

innovative avionics



Propeller regulator PR2P-TL

Installation and operating manual

Revision# 1.0 7/11/2011
For firmware version 2.2

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1. Important notices and warnings

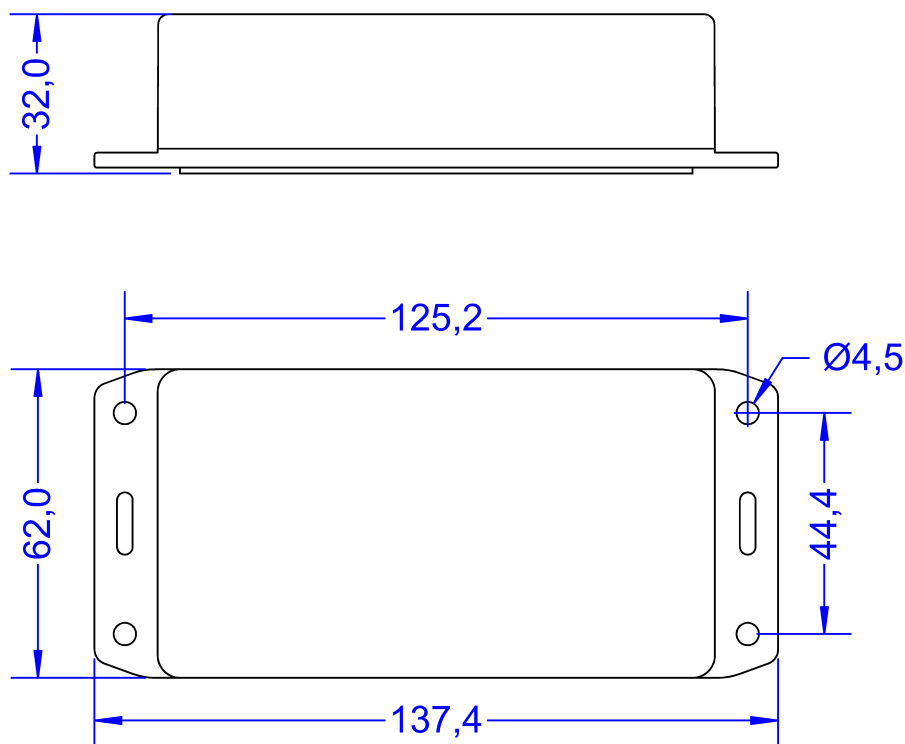
- Read entirely this manual before installing the instrument in your aircraft, and follow the installation and operating instructions described here.
- The pilot must understand the operation of this instrument prior to flight, and must not allow anyone to use it without knowing the operation.
- Keep this manual in the aircraft
- When the cabling is finished you must do a test, prior to flight, turning on all the possible source of electric noise and checking the properly operating of the PR2P-TL.
- Use aeronautic cable for the wiring.
- **The PR2P-TL is connected directly to the propeller pitch actuator: the non-respect of the notices above or a damage to the PR2P-TL may result in unexpected pitch changes.**
- **THE PR2P-TL MUST BE TURNED OFF IN CASE OF START WITH BOOSTER. OPEN THE CORRESPONDING BREAKER BEFORE STARTING. WARRANTY SHALL NOT APPLY FOR DAMAGE TO THE PR2P-TL FOR THIS REASON.**



If you don't agree with the notices above don't install the PR2P-TL in your aircraft but return the product for a full refund.

Microel s.r.l. reserves the right to change or improve its products. Information in this document is subject to change without notice.

2. Enclosure dimensions



(All dimensions are in millimeters)

NOTE: The aluminium panel is electrically connected to ground (GND) and it's used as a heatsink.

3. Electrical installation

3.1 Wiring connections

All the free wires are identified by a label; the connections to be executed are the following:

GND : GND Main supply

+12 : +12V Main supply

RPM : RPM input signal from the pick-up (for ROTAX912/914 engines)

M - : Propeller pitch motor out (-)

M + : Propeller pitch motor out (+)

LED-A : Anode of LED – connect to the (+)anode terminal of an external LED (usually the longer pin)

LED-K : Cathode of LED – connect to the (-)cathode terminal of an external LED (usually the shorter pin)

NOTES:

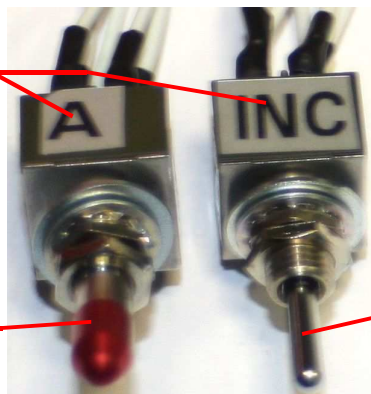
- Insert an adequate circuit breaker to the power lead, depending on the current consumption of the propeller pitch motor (MAX 7.5 A).
- **WARNING:** Voltage peaks that exceeds the operating limits on the supply line can damage the device.
- The PR2P-TL must not be powered in case of start with booster. Open the corresponding breaker before starting.

3.2 Control switches

The PR2P-TL has two removable control switches:

- The operating mode switch, to select between "AUTOMATIC CONSTANT SPEED" or "MANUAL" mode. Top of the switch is marked with "A" to indicate the AUTOMATIC CONSTANT SPEED position.
- The INC/DEC switch, to increase/decrease RPM in manual mode or to enter in various configuration settings in automatic mode. Top of the switch is marked with "INC" to indicate the INC position.

Top switch marking for installation



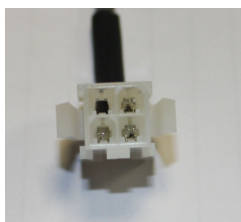
Operating mode switch (AUTO/MANUAL)

INC/DEC switch

The operating mode switch has a safety lock to avoid accidental operation: it must first be pulled on the outside and then moved to the desired position.

3.3 Potentiometer connection

Connection to the lever potentiometer is made via separable connectors (Molex minifit-jr connectors are used). The potentiometer is already wired with the corresponding connector:



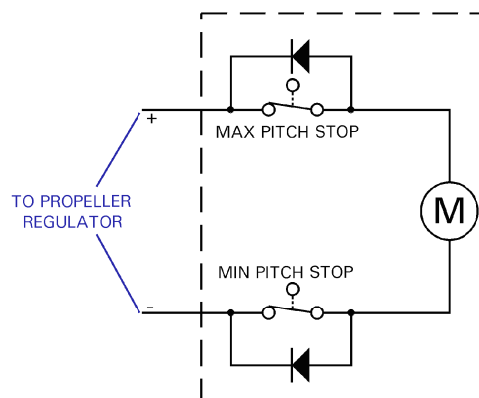
4. Post-installation checks

After the electrical installation has been completed you must execute these checks (with aircraft engine not running):

- Put the operating mode switch in the "Manual" position
- Turn-on the PR2P-TL
- Move the "INC/DEC" switch in the "INC RPM" position (increment RPM) and check that the propeller pitch decrease; check also that the external LED will turn on when the propeller reaches the min pitch stop.
If the propeller pitch change in the wrong direction (towards the max pitch) you must invert the two motor out cable (M+ and M-).
- Move the "INC/DEC" switch in the "DEC" position (decrement RPM) and check that the propeller pitch increase.

NOTE:

- Refer to the propeller constructor's manual if you need to adjust the mechanical min and max pitch stop of the propeller
- PR2P-TL works only with propellers with this type of electrical pitch stop:



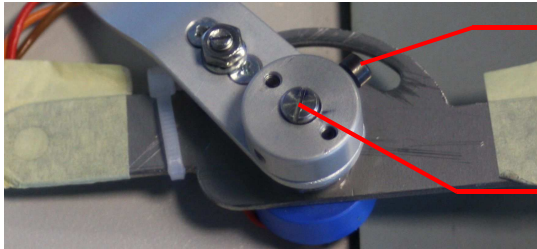
5. Potentiometer calibration (for TL technician only)

The potentiometer calibration procedure must be executed right after installation otherwise the PR2P-TL cannot work correctly.

The procedure also use the external LED for indications so make sure you have connected a LED (LED-A and LED-K wires).

To execute the calibration follow this steps:

- 1- Complete the mechanical installation of the lever/potentiometer assembly, but do not tighten the screw that lock the potentiometer shaft, so that it can be rotated freely:



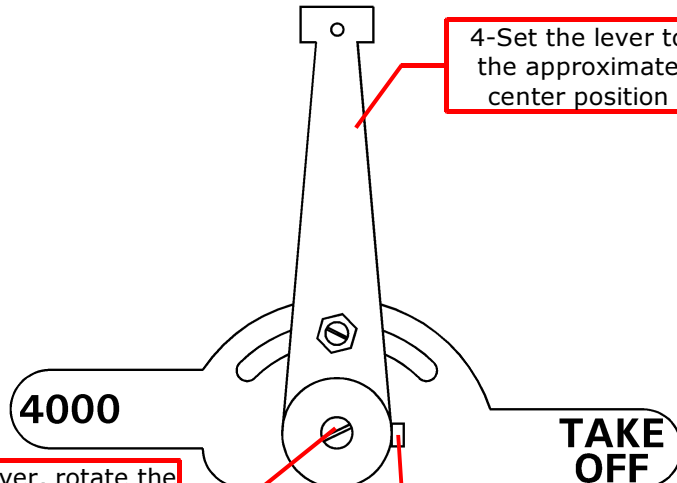
Do not tighten this screw

Check with a screwdriver that the potentiometer shaft is free to rotate

- 2- Move the operating mode switch to the "AUTOMATIC CONSTANT SPEED" position and power on the instrument.

- 3- Press more times the INC/DEC switch to compose the password supplied by Flybox to enter in calibration procedure (ask to Microel if you have not received the password by e-mail); now the PR2P-TL has entered in the programming mode and the LED flash for three seconds to indicate that you have correctly entered in the calibration procedure.

- 4- Set the lever approximately in the center position.
- 5- Using a screwdriver, slowly rotate the potentiometer shaft until the led turn on (fixed on without flashing).
- 6- Tighten the screw to lock the shaft in this position, making sure to not rotate the shaft or the lever.



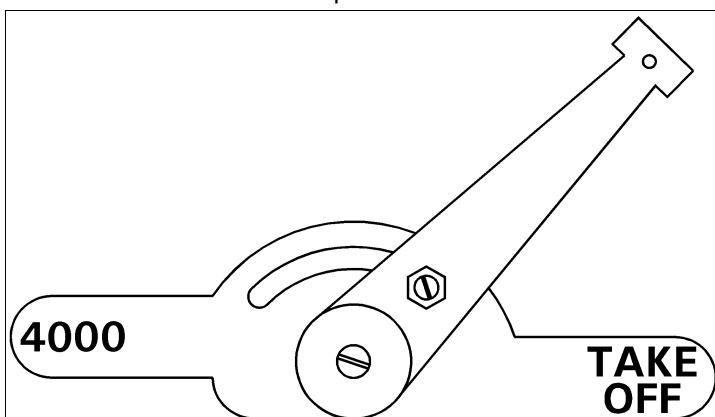
4-Set the lever to the approximate center position

5-Using a screwdriver, rotate the shaft until the led turn on.

6-Tighten the screw, making sure to not rotate the shaft or the lever.

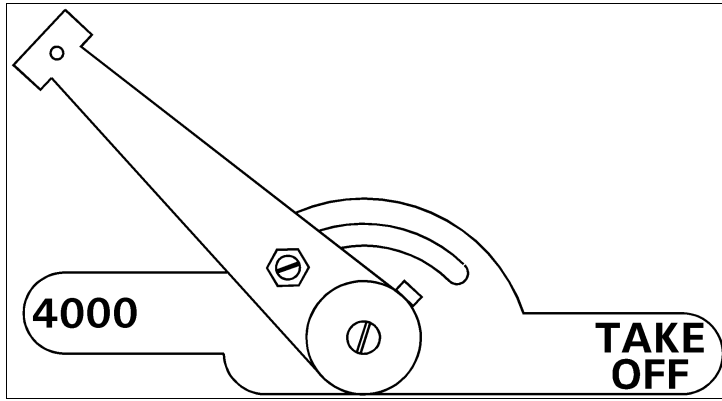
- 7- Press one time the INC/DEC switch in the **INC** position (the led flashes two times to indicate the now you are in the second calibration step).

- 8- Put the lever in the TAKEOFF position:



9- Press one time the INC/DEC switch in the **INC** position (the led flashes three times to indicate the now you are in the third and last calibration step).

10- Put the lever in the 4000 position:



11- Press one time the INC/DEC switch in the **INC** position.
Now the calibration is done, power off the instrument.

6. Operating instructions

The PR2P-TL has two operating modes: "Constant speed" and "Manual": you can select the operating mode using the corresponding switch on the frontpanel.

For normal operations use always the "Constant speed" mode; the "Manual" mode must be used in case of emergency or failure of the PR2P-TL because it exclude the electronic system and drive directly the pitch motor using the INC/DEC switch.

6.1 Use in "CONSTANT SPEED" mode

- To change the target RPM move the lever in the desired RPM position: the PR2P-TL will automatically keep constant the engine speed by varying the propeller pitch.
- The RPM range is from 4000 to 5700 RPM; the "TAKEOFF" position therefore corresponds to 5700 RPM.
- When the propeller reach the min pitch stop the external LED will turn on.

6.2 In case of failure/emergency

If during flight you notice that the PR2P-TL don't adjust correctly the propeller pitch or don't respond to the control lever turn immediately the operating mode switch to the "Manual" position; **this switch has a safety lock to avoid accidental operation: it must first pulled on the outside and then moved to the desired position.**

6.3 Use in "MANUAL" mode

The "Manual" mode must be used only when testing the propeller system and in case of failure or emergency.

In this mode the propeller pitch is adjusted using exclusively the INC/DEC switch: move in the "INC RPM" position to increment the engine RPM and move in the "DEC RPM" position to decrease it.

NOTE: To adjust the propeller pitch in "MANUAL" mode you must use exclusively the INC/DEC switch because the lever has no effect.

7. Technical specifications

- Dimensions: 137.4 x 62.0 x 32.0 mm
- Weight: 200 g
- Operational temperature range: -20 ~ +70°C
- Humidity: 90% max
- Supply voltage : 11 ~ 20 V=
- Supply current: 70 mA
- Maximum motor supply current : 7A
- RPM input for **ROTAX 912/914** engines

8. Warranty

This product is warranted to be free from defects for a period of 12 months from the user invoice date.

The warranty only covers manufacturer defects and shall not apply to a product that has been improperly installed, misused or incorrect maintenance, repaired or altered by non-qualified persons.

MICROEL s.r.l.

Via Mortara 192-194

27038 Robbio (PV) - ITALY

Tel +39-0384-670602 - Fax +39-0384-671830

www.flyboxavionics.it

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Supplement:

Password to enter in FlyBox PR2P-TL calibration

3 click in INC position (up), 4 in DEC position (down), 3 in INC (up) and 6 in DEC (down) (that is 3-4-3-6); now the PR2P-TL has entered the programming mode and the LED flash for three seconds to indicate that you have correctly entered in the calibration procedure. Now follow the manual instructions.