

PowerMouse

The FlarmMouse successor

Version 1.07



LXNAV d.o.o. • Kidričeva 24, 3000 Celje, Slovenia • tel +386 592 33 400 fax +386 599 33 522
info@lxnav.com • www.lxnav.com

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1 Important Notices

The LXNAV PowerMouse system is designed for VFR use only as an aid to prudent navigation. All information is presented for reference only.

Information in this document is subject to change without notice. LXNAV reserves the right to change or improve their products and to make changes in the content of this material without obligation to notify any person or organisation of such changes or improvements.



A Yellow triangle is shown for parts of the manual which should be read carefully and are important for operating the LXNAV PowerMouse system.



Notes with a red triangle describe procedures that are critical and may result in loss of data or any other critical situation.



A bulb icon is shown when a useful hint is provided to the reader.

1.1 Limited Warranty

This LXNAV PowerMouse product is warranted to be free from defects in materials or workmanship for two years from the date of purchase. Within this period, LXNAV will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts and labour, the customer shall be responsible for any transportation cost. This warranty does not cover failures due to abuse, misuse, accident, or unauthorised alterations or repairs.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED OR STATUTORY, INCLUDING ANY LIABILITY ARISING UNDER ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, WHICH MAY VARY FROM STATE TO STATE.

IN NO EVENT SHALL LXNAV BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE, OR INABILITY TO USE THIS PRODUCT OR FROM DEFECTS IN THE PRODUCT. Some states do not allow the exclusion of incidental or consequential damages, so the above limitations may not apply to you. LXNAV retains the exclusive right to repair or replace the unit or software, or to offer a full refund of the purchase price, at its sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

To obtain warranty service, contact your local LXNAV dealer or contact LXNAV directly.

2 Packing Lists

- PowerMouse
- Dipole FlarmAntenna
- 2nd Dipole FlarmAntenna is optional
- USB stick
- Flarm power supply cable
- FlarmView/FlarmLED (Optional)

3 Basics

3.1 LXNAV PowerMouse at a Glance

PowerMouse is standalone PowerFlarm® with external GPS antenna, USB socket and internal Bluetooth module.

It's a collision avoidance device, designed for gliders as well as for other participants in the air. FLARM® is in widespread use and features include:

- Display of nearby Flarm traffic with warning visually and acoustically of approaching other aircraft or fixed obstacles (where database has been installed)
- intelligent motion prediction which minimizes nuisance alarms and supports situational awareness
- integration with over 50 compatible products by other manufacturers (e.g. PDA moving maps) through open serial port protocol
- USB socket for easy uploads and downloads, IGC-format flight recording and OLC-approval
- based on award-winning original FLARM® design, endorsed by FAI, IGC/OSTIV and EASA (AMC Part 21, Part M)
- optional diamond-level IGC-approval with/without engine noise sensor (ENL)
- a typical radio range that can be verified with online radio range analyser
- powerful 72-channel high-precision uBlox NEO8-GPS module
- full compatibility with wide range of Flarm-licensed products
- operation on a license-free radio band, not based on transponder technology
- small size and simple installation

PowerMouse is available in 4 variants:

1. PowerMouse with Flight recorder (Not approved by IGC), with enabled SAR (search and rescue) function
2. PowerMouse with IGC approved Flight recorder (Up to Diamonds) and SAR function
3. PowerMouse with IGC approved Flight recorder (Up to Diamonds), Engine noise sensor and SAR function
4. RFB – second Flarm antenna (dual antenna diversity) -available for all versions (Not IGC, IGC and IGC ENL)

3.1.1 LXNAV PowerMouse Features

- USB stick socket for configuration of Flarm, firmware update or storing IGC flights
- IGC flight recorder (Up to Diamond level)
- Optionally preloaded obstacles (where databases are available) – Obstacles are not any freer of charge.
- Expandable to all standard Flarm displays
- Designed for FlarmView
- Low current consumption
- Second Flarm antenna

3.1.2 Interfaces

- Two Standard Flarm/IGC port on RJ45 with serial RS232 interface
- USB Port
- Bluetooth



Default baud rate of PowerMouse is set to 19200bps. In case, that you have any problems with Flarm indicator (FlarmView), please check baud rate setting on it.

3.1.3 Options

One or more external Flarm Displays can be connected (FlarmView/FlarmLED)

3.1.4 Technical Data

- Power input 8-36 V DC
- Consumption 1.02W (85mA @12V) excl. power for USB stick
- Weight 160 g
- 55mm x 90mm x 25mm

4 System Description

4.1 Switching on the Unit

Unit is switched on automatically, when it gets valid power supply from either PORT1 or PORT2 RJ45 connector.

4.2 Normal operation

PowerMouse goes into normal operating mode, when it receives signals from enough GPS satellites. Then the device becomes visible to and receives data from other FLARM devices.

4.3 Bluetooth

To connect to the PowerMouse via Bluetooth, you must search on a PDA/Smartphone for Bluetooth enabled devices in range. Click PAIR or CONNECT to connect to the PowerMouse. Device will appear as LXNAV-FPM-(5-digit serial). Device doesn't require any pairing password.

Bluetooth is always ON and cannot be configured. Purpose of Bluetooth is to send Flarm objects to the other Bluetooth device.

5 Installation

PowerMouse can be installed behind the instrument panel.

5.1 Connecting LXNAV PowerMouse

LXNAV PowerMouse is connected to DC power supply using PF POWER 12 VDC cable. Red wire goes to + positive and blue wire goes to – ground.

External indicator can be connected via a splitter or directly to the other port.



Instrument has no internal fuse. **3A external fuse is required!**

5.2 Connecting Antennas

PowerMouse has 4 connectors for different antennas. Two SMA connectors (A and B) are for Flarm Antennas. GPS connector serves for GPS antenna and BT connector for Bluetooth antenna.



Following Flarm Antennas are available:

- Short Dipole (90°) $\lambda/4$
- Long dipole (90°) $\lambda/2$
- Flat folded dipole
- Classic dipole
- Antenna with ground plate



For better range, Flarm antennas must be positioned vertically.

For additional information about installation you may have a look at:



<https://flarm.com/wp-content/uploads/man/FTD-041-Application-Note-FLARM-Antenna-Installation.pdf>



1x Flarm Flat dipole antenna is included in the package.

When you buy RFB option, the second Flat dipole antenna is included as well.

5.3 USB port

USB port serves as a SD card on other Flarm devices (FlarmMouse).

Advantage of the USB is, that you can install PowerMouse behind the panel and connect USB extension cable to the front panel.

User can use it for:

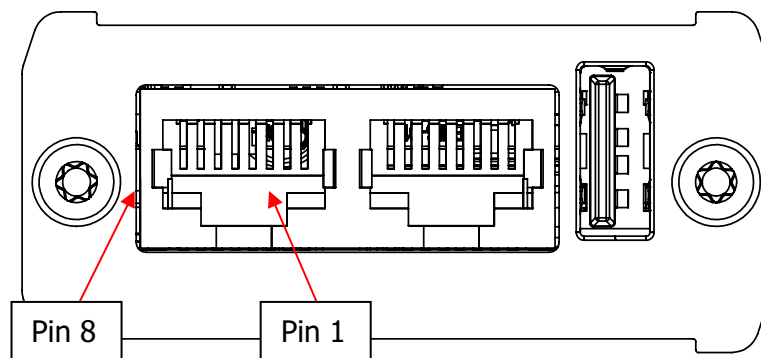
- Updating PowerMouse
- Changing PowerMouse settings (flarmcfg.txt)
- Downloading flights



USB is active only when the device is powered ON.

5.4 Wiring

5.4.1.1 PowerMouse PORT1 and PORT2 pinout (RJ45)



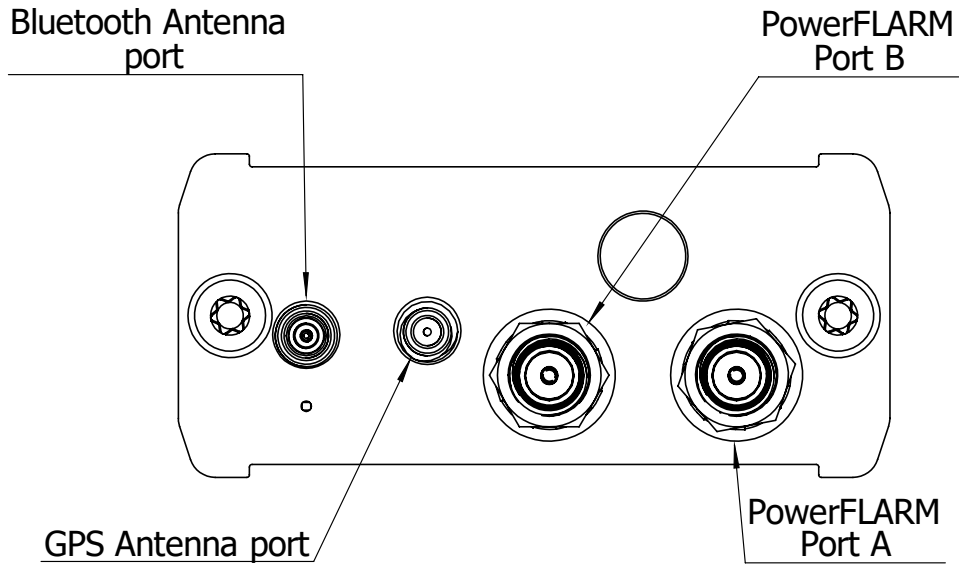
Pin number	Description
1	+ Power input
2	+ Power input
3	3.0V Indicator power output
4	Ground
5	Data output (TX)
6	Data input (RX)
7	- Power input
8	- Power input



Pins 1 and 2 of PORT1 and PORT2 are connected together internally.

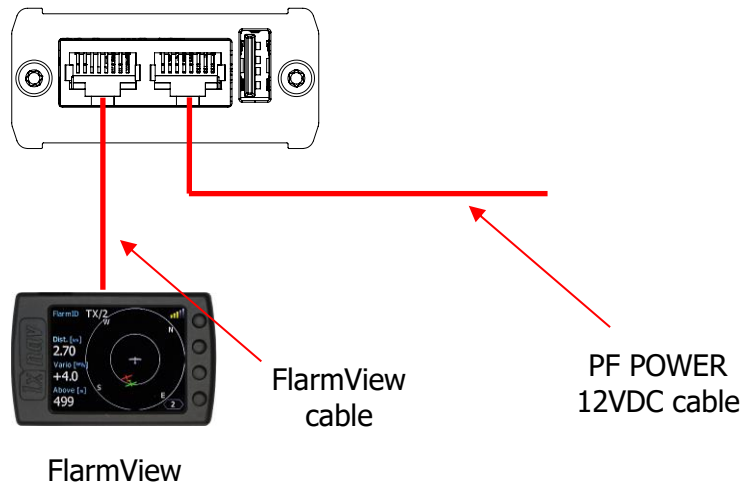
Pins 7 and 8 of PORT1 and PORT2 are connected together internally.

5.4.1.2 PowerMouse RF connector side description

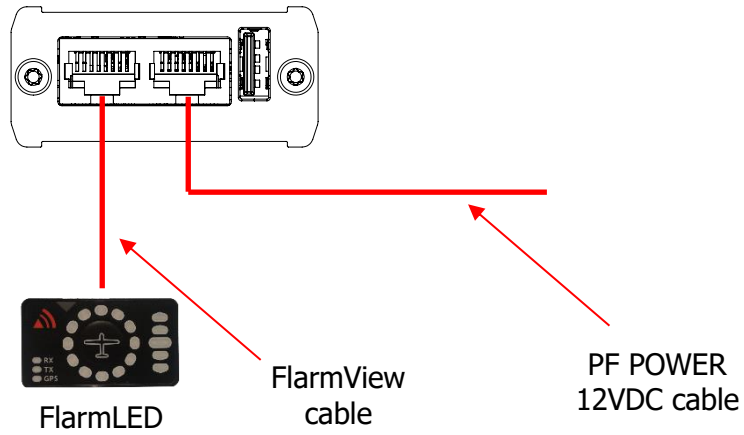


Connector description	Connector type
Bluetooth Antenna port	MCX
GPS Antenna port	SMC
PowerFLARM Port A	SMA
PowerFLARM Port B	SMA

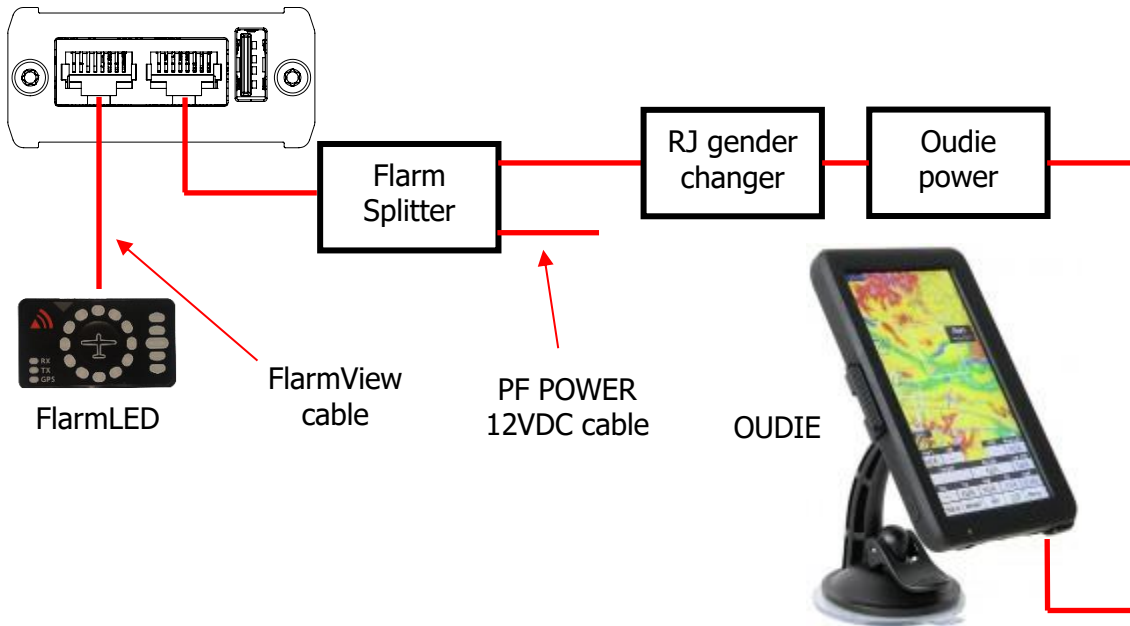
5.4.1.3 PowerMouse – FlarmView



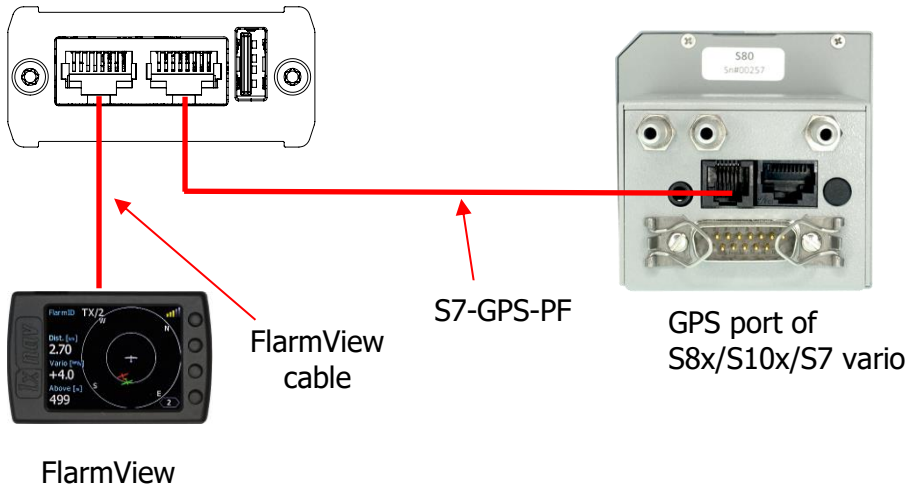
5.4.1.4 PowerMouse – FlarmLED



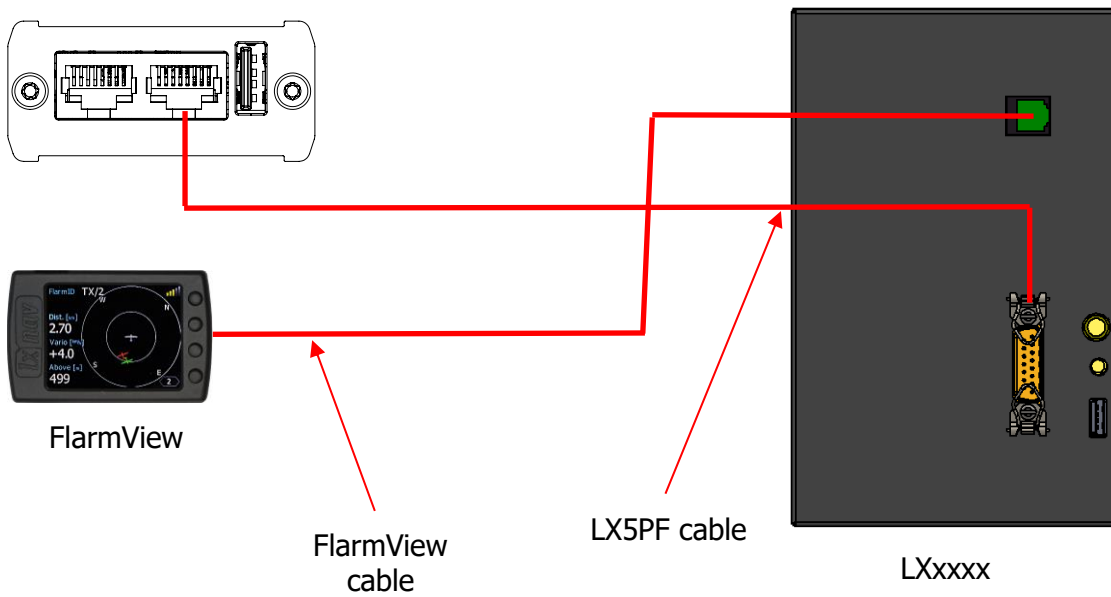
5.4.1.5 PowerMouse – FlarmLED – Oudie



5.4.1.6 PowerMouse – FlarmView – Sxxx Vario



5.4.1.7 PowerMouse – LX9xxx – FlarmView



6 Firmware Update

6.1 Firmware update via USB port (USB stick)

This Method is the easiest one and therefore preferred. The firmware update will be executed, when the system finds the file named `flarm_x*.fw` (x= version nr.) on the USB stick root. This file can be downloaded at www.flarm.com.

Update procedure:

- Switch off the Flarm and insert the USB stick.
- Now switch on the device
- The procedure will start automatically, it takes about one minute.
- When ready, switch off the Flarm
- Please delete the firmware file from the USB stick after the update

Updating the obstacle database:

The firmware update will be executed, when the system finds a file with the extension `*.obs.` on the USB stick root. The procedure runs identically to the firmware update and takes a few minutes. Please delete the obstacle file from the USB stick after the update.

All data must be in the USB stick root directory. Folders and subfolder are not allowed. Names of the files shall not be changed.



FLARM Tools is used only for Classic FLARM and is not compatible with PowerMouse.

6.2 Change PowerMouse settings

Settings of your PowerMouse and declaration of flights can easily be performed by using a configuration file, which is read by the Flarm during the boot process (`flarmcfg.txt`). Some tools for a simple writing of such configuration files can be found in the web, here one example: www.segelflug-software.de/flarmcfg/.

The configuration can also be performed with PC programs like SeeYou or PDA solutions like ConnectME and Pocket StrePla.

6.3 PowerMouse configuration by using FlarmTool

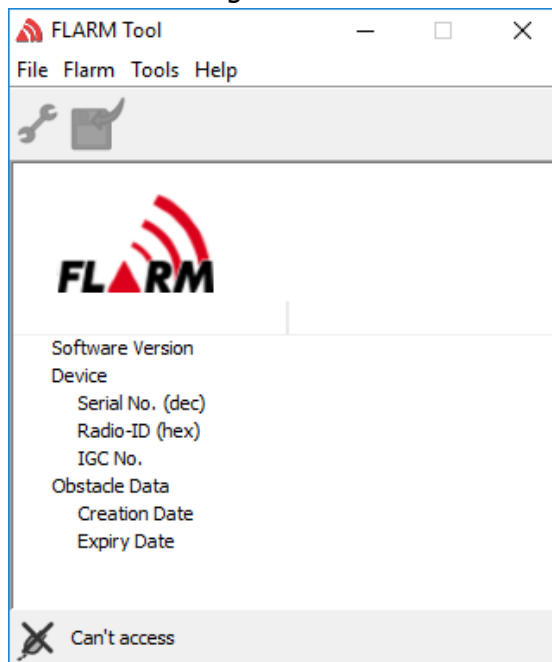
PowerMouse can be configured by Flarm Tool software which can be downloaded here:
<https://flarm.com/support/firmware-updates/download-firmware/>

The screenshot shows the FLARM website interface. At the top, there is a search bar and navigation links for ABOUT US, JOBS, LOG IN, and ENGLISH. The main navigation menu includes PRODUCTS, SOLUTIONS, TECHNOLOGY, BUY, NEWSROOM, and SUPPORT. The content area is divided into several sections:

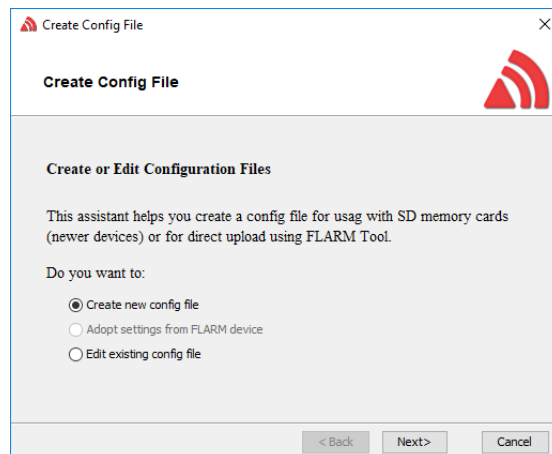
- Rolling Release Cycle:** A paragraph explaining that a rolling release cycle is introduced, requiring an annual update. Each update can be applied anytime during a rolling one year period. This makes it easier to align FLARM firmware updates with the yearly aircraft maintenance process. It is also in line with the maintenance care that a safety system requires.
- Update Cycle:** A paragraph stating that as the update cycle now becomes individual, no generic information will be sent out on individual firmware version expirations.
- Newsletter Sign-up:** A paragraph encouraging users to sign up for the newsletter to be informed when new firmware is released. It mentions that users can do this in the newsletter box at the bottom of the sidebar to the right.
- Download Section:** A heading "Download" followed by a paragraph ensuring users download the correct version for their specific device. It advises owners of PowerFLARM-based devices to download from the manufacturer's website, while owners of old, obsolete Classic FLARM-based devices should use the "Classic FLARM" download. A link to the "Product Selector" is provided.
- PowerFLARM Core and PowerFLARM Portable:** A heading followed by a list of links: "Download Firmware version 6.42 for all PowerFLARM devices" and "Release Notes".
- Classic FLARM & OEM FLARM devices:** A heading followed by a list of links: "Download Firmware version 6.42 for all Classic FLARM devices with SD-card slot, including some OEM devices (TRX, LXNAV, LX Navigation, etc.)", "Download FlarmTool 3.6.4 with firmware version 6.42 for Classic FLARM devices without SD card, including some OEM devices (LXNAV, LX Navigation, etc.)", "Release Notes", and "Download instructions for updating with SD cards".
- Obstacles 2018:** A red box containing the text "Obstacles 2018" and "The updated Obstacle database Alps 2018 is now available in our shop." with a "shop" link.
- Newsletter Sign-up:** A dark blue box with the heading "NEWSLETTER" and the text "Subscribe to our newsletter to receive the latest news and Firmware updates:". It includes an email input field with a required asterisk, a note "* This field is required", and a "SUBMIT" button.

Create Config file:

- Run Flarm Tool
- Click on the button: Tools ->Create Config File



- Create new Config file or Edit existing config file



- Set device settings – Flight Recording

Device Settings

Flight Recording Advanced

Settings

Recording interval... 4

Enable flight recor...

Pilot and airplane

Pilot Name Toni

Aircraft Registration S5-KKEX

Airplane Type ARCUSM

Comp. Class DOUBLE

Comp. ID ET

Save Cancel

- Set device settings - Advanced settings

Device Settings

Flight Recording Advanced

Connection Settings

Baud Rate 19200

Messages Navigation and FLARM

Radio Settings

Horizontal Range [m] 25500
(Max. 25500m, Min. 2000m)

Competition Mode (less Alarms)

Stealth Mode

Disable Tracking

Device ID for Radio Communication

Automatic (default)

Random (changes after each startup)

ICAO aircraft address FFFFFFFA

Aircraft Type Glider / motorglider

WARNING: Incorrect settings may render the device or auxiliary devices inoperative. Please read the manual.

Save Cancel



ICAO HEX code must be entered in case if you have an ADSB module that PowerMouse ignores the transponder on board!

- Press Save, which will create a flarmcfg.txt file.

```
# Basic Settings
$PFLAC,S,ID,fffffa
$PFLAC,S,RANGE,25500
$PFLAC,S,NMEAOUT,1
$PFLAC,S,ACFT,1
$PFLAC,S,CFLAGS,0
$PFLAC,S,PRIV,0
$PFLAC,S,NOTRACK,0
$PFLAC,S,THRE,2

# IGC Settings
$PFLAC,S,LOGINT,4
$PFLAC,S,PILOT,Toni
$PFLAC,S,COMPCLASS,DOUBLE
$PFLAC,S,COMPID,ET
$PFLAC,S,GLIDERID,S5-KKEX
$PFLAC,S,GLIDERTYPE,ARCUSM

# Baud rate
$PFLAC,S,BAUD,2
```

6.4 Saving flight on the USB stick

The last 20 flights will be downloaded at every switching on (only if the USB stick is inserted). If there are already some of the 20 flights on the USB stick, they will not be downloaded again. That means: if you have been flying a lot without downloading flights, the download procedure will take some time, so don't switch off. To download one flight after landing perform the following procedure: Wait a 3 minute after landing. Then switch off power for at least 5 sec. Insert the USB stick (in case it's not already inside) and switch on again.



The collision avoidance functionality does not depend on the status of the USB stick (inserted or not)

7 Revision History

November 2017	Initial release of this manual
January 2017	New chapter 3
February 2018	Flarm Tools removed from manual
March 2018	Added chapter 4.3, Updated chapter 5
April 2018	Added chapters 5.2, 6.3
April 2018	Added chapters 5.3, 5.4.1.2