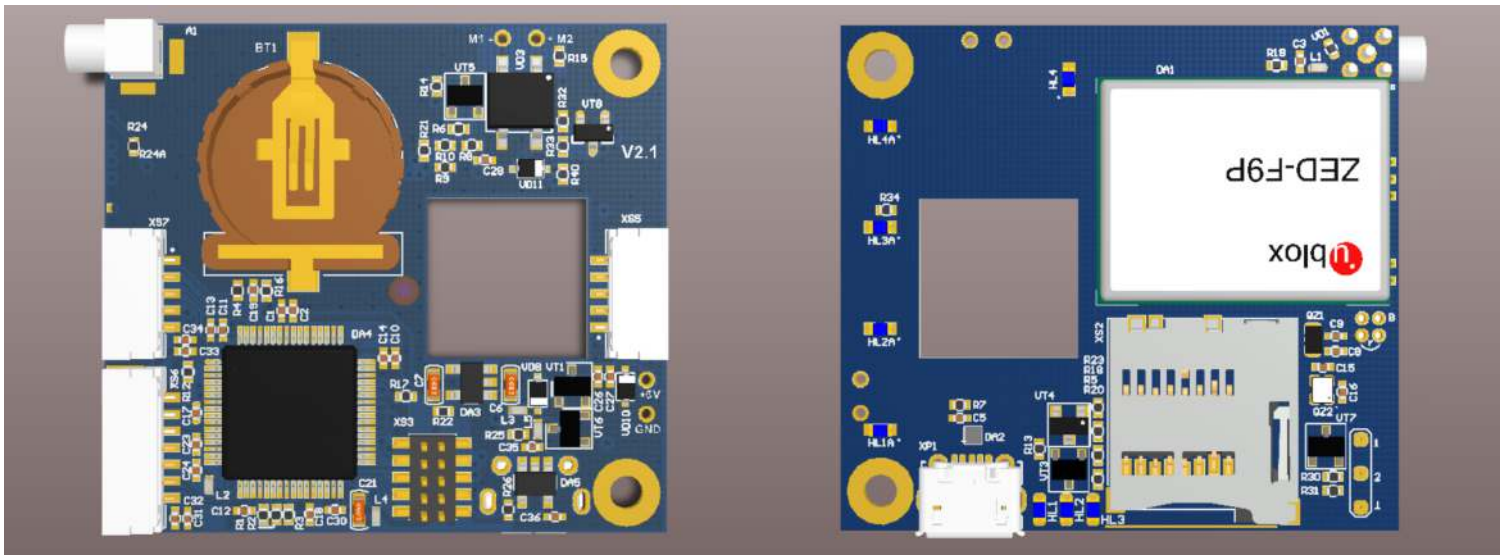
Navigation RTK receiver (board version V2.1) description of external connections

General view:



For normal operation of the device, you need to insert a memory card (microSD) into a special slot designated XS2.
Before using a new card in the device for the first time, it is recommended to format it.
It is recommended to use memory cards:

Type - SDHC
Memory size - not less than 4 GB
Speed class - not less than 10 File system - FAT32

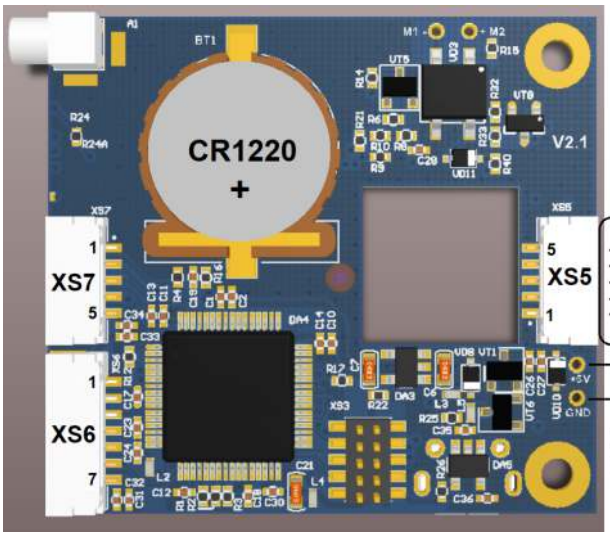
Power supply:

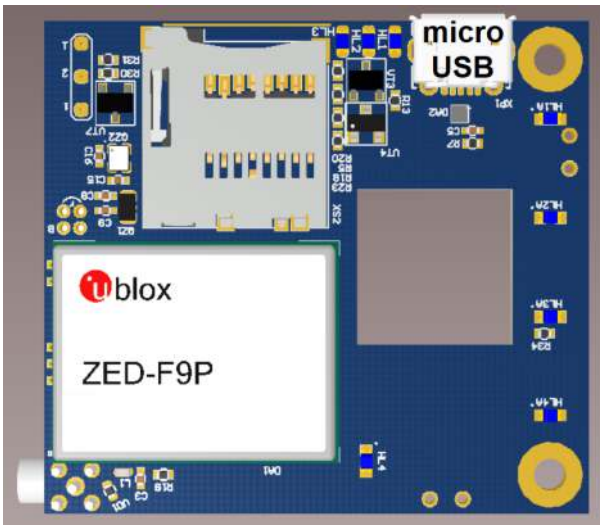
Rated working voltage Vin = +5V
The maximum impulse voltage should not exceed + 7V The minimum operating voltage + 3.7V The minimum power supply current - 300mA (in the absence of additional connected equipment)

XS5 – main connector for supplying voltage to the device.
XS5_5pin – Vin
XS5_1pin – GND

If it is necessary to permanently connect to the module by soldering, the contact pads (marked "+ 5V" and "GND") can serve as an alternative input for supplying the supply voltage to the device.
To be able to connect additional external equipment operating from a single power supply, the voltage from the input (XS5_pin5) is supplied directly to S6_pin7 and XS7_pin5.

Note: *XS5_5pin, XS6_pin7, XS7_pin5 and "+ 5V" pad are directly connected to each other.*
It is forbidden to connect these contacts to several different power sources at the same time.





Micro USB

Power can also be supplied through the micro_usb (powerbank) connector. In this case, the device's power consumption from the XS5 connector will be disabled.

If there are USB information signals on the connector (when connected to a PC, etc.), the device stops writing navigation data to the memory card. The functions of writing and reading data from a memory card become available.

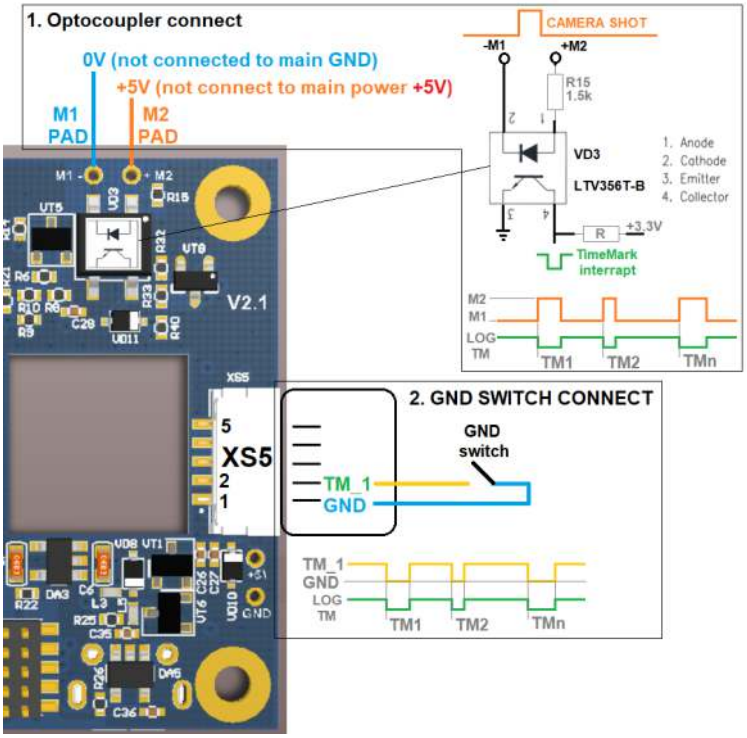
Power RTC

The BT1 battery slot is designed to accommodate a CR1220 + 3V battery pack. Installation is by snapping, negative "-" contact on the side of the board.

To improve the performance of the GNSS receiver, it is possible to install an independent power source (battery). The presence of a battery ensures the operation of the real time clock (RTC) and RAM memory when the main power is turned off. This allows to reduce the time of solving the navigation problem after the main power is turned on, both during hot and warm start. If the battery is not installed or is discharged, the module performs a cold start when the power is turned on.

TimeMark

There are several connection methods to record the time stamp (TimeMark-TM) of the
camera shutter, depending on the type of external device to be connected.



1. Connection via optocoupler.

Designed for devices that generate a positive signal pulse when the shutter is triggered.
The time stamp will be recorded when a positive pulse is applied between pins M1 and M2.
This type of connection is galvanically isolated, providing additional protection and noise immunity for the entire device.
"M1-" - connects to negative pulse signal
“M2 +" - connects to positive pulse signal.

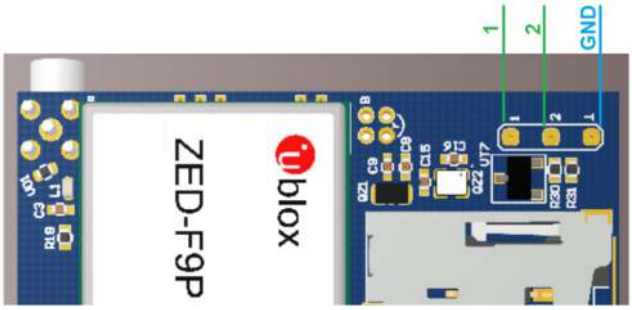
2. Connection "button"

Designed for devices that close the signal to ground when the shutter is activated (normally open button).
The ground contact of the external device is connected to S5_pin1.

Note: *XS5_pin2 has an internal pull-up to 3.3V, when shorted to GND, the maximum current is limited to 0.4mA.*
The input is protected against positive voltage in the form of a series diode, the maximum allowable voltage value: + 12V.

3. Connecting drones.

Designed to connect the shutter signals of drones: Mavic 2 Pro, Mavic mini, Phantom3, Phantom4 Contact pads located in the corner next to the microSD card slot "pin 1" - processor input "pin 2" - transistor converter level "GND" - common ground of the device - Mavic 2 Pro is connected with 3 signals (1,2, GND) - Mavic mini, Phantom3, Phantom4 are connected with 2 signals (2, GND)



Also, for the correct operation of the timestamp recording, it is necessary to adjust
the configuration file accordingly. (see working with config.ini)

External LoRa modem

To connect an external LoRa modem, the XS6 connector is designed

1. GND - common ground, connect to the LoRa ground pin of the modem
2. P2 - output, connected to the P2 LoRa contact of the modem
3. P1 - output, connected to the P1 LoRa contact of the modem
4. BZ - input, connected to the BZ LoRa contact of the modem
5. LoRa_Rx - output, connected to the Rx LoRa contact of the modem
6. LoRa_Tx - input, connected to the Tx LoRa contact of the modem
7. + 5V_OUT - output, connected to the LoRa power supply contact of the modem. (see description of Power supply above)

Note:

1) Signal pins 2-6 are designed to work with 3.3V TTL logic. It is forbidden to directly connect signals with logic of another level. When the device is not powered, it is forbidden to supply signals of any level.
2) XS6_pin7 (+ 5V_OUT) and XS5_5pin (+ 5V) are directly connected inside the device. When connecting external equipment (for example, LoRa modem), the minimum current of the external power supply must be calculated taking into account the additional consumption (300mA + peak consumption of external equipment)

