DIY Blackout Comms Communicator

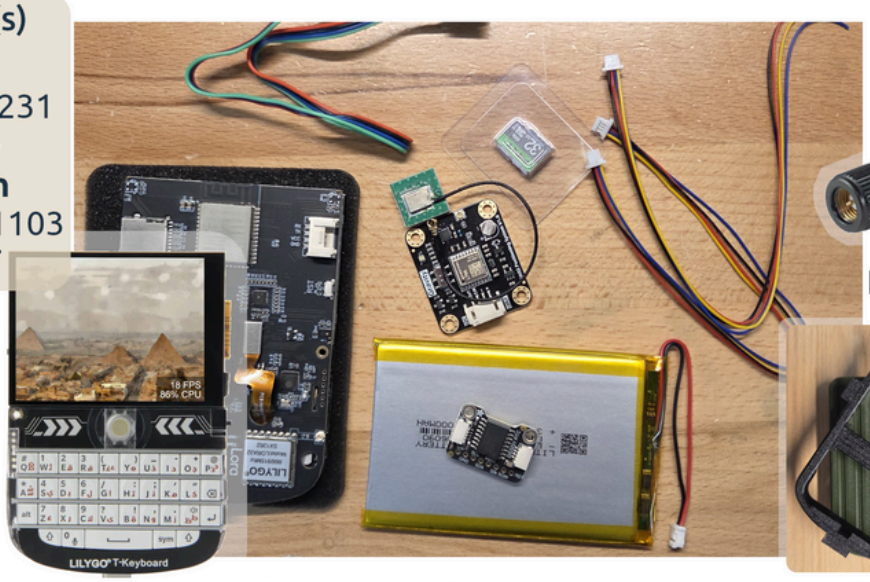
Components Needed:

Time Source(s)

RTC Option
Adafruit DS3231

- and/or -

GNSS Option
DFR Gravity 1103
DFR TEL0157



Connectors
Qwiic, etc

Nuts & Bolts
M3 knurled nuts

Antenna
Lots of options

Battery
5000 mAh
Recommended

Lilygo T-Deck
Download/Print a 3D Case

Micro SD Card
See site for compatible options

Case / Enclosure
Download & 3D Print a Case

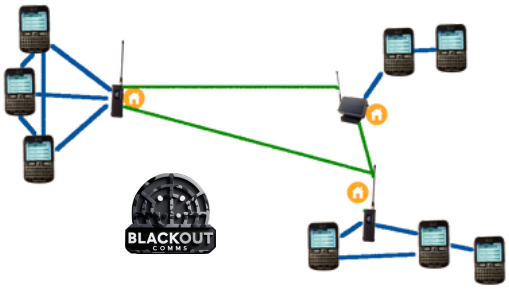
See Full Component List & Links / Sources On The Last Page

You Are Building and Encrypted Off-Grid Mesh Communicator

Blackout Comms firmware allows you to **communicate securely off-grid**. It can run on various devices, including, Lilygo T-Deck, Lilygo Pager, Altware's Full Touch, and more.

Instead of internet & cell service, it uses LoRa, meshing, encryption, and digital signatures for local communication and **does not require service or infrastructure** and works during a grid outage, using local RF signals, encryption, and mesh techniques.

Example Blackout Comms Private Mesh Cluster



Learn more at https://chatters.io

Notice: Assemble at Your Own Risk

You should be familiar with electronics and soldering before attempting this project. This document *may* contain mistakes. ***Mistakes or faulty/incorrect hardware could result in injury, fire, or other damage.***

Print Your Case

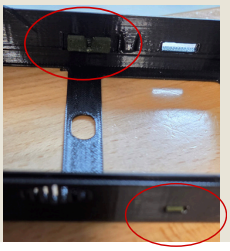
Download printable enclosure files (includes 3MF and STL formats).

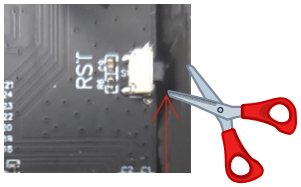
I use Black PETG for the front and colored PETG for everything else. ABS works well too.

Add Case Nuts / Switches

Use a soldering iron tip or other heating method to heat sink the nuts into the locations on the case. 2 M3s will connect the case halves, while all the other nuts shown are M3s.

Add the T-Deck reset & power switch covers.





Clip the T-Deck's Reset Button

The T-Deck's reset button is too long for the enclosure. If you don't clip it to be flush with the side of the T-Deck, the case will hold the reset button down, and the T-Deck will appear to be dead.

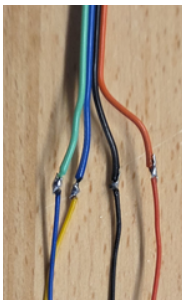
Prepare the T-Deck

- Attach Grove / Qwiic Connector to T-Deck
- Attach pigtail antenna connector
- Move T-Deck speaker out of the way
- Add battery adapter/connector (not the battery yet)
- Remove the screen protective film

**** Carefully press the T-Deck into the case, USB port end first ****

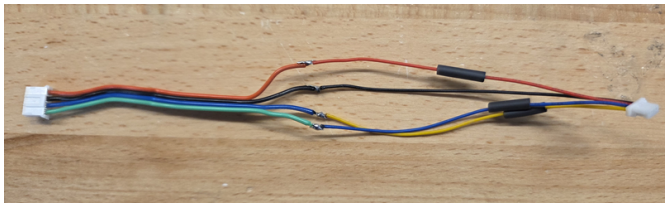
You'll need to spread the case open a little and gently work the T-Deck into place.

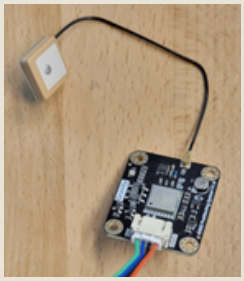
Create a DFRobot / Qwiic Adapter



Create an adapter wire that will allow the DFR cables to attach directly to any Stemma/Qwiic plug. I heat-shrink wrap the connections (they must be insulated). This one there is no pre-made adapter I could find with correct wiring. Beware of any you *do* find as *one* I found has ground/VCC reversed!

Qwiic Yellow/Clk → DFR Blue/Clk
Qwiic Blue/Data → DFR Green/Data
Qwiic Red → DFR Red
Qwiic Black → DFR Black

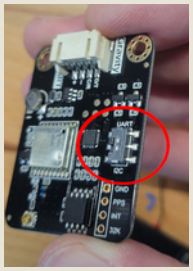


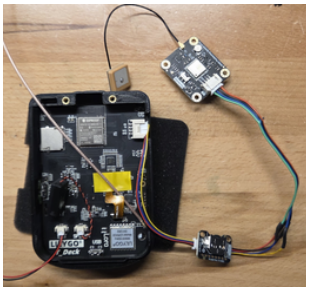


Prepare the DFRobot GNSS

Move the DFR's switch to ***IIC***, and then use a wire cutter/clipper to clip the long plastic switch much shorter. It will just be in the way later on if you don't.

Also, attach the GPS antenna, as well as the cable you just made.



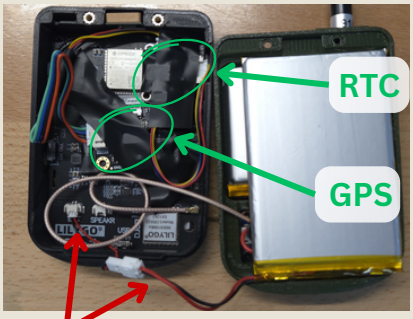


Plug in GPS & RTC

GPS and DS3231 clock are plugged together and to the T-Deck via the Grove/ Qwiic connector as shown.

Add the RTC battery

Insulate metal surfaces of both components with electrical tape so they don't create a short when we mash it all together.



Install the T-Deck Battery & Everything Else

***** Double-check polarity - yours may be different! *****

DO NOT BLINDLY FOLLOW THIS IMAGE! Check your own battery and board polarity.

Plug the battery into the T-Deck when you're sure the polarity is correct. The T-Deck and amp should both be able to take a charge and power on at this point, verifiable by on-board LEDs.

BE CAREFUL. However you connect the battery, be sure the polarity is correct. I test the T-Deck's polarity by checking for continuity between each battery plug pin and the T-Deck's ground. If you don't understand this statement, do not attempt to build this! *If you turn on the power and nothing happens, quickly turn it off and double-check that your polarity is correct.*

Arrange the components in such a way they fit into the enclosure. This isn't as easy as it would seem, as it's a very tight fit. You may even want to consider getting smaller than a 5000 mAh battery. You could easily get by with a 2000 or 2500 mAh battery.

Add the Antenna + SD Card

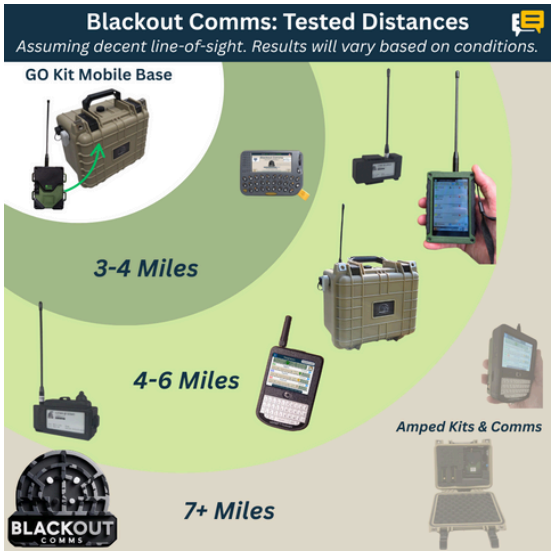
Attach the enclosure's back using a couple of M3 screws.

Insert a compatible SD card.

Now you are ready to flash the firmware.

The USB-C port on the bottom is for both charging and flashing the firmware.

Now you are ready to flash the firmware and create your cluster!



Your cluster is also an encrypted, off-grid *decentralized* mesh cache

Blackout Comms Firmware

DOWNLOAD

After assembling this device, download the firmware for free from *chatters.io*.

User Guide
How to use the T-Deck with Blackout Comms

How it Works
How messaging works in Blackout Comms

Firmware
T-Deck firmware flash page

Firmware Download Mirrors

https://chatters.io/firmware

https://content.chatters.io/esp32/index.html

https://www.meshcomms.club/firmware/esp32/

https://www.offgridcomms.club/firmware/esp32/

Sources used for this build:

Soldering Tools
You will need some basic soldering supplies for connecting wires to one another.

Other Supplies
There may be other miscellaneous supplies/tools not mentioned here.

TDeck	Rokland, Amazon	Dev board (not complete)
T-Deck Battery	Amazon	3.7 LiPo, 5000 mAh. You may want smaller as stated later.
Realtime Clock	Adafruit	DS3231 (Stemma QT)
GNSS/GPS	DFRobot 1103, DFRobot TEL0157	Either option works, often available at Digikey
Antenna & Connector	Rubber Ducky Antenna, IPEX to SMA Male	Antenna + pigtail connector between T-Deck & Amp
Micro SD Card	Amazon	Check compatablity list
Wires	Qwiic, Battery Connector Grove Stemma to Qwiic	*Check your battery polarity* to get correct connector!
Nuts/Bolts	M3 Heat Inset Nuts, M3 Screws	You may use other options, these are what we use
USB Cables	Amazon	Linked one is an example. Need a quality USB-C data cable.

ALTWARE DEVELOPMENT