sparkfun ELECTRONICS

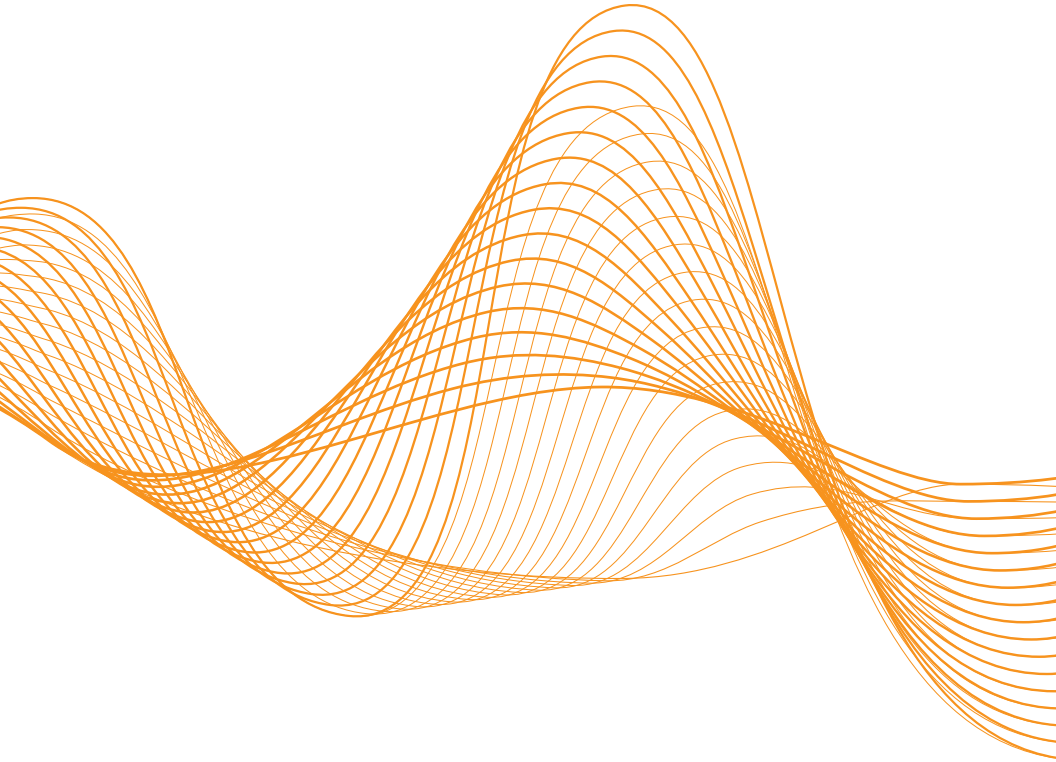
SPARK PNT

Read the Full
User Manual

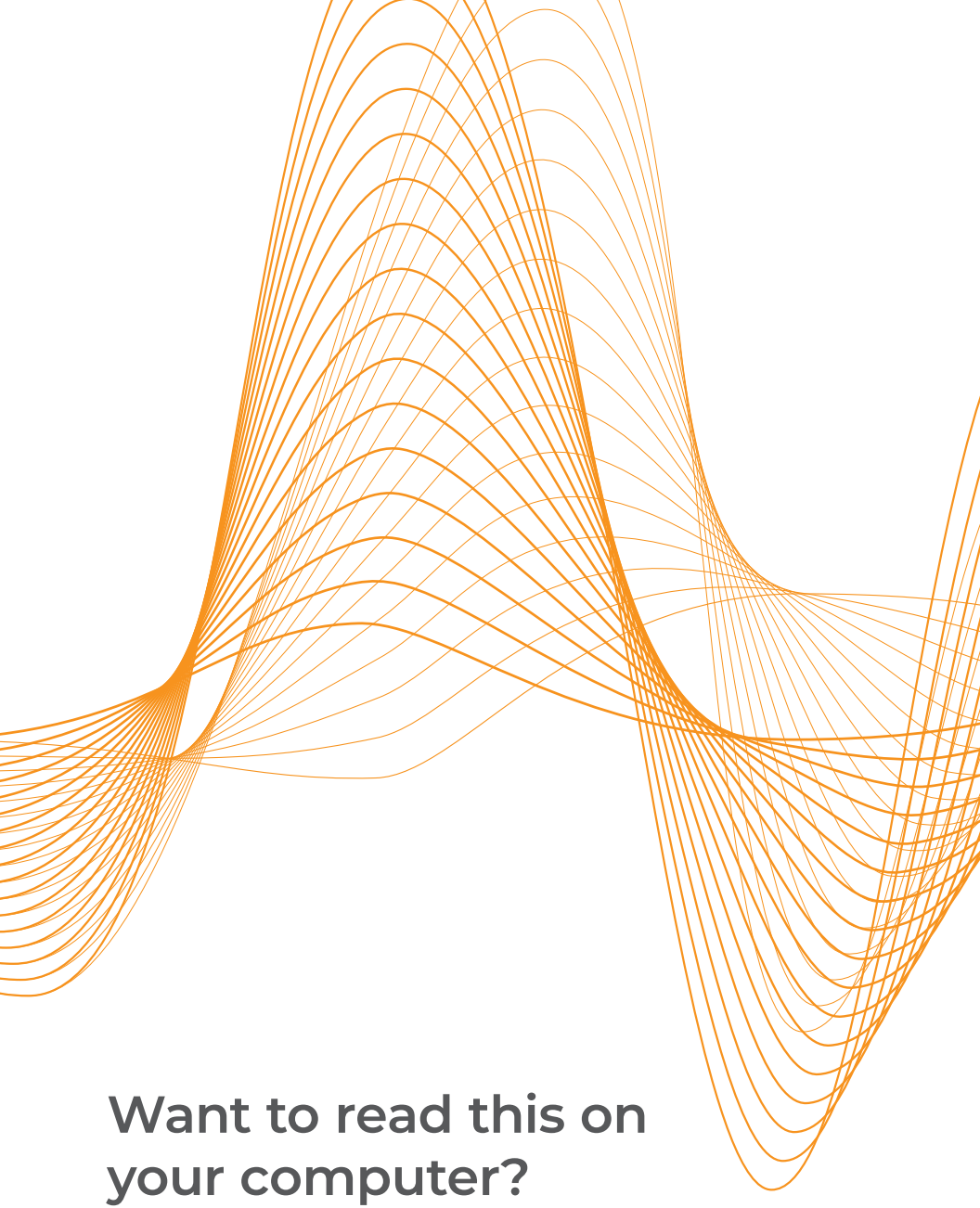
SPARK PNT

GNSS DISCIPLINED OSCILLATOR (GNSSDO)

Quick Start Guide



SparkPNT GNSSDO Quick Start Guide



Want to read this on your computer?

Access the Quick Start Guide at:
docs.sparkfun.com/SparkFun_GNSSDO

WHERE SHOULD I BEGIN?

WHAT'S INCLUDED?

SparkPNT GNSSDO
(GPS-26289)

L1/L2/L5 GNSS
Surveying Antenna
(GPS-21801)

Ethernet Cable
CAT-6, 1m 1m
(CAB-08915)

TNC-SMA Cable 10m
(CAB-21740)

USB-C Power
Charging Cable 3m
(CAB-24060)

SMA-BNC Cable,
RG316, 1m
(CAB-27480)

Power Deliver Wall
Adapter, 65W
(TOL-24059)

32GB microSD Card
Class 10
(COM-19041)

YOU WILL NEED

Computer, Phone
or Tablet

Ethernet network
or Router

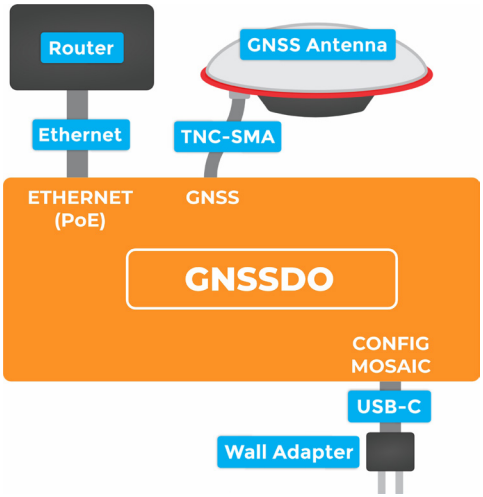
YOU MAY ALSO NEED

Antenna
Mounting Hardware
(KIT-22197)

Antenna
Magnetic Mount
(PRT-21257)

CONNECT USING ETHERNET

The simplest way to get your GNSSDO up and running is to connect it to your Ethernet network or an Ethernet port on your broadband router:



1. Connect the GNSS antenna. Inside your GNSSDO kit, you will find the L1/L2/L5 GNSS "UFO" antenna. It has a TNC connection. Use the supplied TNC-SMA cable to connect the antenna to the GNSSDO GNSS SMA connection. Make sure the antenna is securely mounted to a structure so that it cannot be moved and has a clear view of the sky

2. Connect the GNSSDO to your Ethernet network or router. Use the supplied CAT-6 Ethernet cable to connect the ETHERNET (PoE) port to your network or an Ethernet port on your router. If your router provides Power-over-Ethernet (PoE), you're all set! You should see the red power (PWR) LED light up and text start to appear on the OLED display. If your router does not provide PoE, move on to step 3.

3. Provide power. You can power the GNSSDO using the supplied USB power supply (5V power delivery wall charger). Plug the power supply into the wall. Use the supplied USB-C cable to connect the power supply to

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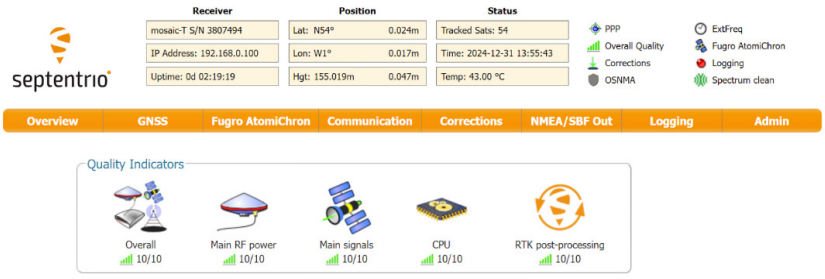
GETTING STARTED

Connect Using Ethernet

either the CONFIG MOSAIC or the CONFIG ESP32 USB-C port. It does not matter which. You should see the red power (PWR) LED light up and text start to appear on the OLED display.

Once the mosaic-T has acquired a satellite signal and is connected to the Ethernet network, the OLED will display: the antenna's position as Latitude (Lat), Longitude (Long); the Ethernet IP (Internet Protocol) network address; and other information.

4. Connect your computer, tablet or phone to the same network, open a web browser and navigate to the IP address shown on the OLED display. You should see the mosaic-T's internal web page. The web page displays a lot of helpful information and can also be used to fully configure the mosaic-T.



CONNECT USING USB-C

The mosaic-T has a built-in high-speed USB port which supports Ethernet-over-USB. To take advantage of this interface, you first need to install the Septentrio drivers.

1. Connect the GNSS antenna. Inside your GNSSDO kit, you will find the L1/L2/L5 GNSS "UFO" antenna. It has a TNC connection. Use the supplied TNC-SMA cable to connect the antenna to the GNSSDO GNSS SMA connection. Make sure the antenna is securely mounted to a structure so that it cannot be moved and has a clear view of the sky.

2. Download and install Septentrio RxTools. RxTools includes the driver for the USB-C port plus several tools which you can use to control and configure the mosaic-T, forward data, log data, analyze the log files, convert the log files to other formats, and configure the module for use with other GIS software.

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GETTING STARTED

Connect Using USB-C

3. Connect the GNSSDO to your computer. Use the supplied USB-C cable to connect the CONFIG MOSAIC port to your computer.

4. Open the mosaic-T web page. Open a web browser on your computer and navigate to **192.168.3.1** to view the mosaic-T's internal web page.

You can now use the RxTools suite to take full advantage of the sophisticated mosaic-T.

RXTools

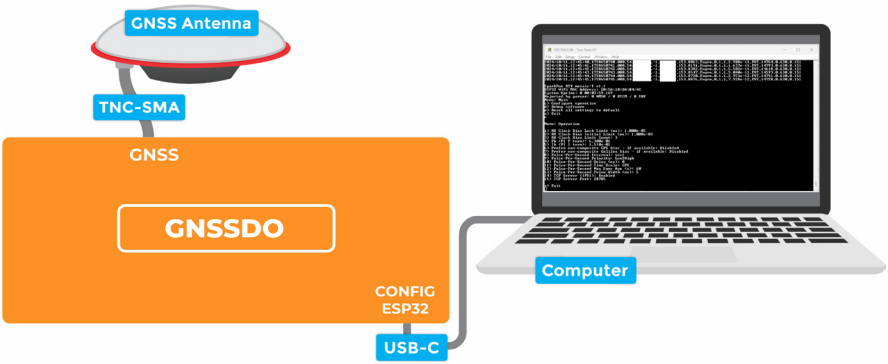
https://www.septentrio.com/en/products/gps-gnss-receiver-software/rxtools

CONFIGURING THE FIRMWARE

The GNSSDO contains an ESP32-WROVER processor which is able to discipline the frequency of the internal SiT5358 temperature-controlled crystal oscillator. By linking the CONFIG ESP32 USB-C port to your computer, you can view and modify the settings of the ESP32 firmware using a terminal emulator.

1. Connect the GNSS antenna. Inside your GNSSDO kit, you will find the L1/L2/L5 GNSS "UFO" antenna. It has a TNC connection. Use the supplied TNC-SMA cable to connect the antenna to the GNSSDO GNSS SMA connection. Make sure the antenna is securely mounted to a structure so that it cannot be moved and has a clear view of the sky.

2. Connect to the CONFIG ESP32 USB port. To modify the ESP32 firmware settings, you need to connect a computer to the CONFIG ESP32 USB-C port and use a Serial Terminal to change the settings. You may need to install a driver first, so that the CH340 serial interface chip is recognized.



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Please follow the QR codes below for more details:

CH340 Drivers

https://learn.sparkfun.com/tutorials/how-to-install-ch340-drivers

Tera Term

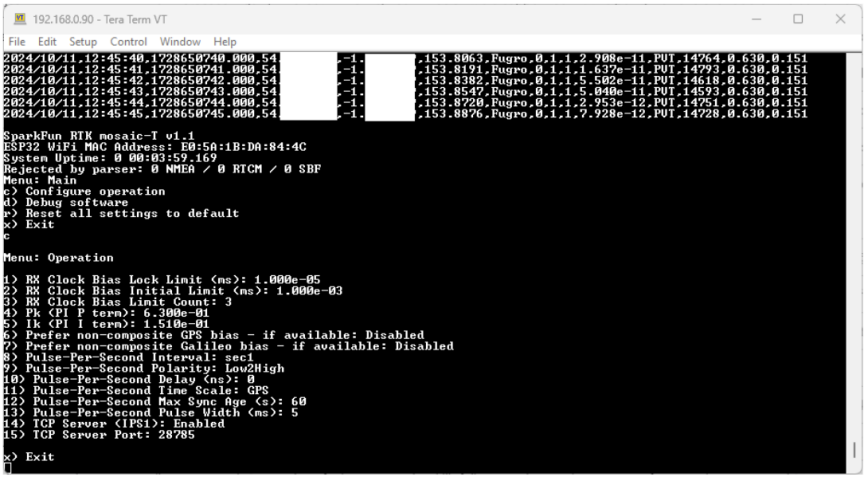
https://learn.sparkfun.com/tutorials/terminal-basics/tera-term-windows

Serial Terminal Basics

https://learn.sparkfun.com/tutorials/terminal-basics

3. Open a Serial Terminal. If you are using Windows, we still recommend Tera Term serial terminal but there are plenty of alternatives. Please see our Serial Terminal Basics tutorial for more details. Open the connection to the CH340 using **115200 baud**.

4. Use the Menus to modify the Settings. When you have the Serial Terminal open, you should see diagnostic messages from the firmware scrolling up the screen. Hit any key on your computer keyboard to open the menu.



The firmware settings are stored in flash (non-volatile) memory when you exit the menus. After changing them, exit the menus completely, then you can disconnect the computer and power the GNSS using the supplied wall charger.

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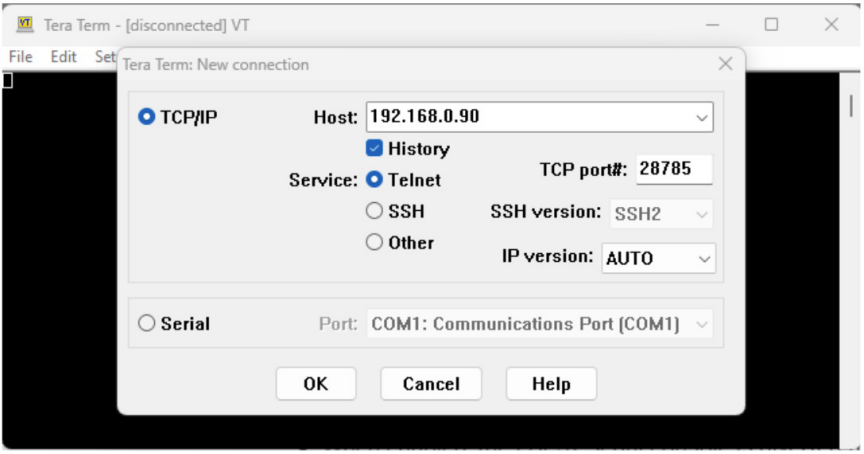
You should never need to change most of the firmware settings, the default settings will meet the needs of almost all users. However, one option you may want to change is “TCP Server (IPS1)”. This is disabled by default. When it is enabled, it allows you to access the firmware console via TCP - over Ethernet or Ethernet-over-USB - instead of CONFIG ESP32 Serial. Tera Term has TCP/IP support built-in:



Common Gotchas

- High-precision GNSS only works with multiple-frequency antennas. This means that GPS antenna you got in the early 2000s with your TomTom is not going to work. Please use the SparkFun L1/L2/L5 antenna provided in the GNSSDO kit.

- High-precision GNSS works best with a clear view of the sky; it does not work indoors or near a window. GNSS performance is generally not affected by clouds or storms. Trees and buildings can degrade performance but usually only in very thick canopies or very near tall building walls. GNSS reception is very possible in dense urban centers with skyscrapers but high-precision RTK may be impossible.

- The location reported by the GNSS device is the location of the antenna element itself. Latitude and Longitude are fairly easy to obtain but if you're capturing Altitude be sure to do additional reading on ARPs (Antenna Reference Points) and how to account for the antenna height above ground in your data collection software.

- The mosaic-T reserves the IP (Internet Protocol) subnet address 3 for its USB-C interface; this cannot be changed. If your Ethernet network is also using subnet 3 (192.168.3.nnn), the mosaic-T may appear to have a valid IP address but communication will fail. Please change your Router configuration to use a different subnet.

Help & Troubleshooting

If you need technical assistance or more information on a product that is not working as you expected, we recommend heading on over to the SparkFun Technical Assistance page for some initial troubleshooting.

Technical Assistance
https://www.sparkfun.com/technical_assistance

If you can't find what you need there, the SparkFun GPS Forum is a great place to ask questions.

SparkFun GPS Forum
https://community.sparkfun.com/c/global-positioning-system-gps/96

If this is your first visit to our forum, you'll need to create a Forum Account to post questions.

Forum Account
https://forum.sparkfun.com/ucp.php?mode=register