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› SoloGood M10-180C GPS Module with Compass User Manual

SoloGood M10-180C

SoloGood M10-180C GPS Module with Compass User Manual

Model: M10-180C

1. INTRODUCTION

The SoloGood M10-180C GPS module is a compact and high-performance Global Positioning System receiver designed for RC racing FPV drones and airplanes. Utilizing a 10th generation design, it offers fast and accurate positioning capabilities. This module is compatible with a wide range of applications, particularly 2-7 inch traversing drones, and supports a flexible power input of 3.6V-5.5V DC. It features a 10Hz output frequency and supports standard output protocols for seamless integration with flight controllers.

2. PRODUCT COMPONENTS

The SoloGood M10-180C GPS module package typically includes the following:

- 1x SoloGood M10-180C GPS Module with Compass
- 1x Connection Wire Harness

Wiring Diagram **(Note: TX RX is cross-connected to TX RX of the flight controller, and I2C interface is connected accordingly without crossing)**

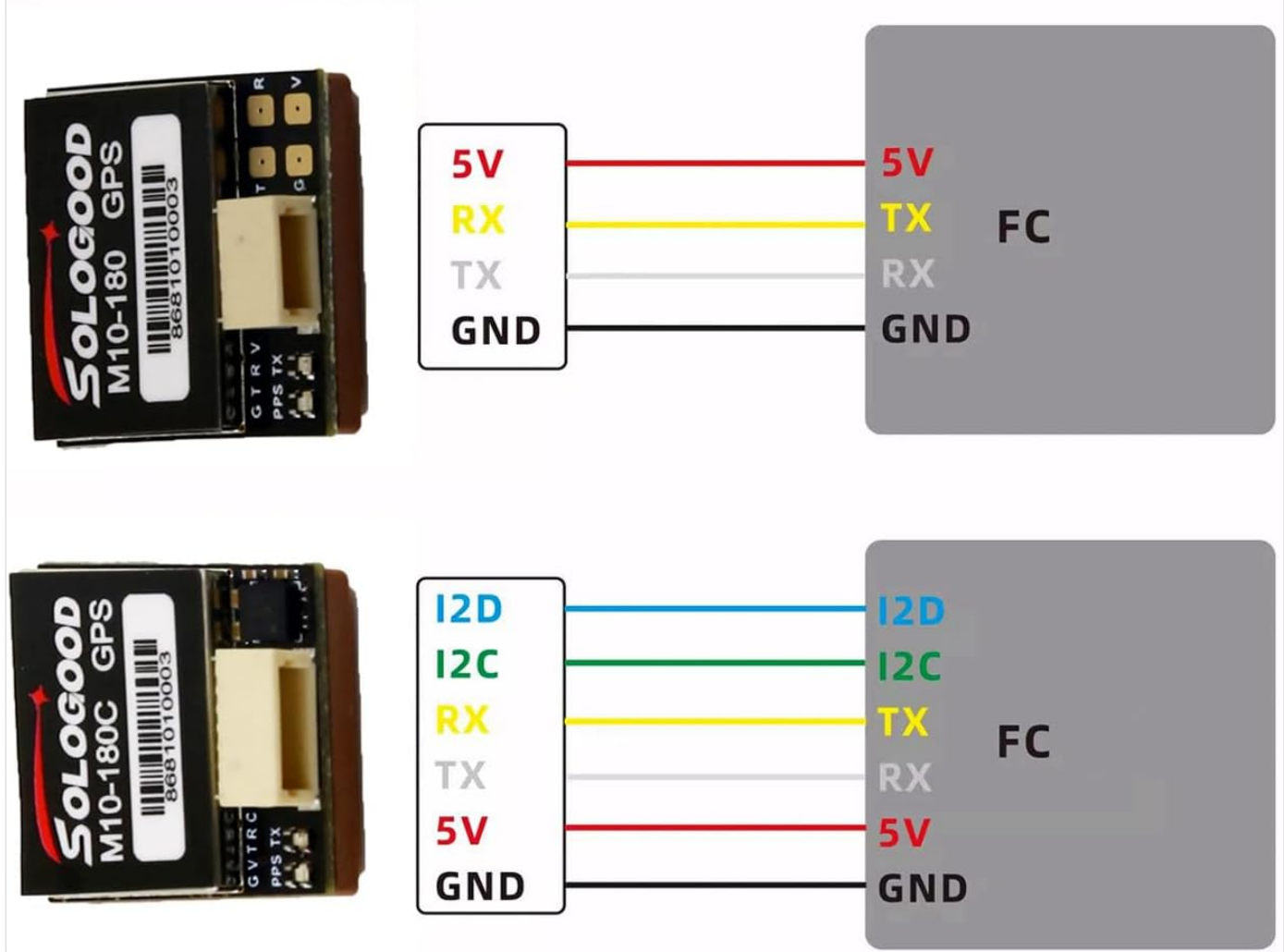


Image: SoloGood M10-180C GPS module shown with its included wire harness.

3. SPECIFICATIONS

- **Model:** M10-180C (also referred to as M10 FPV GPS)
- **Brand:** SoloGood
- **Input Voltage:** 3.6V-5.5V DC
- **Output Frequency:** 10Hz
- **Positioning:** 10th generation design for fast and accurate positioning
- **Compatibility:** Suitable for 2-7 inch traversing drones
- **Dimensions:** Approximately 0.1 x 0.1 x 0.1 inches
- **Weight:** Approximately 0.317 ounces
- **Included Components:** 1*M10 FPV GPS module

4. SETUP AND INSTALLATION

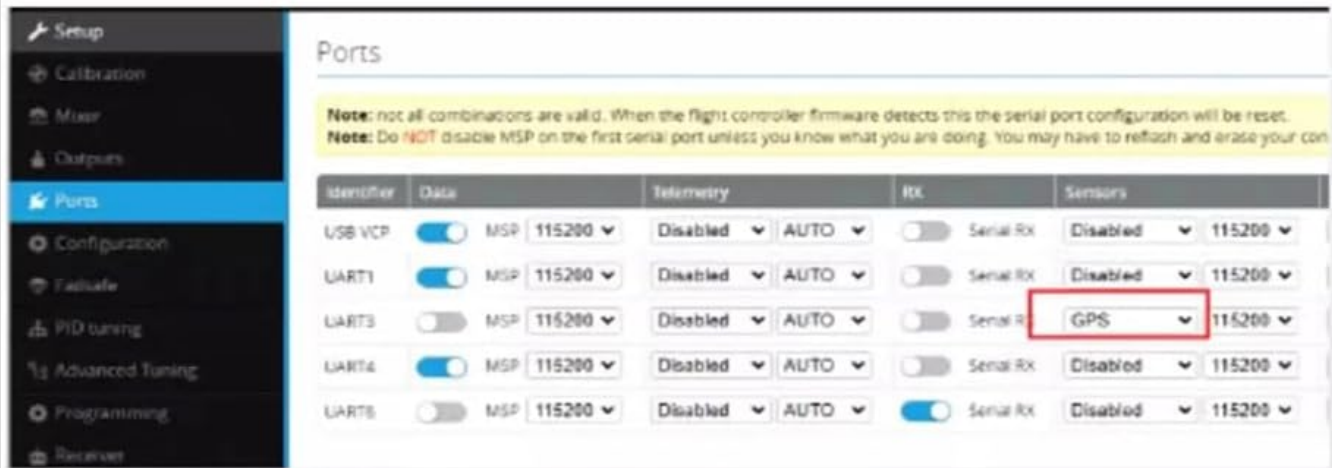
4.1 Wiring Diagram

Proper connection to your flight controller is crucial for the GPS module's functionality. The module supports both UART (for GPS data) and I2C (for compass data) interfaces. Ensure correct cross-connection for TX/RX lines.

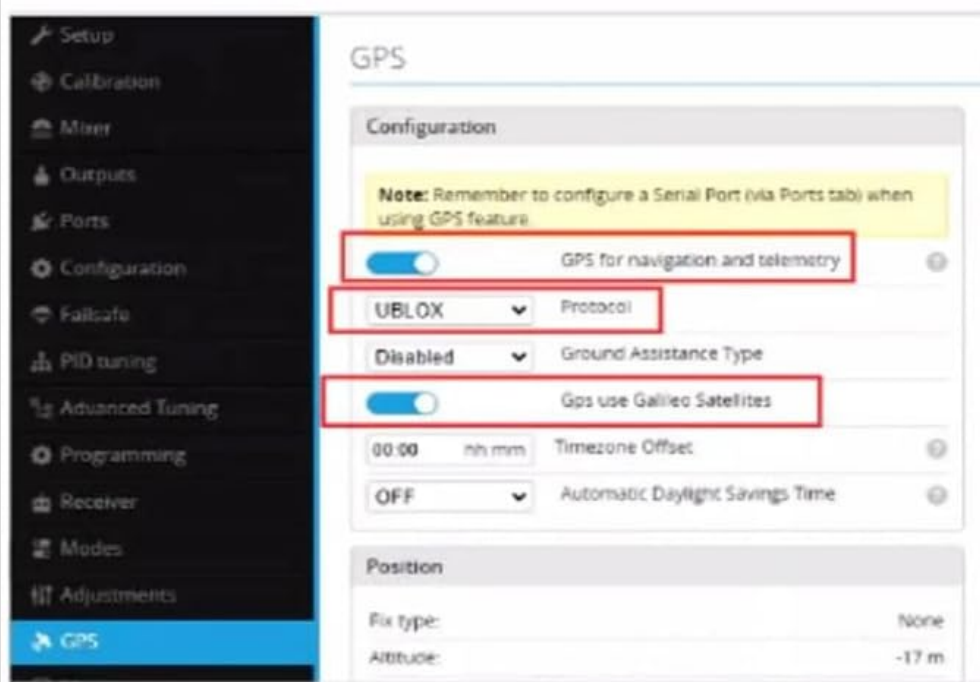


The GPS is used as a guide:

1. Connect the GPS to the free serial port of the flight control, and open the GPS function of the corresponding port in the host computer.



2. Enable GP5 in the GPS setting page, and set it as shown in the following figure.



- 3, restart the flight control, you can see that the GPS label has been lit, and then you can take the airplane to the outdoor open space to test the effect of star search (M0's power-up identification will be a little slower, about 30 seconds)



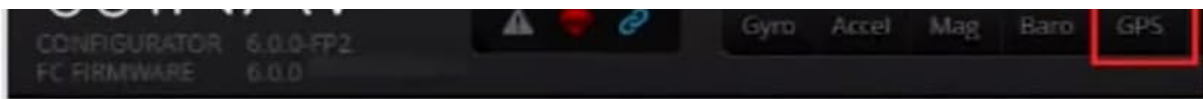


Image: Wiring diagram illustrating connections for UART (GPS data) and I2C (compass data) to a flight controller. Note the TX-RX cross-connection.

- **UART Connection (GPS Data):** Connect the GPS module's TX to the flight controller's RX, and the GPS module's RX to the flight controller's TX. Connect 5V to 5V and GND to GND.
- **I2C Connection (Compass Data):** Connect the GPS module's I2D to the flight controller's I2D, and I2C to I2C. Connect 5V to 5V and GND to GND.

4.2 Software Configuration (Betaflight)

Follow these steps to configure your SoloGood M10-180C GPS module in Betaflight:

1. Connect the GPS module to a free serial port on your flight controller.
2. Open the Betaflight Configurator on your host computer. Navigate to the 'Ports' tab. Enable the 'GPS' function for the corresponding UART port where the GPS is connected. Set the baud rate to 'AUTO'.

Image: Betaflight 'Ports' tab showing GPS enabled on a UART port with 'AUTO' baud rate.

3. Go to the 'Configuration' tab. Scroll down to the 'GPS' section. Enable GPS. Select 'UBLOX' as the GPS protocol. Enable 'Auto Baud Rate', 'Auto Setup', and 'Use Galileo Unified'.

Image: Betaflight 'Configuration' tab showing GPS enabled, UBLOX protocol, Auto Baud Rate, Auto Setup, and Use Galileo Unified selected.

4. Save and restart the flight controller. After restarting, you should see the GPS icon lit in the Betaflight OSD or configurator, indicating satellite acquisition. For initial star search, take the aircraft to an open field.

4.3 Software Configuration (INAV)

Follow these steps to configure your SoloGood M10-180C GPS module in INAV:

1. Connect the GPS module to a free serial port on your flight controller.
2. Open the INAV Configurator on your host computer. Navigate to the 'Ports' tab. Enable the 'GPS' function for the corresponding UART port where the GPS is connected. Set the baud rate to 'AUTO'.

Image: INAV 'Ports' tab showing GPS enabled on a UART port with 'AUTO' baud rate.

3. Go to the 'GPS' setting page. Enable GPS. Set the protocol to 'UBLOX'. Enable 'Ground Assistance Type' and 'Automatic Daylight Savings Time'.

Image: INAV 'GPS' settings page showing GPS enabled, UBLOX protocol, Ground Assistance Type, and Automatic Daylight Savings Time selected.

4. Save and restart the flight controller. After restarting, the GPS label should light up. Take the aircraft to an outdoor open space for satellite acquisition. Initial power-up identification (M0) may take approximately 30 seconds.

5. OPERATING PRINCIPLES

5.1 GPS Data Protocol Description

The SoloGood M10-180C GPS module outputs relevant data via its serial port, supporting two primary data protocols:

Protocol Type	Description
NMEA	An internationally recognized GPS protocol based on string messages.
UBX	A binary-based GPS protocol developed by Ublox.

About the UBX Protocol

The UBX protocol is a binary protocol that is generally more efficient and easier to parse than NMEA. Modern Ublox chips (eighth generation and later) provide PVT (Position, Velocity, Time) statements, which contain most of the information required by users. The UBX protocol offers enhanced positioning accuracy estimation values such as hAcc (horizontal accuracy estimate) and vAcc (vertical accuracy estimate), which are more valuable than the hdop (horizontal dilution of precision) and other data found in NMEA. For these reasons, most UAV flight controllers utilize the UBX protocol over the traditional NMEA. It is generally recommended to use the UBX protocol for optimal performance.

6. MAINTENANCE

To ensure the longevity and optimal performance of your SoloGood M10-180C GPS module, consider the following maintenance guidelines:

- **Physical Protection:** Avoid exposing the module to excessive physical shock, moisture, or extreme temperatures.
- **Interference:** Keep the GPS module away from strong electromagnetic fields, especially from video transmitters (VTX) and high-current power lines, as these can interfere with satellite signal reception. A distance of at least 3-4 inches from the VTX antenna is recommended.
- **Cleaning:** If necessary, gently clean the module with a dry, soft cloth. Do not use liquid cleaners or solvents.

7. TROUBLESHOOTING

If you encounter issues with your SoloGood M10-180C GPS module, refer to the following common problems and solutions:

- **Slow Satellite Acquisition or No Satellites Found:**
 - Ensure the drone is in an open outdoor area with a clear view of the sky.
 - Verify that the GPS module is positioned away from potential interference sources, such as the VTX antenna.
 - Check all wiring connections for proper seating and correct TX/RX cross-connection.
 - Confirm that the correct GPS protocol (UBLOX recommended) and baud rate are selected in your flight controller software (Betaflight/INAV).
 - Allow sufficient time for initial satellite lock, which can sometimes take a few minutes, especially after the first power-up or if the module has been moved significantly.
- **Incorrect GPS Data or Unstable Readings:**
 - Double-check the wiring, particularly the TX/RX connections, to ensure they are not reversed.
 - Ensure the flight controller's GPS settings match the module's capabilities and recommended protocols (UBLOX).
 - Inspect for any physical damage to the module or wiring.
- **Module Not Powering On:**
 - Verify the power connection (5V and GND) from the flight controller to the GPS module.

- Ensure the flight controller itself is receiving power.
- Check the input voltage to ensure it is within the supported range of 3.6V-5.5V DC.

8. WARRANTY AND SUPPORT

For warranty information and technical support, please refer to the SoloGood official website or contact your retailer. Keep your purchase receipt as proof of purchase.

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