

LidarLiteBank identifies which Lidar sensors are connected over I2C, and initializes them to the correct address(es). It then passes control of each sensor to the corresponding LidarLite, which configures the sensor and begins a read loop.

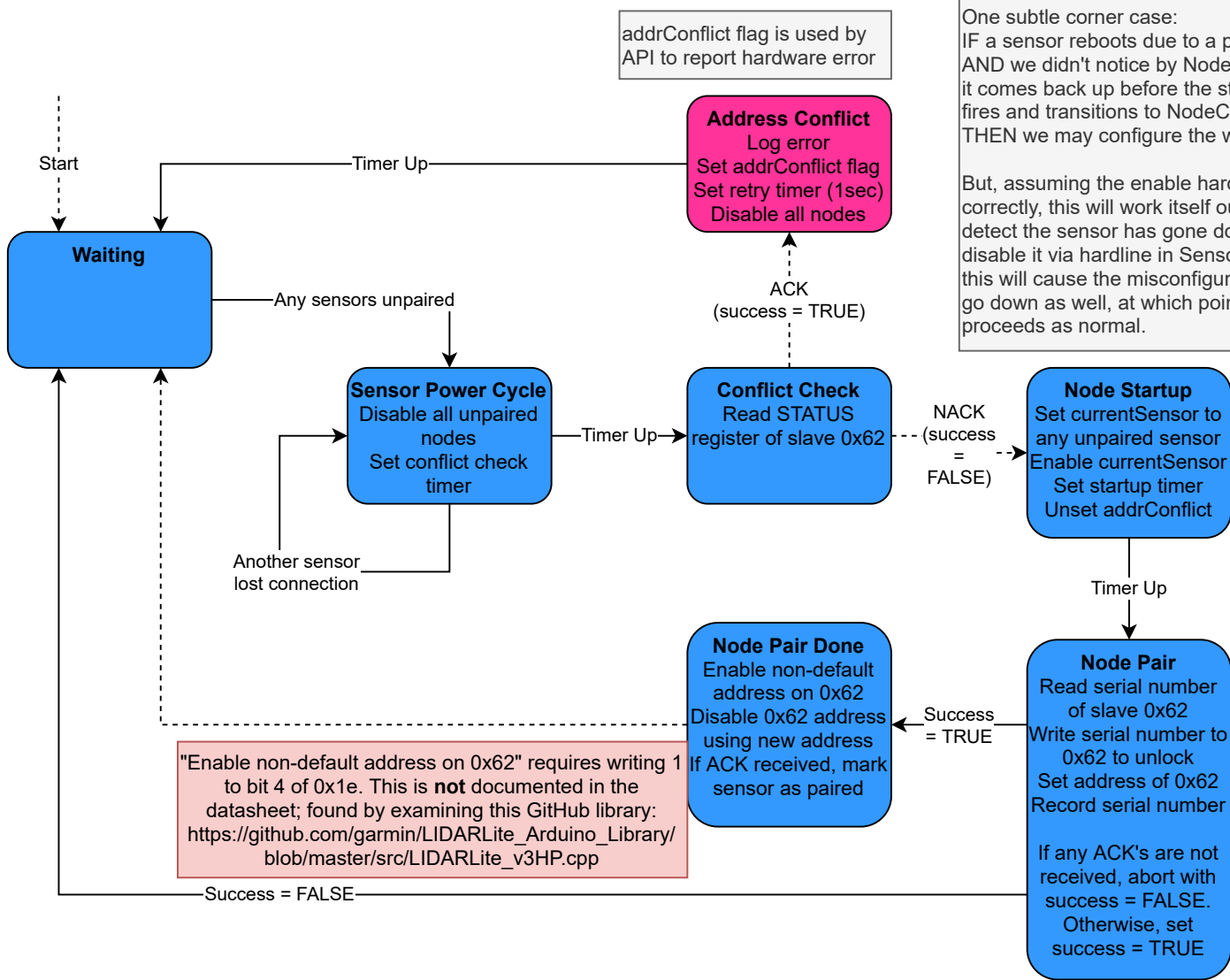
Key features:

- 1. Correctly identifies which sensor is which using the enable lines
- 2. Automatically reconnects to sensors when they are power cycled
- 3. Sensors are hot-pluggable and can be replaced even while the controller is running
- 4. Handles all sensors fairly and separately; i.e. If one sensor is missing, the others will still auto-connect just fine.

Notes:

- In the NodeStartup state, currentSensor is selected by incrementing the counter from its previous value (mod NUM_SENSORS) until an unpaired sensor is found. This ensures that, if one device is missing, the other devices can still be paired, as currentSensor won't get "stuck" on the missing sensor.
- Per the datasheet, startup time is about 22ms. The startup timer (and the duplicate startup timer) is set at 50ms. If a sensor takes longer than this to come up, the pairing process will fail.

To edit this document, open the *.drawio file in <https://diagrams.net>.



LidarLiteSensor controls a single laser distance sensor. It must be paired by LidarLiteBank. Once paired, it configures its sensor, and then reads the current height value at regular intervals.

- Key features:
- 1. Automatically detects disconnection (i.e. sensor lost power)
 - 2. Minimal I2C bandwidth (once configured, just a 5-byte message every time the timer rings).

From reading the datasheet, it appears 100Hz is a good read frequency, so the read timer is set at 10ms.

- This has the added advantage that 10ms is less than the sensor startup time, so if a device goes down we're almost guaranteed to detect it *before* it comes back up. This makes the pairing process more efficient and less error-prone. (In particular, it's hard to enter the AddressConflict state accidentally)
- The LidarLite sensor is also configured to use a 10ms timer between readings. This timer does NOT account for time spent taking a reading though, so the actual update rate will be slightly less than 100Hz.

Future features:

- Could add some signaling between LidarLiteBank and LidarLiteV3 about when to measure. This would allow spreading the load, decreasing the max cycle time of the LidarLite control logic.

