

FLYBOX®



Oblò backup system 2.0

Revision#1.0, 07/11/2018

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SECTIONS

MECHANICAL INSTALLATION

ELECTRICAL INSTALLATION

OPERATING INSTRUCTIONS

TECHNICAL SPECIFICATIONS

Thank you for purchasing a Flybox® product. We hope it fully satisfy you.

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.



NOTE: *Keep this manual in the aircraft. This document must accompany the device 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 this device in your aircraft, and follow the installation and operating instructions described here.*



CAUTION: *When the installation is finished you must do a test, prior to flight, switching on all the possible source of electric noise and checking the properly operation of this device.*



WARNING: *Responsibility for installation lies entirely with the installer. Responsibility for operations lies entirely with the operator.*

IMPORTANT: *If you do not agree with the notices above do not install the device in your aircraft, but return the product for a refund.*

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

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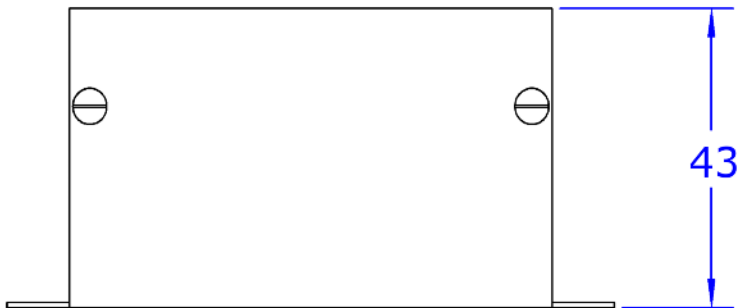
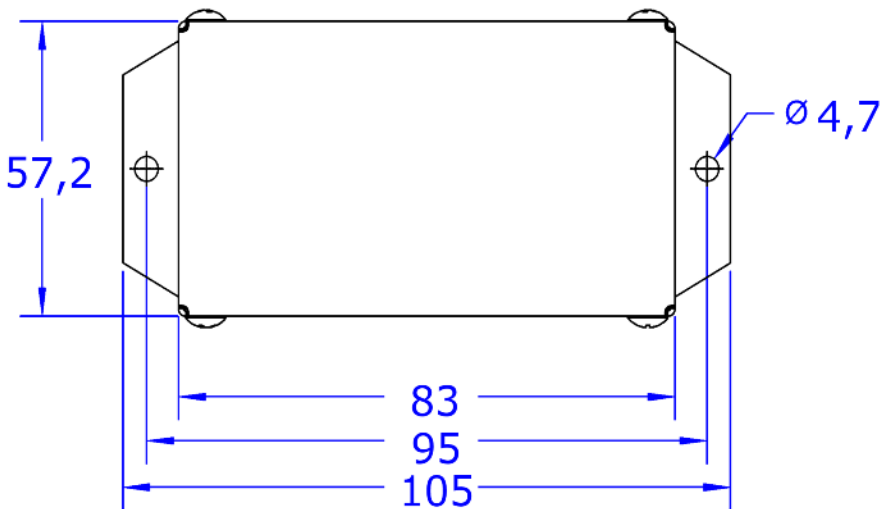
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SECTION 1

1.1 MECHANICAL INSTALLATION

The aluminum enclosure can be fixed using the two holes on the flanges.



Dimensions in millimeters

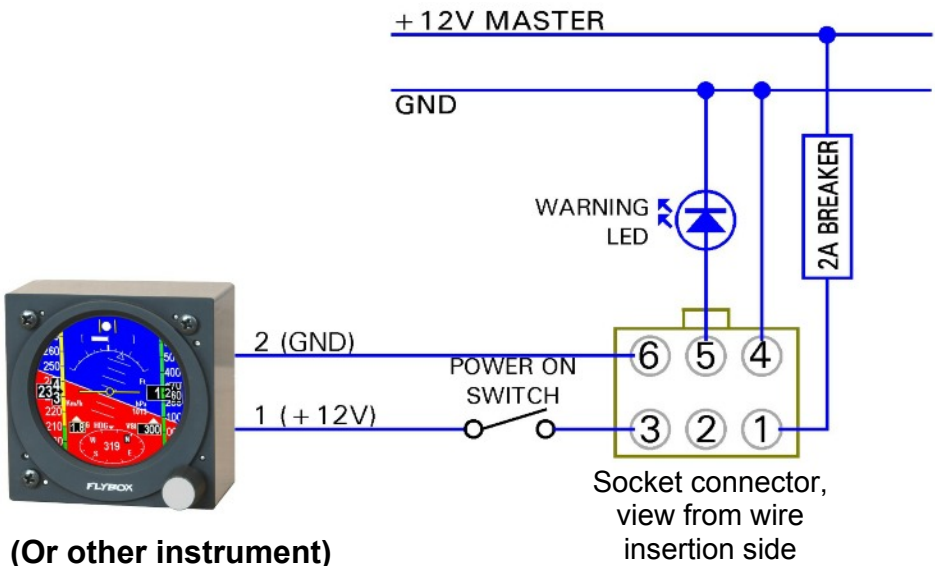
1.2 INSTALLATION NOTICES

- This device contains a Ni-Mh battery pack, with operating temperature range 0~45°C. Outside of these limits the battery is not charged, so you need to install it away from heat sources (for example heater vents). If possible choose an area where there is some air circulation.
- Select an area that is accessible, to allow for future battery servicing.

SECTION 2

2.1 ELECTRICAL INSTALLATION

Below is the wiring connection for the 6 pin Molex minifit-jr connector of the device.
 Included in the kit there are the corresponding socket connector and the crimp terminals.



⚠ NOTE: Warning led must always be installed.

**NOTE:**

- This device was designed to drive one or two Oblò instrument. If you connect other instruments note that the output current limit is 0.45 Amps.
- The power supply can be taken either from a line that remains energized during engine start (ie master bus) or from a line that remains off during engine start.
- The power-on switch on pin#3 is necessary to turn off the Oblò or other connected instruments, because from pin#3-6 is always present the voltage of the internal battery.
- Complete the wiring harness and connector installation prior to attaching the connector to the device. This is essential to ensure the wires do not inadvertently short together during installation (remember that the internal battery of the device is ready to deliver output power even when the aircraft electrical system is in the off state).
- The warning led on pin#5 is used for eventual error indications (ie battery fault, temperature outside operating range...).
- Insert a 2 amp circuit breaker to the +12V power lead (pin#1).



CAUTION: Voltage peaks on the supply line that exceeds the operating limits (20V) can damage the device.

SECTION 3

3.1 DESCRIPTION AND USE OF THE DEVICE

The Backup System for Oblò is an electronic device that contains a Ni-Mh battery pack and an electronic system that manage the battery charging. It is designed to drive one or two Oblò instrument (or other instruments with maximum load current of 0.45 Amps) even in the absence of main power supply, or during engine start. Connects directly to the power bus of the aircraft and provides at its output the supply voltage for connected instruments and simultaneously charge the internal battery pack.

Charging system:

The device continuously monitors the state of the internal battery and recharges it as necessary when the aircraft electric system is turned on.

The maximum input current for battery recharging is 1.5 Amps. If the internal battery is fully discharged it may require up to four hours of recharge time.



NOTE: This device contains a Ni-Mh battery pack, with operating temperature range 0~45°C. Outside of these limits the battery is not charged.

Ground based recharging:

To accomplish ground based charging, turn on the aircraft master switch and keep turned on for 3-4 hours, to allow the backup system to be charged. Leave all other aircraft loads in their off state. After 3-4 hours the internal battery is fully charged, turn off the master switch. It may be necessary at this point to charge also the main aircraft battery (with an appropriate charger), as it was used to charge the backup system.

Battery capacity and duration:

The backup system contains one battery pack with nominal capacity of 2 amp-hours. Battery capacity depends on many factors: actual state of charge, age of the battery pack, number of charge/discharge made, ambient temperature.

With battery in good condition and fully charged, the following average performance can be expected in terms of operating duration:

Current draw by the load	Duration
0,26 A (1 Oblò)	6 hours
0,45 A	3 hours

To avoid damage to the battery pack you must avoid to fully discharge it (the battery voltage should never drop below 9.5 Volt).

If you have connected one Oblò instrument, it will turn off when voltage drop below 10V, or you will notice continuous turn-off/turn-on. In this condition is essential to turn the instrument off, to avoid further discharging of the battery, and proceed with a charge as soon as possible.

Storage beyond 3 months:

If you are not using the aircraft, or if you leave disconnected the backup system, be sure to make a full charge as explained in the paragraph “Ground based recharging”, at least once every 3 months. This is necessary because Ni-Mh batteries discharge, after long periods of time, even when not in use.

3.2 NORMAL OPERATING PROCEDURES

For normal operation the following is the recommended operating procedures:

Start-up procedure:

- Prior to turning on the aircraft master switch, turn on any equipment that derives power from the backup system. In this way you can check the correct operating of the backup system and you can check that the internal battery is not fully discharged.
- Turn on the aircraft master switch and ensure that equipments connected to the backup system remains energized.
- Continue with the normal start-up operating procedures.

Shut-down procedure:

- Shut down aircraft engine using normal procedures.
- Shut down the aircraft master switch and verify that equipments connected to the backup system remains energized.
- Turn off the equipments connected to the backup system.

3.3 ENDURANCE TESTING

At least once a year perform this test to check the endurance capability of the backup system:

1. Shut down the aircraft master switch.
2. Turn on the equipment connected to the backup system.
3. If the equipment connected is an Oblò:
 - Measure the time until the Oblò turn off, or it begin continuous turn-off/turn-on.

If the equipment connected is not an Oblò:

- Measure the time until the equipment no longer functions or the time until the output voltage of the backup system drops to 9.5 Volt. Avoid voltage to fall below 9.5 Volt, to not damage the battery pack.
4. At the end of the test fully charge the battery by performing the procedure explained in chap.4, paragraph “Ground based recharging”.

If the measured duration no longer meets your endurance testing requirement, the internal battery of the backup system must be replaced.

3.4 WARNING LED NOTIFICATIONS

The warning led is used to indicate any faults in the system or in the internal battery pack. When power supply is applied to the backup system, the led lights up for 3 seconds to confirm correct operation.

The possible notifications are:

- 2 flashes followed by a pause: internal battery faults (contact Microel srl to order a new battery pack).
- 3 flashes followed by a pause: excessive charge time; it means that the battery pack no longer holds a full charge, so you need to replace it (contact Microel srl to order a new battery pack).
- 4 flashes followed by a pause: battery temperature outside the operating limits (0~45 °C); in this case the charging system will inhibit the charge of the battery until the temperature falls within the operating limits (above 0° or below 45° C).
- 5 flashes followed by a pause: internal battery temperature sensor fault (contact Microel srl to order a new battery pack).
- 6 flashes followed by a pause: internal battery faults (contact Microel srl to order a new battery pack).

SECTION 4

4.1 TECHNICAL SPECIFICATIONS

- Dimensions: 105.0 x 57.2 x H43 mm.
- Electrical connections using 6-poles Molex minifit-jr connector (included).
- Operating temperature range: -10 ~ +60 °C.
- Charge operating temperature of the internal battery pack: 0 ~ 45 °C.
- Supply voltage: 10 ~ 16 V.
- Max continuous input current: 1 A.
- Max continuous output current: 0.45 A.
- Output voltage: 10 ~ 12 V during backup operation
- Batteries: Internal Ni-Mh battery pack.
- Weight: 220 g.

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	Revision	Description
11/2018	1.0	First release

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