the connected network.

4. Hardware Troubleshooting

4.1. The Sensor is not powering on.

4.1.1. Check if the power switch is on:

- Switch the sensor on by moving the switch in the ON direction.
- Once the switch is on a red led will start flashing. It might take 1 to 2 minutes till the green-colored LED starts blinking on the sensor to indicate a successful connection to the.
- If you see a green light flashing. The sensor now can be closed and please make sure the enclosure is tight enough so no moisture or dirt can go inside.

4.1.2. Check the battery voltage:

- If the battery voltage is below 3.3 volts. Please contact Nanoprecise to get a new battery.

4.1.3. Check battery installation

Ensure that the positive and negative terminals of the battery are making good contact with the terminals of the sensor, as shown in the picture below.

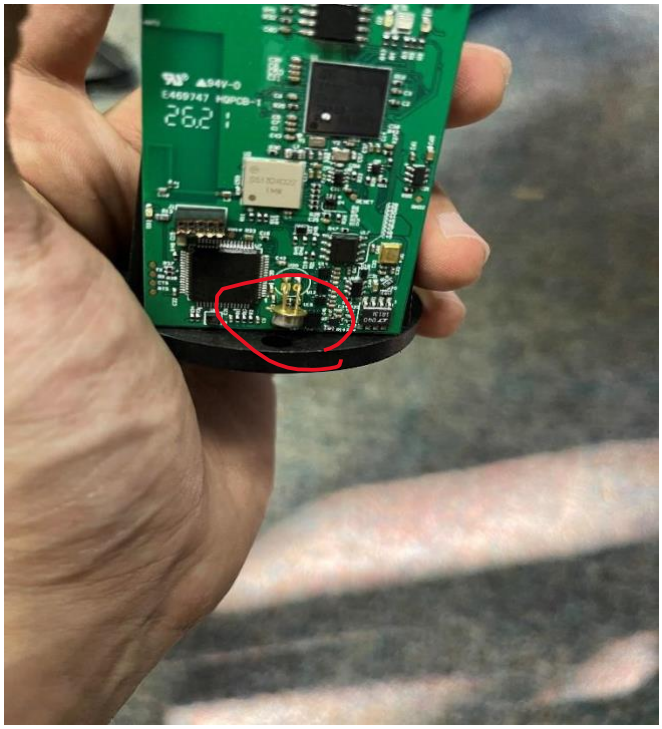
4.2. Troubleshooting the A board.

4.2.1. Check for damage on board

Ensure that no pins on the A board are bent, and that the switch is functioning and can move between the on and off position freely.

4.2.2. Verify IR sensor position

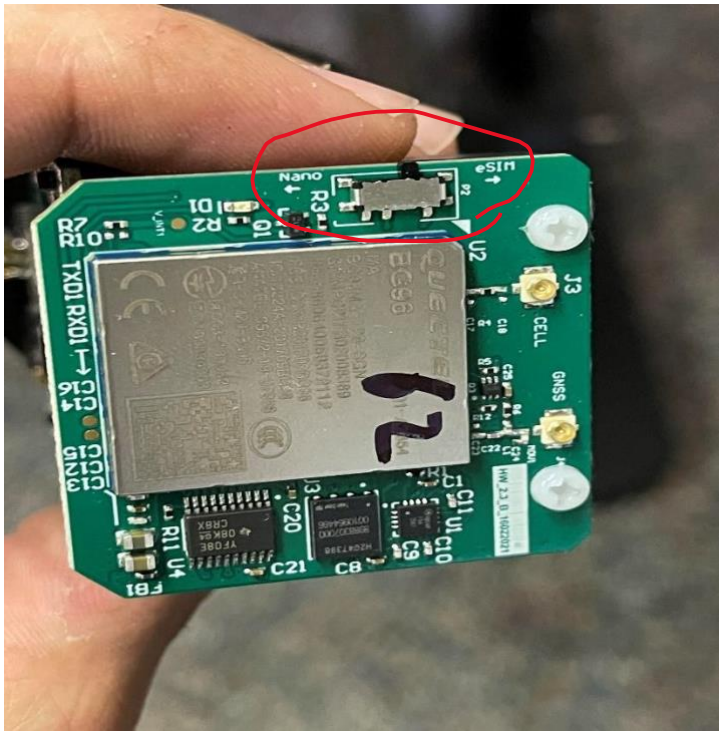
Ensure that the IR sensor is positioned correctly, with the bottom of the IR sensor pointing downwards and through the hole, as shown in the below images.



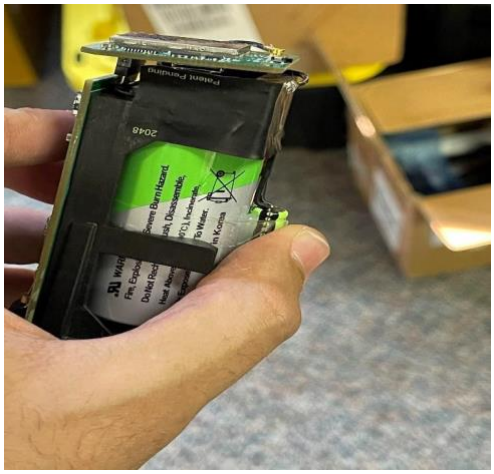
4.3. Troubleshooting the B board.

4.3.1. Ensure that the eSim Switch is selected.

When not using a physical SIM card, assure eSim position is selected on switch.



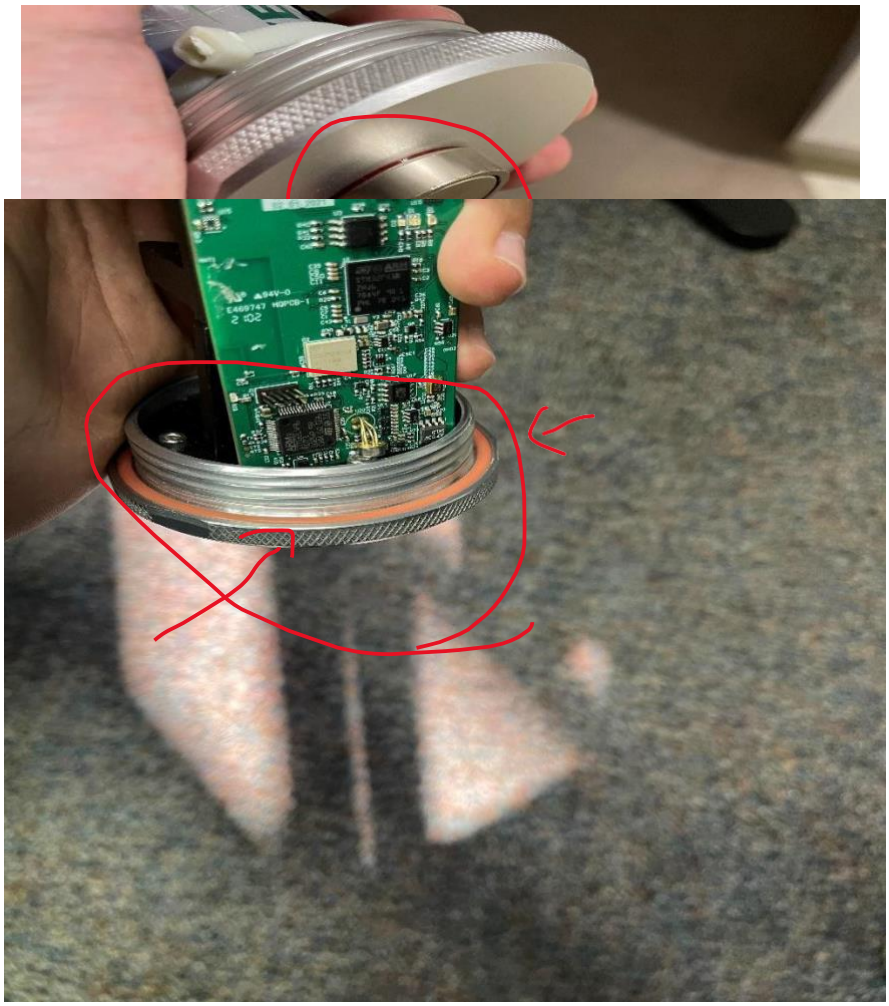
4.3.2. Ensure that the antenna is correctly positioned.



4.4. Troubleshooting the sensor enclosure.

4.4.1. Ensure that three base screws are present and secured.

4.4.2. Ensure that the magnet at the bottom of the sensor is screwed in securely, with thread locker applied.



4.4.3. Ensure that the O-ring is in place at the inner base of the sensor, as this ring provides a strongseal and prevents dust, debris, and other environmental elements from entering the inner sensor enclosure.

4.4.4. Ensure that the sensor housing closes properly, and that it is not damaged.

5. WIFI Blink up Troubleshooting

5.1.1. Stuck at 'No WiFi settings' (long amber flash)

The imp hasn't received any BlinkUp settings — try BlinkUp again. Try to block out any directbright lights, or perform a BlinkUp in the shade, and hold the device still during the process.

5.1.2. Stuck at 'Searching for WiFi network' (long red flash followed by two short red flashes)

Check that your network name (SSID) has been entered correctly, making sure that you observe capitalization, special characters etc. imp001-, imp002- and imp003-based devices will only join 2.4GHz WiFi networks. imp005-based devices can connect to both 2.4GHz and 5GHz WiFi networks.

5.1.3. Stuck at 'Joining WiFi network' (long red flash followed by three short red flashes)

Check that your network password has been entered correctly, making sure that you observe capitalization, special characters etc.

5.1.4. Stuck at 'Getting IP address' (alternating short red and amber flashes)

Ensure that DHCP is active on your router and has sufficient IP addresses for all of yourdevices, including your imp-enabled device. Also check that 'MAC address filtering' isn't enabled, or if it is that it isn't denying the imp access to the network.

5.1.5. Stuck at 'Resolving server name' (alternating short amber and red flashes)

Check the DNS settings on your router. Devices still running early versions of impOS™ maybe confused by the 'DNS Relay' mode on some routers — try disabling this mode.

5.1.6. Stuck at 'Connecting to server' (alternating long amber and short redflashes)

Check the firewall settings on your router. The imp needs to make a TCP connection to port31314; ensure this is not blocked. Only TCP 31314 needs to be open; UDP 31314 can remain closed.

5.1.7. Connects to server (green flash), then flashes red, then repeats?

This is usually the symptom of a runtime error in the device's Squirrel code. For developerdevices, an error message will be logged in impCentral™ when this happens.

5.1.8. Connects to server (green flash), then flashes orange only?

This usually indicates that the imp has been rejected by the server. Are you using the wrong type of app? A production device cannot be configured with the Electric Imp mobile app, forexample.

5.1.9. The LED stays red or flashes red very rapidly?

This indicates a power supply issue. The device boots, turns the red LED on and then triesto activate Wi-Fi. However, the Wi-Fi power draw reduces the on-board imp's operating voltage below tolerance and the imp resets. This continues *ad infinite*. Check the power supply feeding your device.