Manual of Multi Copter Controller I86

Thanks for purchasing this Multi copter Controller Series. I86 is a flight control board especially developed for remote Control Multi copters. Its working principle is to measure the angular speed of the aircraft rotating around reference axis of Pitch, Roll, Yaw, and make necessary correction automatically, so as to maintain the stability of the aircraft during flight.

I86 uses AVR high-performance, low-power 8-bit micro controller and High-precision MEMS digital three-axis gyro from ST Microelectronics. It offers advantages of good stability, flexibility, impact-resistant ability and reliability.

**[Features]**
1. 8 Multi copter Types are in support including Aero Copter, Dual Copter, Tri Copter, Quad+4 Copter, Quad+4 Copter, Hex Copter and Y6 Copter, which could be easily switched through on-board DIP-Switches;
2. 2 Flight Modes to choose from, including Normal Mode and Sport Mode, which could be easily switched through on-board DIP-Switches;
3. Maximum of 6 PWM output channels, compatible with most Electric Speed Controllers (ESC) and servos;
4. Independent gyro gain adjustment for Pitch, Roll and Yaw;
5. Basic setting function including stick centering and ESC throttle calibration;
6. Blue and Red LED for working status display and error report;
7. Convenient firmware upgrade.

**[Special Note]**
Remote Control Models are NOT toys. The high-whirling propeller of aircraft is very dangerous, therefore please carry out debugging and test flight in open space far away from the crowd. The beginner should be directed by someone experienced. The effect of flight depends on many factors, and the control board just makes necessary adjustment and correction, but it cannot totally take the place of other devices. To better use your multicopter controller, please take the following suggestions into consideration:

- Read this instruction manual carefully to understand the product’s feature, installation, setting method, etc.
- Choose high-precision, good-quality stander;
- Choose high-line, quick-response ESSCs or servos;
- Take all measures to reduce vibration, avoiding disturbance to the controller caused by mechanical shock;
- Upgrade the firmware as soon as releases new version.

**[Specifications]**
- Input Voltage: 4 V to 6 V
- Input Signal: 50 Hz standard PPM signal
- PWM Frequency: 400 Hz for ESC, 50 Hz for Servo
- Gyro: Scale: ±500 dps, ODR-800 Hz
- Operating Temperature: -40 °C to +85 °C
- Dimension: 40 mm x 40 mm
- Weight: 8 g

**[Installation & Wiring]**
**VERY IMPORTANT** Please use the supplied double-sided adhesive tape for installation. Application of two pieces of tape is recommended to better reduce the vibration. Firmly fix the control board in the centre of the body. The board must also be mounted with the white arrow facing the direction of forward flight. Incorrect or careless installation might harm the performance of the Multi copter controller or even result in complete failure.

**[Wiring Diagram]**

**[Multi copter Types & Flight Mode Selection]**
I86 has a 4-bits DIP-Switch for Multi copter Type and Flight Mode selection, the first three bits for Multi copter Type selection and the last bit for Flight Mode selection. **VERY IMPORTANT** Please re-power the controller to make the newly-selected mode effective.

**[Multi copter Types Setting Table]**

<table>
<thead>
<tr>
<th>No</th>
<th>Multi Copter Types</th>
<th>SW1</th>
<th>SW2</th>
<th>SW3</th>
<th>SW4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aero Copter</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>Dual Copter</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>Tri Copter</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>Quad+4 Copter</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>Quad X 4 Copter</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>X</td>
</tr>
<tr>
<td>6</td>
<td>Hex Copter</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>X</td>
</tr>
<tr>
<td>7</td>
<td>H6 Copter</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>X</td>
</tr>
<tr>
<td>8</td>
<td>Y6 Copter</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>X</td>
</tr>
</tbody>
</table>

**[Flight Mode Setting Table]**

<table>
<thead>
<tr>
<th>No</th>
<th>Flight Mode</th>
<th>SW1</th>
<th>SW2</th>
<th>SW3</th>
<th>SW4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Normal Mode (Recommended for beginners)</td>
<td>▲</td>
<td>X</td>
<td>X</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Sport Mode</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes: "▲" represents "OFF", "X" represents "ON", "X" represents influence- proof for the mode sel. i.e. Modes between Normal and Sport are either available for any Multi copter Types: ▲ the default setting.

**[Gyro Gain Adjustment]**
I86 offers three Trimming Potentiometers for control the gyro gain of pitch, roll and yaw. Clockwise for increase, anticlockwise for decrease. Please adjust the gain to meet Your needs. The adjustment becomes effective immediately and you don't need to restart it. For your safety, please do not adjust the gain until all the propellers become motionless.

**[Stick Centering]**
**VERY IMPORTANT** Since different transmitter has different signal range, we strongly suggest you apply this function to calibrate channel range after first-time installation or application of new radio system. N6 will automatically save and range the value of PPM signal from the four channels of your receiver in order to provide better linearity afterwards in daily usage.

**Step 1** Turn pitch pot to 0% position, Roll and Yaw to about 50% as shown on the right.

**Step 2** Turn on the transmitter, put the trimming buttons of all channels to zero, move throttle stick to the bottom position, the other stick stay in the middle position;

**Step 3** Connect the battery pack to ESC or receiver. You will see the blue and red led flash simultaneously for once. Wait about 1 second. Sync fast flash of both blue...

Connect the channels (Aileron, Elevator, Throttle and Rudder) from your receiver to the pins on the board marked No.1 to 4 and plug the ESCs or servos onto the pins M1 to M6 in the correct order according to the Multi copter Type you select (see P4 “Supported Multi copter Types”). When connecting, please pay attention to the colors of wires to avoid anti-plug. The WHITE(YELLOW)signal wires should be connected corresponding to the inner pins on the board, the RED(VCC)wires to the center pins, and the BLACK(GND) wires to the pins on the outer edge of your board, as shown below: