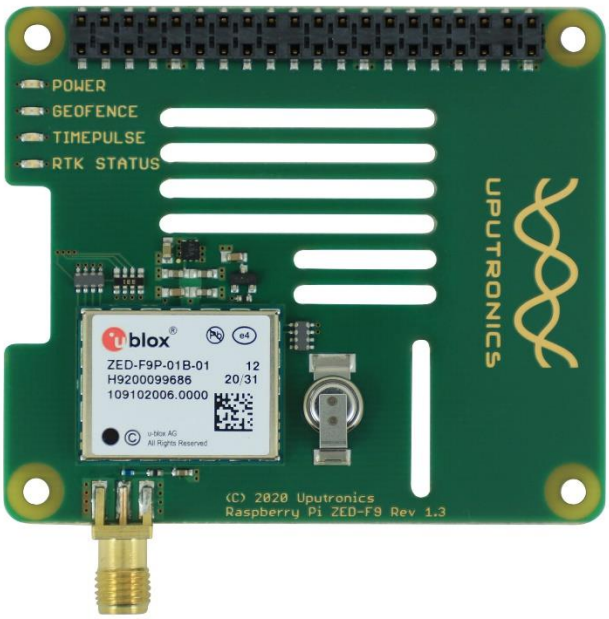
Raspberry Pi+ Ublox ZED-F9P Expansion Board Datasheet

Description

This document relates to boards with rev 1.3 on the PCB.

The Uputronics Raspberry Pi+ Ublox ZED-F9P Expansion Board provides a modern centimetre level capable multi GNSS GPS receiver with quick no soldering required connection to all Raspberry Pi boards with the 2x20 header (the original Pi Model A/B are not supported). Featuring PPS (Pulse per second) output to permit the use of the board for PPS disciplined NTP servers, RAW output available from the UBlox™ M9 GPS module and a super caps for GPS hot start/setting retention. Settings can also be stored to the on module flash.

This board retains backwards compatibility with previous generation Uputronics Pi GPS boards and cases.



Uputronics™ T/A Nevis Computers Limited. Cottingley Business Park,Bingley,BD16 1PE.
Phone +441274550919. Company number 3356647 E-Mail : orders@uputronics.com
Web : https://store.uputronics.com Revision 1.0 07.2022

Raspberry Pi Header Pin Configurations

Pin	Raspberry Pi Name	Board Purpose
01	3.3V DC Power	3.3V DC Power
02/04	5V DC Power	5V DC Power used for super cap
03	GPIO02(SDA1,I2C)	GPS/RTC SDA
05	GPIO03(SCL1,I2C)	GPS/RTC SCL
08	GPIO14(TXD0)	GPS SERIAL RXD
10	GPIO15(RXD0)	GPS SERIAL TXD
12	GPIO18	TIME PULSE
32	GPIO12 (TXD5)	RTCM SERIAL RXD
33	GPIO13(RXD5)	RTCM SERIAL TXD

Uputronics™ T/A Nevis Computers Limited. Cottingley Business Park,Bingley,BD16 1PE.
Phone +441274550919. Company number 3356647 E-Mail : orders@uputronics.com
Web : https://store.uputronics.com Revision 1.0 07.2022

Board Physical Specifications

Weight	15g excluding fixings.
Batteries	1 x 0.2F 3.3V Super Capacitor
Connector Pitch	2.54mm pitch Raspberry Pi 2x20 Header.
Power Usage (from 3.3V)	Acquire 90mA / Tracking 85mA / Max 130mA
GPS Antenna Connector	SMA Female (3V supplied)
Operating Temperature	-40°C to +85°C

GPS Specifications

The GPS has the following specifications:

- 184-channel u-blox™ M9 engine
- Up to 4 concurrent GNSS (BeiDou,Galileo,GLONASS,GPS/QZSS)
- Default GNSS: GPS/GLONASS.
- -167dBm Navigation Sensitivity
- Up to 20Hz navigation rate.
- RAW Output available via UBX-RXM-RAWX Message
- 3V supplied to antenna port to power active antenna
- Flash Memory.
- Antenna requirements: Active 3V Ceramic Patch (Quad band uBlox ANN-MB recommended)
- Default baud rate: 38400bps
- Robust SMA antenna connection.
- Positional Accuracy RTK 0.01m +1 ppm CEP
- Thermal assistance for PoE HAT (Board vents)
- LED indicators for power, PPS, RTK and GeoFence.
- RTCM/Serial2 Connected to Pi4+ RXD/TXD 5 (GPIO12/13)

For full documentation please consult the u-blox ZED-F9P product documentation here

https://www.u-blox.com/en/product/zed-f9p-module

In The Box

1 x Raspberry Pi+ Ublox ZED-F9P Expansion Board
4 x 11mm standoffs w/8 M2.5 Screws
1 x Header with 4.93mm tails

Uputronics™ T/A Nevis Computers Limited. Cottingley Business Park,Bingley,BD16 1PE.
Phone +441274550919. Company number 3356647 E-Mail : orders@uputronics.com
Web : https://store.uputronics.com Revision 1.0 07.2022

Disclaimer

All Uputronics products are sold as test equipment with no guarantees of performance or operation, they are intended for engineering, research or lab use only not for use in production or commercial systems.

This is not to say there is any quality issue with our boards, people are using these in such varying and dynamic environments its not possible for us to test every possible scenario. Therefore we advise you do your own testing to ensure operation in your environment.

Installation

Attach the header to the Raspberry Pi 2x20 header. Attach the four supplied standoffs to the Raspberry Pi using the M2.5mm screws. Clip the GPS/RTC Expansion Board on top of the header, the header pins push through the bottom with a click. The supercap should face upwards when correctly installed. Secure the board using the remaining four screws :

Uputronics™ T/A Nevis Computers Limited. Cottingley Business Park,Bingley,BD16 1PE.
Phone +441274550919. Company number 3356647 E-Mail : orders@uputronics.com
Web : https://store.uputronics.com Revision 1.0 07.2022

GPS/PPS Operation

To verify operation of PPS:

```
sudo apt-get install pps-tools
sudo nano /boot/config.txt
```

add the following line:

```
dtoverlay=pps-gpio
```

```
sudo nano /etc/modules
```

add the following line:

```
pps-gpio
```

```
sudo reboot
sudo ppstest /dev/pps0
```

To verify the operation of the GPS via serial

```
sudo apt-get install minicom
minicom -b 115200 -o -D /dev/ttyS0
```

It is beyond the scope of this datasheet to explain how to use this board as a GPS disciplined NTP server.

Uputronics™ T/A Nevis Computers Limited. Cottingley Business Park,Bingley,BD16 1PE.
Phone +441274550919. Company number 3356647 E-Mail : orders@uputronics.com
Web : https://store.uputronics.com Revision 1.0 07.2022