FLYBOX®

RT1 multifunction
RPM / Timer

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SECTIONS

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Thank you for purchasing a Flybox® product. We hope it fully satisfy you and makes your flights pleasant and secure.
Developing RT1, our intent was to create a compact and lightweight tachometer, easy to install and quick to consult.

SYMBOLS USED IN THE MANUAL

NOTE: Used to highlight important informations.

CAUTION: Used to warn the user and indicate a potentially hazardous situation or improper use of the product.

WARNING: Used to indicate a dangerous situation that can cause personal injury or death if the instruction is disregarded.

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⚠️ *NOTE:* Keep this manual in the aircraft.
This document must accompany the instrument in the event of change of ownership.

⚠️ *NOTE:* This device is intended for installation onto non type certified aircraft only, because it has no aviation certifications. Refer to your local aviation authorities to check if this device may be installed in your aircraft.

⚠️ *CAUTION:* Read entirely this manual before installing the instrument in your aircraft, and follow the installation and operating instructions described here.

⚠️ *CAUTION:* Using this instrument over the maximum allowable ranges can cause malfunction or wrong indications.

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

RT1 - **Manuale Utente**
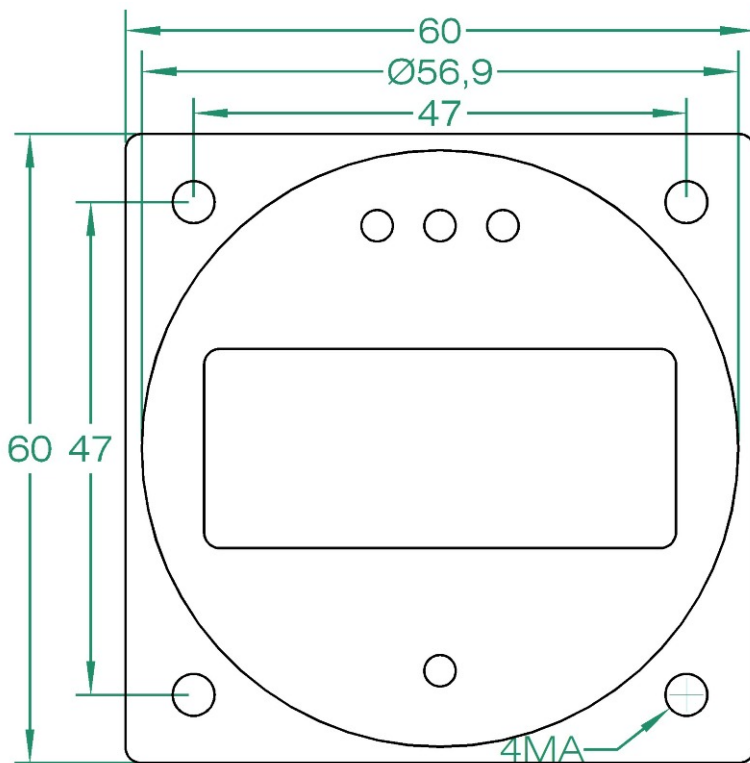Rev. 3

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SECTION 1

1.1 MECHANICAL INSTALLATION

1) RT1 fits in a standard 2 1/4" (57 mm) cutouts.

2) Avoid placing in hot locations (for example near heater vents).

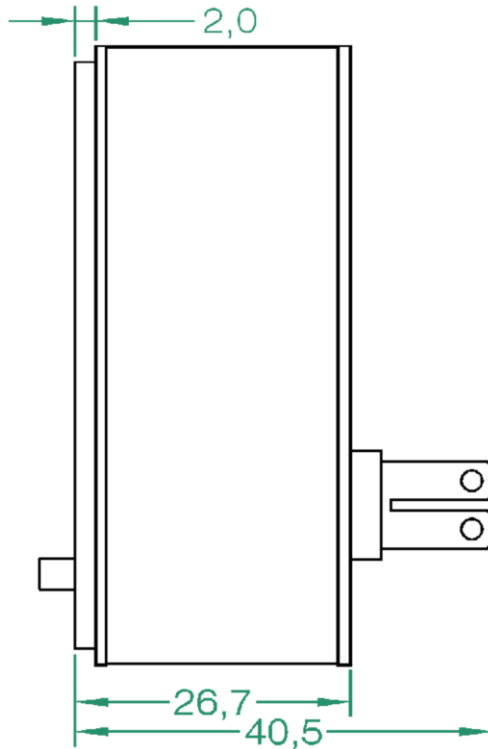3) Find a location where the display will always be completely visible.

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SECTION 2

2.1 DIMENSIONS

Front view

Dimensions in millimeters
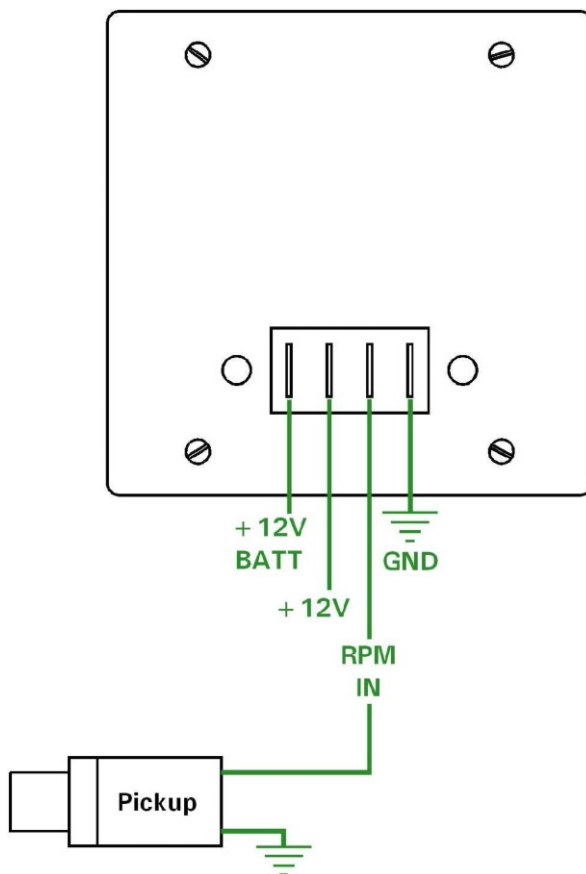
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Side view

Dimensions in millimeters

SECTION 3

3.1 ELECTRICAL INSTALLATION

On the back of the instrument there's a four-pole connector.

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Description of connections:

+12 BATT: power lead, can be connected to an auxiliary backup battery, if available.

+12 V: power lead, connects to 12 Volt main line.

RPM IN: RPM signal input from engine pickup.

GND: Ground lead

⚠️ *NOTE:*

- For ROTAX 503/582 engines: connect "RPM IN" to gray wire.

- For JABIRU engines: Use the pickup available at RS components with the code 285-756.
To have a correct signal from the pickup it's important to place it to the minimum possible distance from the metal block.
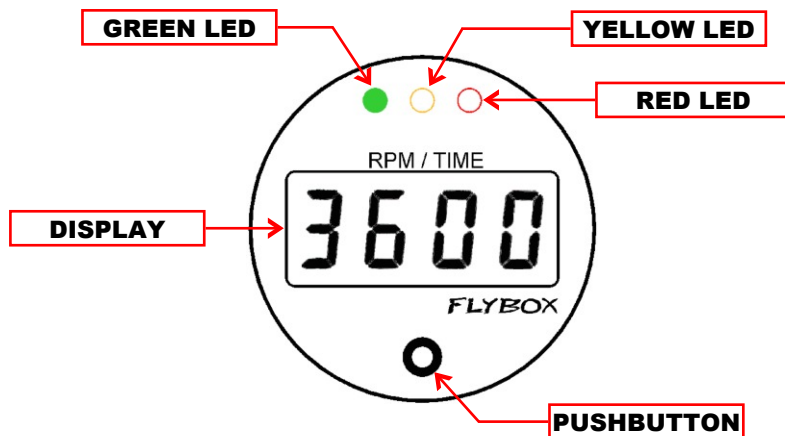
- Insert a 1 Ampere circuit breaker to the power lead (**+12V wire**).

⚠️ *CAUTION:* Voltage peaks on the supply line that exceeds the operating limits can damage the device.
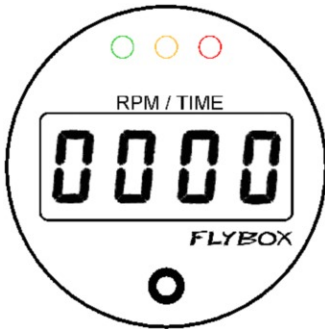
SECTION 4

4.1 PANEL INDICATOR AND COMMANDS

GREEN LED — YELLOW LED — RED LED — DISPLAY — PUSHBUTTON

RPM / TIME

3600

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- Symbols used in the manual:

○ **LED IS OFF**

● **LED IS ON**

☀ **LED IS FLASHING**

SECTION 5

5.1 USE DURING FLIGHT

After power-on the display briefly shows the software version, then it will be ready to work.

when the engine is stopped the display shows "0000" and the three LEDs are off; when the engine is running, the display shows the RPM and at the same time one of the LEDs turns on indicating the rotation range of the engine.

Engine RPM / range colors match table			
ENGINE	**GREEN ZONE**	**YELLOW ZONE**	**RED ZONE**
ROTAX 912/914	500-5500 RPM	5500-5800 RPM	> 5800 RPM
ROTAX 503/582	500-6200 RPM	6200-6800 RPM	> 6800 RPM
JABIRU	500-2800 RPM	2800-3200 RPM	> 3200 RPM
SIMONINI	500-5800 RPM	5800-6500 RPM	> 6500 RPM

FLIGHT TIMER:

The flight timer starts automatically when the engine meets or exceeds 4000 RPM for 30 seconds (2400 RPM for JABIRU engines) and it stops automatically when the engine is turned off (0000 RPM).

Click on the button to view the duration of the current flight (the time is shown in hours and minutes); click again to return to the RPM mode (or wait 5 seconds). The maximum measurable value is 9h59min.

During the flight it is possible to reset the timer by pressing the button for 3 seconds, until the display shows "Clrd".

SECTION 6

6.1 USE AFTER THE FLIGHT

After the flight, seven different readouts become available:

1) **Last flight timer**

2) **Max RPM reached by the engine during the last flight**

3) **Total accumulated engine time**

4) **Total accumulated time in "green" zone**

5) **Total accumulated time in "yellow" zone**

6) **Total accumulated time in "red" zone**

7) **Max RPM ever reached by the engine**

⚠️ *NOTE:*

- After 10 seconds of inactivity the display automatically return to the actual RPM screen.

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To scroll through the various functions click on the button; the following describes in sequence the various functions displayed:


1- The Flight timer stores in memory the last flight's time in hours and minutes; it will reset automatically at the next takeoff. It's available also during the flight, showing the current flight time.
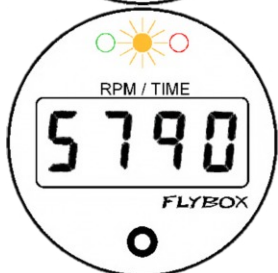
2- Maximum peak RPM reached by the engine in the last flight; it will reset automatically at the next takeoff.

All the following functions show the time in the format HHHH:MM (thousands of hours and minutes); the display shows alternatively the hours and then the minutes, for example:
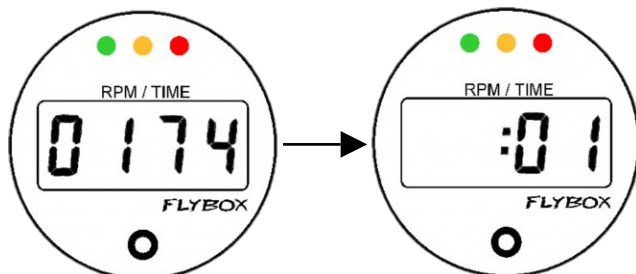
means 174 hours and 1 minute.

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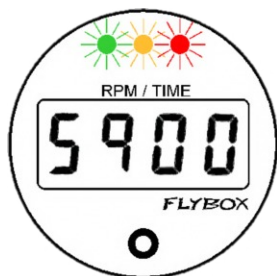**3-** Total time accumulated by the engine.

4- Total accumulated time in "green" zone.

5- Total accumulated time in "yellow" zone.

6- Total accumulated time in "red" zone.

**7-** Maximum peak RPM reached by the engine during its life.

SECTION 7

7.1 PROGRAMMING

The programming mode allows you to:

- Reset or modify the total accumulated engine time (modify is useful when installing on a used engine).

- Reset the total accumulated time in "yellow" and "red" zone

- Reset the maximum peak RPM

To enter the programming mode:

With the instrument turned off press and hold the button, then power on the instrument and wait 5 seconds until the display shows the word "ProG", that continuously alternates with the first parameter to be programmed.
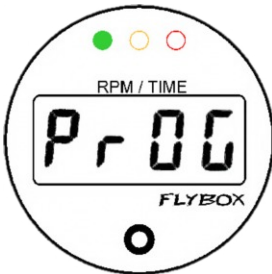
Now you can set the hour for the total accumulated engine time in "green" zone (and therefore also in the total accumulated engine time).

Press the button again for 3 seconds until the display shows the first digit of the number flashing; click on the button to increase the value by one unit, hold the button to go to the next digit, and repeat this step for all four digits.

When the insertion is completed the value is stored in memory and the display confirms by showing the word "MEMO".

The following values (total accumulated time in "yellow" and in "red" zone) can only be cleared (reset to zero):
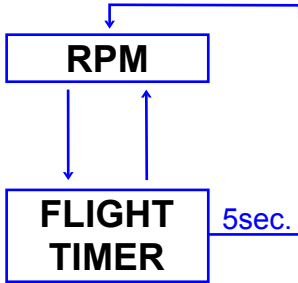
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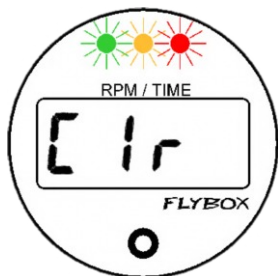
To clear a value press and hold the button until the display shows "Clrd", to jump to the next value without clearing just click the button.
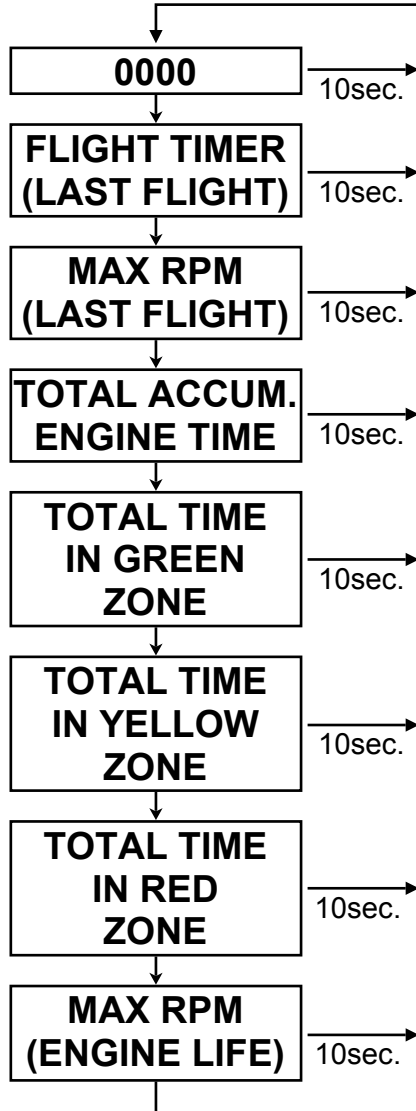
The last parameter is the maximum peak reached by the engine; this parameter can only be cleared (reset to zero). To clear it press and hold the button until the display shows "Clrd".

To exit the programming mode turn off the power and wait a few seconds before turning on again.

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USE DURING FLIGHT (ENGINE ON)

```
    ┌──────────┐
    │   RPM    │
    └──────────┘
         ↓  ↑
    ┌──────────┐
    │  FLIGHT  │  5sec.
    │  TIMER   │
    └──────────┘
```

USE AFTER FLIGHT (ENGINE OFF)

```
┌─────────────────┐
│      0000       │  10sec.
└─────────────────┘
┌─────────────────┐
│  FLIGHT TIMER   │  10sec.
│  (LAST FLIGHT)  │
└─────────────────┘
┌─────────────────┐
│    MAX RPM      │  10sec.
│  (LAST FLIGHT)  │
└─────────────────┘
┌─────────────────┐
│  TOTAL ACCUM.   │  10sec.
│  ENGINE TIME    │
└─────────────────┘
┌─────────────────┐
│   TOTAL TIME    │  10sec.
│   IN GREEN      │
│     ZONE        │
└─────────────────┘
┌─────────────────┐
│   TOTAL TIME    │  10sec.
│   IN YELLOW     │
│     ZONE        │
└─────────────────┘
┌─────────────────┐
│   TOTAL TIME    │  10sec.
│   IN RED        │
│     ZONE        │
└─────────────────┘
┌─────────────────┐
│    MAX RPM      │  10sec.
│  (ENGINE LIFE)  │
└─────────────────┘
```

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SECTION 8

8.1 TECHNICAL SPECIFICATIONS

- **Case dimensions:** 60 x 60 x 40.5 mm

- **Weight:** 103 g

- **Power requirements:** 10 ~ 30 V / 40 mA

- **Measurable RPM Range:** 500 ~ 8000 RPM

- **Resolution:** 10 RPM

- **Accuracy:** 0.02%

- **Operating temperature range:** -20 ~ +70 °C

- **Relative humidity:** 10% ~ 90% (without condensate)

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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 person.

Date	Version	Description
03/2010	2.4	First release
04/2014	3.0	Layout update

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