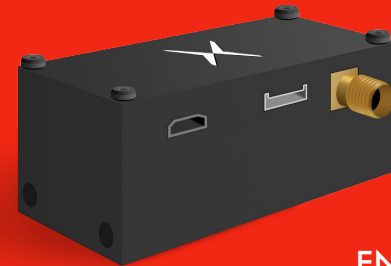




FIXPOSITION

OPERATION MANUAL

NAV-RTK SYSTEM



MARCH 2019

ENGLISH

QUICK NAVIGATION

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For more information please visit [Fixposition.com](https://www.fixposition.com)



INTRODUCTION

NAV-RTK is an RTK (Real Time Kinematic) GNSS sensor that uses differential carrier phase positioning technology to provide cm-precision positioning in real-time. It is the perfect choice for mapping, inspection, or light-show swarm drones.

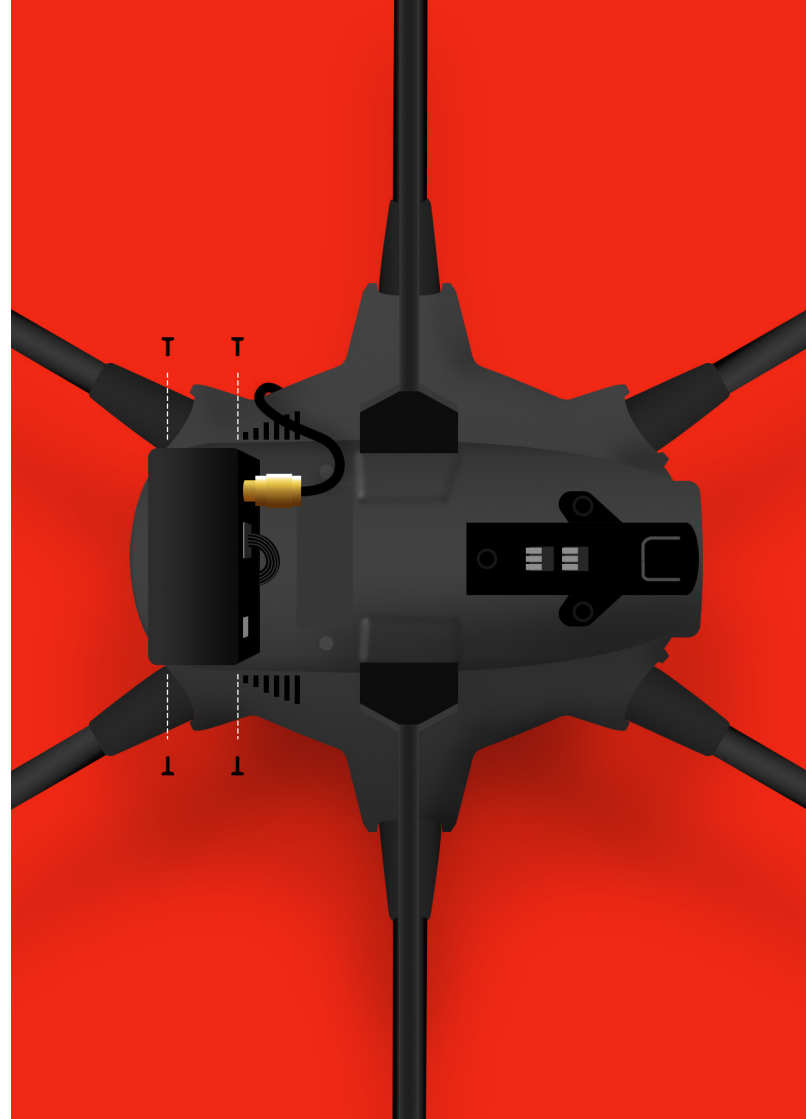
FEATURES

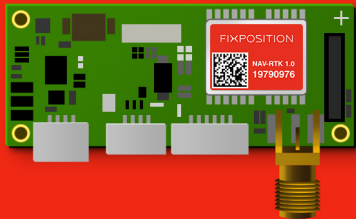
- Maintains cm-precision even in challenging environments
Like between high buildings in cities or between trees in forests
- Precise navigation down to cm
1cm + ppm horizontal- and 1.5cm + ppm vertical-accuracy
- 5 Hz update rate for position, velocity and time
Higher update rates available via software upgrade
- RAW GNSS and real-time solution are logged
Ready for PPK (Post Processed Kinematics)
- Use up to three GNSS constellations
GPS, GLONASS, Galileo or BeiDou
- Ready for PX4 based drones
Like a Yuneec H520
- Network RTK or Base Station needed
- Additional inertial sensors
For RTK + IMU integrated navigation

TO CONNECT

FOLLOW THESE STEPS

1. Use screws to attach the NAV-RTK sensor to your drone
2. Attach your GNSS antenna on the top
3. Connect your GNSS antenna to the sensor
4. Plug in the Power and Data cables
5. Power up your drone
6. Place the Base Station into an empty field
7. Check the ST16 controller GPS Lock value
 - 3D Lock: 1-5 m accurate
 - Floating: 0.1-1 m
 - Fixed: 1-2 cm
8. When you see “Fixed” you can take off





OUR SENSOR SPECIFICATIONS

Size	5.6 x 2.6 x 2.4cm
Weight	76g (with case and Antenna)
Operation Range	-40°C to 85°C
Input Voltage	5V to 20V
Current @ 12V	min. 70mA avg. 120mA max. 330mA
Protocol	UBX; NMEA
Accuracy	Horizontal 1cm + ppm Vertical 1.5cm + ppm
Time to cm Accuracy	20s within 1km 30s within 5km
Connectivity	USB Wi-Fi Bluetooth CAN UART SMA (GNSS) I2C

PORT ASSIGNMENT

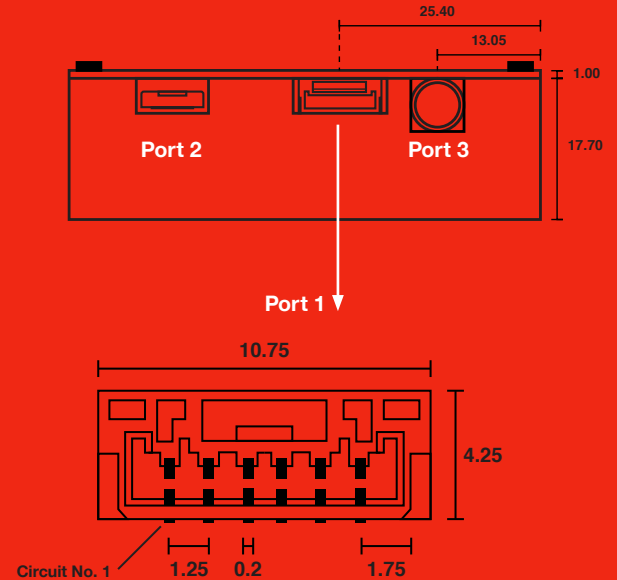
Port 1: UART/I2C Connector

1	VCC	Supply Voltage	5V-20V
2	RXD	Serial Port	3.3V
3	TXD	Serial Port	3.3V
4	SCL	DDC Clock	3.3V
5	SDA	DDC Data	3.3V
6	GND	Ground	GND

Port 2: Micro-USB Connector

For Log-Data Download and Software Update
Please make sure the RTK sensor is powered on

Port 3: GNSS Connector



PAIR TO WI-FI AND SETUP NTRIP/CORS

CONTENT OF NAV-VR1.CFG



```
[network]
ssid      = "abcdef"
psk       = "1234567890"
```

```
[rtknav]
reference-src = account:password@ip:port/mountpoint
```

1. Connect the NAV-RTK Sensor via USB, a folder will open
2. In the folder, you can find a file called **“nav-vr1.cfg”**
If it doesn't exist, create a new file titled “nav-vr1.cfg” and enter the information you see on the left
3. Input the ssid and psk values of your Wi-Fi
On Windows use Wordpad instead of Editor to get correct line breaks
4. Input your NTRIP/CORS account in reference-src
(only for Network RTK)
5. Save **“nav-vr1.cfg”** and close it
6. Safely remove the drive (important)
7. Remove the USB cable,
NAV-RTK will then connect to your Wi-Fi

SOFTWARE UPDATE OF THE RTK SENSOR

UPDATE BY CABLE

1. Power up the sensor
2. Connect the sensor to your computer with Micro USB
3. Open the now available mass storage called "DATA"
4. Open the folder called **"Firmware"**
If there is no folder with this name please create it
5. Copy **"image.swu"** to the folder **"Firmware"**
(provided by Fixposition)
6. Safely remove the mass storage from the computer
This is important to ensure the file system doesn't get corrupted
7. Unplug the Micro USB cable from the sensor
8. Wait until the sensor stops blinking
First it blinks quickly, after a few seconds it blinks slower while updating
9. Your sensor is now successfully updated

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UPDATE BY WIFI

1. Power up the sensor
2. Connect the sensor to the wifi (See page 14)
3. Find the IP address of the sensor
(Check your router or scan the network for NAV-VR1-IP)
4. On a computer in the same network open <http://IP:8080/>
(For example <http://192.168.43.19:8080/>)
5. Upload **"image.swu"**
6. Wait until the sensor stops blinking
First it blinks quickly, after a few seconds it blinks slower while updating
7. Your sensor is now successfully updated