

CGM in Cloud Info Sheet

Over a year ago, John Costik developed a series of apps to be able to read his son's CGM while he was at school. The idea was to "create a mobile solution that could be carried around", something he was surprised didn't already exist! He and his wife connected their son's Dexcom G4 receiver to an Android smartphone connected by an open source USB, that sends the data to the cloud so it can be accessed from anywhere.

He held on to the code tightly for about a year until he released it in March 2014 on github (an open source code repository) and described his system on his blog: hackingtype1.com. John's story was made public in the November 2013 DiabetesMine article: <http://www.diabetesmine.com/2013/11/diabetes-data-all-with-a-quick-glance-at-your-wrist.html>

Listen to an interview with John on his reasoning for developing the original code: <http://www.blogtalkradio.com/diabetessocmed/2014/05/09/hacking-type-1>

The apps work by connecting a Dexcom G4 receiver to an Android phone via the micro USB port. The USB port on the Dexcom receiver is very weak, many have snapped USB ports after setting up the system and not being careful with the port. The Dexcom connects to the Android with two cords; a USB OTG cable and a micro USB cord. The Android phone has an app installed that pulls the data from the G4 and posts the data to a webapp/server. A second group of dads wrote a webapp that acts as a web-based CGM allowing multiple caregivers to remotely view a patients continuous glucose data in realtime. The continuous glucose data sent from the Android App is displayed on a web browser. Alarms are generated for high and low values, which can be cleared by any watcher of the data. Email alerts are also setup to send an email for low and high cgm levels.

John then integrated his original system into [a Pebble smartwatch](#), allowing quick access to his son's D-data with just a glance at his wrist! The Pebble watch app makes a "call" to the server in the cloud every 5 minutes and displays the value on the watch face and alerts with patterns of alerts or vibrations to low, high, or arrows up or down.

How can you get started:

If you are a programmer, you can access the code for the apps at github and there is a wiki for installation: <https://github.com/rnpenguin/cgm-remote-monitor/wiki>

If you are not a programmer, there is an option to use freelance programmer to compile the apps and build the database for you. Rajat Gupta, a young university student in India, has set

up a number of families to date and is now eager to help others as he has learned about our challenges.

Rajat's plan is to develop the system so that it is more scalable than in its current form with a simple webapp and pebble app. Once the scalable webapp is ready (scheduled for late May/early June) Rajat is willing to setup the system, build the database for each and support the system for major crashes. The software is distributed without charge under open source license, Rajat offers his services for \$11/month for database setup, maintaining the servers, and basic support. If interested in getting started please email Rajat Gupta at rajatgupta431@gmail.com.

The system and apps are not perfect, the database and apps will crash but if you are not waiting like us, then this might be something for you.

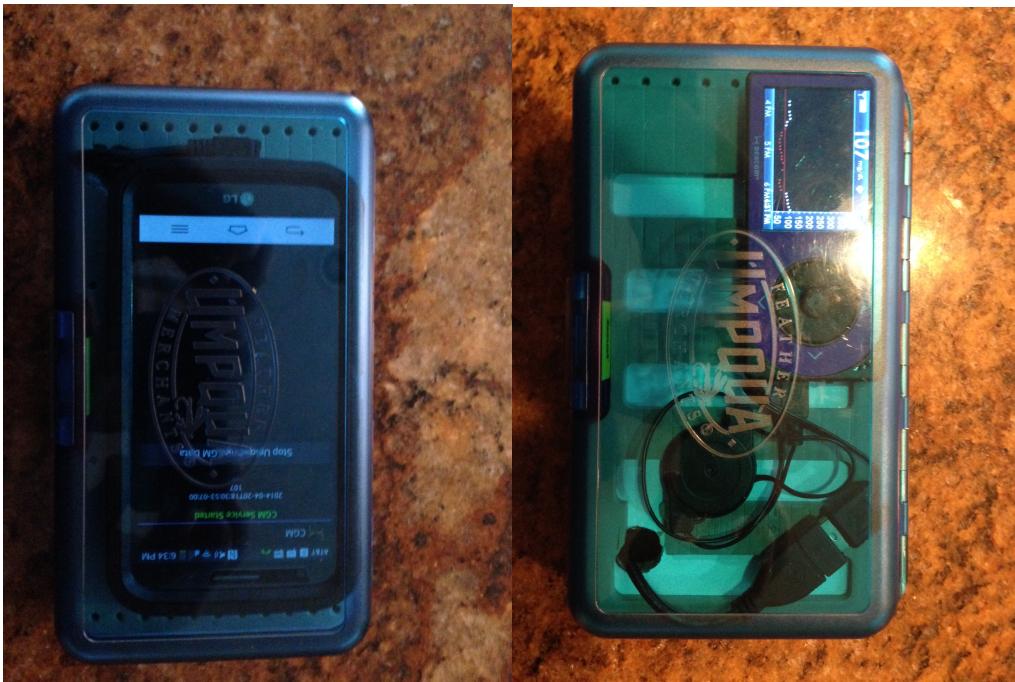
What do you need to get started:

Dexcom G4 Receiver - If you do go down this road, beware that the USB port is incredibly fragile. The Dexcom USB port will break! It was not designed for frequent connect/disconnects. Get a spare:-) and be VERY GENTLE.

Android Phone - See second document for recommended phones/carriers.



Moto X (above) in a clear Scientific Anglers fly box



LG G2 (above) in an Umpqua fly box

USB OTG Cord - Purchased at Fry's electronics



USB OTG Cord (above)

Micro USB Cord (skinny retractable cord works well to not put stress in the USB port) - can be purchased at Fry's electronics, likely available at major Electronics stores and online

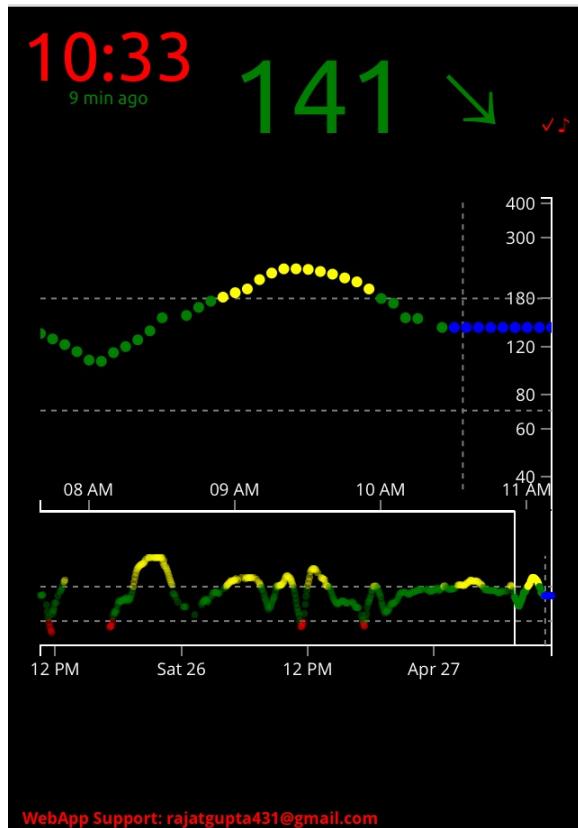


Fly Box - Many of the current users have used double sided fly boxes to create an ambulatory device that can be easily transported. With a Moto G sized phone, it is possible to use a smaller Scientific Anglers Fly Box, with a larger LG G2 or Droid Maxx some have used an Umpqua Large Fly Box pictured above. A hole is drilled into the middle of the fly box to allow the cords to go from one side to the other.

Pebble Watch (optional) - The continuous glucose values can be seen on the webapp on any web browser and therefore can be seen on iphone, android, ipads, computers. A pebblewatch is optional, connects to either an iphone or android phone and allows quick access to D-data with just a glance at your wrist!



3 Apps - Android/CGM App, Webapp, and Pebble App. The apps are still very basic and need a programmer to setup the web server, and customize each the android and pebble app to point to the right server.



Current Webapp on iPhone screen

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Original Android Application and Pebble Application are Copyright (c) 2014, John Costik
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