

POWERFLARM CORE WITH FLARMVIEW

INITIAL SET UP FILES - A "CHEAT SHEET" FOR DUMMIES

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Scope

This document explains how to prepare and install the configuration and firmware files necessary for setting up a PowerFLARM system that is mated with a FlarmView display. It does not cover PowerFLARM **hardware** installation or go into any details on selection of configuration options. It presumes your hardware is already installed. It does not cover optional features such as Obstacle Databases (see <https://flarm.com/shop> for optional features and related documentation). This document also does not cover the considerable challenge of cockpit operation and understanding of PF. This is vital if the device is to be a reasonable safety tool. The factory manuals don't cover this well, so seek out this knowledge elsewhere. This document also assumes the reader has basic PC skills. If you don't have these skills, stop and find someone who does.



NOTE: Even if you have someone else do the installation and setup of your PowerFLARM system, ***as P.I.C, you are still responsible to fully understand and comply*** with the manufacturers' system requirements. Pay particular attention to sections in this tutorial indicated by this symbol.

Big Picture

The two devices – **PowerFLARM Core** and **FlarmView** – must each be independently set up. The two boxes do talk with each other, but not for configuration purposes. Each has its own firmware and configuration files that need to be loaded on your FLARM system.

The **PowerFLARM Core** (made by Flarm) handles all radio communication ((non-verbal) and data processing as well as collision risk calculations. The device is usually mounted behind the panel together with other avionics boxes.

FlarmView (made by LxNav) is one of many display options for the PowerFLARM Core. It is mounted on the panel and shows traffic information provided by the PowerFLARM Core. It also displays climb rate, altitude and distance for selected target. It has an alert beeper and uses FLARMNET database for glider target names (tail numbers displayed).

For both boxes there are firmware files from the manufacturers that are updated from time to time (at least yearly for the Core), and also personal settings files for a plethora of configuration choices.

You must create and load a unique Core configuration file for your system before using it. And you must update the Core firmware every year for the device to work correctly.



Failure to configure or a false configuration may lead to failure to alert, operate or cause nuisance alarms!

(This is a quote from the manufacturer.)

The FlarmView comes with a micro SD card. The Core uses a USB stick. In both cases the files are transferred from a PC to the USB stick or micro SD card which is then inserted into the associated FLARM box before power up. Upon power up the files are loaded into the device automatically. The Core USB stick must be removed after loading. The micro SD Card remains in the FlarmView and should not be removed except for updating.

Note: You can use the USB stick from LXNAV that comes with the FlarmView, but you may prefer a separate, dedicated USB stick. The one included with the FlarmView is cluttered with documentation and extraneous files. If you use your own USB stick, it must be USB 2.0, ≤ 32 GB and formatted to FAT16 or FAT32. (USB 3.0 connectors are typically blue on the inside and will not work.)

Following this Tutorial



This tutorial has six steps and is followed by some general tips.

Step 1: Before Starting

1. Download, print out read and keep these documents:

- [PowerFLARM Core Manual, Version 150](#)
- [FLARM Config Manual](#)
- [FlarmView Manual](#)



As Pilot in Command, you are responsible to understand and comply with the contents of these documents.

2. Obtain a USB 2.0 stick \leq 32 GB in size.

3. Make sure you have a PC adapter that takes a micro SD card.

4. At your glider, note what firmware versions are currently installed on both the Core and FlarmView devices.

- POWER ON the PowerFLARM system and quickly look at the FlarmView display.
- The current FlarmView firmware revision and the serial number of your unit will be displayed on the first boot screen.
- If you miss the first screen, you can find the same information on the ABOUT screen.
- After system initialization, to find the current firmware revision in your Core, click the top button on the display a few times to get to the page that says “FLARM” then find FLARM INFO and enter that data field to get at the firmware rev. This screen also shows the serial number for your Core device.
- POWER OFF
- Remove the micro SD card from the FlarmView. It is found on the top edge of the display. Push in and it will pop out. (Don't lose it – very small!)



5. Relocate to your PC.

Step 2: Preparing PowerFLARM Core Files

There are two files that must be created/obtained for the Core:

1. FLARMCFG.TXT – loads configuration details and options
2. Powerflarm_x.xx_xxx.fw – a firmware file that provides the logic that drives the Core.

1. Create FLARMCFG.TXT Configuration File

Again, you **MUST** create a unique configuration file for your Core. *Failure to do so may lead to failure to alert, operate or cause nuisance alarms!*

Some info you will need before starting:

- Part number and Serial Number of your PowerFLARM Core (on the shipping box or in the ABOUT tab)



- The FAA registration number of your S-Mode transponder (if you have one)
Find it here by entering your aircraft registration number: <http://www.airframes.org/>

The config file can be created manually or via an online configuration tool.

- Here is a sample FLARMCFG.TXT file which can be edited:
<https://www.cumulus-soaring.com/FLARM/FLARMcfg.txt>

- Here is the online configuration tool:
<https://FLARM.com/support/tools-software/FLARM-configuration-tool/>

Also see: <http://www.cumulus-soaring.com/FLARM/PowerFLARM-Tips.pdf>

And refer to the [FLARM Config Manual](#) (you already printed it, right?)

The configuration file must be loaded on to the root directory of the USB stick (not inside any folders).

2. **Get Latest Core Firmware**

Your Core unit may already have current firmware, but it doesn't hurt to get the latest file, save it on your PC and put it on the stick. (It is also a matter of convenience if your PC and internet connection are at home and your glider is at the airport!) PowerFLARM will ignore the file if it is already installed, so no harm.

You will need to follow this procedure at least once a year when new firmware is provided by Flarm. Sign up to receive the FLARM newsletter for notifications. <http://flarm.com/newsroom/latest-news/>

Here is the path to get the latest firmware (free):
<http://FLARM.com/support/firmware-updates/>

Towards the bottom of this page will be a link to download the latest firmware (currently 6.0.6)
E.g.: "Download Firmware version 6.06"

Then again towards the bottom of the page will be a link
"Download Firmware version.xxx for all PowerFLARM devices"

The firmware file will be named "powerflarm_ version.fw". E.g.: powerflarm_6.05_7862.fw.

Download the file to your PC, and copy the file to the root directory of the USB stick (not inside any folders).

NOTE: When you load a new firmware version into PowerFLARM, all of configuration settings are reset to factory defaults. So be sure to include your FLARMCFG.txt file on the USB stick whenever doing a firmware update, even if there are no changes to your configuration.

Step 3: Preparing FlarmView Files

There are possibly three FlarmView files to be modified/obtained for FlarmView:

1. fview.fw – firmware file that provides the logic that drives the FlarmView.
2. system.ini – loads configuration details and options
3. flarm.flx – a database that translates FLARM Core ID's to Contest Numbers so you can see who you are flying with.

Use an adapter to connect the micro SD card to your PC and copy all existing files to a folder on your PC for back-up purposes.

1. **Get Latest FlarmView Firmware**

Like the FLARM Core, your system may already have the latest firmware. But if you need to update, the file can be found here:

<http://www.lxnav.com/downloads/firmware/fview.fw>

Copy this file to the root directory of the micro SD card. (Not inside any folders.)

2. **Setting up your System.ini Configuration File**

You will probably want to customize your FlarmView settings. There are many choices here and you should study the manuals to familiarize with what they all mean and how you want them set. For example, range for warnings, screen colors, beeper loudness, etc. With experience you may want to change them. You can write a new config file or also change your settings through the FlarmView screen. Your choices are kept in the system.ini file.

You can select your setting via the FlarmView display itself, but this can be burdensome.

See the [FlarmView Manual](#) and <https://www.youtube.com/watch?v=OGQgwp41AKw>.

An easier way to go is to copy a system.ini from a friend with settings you like. You can then tweak the settings using the FlarmView display.

If you set up or make changes to your FlarmView options via the FlarmView display, you may want to save a backup on your PC. Just copy the system.ini file that is on the micro SD card to your PC. This will avoid losing your revised settings.

If you use a friend's file, or wish to restore a backed up file, copy sytem.ini to the root directory of the micro SD card. (Note inside any folders.)

3. **FLARM Net Database (optional)**

The manufacturer recommends registering your FLARM Core/glider at www.FlarmNet.org, and installing the FLARM database file. The database file is installed in the FlarmView.

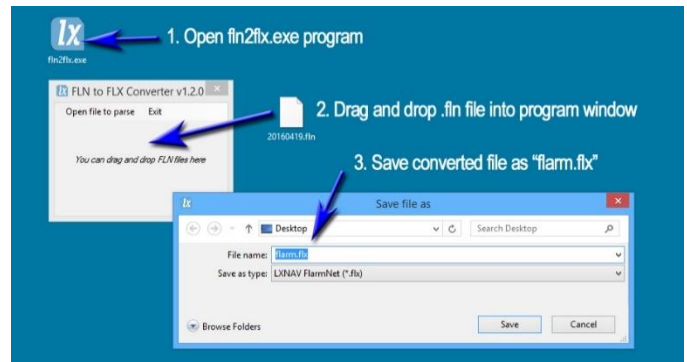
The FlarmNet database translates FLARM unit ID numbers into glider contest numbers. FlarmView units with the database installed will see the target PF and unit ID numbers and convert to contest numbers on your screen so you know who is close to you with PF. If you don't register, others won't know it is you they are seeing and you will not see the call sign of those that appear on your screen.

The download process is convoluted and involves renaming and converting files. (Ugh!)

- Here is a link to the FlarmNet database file: <http://www.flarmnet.org/files/lxfile.php>. This downloads the FlarmNet database file with a file name that is the current date with a ".HTM" extension, e.g., 20160419.HTM.
- Change the .HTM extension to .FLN. E.g, rename the file from 20160419.HTM to 20160419.FLN.



- You must then use the FlarmNet Converter Tool on your PC to convert the .FLN file to a .FLX file. Here is a link to the tool.
<http://www.lxnav.com/downloads/software/fln2flx.exe>
- Run the fln2flx program.
- Drag and drop the .flx file into the fln2flx program window.
- Save the converted file as “flarm.flx” the copy it to the root directory of the micro SD card. (Not inside any folders).



Step 4: Loading Files on to the FLARM Core

Back to your glider...

1. With POWER OFF, insert the USB stick device into USB port on the back of the PowerFLARM Core or the remote access port if installed.
2. POWER ON.
3. WAIT for automatic file updates and initialization. The process will not be visible at first (assuming you can't see the blinking LED on the Core box). It might take a few minutes, and there may be more than one download process in sequence, so wait until it is stable for at least 3 minutes. During all this the top right corner of the FlarmView screen, where the GPS bars usually show, will continue to read “NC” until the process is complete and the device reverts to normal operation with the green GPS signal bars. So watch for that.
4. If you can see the Core box itself, you will see the box blink a green LED once for every command processed. When it stops blinking or alternating colors. It is finished.
5. POWER OFF and remove the USB stick.
6. POWER ON and confirm proper firmware revision is installed. (Click the top right button on the display a few times to get to the page that reads FLARM then find FLARM INFO and enter that data field to get at the firmware rev.)
7. DONE.
8. If there seem to be problems, or to simply validate that the update process worked, you can look at a log file (at your PC) that is written to the USB stick. The log file will have a name similar to “PFC03959.TXT”. Every time you boot the Core with the USB stick inserted, the Core adds to this log file. So if you don't want to wade through lines and lines of log entries, delete the log file from the USB stick before inserting it into the Core again.

Step 5: Loading Files on to the FlarmView

1. POWER OFF.
2. Insert the micro SD card into the top of the FlarmView with connectors facing front.
3. POWER ON PowerFLARM.
4. FlarmView will automatically load the new files on power up.
5. WAIT for this auto load process to finish. FlarmView will go to initial screen eventually.
6. POWER OFF and POWER ON again.



7. Check for correct firmware revision shown during start-up screen (for just a few seconds). The same information can be found on the ABOUT screen.
8. DONE.



Once you have loaded all your files, you still need to learn the FlarmView screen manipulation and check to make sure it displays things how you like. It is another rather complex operation with a ton of choices such as screen color codes, various distances for various warnings, metric or English units, and many other things. This is in the config file you just loaded, but you still need to go through it all to become familiar and confident it will display as you want it to do. Any changes you make to the screen set-up will revise what is in your system.ini file and when you turn it OFF and ON it will retain your changes.

Step 6: System checks and familiarity on the ground



1. POWER ON.
2. Watch initialization screens for anything that looks wrong.
3. After a couple of minutes the GPS signal bars (at top right corner) should change from 'NC' to show full bars in green.
4. If you have any "targets" in the area, zoom the screen with top button to get a scale that will show the targets. Verify by looking for the targets in the sky if you can. And note the different notification graphics for a PF target versus a transponder target, the PF data available for each target, and the various screens that will be useful in flight. (Again – a separate tutorial is needed for this cockpit familiarization.)
5. Identification data for the nearest target should show on left side of main screen. If not, press the third button down (down arrow) and data should then show up.
6. Flick through all the menu screens to become familiar and decide if you want to change any selectable parameters. To do this, keep pressing the top right button through all the range selections and then you will get to the menu screens. From there it is pretty intuitive.
7. Familiarize with all the screens that will be viewed in flight.
8. Familiarize with how the user selectable choices have been programmed – so you know the threat warning ranges, how PF targets will look, how transponder targets will look, etc.
9. Note that the compass and "track up" won't work until you are moving. Also, warnings don't work until you are in the air (even when taxiing).
10. If you have a transponder, turn it on to be sure it does not interfere and become a nuisance target. That is a selectable item in the .ini file.
11. GO FLY and do not get distracted by PF!! But do check for proper operation in terms of threat warnings, beeps, etc.
12. Note any concerns and wait till on the ground to address them.



General Tips

Yes, this is all very complex. In summary, the steps you must follow are:

1. select and purchase the hardware (many choices here!),
2. install it correctly,
3. configure it all, and
4. learn how to use it in the cockpit.

This document only addresses configuring.

For configuration, there are 2 separate files needed on the Core (Operating System firmware and personal configuration file) and 3 for the FlarmView (Operating System, screen configuration, and the file that makes glider contest numbers readable). And all must be updated periodically. With all this done correctly, you will be armed with a powerful collision avoidance tool. But don't think you can simply throw down some money and you will be covered and safe – it just won't happen without significant study and knowledge on the part of the PIC!

Before installing FlarmView, consider the ergonomic factors. That is, which hand will you use to press the buttons, where will it be located for easy reach and also to be of insignificant effect on outside visibility? That all affects the type of mount, location, and whether you want the screen right side up or upside down (buttons left side or right side). Another consideration is when you fold the seat forward – will it contact the spot where you plan to install the FlarmView screen, with the potential for damage?

The installation location of FLARM Core is more about where it might fit among your glider avionics. There is no generic answer, but it does not need to be visible.

If it is difficult to reach the USB port on the back of your Core box, consider installing the PF USB extension port or a USB extension cable for easier updating.

Positioning of the antennas is vitally important, so follow precisely the guidance in the installation manual. And look for guidance from pilots with the same make & model.



Be aware that the capabilities of PF are extremely broad and sophisticated. Do not be fooled by an in-flight warning that correctly advises of a target close by. This is confirmation only of that particular feature of PF. To confirm it is working, and correctly, for all parameters and across the entire envelope, you will have to safely conduct extensive testing with other cooperative targets in the air. For example, confirming that you are correctly warned of a PF target does not prove you will be properly warned of a mode C or S target. And a target that correctly alarms in one quadrant, say in front, does not mean there is not a blind shadow area to your rear. And of course, there will be targets up there that are not squawking at all, or squawking incorrectly. The system relies entirely on proper operation of all devices involved. Don't trust, but verify with your eyeballs!



https://www.youtube.com/watch?v=hwj6DA8OITU&ebc=ANyPxKoQdtsEs7QVsxZW5Oe8Rw5igsG-XnNA9hUr4MPtrD-AScBltoUNc21kXENjvwUItNHFh_Awf0Rnquq86Xydm4tvN-Twpg&nohtml5=False

This video gives a good idea of basic flight testing, but it is just one of many needed tests.

Other Resources

<http://www.williamssoaring.com/news/showthread.php/552-Update-your-PowerFlarm-By-Hans-VanWeersch>

<https://sites.google.com/site/threeuniform/powerflarm>