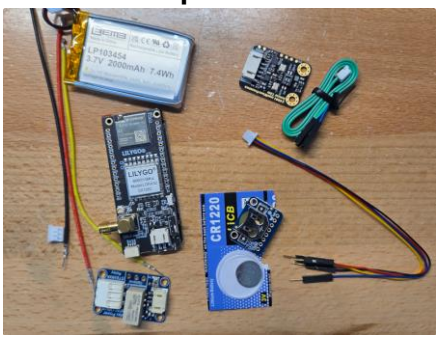
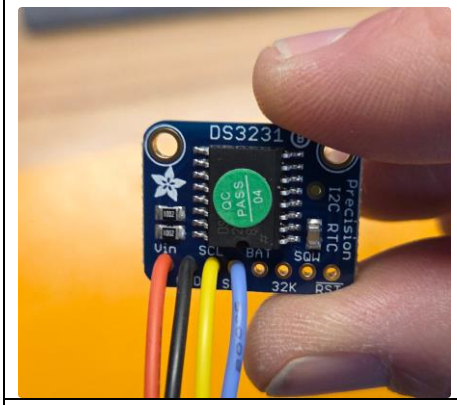
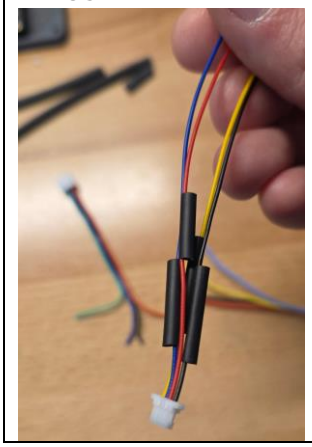
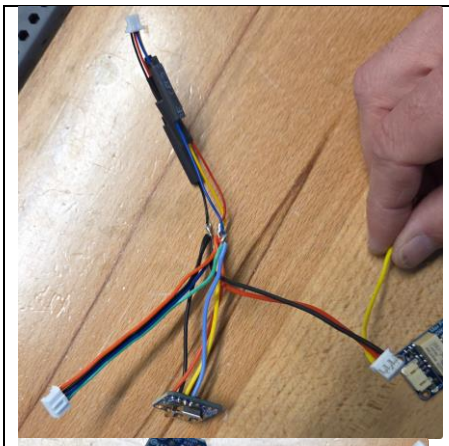
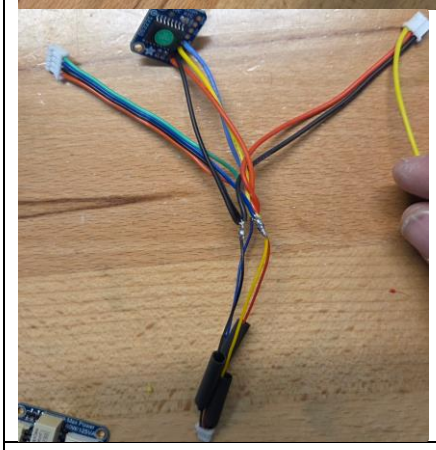
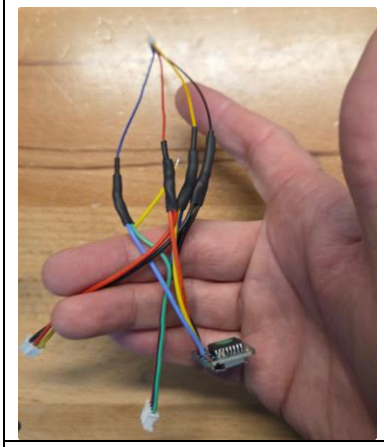
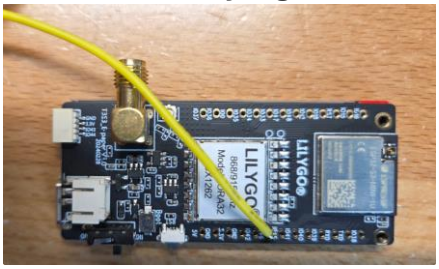
ChatterBox E-Paper Proximity Node Assembly

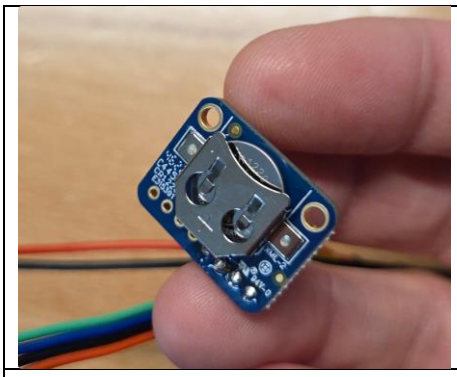
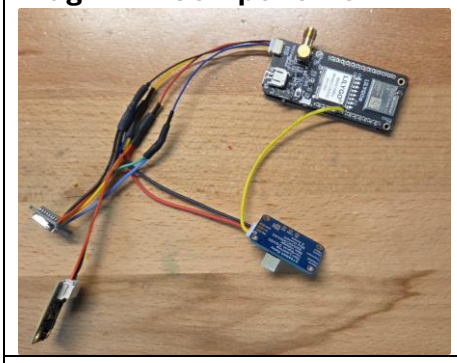
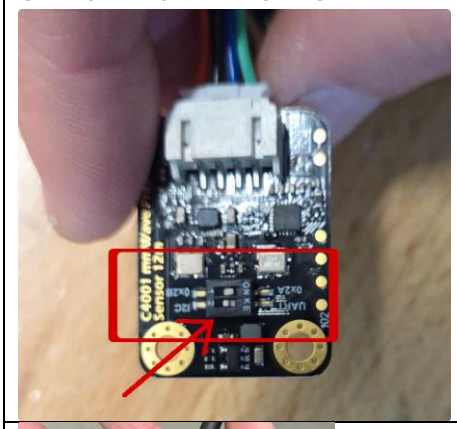
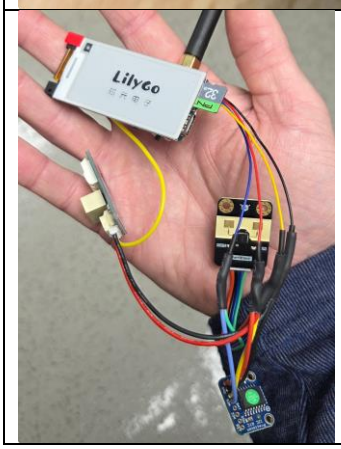
Based on Lilygo T3S3 E-Paper

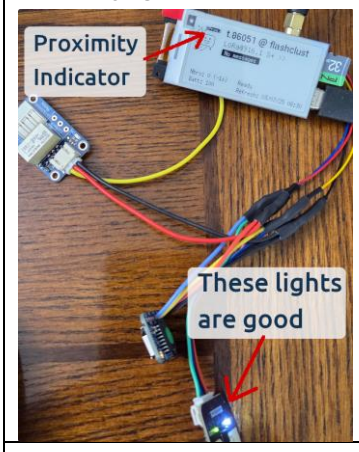
WARNING: Do not attempt unless you have a good understanding of electricity, wiring, and batteries. LiPo batteries can be dangerous and cause fires!

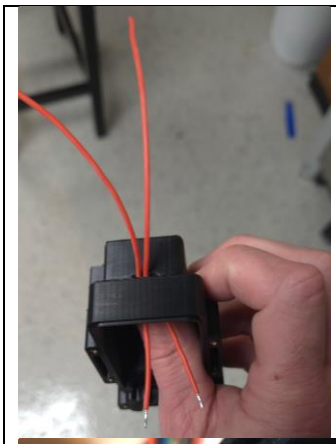
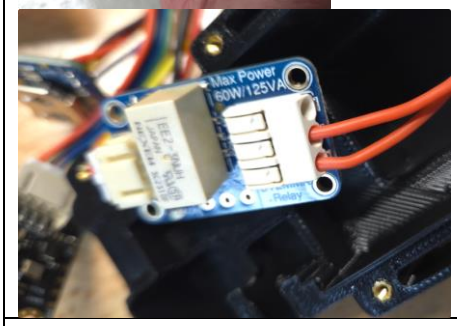
Print your Case 	This enclosure is a work in progress. 3D print the enclosure for your E-Paper Mini Node. There are 3 parts to the enclosure, which you can download here. **STL Format** Case Front Case Back On/Off Switch **3MF Format** All in One

Gather Components 	You will need the following components: Lilygo T3S3 E-Paper (Source: Rokland) Adafruit DS3231 2000 mAh LiPo Battery Qwiic Connector SD Card M2 Knurled Nuts M2 Bolts DFRobot mmWave Sensor Adafruit Non-Latching Relay
Solder Qwiic Connector to RTC 	On the DS3231, we only connect VIN, GND, SDA, and SCL. Red : VIN Black: GND Yellow: SCL Blue: SDA This device will be completely connected to both the proximity sensor and the T3S3, as they're sharing an I2C bus.
Prepare the Qwiic connector wires 	I slide some heat shrink insulation over the wires before doing any soldering, since it won't be possible after this step.

 	As I said, the RTC and Proximity completely share I2C connections and vcc/ground. The Relay shares vcc/ground, but has a separate signal wire that will be connected to T3S3 pin 46. Go ahead and connect all the wires as shown and solder them. The image is shown from a couple of angles for clarity. All red/black wires are paired with red/black wires. The proximity sensor's blue wire is actually the I2C clock wire, so it pairs up with the RTC yellow and Qwiic yellow. The proximity module's data wire is green, so the proximity green wire pairs up with the RTC blue and Qwiic connector's blue wire.
Final view of Wires 	Here's what the final set of wires looks like, ready to plug into all components. I've moved the heat shrink over the soldered joints and heated it.
Solder the Relay Signal Wire  Add the RTC Battery	The remaining yellow wire from the relay connects to pin 46 on the T3S3.

	
Plug in All Components 	This is straightforward as each plug can only fit in one place and one direction.
Switch the DFR to I2C 	The DFR UART/I2C switch should be moved to the **I2C** position. You'll probably need to get your reading glasses out for this, if you didn't already have them out. The address switch should be in the 0x2A position (normally it's already in that position).
	This is what it looks like all together (minus enclosure). It's ready to start up and try out at this point.

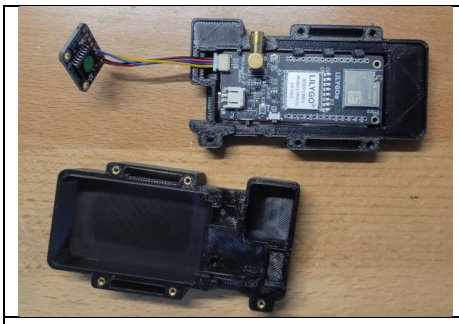
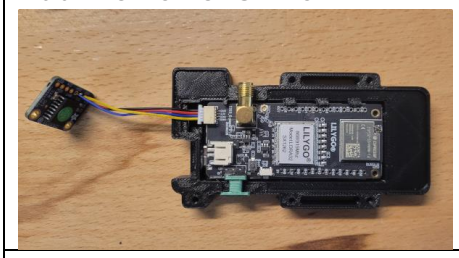
Install the ChatterBox Firmware 	At this point, we should be able to see if everything is working by flashing the device and getting the device onboarded. If you don't see the proximity indicator and/or lights on the proximity module, something isn't wired right or one of the components has an issue. You can download the firmware at: https://www.offgridcomms.club/firmware https://chatters.io/flash
The Node is Working – Now Insert into the Enclosure	
Press Nuts Into Case Back 	Press knurled nuts into the 5 bolt holes of the case back as shown. You need to heat the nuts so they can seat into the case back. There are inexpensive soldering tips for this, but you can also use a heat gun
Connect Relay Circuit Wires	I'm not actually putting this node into a circuit at this time, but it's easier to insert the circuit wires now and just leave them disconnected from anything now than it is to open this enclosure and do it later. I tin the wire ends so they're a little easier to insert into the adafruit relay, but you could use solid copper wire and that would work just fine too. Press the plastic tabs lightly to give the wire a little more room to slide in.

<table>
<tr><td> 
  </td><td></td></tr>
<tr><td>Insert the Sensor and Relay into the Enclosure
  </td><td>The metallic side of the proximity sensor is the detection side, so you want that facing out/away from the rest of the components. There is room to add the relay right over top of it, as shown here.

Of course, you may want to design or find your own enclosure instead.</td></tr>
<tr><td colspan="2">The remaining steps are a work in progress, as the 3d enclosure is in the process of being modified to have room for everything. If you are using your own enclosure, you can install the components into your enclosure at this point, and your node will be ready to use.

The images below do not match the proximity node, since the case is still being finalized, but the instructions should be consistent.</td></tr>
<tr><td>Gently Seat the T3S3 into the Case Front</td><td>You have to be careful here, and use your fingers to pry the window opening of the case front a little.

Remember, the front of the T3S3 is thin glass and will easily break if pressure is put on the edges or corners. So as you’re seating the T3S3 in place, do whatever you need to to ensure you’re not harming the glass front.</td></tr>
</table>

	
Add the Power Switch 	The power switch should snap into place fairly easily.
Connect the Battery 	Connect the battery and insert both the battery and RTC into the case back as shown. Be careful to make sure the polarity of the battery is correct for the T3S3. Markings on the T3S3 show +/- to help you get this right. The plug will not necessarily have the correct polarity, as China-based and American-based sources (Amazon resellers) tend to send opposite polarity.
Close the case	
Install the antenna	