FLARM Device Configuration and Registration

By John DeRosa

This document may have recently been updated.
Be sure to download the latest version!

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PLEASE NOTE

This presentation **may have been recently updated** with new information, changes, and/or corrections.

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It could make an important difference with your work!

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Thank you, John (OHM Ω)

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Meaning of "FLARM" versus "Flarm" Use Within this Document

- **"FLARM" (all capitals)**
  - This refers to the physical FLARM device itself.

- **"Flarm" (initial capitals only)**
  - This will refer to the Flarm system as a whole or parts thereof.

Why is This Presentation Important?

The work detailed in this presentation is very important to the proper operation of your FLARM Device.

It is not enough to simply install your Flarm. It must be configured with the correct information as to its proper operation, to specific details of your aircraft, and (somewhat less importantly) to specific details about you as the Pilot-In-Command (PIC).

To make your Flarm valuable to those other pilots flying with, or near you, you also need to register your unique FLARM Device at a Flarm database hosting site.

PS – This presentation does **NOT** show you how to install a FLARM Device into your aircraft.

Basic FLARM Device Information

Flarm is a proprietary electronic system used to selectively alert pilots to potential collisions between aircraft. It is not formally an implementation of ADS-B, as it is optimized for the specific needs of light aircraft, not for long-range communication or ATC interaction. FLARM is a portmanteau of "flight" and "alarm".

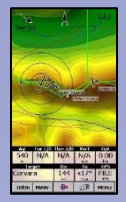
The installation of all physical Flarm Devices is approved as a "Standard Change", and the PowerFLARM Core specifically as a "Minor Change" by the European Union Aviation Safety Agency; and in addition the Minor Change also approves the PowerFLARM Core for its IFR and at night.

Flarm obtains its position and altitude readings from an internal GPS and then broadcasts this together with forecast data about the future 3D flight track. At the same time, its receiver listens for other FLARM Devices within range and processes the information received.

This information is used to predict potential conflicts for other aircraft and alert the pilot using visual and aural warnings.

Source: https://en.wikipedia.org/wiki/FLARM

FLARM Hardware Requirements

- **You will need three things;**
  - **A FLARM Device ➔**  
  - **Your Contest ID**
  - **Your Radio ID***
  - **A Flarm traffic Display Device ➔**   
- **Steps you will need to take;**
  1. **Create a configuration file & download it to your FLARM Device**
  2. **Register your FLARM Device on FlarmNet**
  3. **Download the latest global FlarmNet user database to your Flarm Display Device**
  4. **Optional: Register your FLARM Device on GliderNet (OGN)**

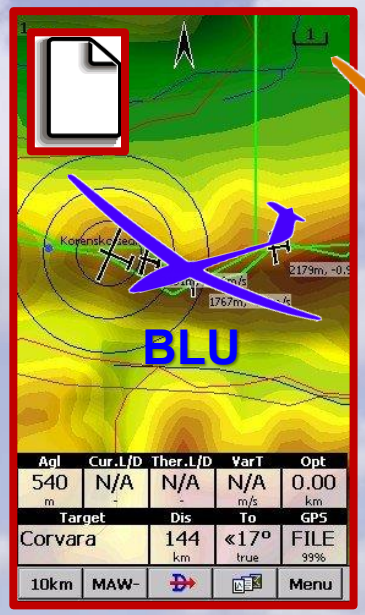
*The recommended FLARM Radio-ID is the 6-digit hexadecimal ICAO address of your aircraft (also known as Mode S Code). In the USA look up the ICAO number for your aircraft at https://registry.faa.gov/aircraftinquiry/search/nnumberinquiry

CRITICAL FIRST STEPS

Creation & Installation of …

> FLARM Configuration File
> FlarmNet Database File

FlarmNet
Database File



Glider "BRN"

STEP 1

Creating and Downloading a FLARM Configuration File

Your FLARM device cannot operate properly, or at all, with out a configuration file for your glider. It is very important that the device configured correctly.

Use the flarm configuration tool to configure your Device. After selecting the desired options, the configuration file is downloaded and installed into your FLARM Device.

FLARM Configuration File

When installing FLARM in an aircraft, and before using a FLARM Device, it is very important that it is configured correctly.

Use the flarm configuration tool to create a flarmcfg.text file. After selecting the desired options, the configuration file is quickly downloaded to your FLARM device.

Use the FLARM Device
Configuration File Creation Tool found at
https://www.flarm.com/en/support/tools-software/configurator/

Continued on Next Slide

FLARM Configuration File

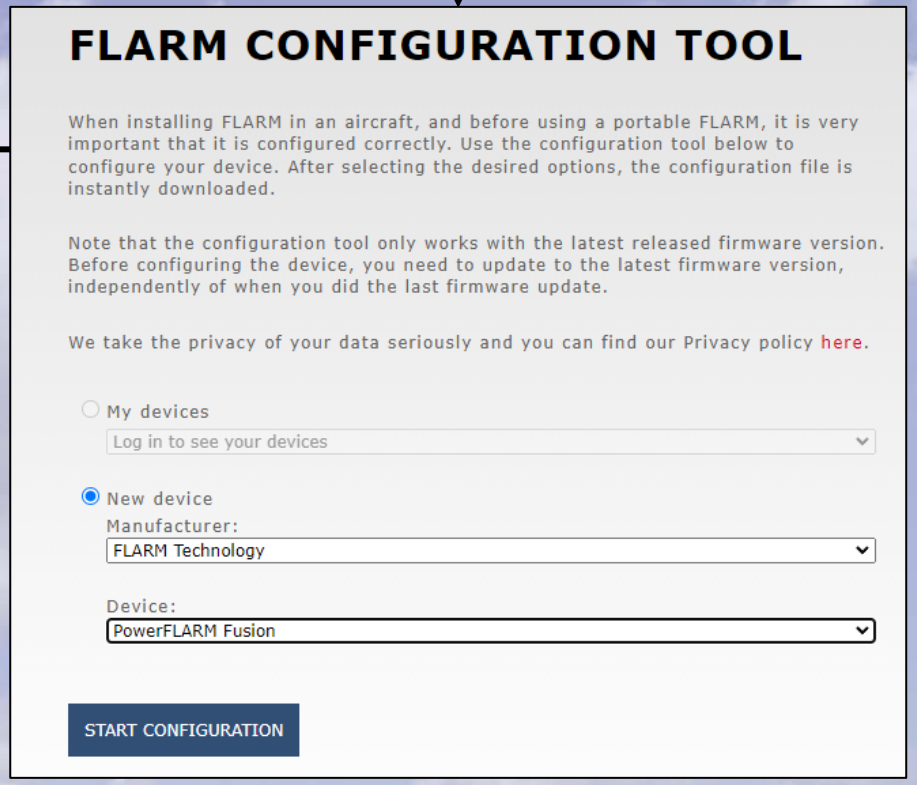
From Previous Slide

Enter your FLARM Device manufacturer and model

CLICK ON

START CONFIGURATION

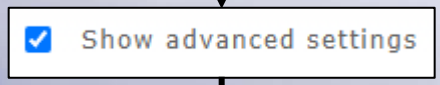
Continued on Next Slide



FLARM Configuration File

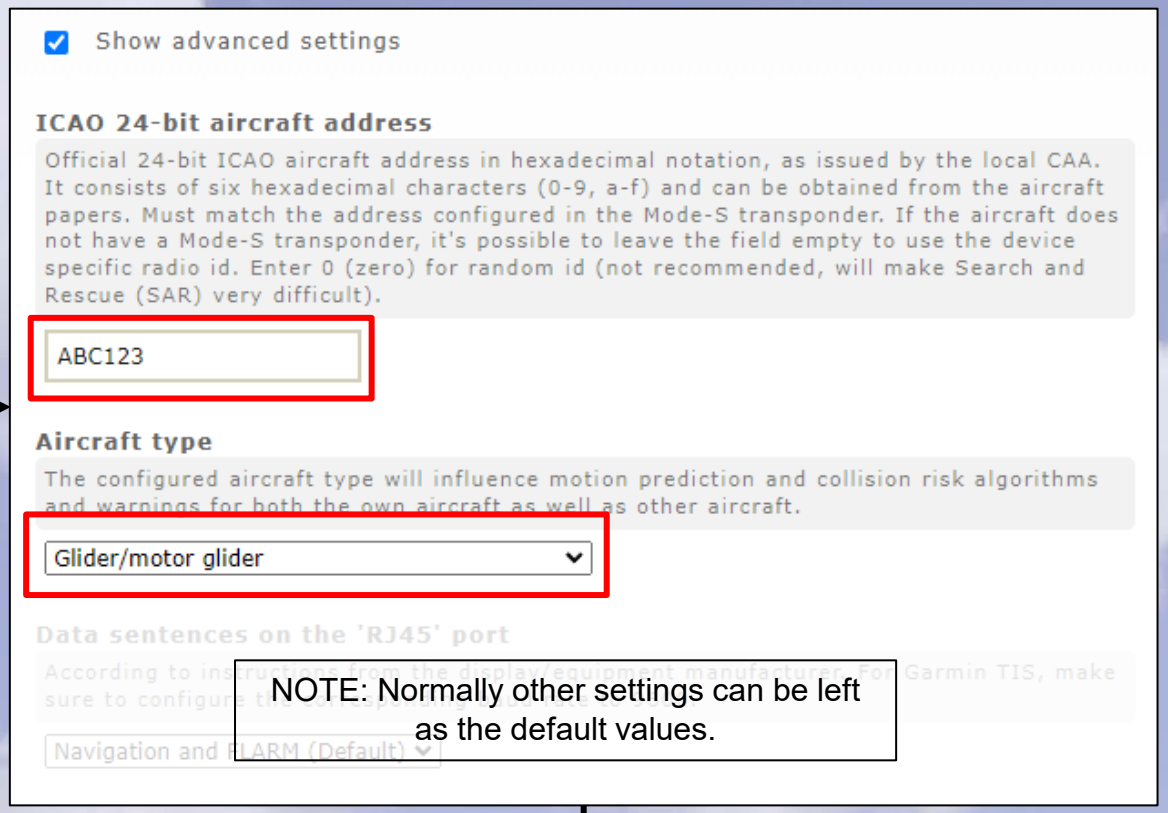
From Previous Slide

CLICK ON



Enter your ship's Mode-S ICAO* Address

Enter your ship's Aircraft Type



NOTE: Normally other settings can be left as the default values.

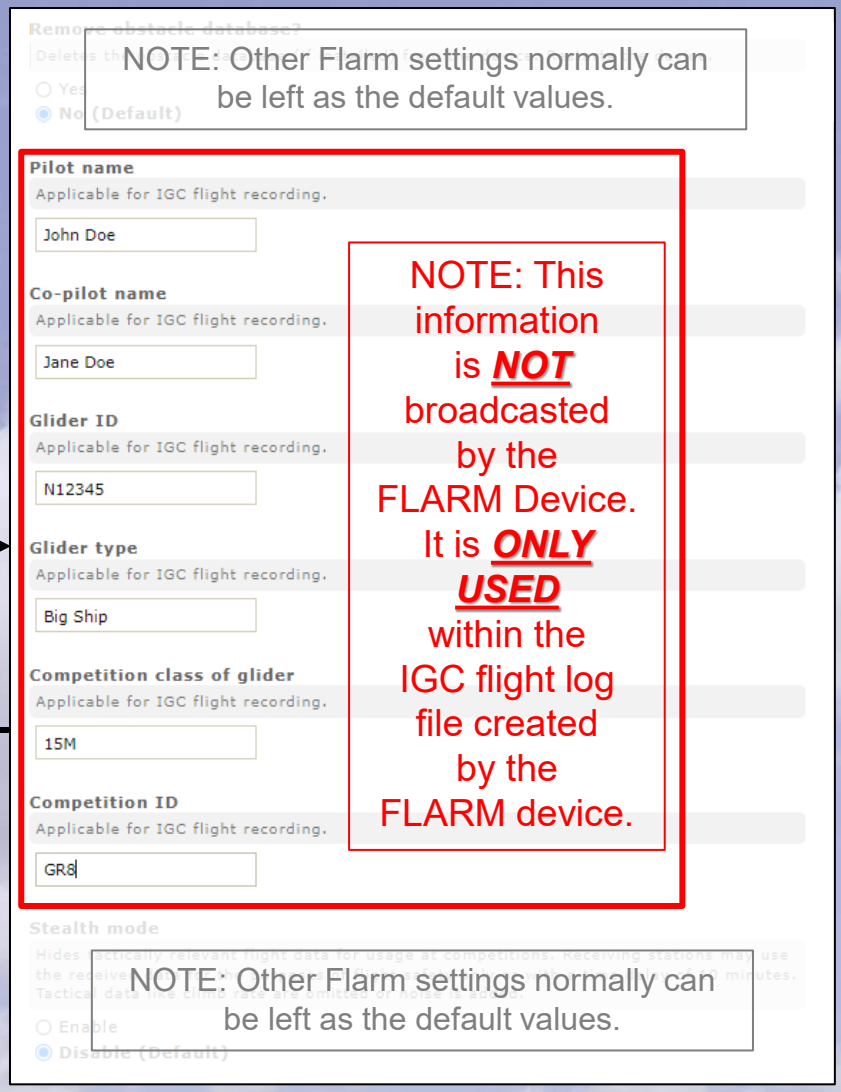
* In the USA look up your ICAO Address at https://registry.faa.gov/aircraftinquiry/search/nnumberinquiry

Continued on Next Slide

FLARM Configuration File

From Previous Slide

Enter your Name, Tail Number, Contest ID, etc. (NOTE: This information is ***NOT*** broadcast by the FLARM. It is ***ONLY USED*** within the IGC flight log file created by the FLARM device)



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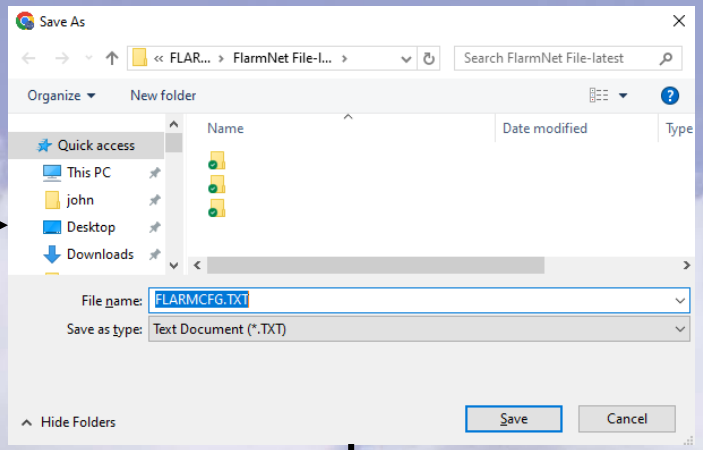
FLARM Configuration File

From Previous Slide

CLICK ON

CREATE CONFIG FILE

Save the FLARM configuration file to your computer



CLICK ON

Save

flarmcfg.text

Continued on Next Slide

FLARM Configuration File

From Previous Slide

Transfer the Flarm configuration file into your FLARM Device using the manufacturer's instructions.*

flarmcfg.text

* Typically this is done by copying the flarmcfg.text file to a USB "thumb" drive of micro SD card. Then plugging that drive into your FLARM and applying power to the device.

STEP 2

Registering Your FLARM Device At FlarmNet.org

Welcome to Flarmnet.org

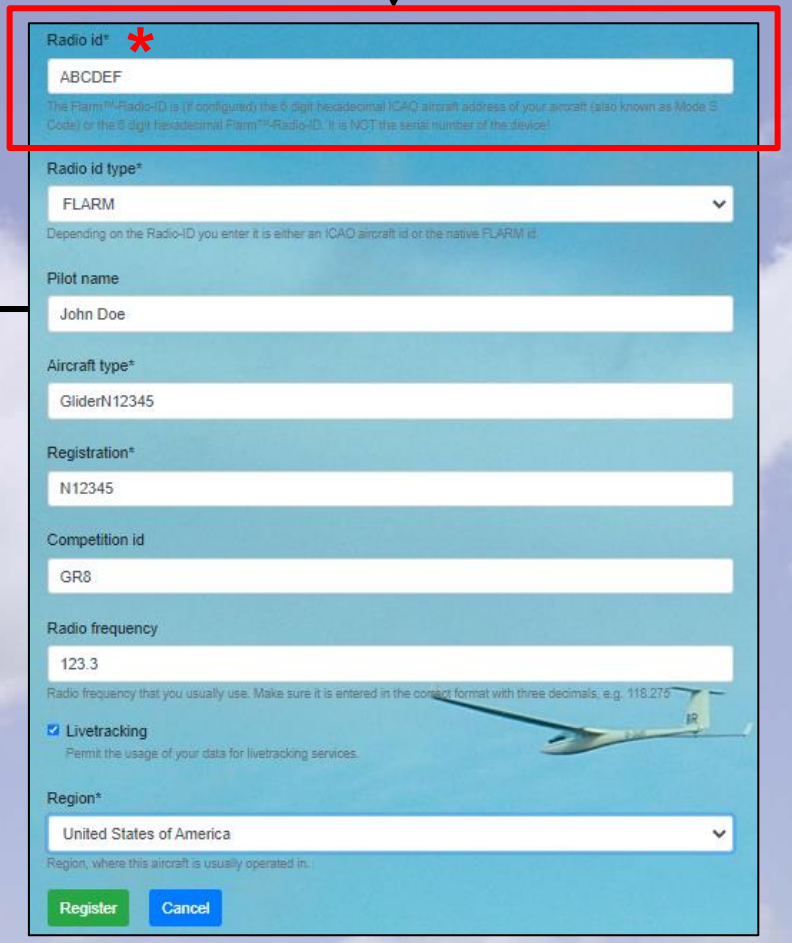
FlarmNet is a community of users of FLARM®-compatible collision avoidance systems.

FlarmNet is a database, in which people can enter their Flarm®-Radio-ID, an unique identifier stored in all FLARM®-compatible devices. Additional information such as name, aircraft type or registration can be added as well. With FlarmNet-compatible devices you can see all the submitted information to the corresponding FLARM®-Radio-ID. This means you can see who is flying other aircraft, on which radio frequency he usually is and even more - all directly in the air in your cockpit. FlarmNet compatible devices are available from many different manufacturers.

Source: ***http://flarmnet.org***

Flarmnet Registration

Enter the ”Radio ID”* and other information for your FLARM Device at http://flarmnet.org



CLICK ON

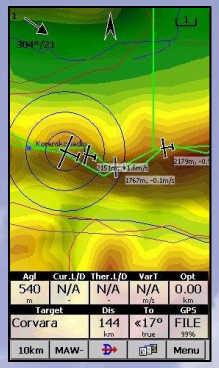
Register

Your FLARM Device has now been added to the flarmnet.org Global Database Which links your ”Radio ID”* (only) to your Contest ID

*The recommended FLARM Radio-ID is the 6-digit hexadecimal ICAO address of your aircraft (also known as Mode S Code).
In the USA look up the ICAO number for your aircraft at https://registry.faa.gov/aircraftinquiry/search/nnumberinquiry

STEP 3

Download and Install the Latest FlarmNet Database



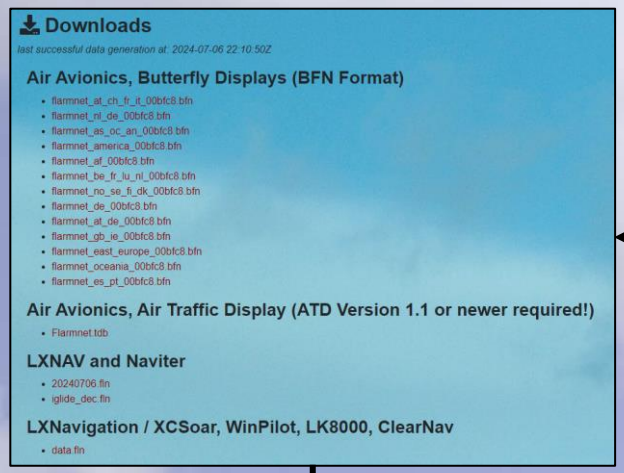
The FlarmNet database contains a listing of all registered FLARM Devices and their associated information primarily ICAO & Contest ID.

Transfer the latest database to your FLARM display device so that this information (i.e. Contest ID) can be displayed next to the aircraft's icon on your display device.

FlarmNet Database File

Download/save to your computer the appropriate FlarmNet global database file for your particular FLARM Display Device from

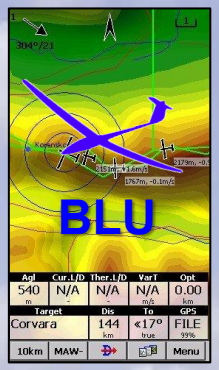
https://www.flarmnet.org/flarmnet/downloads/*



[date].fln
data.fln
etc.

Transfer the new FlarmNet database file into pilot's display Devices using the manufacturer's instructions.

This allows viewing of flarm traffic's information (i.e.Contest IDs) on their displays *



* The FlarmNet database file is updated daily and should be re-downloaded and re-installed yearly or more often.

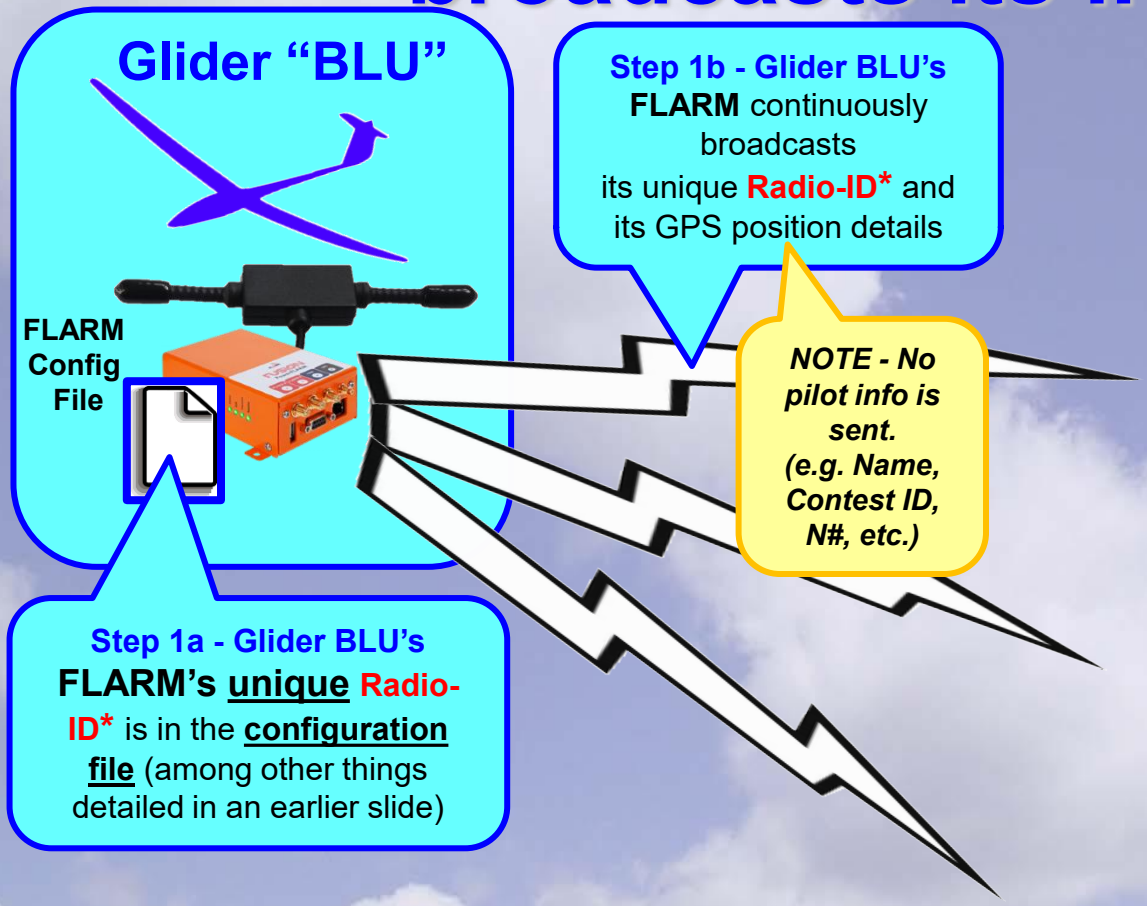
How does Flarm Transmission & Reception Work? Watch this "Animation"

Now that you have your FLARM device set up it is **important** for you to now understand how the Flarm systems "Talk" between Gliders.

The following few slides creates an "animation" of the step-by-step process of how the Flarm system communicates between two aircraft (gliders).

Step through the slides one at a time.

Step 1 – Glider BLU's FLARM broadcasts its information



* The recommended FLARM's "Radio-ID" is the aircraft's unique 6-digit ICAO number. In the USA look up your ICAO number at https://registry.faa.gov/aircraftinquiry/search/nnumberinquiry

Step 2 – Glider BRN's FLARM Receives "BLU's Flarm Data

Glider "BLU"

FLARM Config File

Step 1a - Glider BLU's FLARM's unique Radio-ID* is in the configuration file (among other things detailed in an earlier slide)

Step 1b - Glider BLU's FLARM continuously broadcasts its unique **Radio-ID*** and its GPS position details

NOTE - No pilot info is sent. (e.g. Name, Contest ID, N#, etc.)

Step 2 - Glider BRN's FLARM listens & receives **Glider BLU's** Flarm data including its unique **Radio-ID*** and GPS position details

Glider "BRN"

*** The recommended FLARM's "Radio-ID" is the aircraft's unique 6-digit ICAO number. In the USA look up your ICAO number at https://registry.faa.gov/aircraftinquiry/search/nnumberinquiry**

Step 3 – Glider BRN's FLARM sends Glider BLU's info to a Display Device

Glider "BLU"

FLARM Config File

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Step 1b - Glider BLU's FLARM continuously broadcasts its unique **Radio-ID*** and its GPS position details

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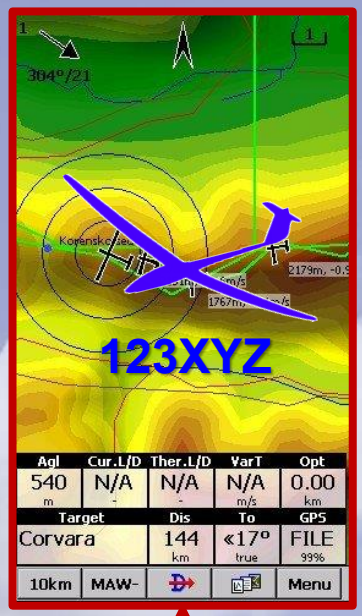
Glider "BRN"



Step 3 - Glider BRN's FLARM sends **Glider BLU's** Flarm data of **Radio-ID*** and GPS position details to your **Flarm Display Device** (i.e. an Oudie) which then displays a target.

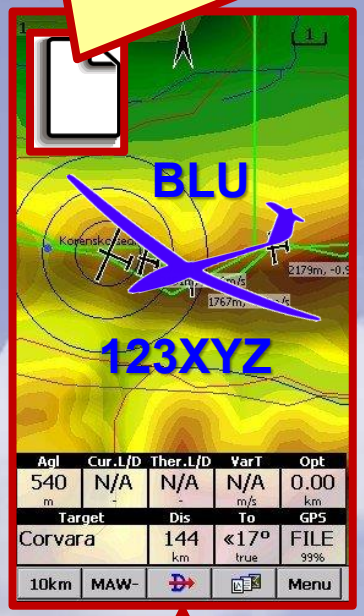
*** The recommended FLARM's "Radio-ID" is the aircraft's unique 6-digit ICAO number. In the USA look up your ICAO number at https://registry.faa.gov/aircraftinquiry/search/nnumberinquiry**

Step 4 – Glider BRN's display device uses FlarmNet Database

Step 4 - Glider BRN's Display Device looks into it's **FlarmNet database file** for **Glider BLU's Radio-ID* 123XYZ** is **Glider BLU** and shows **"BLU"** on the Flarm display device's screen.

FlarmNet Database File >

"123XYZ" ➡ "BLU"



Glider "BLU"

FLARM Config File

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Step 1a - Glider BLU's FLARM's unique Radio-ID* is in the **configuration file** (among other things detailed in an earlier slide)

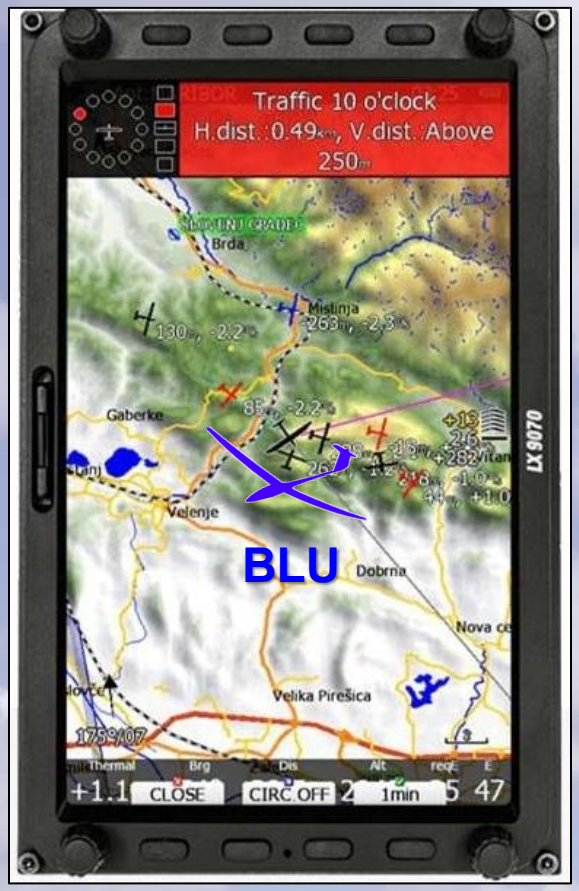
Glider "BRN"

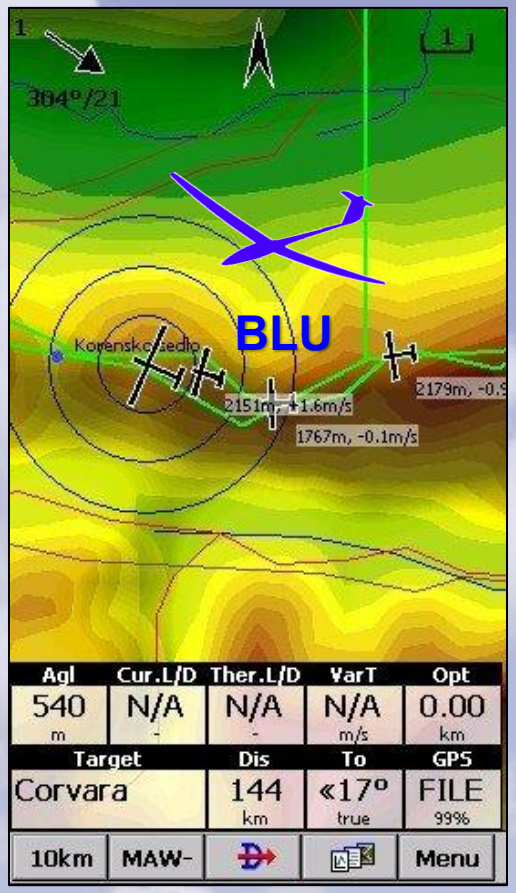
Step 3 - Glider BRN's FLARM sends **Glider BLU's** Flarm data of **Radio-ID*** and GPS position details to your **Flarm Display Device** (i.e. an Oudie) which then displays a target.

*** The recommended FLARM's "Radio-ID" is the aircraft's unique 6-digit ICAO number. In the USA look up your ICAO number at https://registry.faa.gov/aircraftinquiry/search/nnumberinquiry**

FLARM Display Devices

Now your FLARM Device is configured and registered. You will see all other FLARM equipped aircraft (and ADS-B traffic). Other pilots with a FLARM device and a configured database will see your aircraft information (i.e. contest ID). This provides critical collision avoidance even when the contest ID is not displayed.





STEP 4 (Optional)
Register Your FLARM Device At ddb.glidernet.org

OGN Devices DataBase

glidernet.org

30812 registered devices

HOME

CREATE AN ACCOUNT

Log in

Email address:

example@email.com

Password:

SUBMIT

This is the place to register your glider, towplane or other FLARM/OGN-equipped aircraft to the Open Glider Network. Registering has several advantages:

- You can influence how your glider is displayed on live.glidernet.org and other tracking sites
- In case of SAR, your glider may be easier to find
- You contribute to traffic-awareness among other pilots and ATC

The data is freely available under the ODC-BY license.

If you're not already a member, Create an account

Forgot your password ???, Reset password

Need help? contact@glidernet.org

Source: http://ddb.glidernet.org

Glidernet - The OGN Database Accepting FLARM Registrations

There is an independent database at http://ddb.glidernet.org that is related to the OGN environment. Besides accepting OGN devices registrations it also accepts FLARM device registrations.

Note that the OGN (glidernet) database is not limited to Flarms, it includes other registered devices or aircraft IDs that may be broadcast by transponders, SPOT/Inreach, phone apps, etc. Sanity prevails as long as all devices in an aircraft use the same Radio-ID (ICAO number*).

Some people register with either the ddb.glidernet.org site, flarmnet.org site, or both. The two databases can even hold conflicting information about the same Radio-ID. One can also create their own personal data file based on information from both of those databases plus local observations.

Use http://ddb.glidernet.org/download to download that database as a text file.

Source: Moshe Braner

*The recommended FLARM Radio-ID is the 6-digit hexadecimal ICAO address of your aircraft (also known as Mode S Code). In the USA look up the ICAO number for your aircraft at https://registry.faa.gov/aircraftinquiry/search/nnumberinquiry

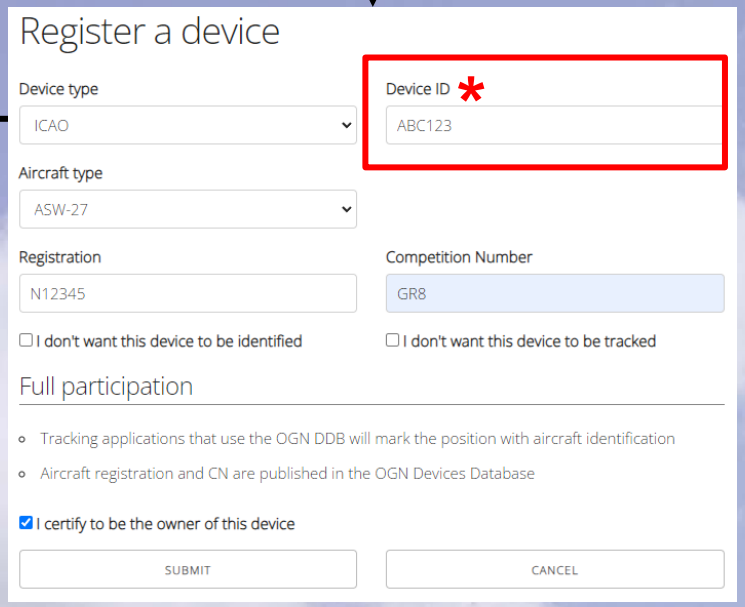
Glidernet Registration

Log in at http://ddb.glidernet.org

CLICK ON

ADD DEVICE

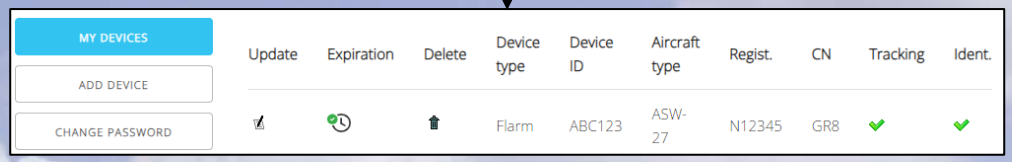
Enter Device Type as ICAO, enter the Device ID"*, and other aircraft information



CLICK ON

SUBMIT

Your FLARM Device has been added to the ddb.glidernet.org Global Database Which links your "Device ID"* to your Contest ID



Database Search
http://wiki.glidernet.org/ddb-list

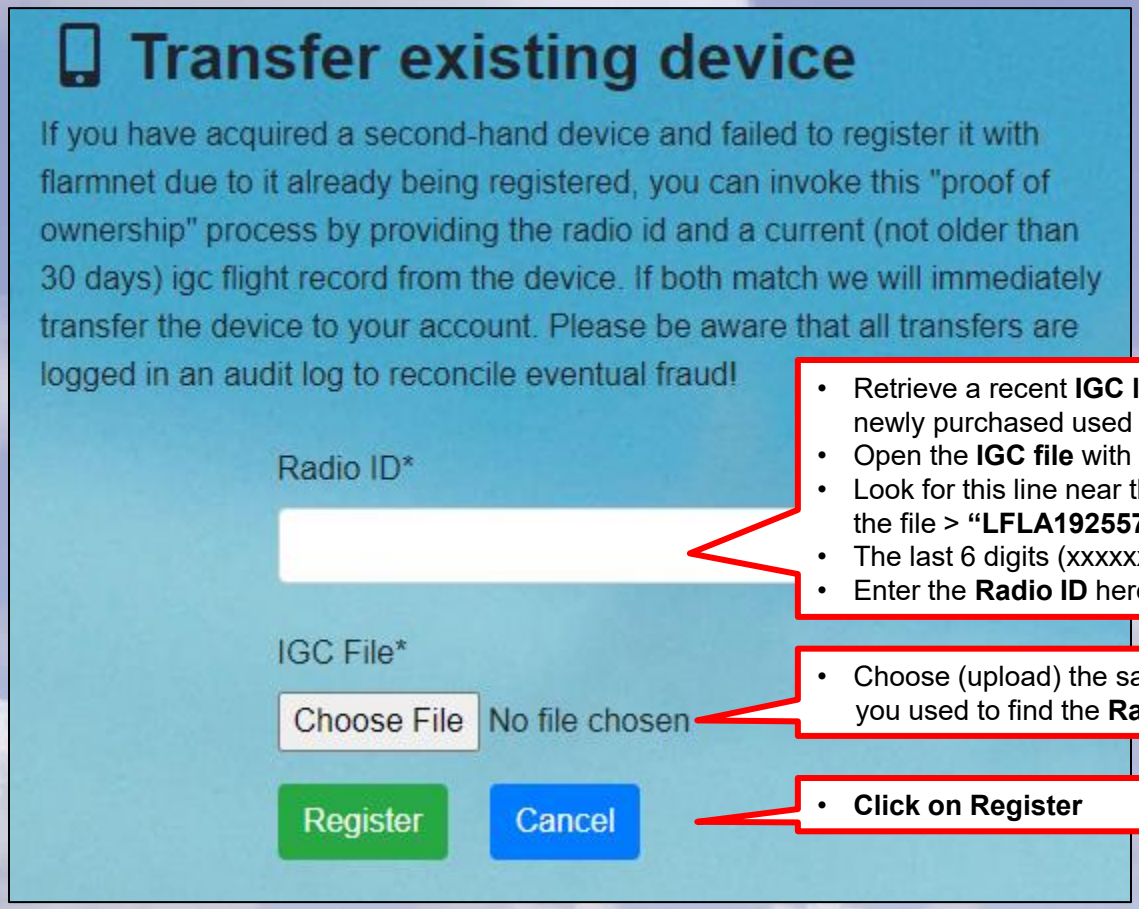
*The recommended Device ID (a.k.a Radio-ID) is the 6-digit hexadecimal ICAO address of your aircraft (also known as Mode S Code). In the USA look up the ICAO number for your aircraft at https://registry.faa.gov/aircraftinquiry/search/nnumberinquiry

Miscellaneous HOW TO…

- *Transferring the Ownership of a FLARM Device*
- *Transferring your FLARM Device to a New Aircraft*

Transfer a **Flarmnet** registered FLARM Device to a New Owner

https://www.flarmnet.org/flarmnet/device/transfer/



- Retrieve a recent **IGC log file** from your newly purchased used **FLARM** device
- Open the **IGC file** with a text editor
- Look for this line near the beginning of the file > **"LFLA192557ID 1 xxxxxx"**
- The last 6 digits (xxxxxx) is the **Radio ID**
- Enter the **Radio ID** here

- Choose (upload) the same **IGC file** you used to find the **Radio ID**

- **Click on Register**

Transfer a **Glidernet** registered FLARM Device to a New Owner

Method #1

- Contact the previous owner
- Ask them to Log into their account on ddb.glidernet.org
- Have them go to “My Devices”
- Look for the correct FLARM device and click on the trash can symbol to delete it
- Re-register your FLARM device as shown in this presentation

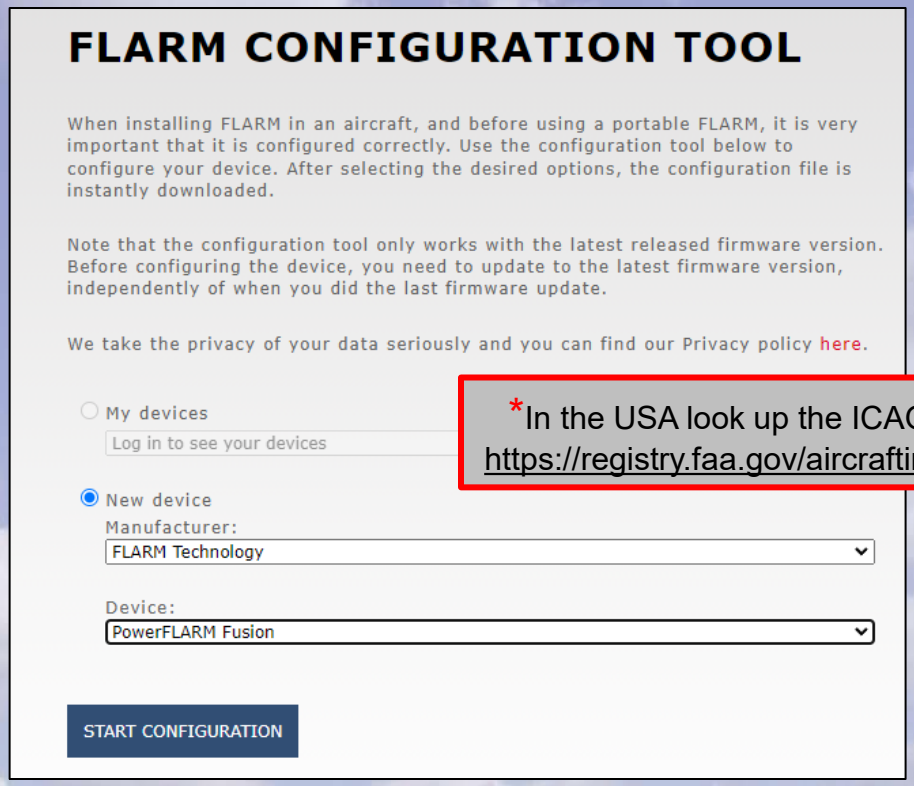
Method #2

- All Glidernet registrations expire after one (1) year
- Once the registration expires re-register your FLARM device as shown in this presentation

Update	Expiration	Delete	Device type	Device ID	Aircraft type	Regist.	CN	Tracking	Ident.
			ICAO	ABC123	ASW-27	N12345	GR8	✔	✔

Transferring Your FLARM Device into another Aircraft

- **Be sure to create a new flarmcfg.txt file with the new aircraft's ICAO* number per the instructions at the top of this presentation.**



*In the USA look up the ICAO number for your aircraft at https://registry.faa.gov/aircraftinquiry/search/nnumberinquiry

Miscellaneous Flarm Information

Flarm Informational Web Sites

- https://nadler.com/GliderPilotUSAflarmWeb/Flarm-WhatDoesItDo.html
- https://www.flarm.com/en/
- https://www.flarm.com/en/support/faq/
- https://www.flarmnet.org/faq
- https://en.wikipedia.org/wiki/FLARM
- *http://www.cumulus-soaring.com/flarm/PowerFLARM-Tips.pdf*

FLARM Configuration File (flarmcfg.txt) Command Options with Details

```
##########################################################################
# PowerFLARM Configuration Key by Paul Remde of Cumulus Soaring, Inc.
##########################################################################
# This configuration file must be text only and reside in the top directory
# of the USB stick, SD card or FLARM Tool.
# This configuration file must be named FLARMCFG.TXT
# If you wish to change the settings, you can revisit the online
# configuration tool at any time: http://www.flarm.com/
##########################################################################
```

Source: http://www.cumulus-soaring.com/flarm/PowerFLARM-Tips.pdf

FLARM flarmcfg.text File to Reset Flarm Device To Factory Settings

```
##################################################################
# This configuration file must be text only and reside in the top directory
# of the USB stick, SD card or FLARM Tool.
# This configuration file must be named FLARMCFG.TXT
# If you wish to change the settings, you can revisit the online
# configuration tool at any time: http://www.flarm.com/
##################################################################
$PFLAC,S,DEF
```

Sample Flarm Information found in an IGC Flight Log File– Page 1/2

LFLA19255707FRW 7.24
LFLA192557 STEALTH OFF
LFLA192557 NOTRACK OFF
LFLA192557ID 1 A1FB1D
LFLA192557OB
LFLA19255707OBSTEXP
LFLA19255707DEVNO FLAFUS10W-000790
LFLA19255707BUILD ab6c756fe
LFLA19255707RANGE 25500
LFLA19255707ACFT 1
LFLA19255707THRE 255
LFLA19255707CFLAGS 00
LFLA19255707RFTX 1
LFLA19255707MISC 00
LFLA19255707LOGINT 4
LFLA19255707NMEAOUT1 91
LFLA19255707BAUD1 2
LFLA19255707NMEAOUT2 1
LFLA19255707BAUD2 2
LFLA19255707VRANGE 2000

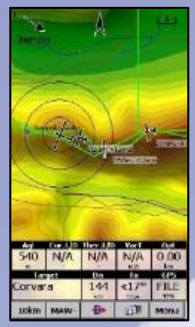
Sample Flarm Information found in an IGC Flight Log File – Page 2/2

LFLA19255707PCASPFLAU1 0
LFLA19255707PCASPFLAU2 0
LFLA19255707XPDR 0
LFLA19255707PCASRANGE 7408
LFLA19255707PCASVRANGE 610
LFLA19255707ADSBRANGE 65535
LFLA19255707ADSBVRANGE 65535
LFLA19255707PCASCALIBRATION 30
LFLA19255707MODESALT 1
LFLA19255707MODEC 1
LFLA19255707PCASBEEP 1
LFLA19255707ADSBWARNINGS 1
LFLA19255707CAL57DBM 0
LFLA19255707MSG 1
LFLA19255707ADSL 1
LFLA19255707CAP
DP2;USBH;XPDR;DLED;BARO;AUD;RFB;ENL;TIS;IGC;ADSR
LFLA19255707LIC AUD:1;ENL:1;IGC:1;RFB:1;TIS:1;ADSR:1

Flarm Data "Packet" Elements Sent Between the FLARM Device and the Flarm Display Device

<AlarmLevel>
<RelativeNorth>
<RelativeEast>,
<RelativeVertical>
<IDType>
<ID>
<Track>
<TurnRate>
<GroundSpeed>,
<ClimbRate>
<AcftType>

Source: Moshe Braner



See My Other Presentations

- Glider Electrical Wiring
- Bailing Out Successfully
- Transceiver Troubleshooting
- Oxygen Systems
- Working with Glider Air Lines
- Trailer Chains
- Soaring Pilot Relief Systems
- Battery Testing
- Emergency Location Devices
- Survival Kits
- Spar Alignment Tool
- L'Hotellier Fittings
- Carbon Fiber Panels
- IGC Filename Decoding
- Blanik L-23 Strut Work
- Removing Painted Lettering
- Open Glider Network
- Instrument Knob Extensions
- Landing Gear Warning

http://aviation.derosaweb.net/presentations

Let me know of any comments!