

# Satpro Mavlink Telemetry

## Mavlink Telemetry

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The purpose of this guide is a quick check of the Mavlink Telemetry between the WMX481 radio module, RXLRS receiver and Cube Orange or similar autopilot that works with the Mavlink protocol, take these tests in the office.

You will use: The SATPRO tracker antenna together with the WMX481 radio module, XLRS GCS o XLRS Transmitter, RXLRS receiver and Cube Orange or similar.

For the first tests it isn't necessary to modify the modem port configuration of the RXLRS receiver.

### **Attention:**

Please don't modify any parameters in RXLRS and perform the tests below.

Later, when you have more experience and understand how the entire XLRS system works, if necessary, you can modify the baud of the "Modem" port to your liking.

This is an example guide, you can use another type of autopilot as long as it is compatible with the Mavlink protocol.

### Before starting:

Have all XLRs devices turned off. **Default configuration port "MODEM" in RXLRs** 

By default the "MODEM" port of the XLRs receivers are configured at: Baud: 38400 | Bits: 8 | Parity: N.

In this test it isn't necessary to make any changes, this is for advanced users.

Later if you need it you can change the baud, bits and parity, remember the default speed is 38400b. (If you make any changes to the baud rate, you must also modify the speed of your autopilot's telemetry port).

It should be taken into account that even if the speed is increased, it is limited by the speed of the radio link, which can be 50000 or 100000b. If it is uploaded and not using hardware flow control (RTS, CTS) it can overflow the buffer and lose data. **Cube Orange autopilot, configure parameters in telemetry port 1 (TELEM 1)** 1- Connect the Autopilot USB port to your PC.



2- Open Mission Planner software or similar, select the corresponding COMx port and connect to configure the autopilot parameters.



3- Access the CONFIG/TUNNING tab, select Full Parameter Tree.

4- Configure the baud of telemetry 1 to 38400b from the parameter "SERIAL1\_BAUD = 38. (If you have the telemetry ports configured at another speed it will not work in this test).

5- Configure the protocol to be used in telemetry 1 from the parameter "SERIAL1\_PROTOCOL = 1", by default should be set to 1 (MAVLINK).



6- Configure the parameters of "SR1", (It isn't necessary to configure each parameter exactly as shown in the images, it is just an example).



7- Remember to save all the modified parameters, click on the "Write Params" button. **Connection diagram: RXLRS + Cube Orange** Make the connection between RXLRS and Cube Orange, as shown in the following diagram.



1- Connect the Telemetry cable "RX\_MODEM" from the "MODEM" port of RXLRS to the "TELEM1" port of the autopilot.

2- Connect the "SPPM" cable from the "CH7/SPPM" of the RXLRS to the "RCIN" port of the autopilot.

3- Connect the Cube Orange GPS.

4- Check all the connections between RXLRS and Cube Orange, if everything is correct turn on both devices. **Reception of Mavlink Telemetry in**

**SATPRO with WMX481 and GCS or XLRS Transmitter.** 

### **Warning:**

Don't have any objects near SATPRO, once SATPRO starts receiving Mavlink telemetry (GPS) data, it will start moving since the autopilot will be sending different GPS positions of

the aircraft.

### **Additional Information:**

When SATPRO is receiving GPS data from Mavlink Telemetry for the first time, it may move, depending on the distance that the GPS indicates at that moment.

Depending on the GPS, if it isn't very accurate, it is possible for SATPRO to start rotating based on the GPS data it is receiving.

If you are inside a building, the GPS may not be able to obtain many satellites and may not be very accurate.

If the distance shown by the GPS is less than 5 meters then SATPRO will not move. For security, SATPRO will not move until it detects that the GPS distance is greater than 5 meters.

### **Basic operation of receiving Mavlink telemetry**

The operation is quite simple, once the Cube Orange autopilot is receiving GPS data, it will send the Mavlink telemetry through the "TELEM1" port to the "MODEM" port of the RXLRS receiver, then it will send the Mavlink telemetry data to the WMX481 module which in turn sends them to the SATPRO and the GCS or XLRS transmitter.

SATPRO will be receiving GPS data through Mavlink Telemetry, from the SATPRO display you can see some GPS data that it is receiving such as: GPS Latitude, GPS Longitude, Current Distance, etc... You can see more information about the data on the display from SATPRO at the following link: [Satpro Display](#)

The GCS or XLRS Transmitter (if connected to a PC) will also be receiving Mavlink telemetry data and at this time if you

activate telemetry on your XLR5 RC transmitter and communicate via USB with software compatible with the Mavlink protocol such as: Mission Planner , QGroundControl, UgCS or similar, you can see the status and information of your autopilot through a map, here you can also modify any telemetry parameter or send new missions to your autopilot.

## **Firts Steps**

1- Verify that the autopilot GPS has satellites and is receiving data.

You can verify it by checking the status of the LEDs on the GPS itself or if you connect the autopilot to Mission Planner on the main page you will be able to see the current status of the GPS as RTK Float, RTK Fixed or 3D RTK.



2- Turn on the GCS or XLR5 Transmitter, remember before turning on the XLR5 device you have to connect the RCBUS cable to SATPRO.



3- Turn on SATPRO.



4- Verify that you have a link between WMX481 and the XLR5 Receiver.



5- Optional: Verify that you have Radio Control, for example connect a servo to CH3 and move the left joystick "JOYLY".

6- Verify that SAPTR0 is receiving GPS data, check the data on

the SATPRO display, it should be receiving the GPS coordinates of the autopilot.



7- On the GCS or XLR5 Transmitter (Connected to a PC via USB), open the Mission Planner software and perform communication.

7.1- Check which USB COMx port the GCS is connected to the internal PC (You can see it from Control Panel\Hardware and Sound\Devices and Printers)

7.2- To establish the connection with Mission Planner, you must first have USB telemetry activated from the GCS.



Check if you have USB telemetry activated: From the central display, at the bottom right you can see the parameter "MAV:", this parameter shows the status of the telemetry, if the telemetry is working via USB it will show "Mav: USB".

If another parameter is displayed, then we will configure the GCS so that the telemetry works by USB, use the central encoder "Menu", turn the encoder several points to the right and this will configure the telemetry parameter to show "Mav: USB" .

Note: By default, once the GCS is turned on, it will automatically activate USB telemetry "MAV: USB" after 20-30 seconds.


7.3- Now in Mission Planner select the corresponding COM port and 115200b.



7.4- Click on Connect, if everything is fine, Mission Planner will begin to read and load the Mavlink telemetry

parameters of your autopilot.



 7- Once this process is finished you will have the GCS linked to the Mavlink telemetry.

8- Once you have communication with Mission Planner you can check if the RXLRS SPPM signal from all the RC channels is reaching the autopilot, from the MP/SETUP/Mandatory Hardware/Radio Calibration tab, a quick test is to move a joystick and verify on the screen that the values change in each RC channel.

