Flarm Indicator

User's manual

version 1.0

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Contact Information

Publisher and producer:

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Revision History

The following table shows full description of changes made in this document.

DATE	DESCRIPTION
October 2021	- Initial release of document

Contents

1 Introduction

The Flarm Indicator is digital flarm monitoring instrument. It features circular "2.1"inch display which is fully visible during direct sunlight. With an integrated ambi-light sensor, the unit dynamically adjusts the brightness level of the display depending on the exposed sunlight. This helps to optimize power consumption and ensures optimal visibility.

User interaction with the Flarm Indicator unit requires only one rotary knobs. With a built-in multi-language voice module, the unit offers the pilot voice warnings, alerts, Flarm visual support, gliders data base with Flarm ID and lot's more.

Below is the short list of the Flarm Indicator functionality:

- Internal beeper
- Integrated voice module
- Single rotary-push knobs for user interface
- Two data ports for 3rd party Flarm devices
- Integrated Flarm splitter
- Side facing micro SD card port for data transfers
- Audio connection port with 3.5mm connector as an option (1W or intercom output)
- Intercom audio output as an option for powered aircraft
- Internal Flarm glider database with Flarm Id-s, Callsigns, etc.
- Multi language support

1.1 Reserves all rights

For more additional info, please visit our website https://www.rc-electronics.eu/

2 Basic operation

In the following section we will provide more details of the Flarm Indicator unit. We will show you the easiest way to start up using your new device and its features.

2.1 Powering up

To turn on the device, no interaction is needed. After connecting main DC supply, the unit will automatically start the power procedure. Unit is powered over RJ12 connector from Flarm unit!

Once turned on, the Flarm Indicator intro screen will appear.

2.2 Front view

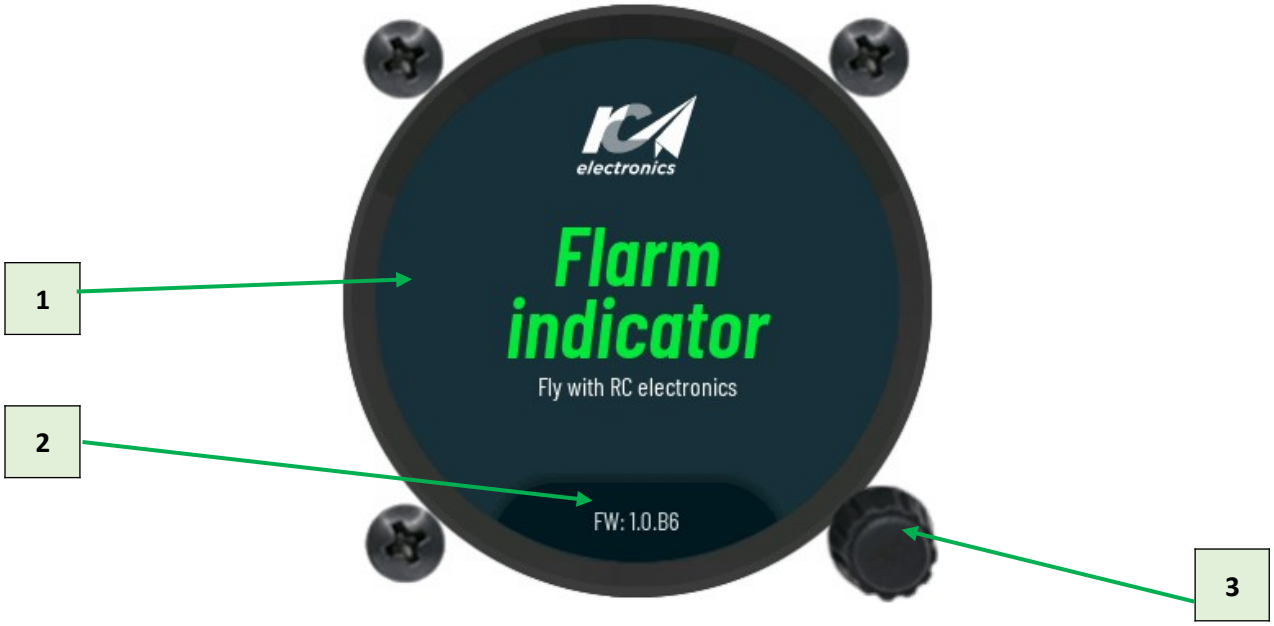

Figure 1: Reference front view of the unit. Also the Flarm Indicator intro screen.

- **1 –** Main screen
- **2 –** Device version
- **3 –** Push-rotary knob

2.3 User interface

One rotary knobs is used by the pilot to interact with the unit. To get more understanding of its use, we will describe all functions in next sub-sections. Knob can be turned clockwise **(CW)** or counter clockwise **(CCW)** rotation with addition of a central push-press switch.

2.3.1 Push-rotary knob

Following functions are possible with use of press-rotary knob:

- Rotation will change displayed radar range or change values in the edit fields.
- Short press for confirmation, entering sub-menus and confirming edit values.
- 2 seconds press will perform entering in to menu from main page or exiting from sub-menus.

2.4 Software update

New updates will be published on website www.rc-electronics.eu After downloading update file, copy it to dedicated micro-SD card and use update procedure below:

- Shutdown device by cutting of power delivery.
- Insert micro-SD card in the side slot of the device.
- Restore power delivery and wait for update to complete.
- After successful update, micro-SD card can be removed.

NOTE

During software update, keep external main input power present.

2.5 Device shutdown

2.5.1 Loss of main input power

Short interruption of main power can accrue during the flight when pilot switches from primary to secondary battery. In that time the unit may restart.

3 Page overview

Each page was designed in such a way as to give best user experience and to be clear to read on fully round 2.1 inch display.

3.1 Main page

With the externally connected Flarm device into a data port of the Flarm Indicator, nearby objects can be viewed on the main **Flarm radar page**. Displayed graphical radar with additional numeric information on the main screen will give the pilot quickly needed information about the surrounding objects.

Figure 2: Flarm Radar reference page.

Main screen displays graphical radar, with all nearby detected objects. The pilot position is represented as green displayed glider in the middle of the screen. Colored arrows will represent

nearby objects. Blue arrows show objects which are higher, brown the ones which are lower and white the ones which are the same altitude with the offset of ±20m. Selected object is colored yellow.

Bottom area of the display is reserved for additional data of the currently selected object as for the currently selected radar scale.

- **F.VAR –** will display vario information of the selected object.
- **F.ALT –** will display relative altitude of selected object.
- **F.DIST** – will display the relative distance from us.
- **F.ID –** will display the ID (3 letter code) of the selected object.

Short press on bottom rotary knob will allow pilot to select different object from displayed radar. Switch will also refresh selected object information's on the bottom area of the display. Once short press is made, currently selected object will be mark with the yellow circle. Switching between objects is made with the CW or CCW rotation of the rotary knob. Final selected object is the confirm with the short press on the rotary knob.

With only of the rotation with the rotary knob, the range of displayed radar can be changed from 1 km up to 9 km. No short or long press on rotary knob is needed to perform this change.

Figure 3: Flarm Radar reference .

- **1 –** Displayed type of the selected glider or name from Flarm database.
- **2 –** Our current position.
- **3 –** (Brown Arrow) Object, with the lower altitude.
- **4 –** Additional information of the currently selected glider.
- **5 –** (Yellow Arrow) Currently selected object.
- **6 –** (Blue Arrow) Object, with higher altitude.
- **7 –** Radar range **(can be selected from 1 to 9).**

3.2 Settings

To enter the **Settings** page, long press on rotary knob must be made. Once in the menu, the pilot can set parameters of the unit. Scrolling through the menu is done by CW or CCW rotation on the rotary knob. To select or confirm the parameters in sub-pages, pilot must short press on rotary knob. Value of the selected parameter can be then change by rotating knob in CW or CCW.

To exit back to **Settings** page, select exit option or use long press on rotary knob.

Any confirmed modified parameter is then saved into the internal memory of the unit. If the power shutdown event occurs, save parameters will not be lost.

3.2.1 Details

Sub-menu page **Details** allow pilot to view, add or change information of the currently selected object on the radar main page.

The following settings can be viewed or adjusted in the **Details** sub-menu:

➢ Flarm ID	➢ Callsign	➢ Type
➢ Registration	➢ Frequency	

Figure 4: Details sub-page reference.

NOTE

Flarm ID is only parameter that cannot be adjusted by the pilot.

3.2.2 Voice

In the **Voice** setup sub-menu the pilot can adjust volume and mixer setting for voice warnings. Sub-menu page also includes setting for additional voice alerts, which can be left disabled or enabled for use during a flight. The **Voice** sub-menu includes following settings:

- **Volume**
  Range: 0% to 100%
- **Voice test**
  To test audio level.
- **Flarm traffic**
  Options:
  - Enable
  - Disable
- **Flarm warnings**
  Options:
  - Enable
  - Disable
- **Flarm obstacle**
  Options:
  - Enable
  - Disable
- **Flarm h. distance**
  Options:
  - Enable
  - Disable
- **Flarm v. distance**
  Options:
  - Enable
  - Disable

Figure 5: Voice sub-menu reference.

3.2.3 Units

The displaying units for every numeric and graphical displayed indicator are adjusted in the **Units** sub-menu. The following settings can be made on indicators:

- **Altitude**
  Optional units:
  - ft
  - m
- **Climb rate**
  Optional units:
  - m/s
  - m
- **Distance**
  Optional units:
  - km
  - nm
  - mi

Figure 6: Units sub-menu reference.

3.2.4 Data port

Working configuration of the external data ports is set in sub-page **Data port.** The pilot can set following parameters:

- **Data port –** parameter to set communication speed between the Flarm Indicator data ports and the externally connected device. The following speeds can be chosen:
  - **BR4800**
  - **BR9600**
  - **BR19200**
  - **BR38400**
  - **BR57600**
  - **BR115200**

NOTE

Data port communication speed applies the same for data port 1 and data port 2.

Figure 7: Data port sub-menu reference.

3.2.5 Localization

Local settings can be set in the **Localization** sub-menu, containing preferred language. Pilot can choose between English and German language.

Figure 8: Localization sub-menu reference.

3.2.6 Password

Special function passwords can be used:

- **46486 –** will set Flarm Indicator to the factory default state (all settings are cleared and default settings are used)

Figure 9: Password sub-menu reference.

3.2.7 Info

Unique device identifiers can be seen in sub-menu **Info**. Displayed list shows following identifiers:

- **Serial nr. –** serial number of the Flarm Indicator unit.
- **Firmware –** current version of running firmware.
- **Hardware –** version of hardware used inside the Flarm Indicator unit.

Figure 10: Info sub-menu reference.

3.3 Warnings

For the warnings references please see pictures below.

Traffic warning will indicate if aircraft is nearby. The red direction symbol will indicate the detected direction of the aircraft.

Red rhombus will indicate if the nearby aircraft is located below or above from our current height.

Figure 11: Traffinc warning view.

An **Obstacle** warning will be triggered if the pilot is to close to an obstacle.

Red rhombus will indicate, if for the nearby obstacle is higher or lower.

Figure 12: Obstacle warning view.

Zone warning will be triggered if the pilot is getting close to the prohibited zone. Type of zone is also displayed in the large gray area of the display.

Red rhombus will indicate, if for the nearby zone is higher or lower.

Figure 13: Zone warning view.

4 Rear of unit

The Flarm Indicator contains the following external peripheral connections.

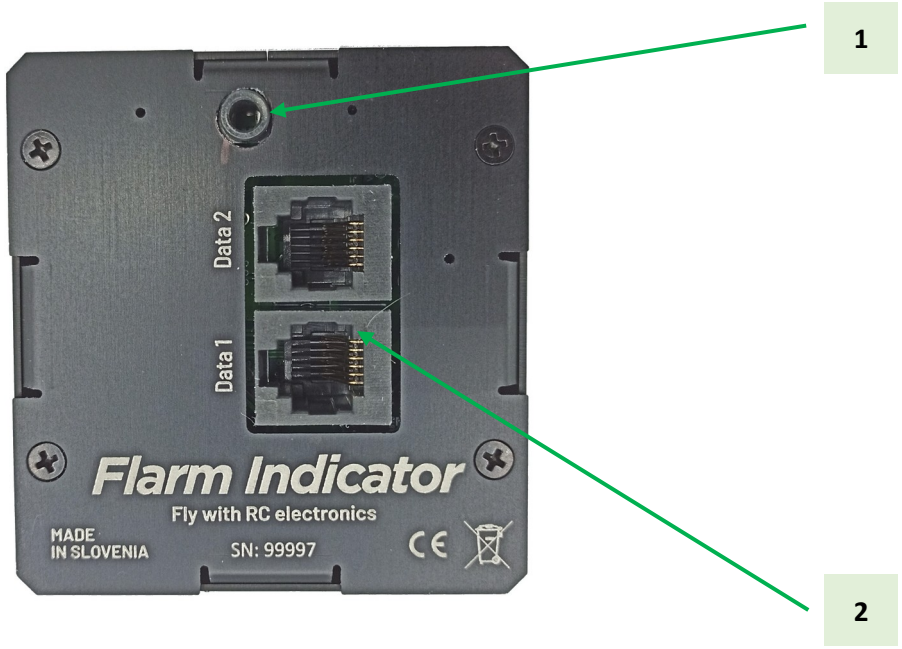

Figure 14: Reference rear view of the Flarm indicator.

Description:

1. Audio 3.5mm Mono output for speaker or intercom (as option).
2. Data 1 and Data 2 which is used to connect devices with RS232 communication protocol. Power is received over this data ports. See pinout specification

4.1 Data port pinout

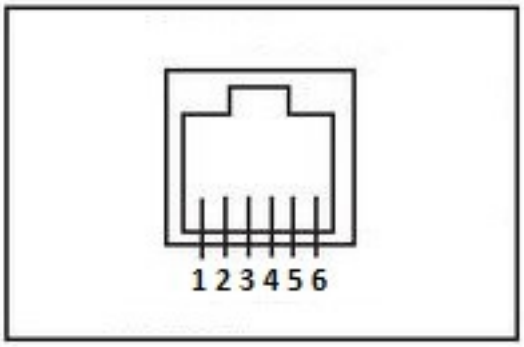

Figure 15: Data connectors pin-out

Pin number	Pin description
1	Power input/output (9 – 32Vdc)
2	Not used
3	Not used
4	RS232 data input (Flarm Indicator receives data)
5	RS232 data output (Flarm Indicator transmits data)
6	Ground (GND)

5 Physical properties

This section is used to describe mechanical and electrical properties.

Dimensions	65mm x 62mm x 30mm
Weight	120g

5.1 Electrical properties

POWER USAGES

Input voltage	9V (Vdc) to 32V (Vdc)
Input current	80mA @ 13V (Vdc)

AUDIO (POWER DELIVERY)

Output power	1W (RMS) @ 8Ω or 300mV for intercom as an option

DATA PORTS (POWER DELIVERY)

Output voltage	Same as Input voltage of power connector
Output current (MAX)	-500 mA @ 9V (Vdc) to 32 (Vdc) per port

6 Installation of the unit

6.1 Mechanical installation

Flarm Indicator unit fits in standard 57mm hole in instrumental panel so no extra cutout is required. To install the unit in instrumental panel, unscrew three mounting screws (black) with a screwdriver and knob of rotary switch.

To remove the knob do not use force. Remove the press-in cover first to get to the screw. After unscrewing the screw pull off the knob. Then unscrew mounting nut for rotary switches.

Place the unit in the instrumental panel and first screw in the two black screws and then mounting nuts for rotary switches. After that put back the knob on the rotary switch. Don't forget to screw the knob in place and put the press-in cover back on.