

PowerFlarm

Recommendations, tips,
Misconceptions and Issues

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Where's the danger?



'... the physical limitations of the human eye are such that even the most careful search does not guarantee that traffic will be sighted.'
Australian Transport Safety Bureau

The problem it solves

- Zell am See (AT), Aug 28, 2011: **A Cessna C150 and a Super Dimona collide, four fatalities.**
- Donzdorf (DE), Sep 6, 2011: **A paraglider and a glider collide, no fatalities.**
- Mount Swansea (CA), Sep 3, 2011: **Two gliders sharing a thermal collide, two fatalities.**
- Frankfurt (DE), Dec 8, 2012: **A Regent and a Saratoga collide, eight fatalities.**
- Kaiserslautern (DE), Mar 4, 2013: **Airprox between EMB-505 and C177, no fatalities.** Embraer TCAS failed to alert, PowerFLARM alerted the Cessna pilot.
- Kempten (DE), May 15, 2013: **A Cessna and a Katana collide, two fatalities.**
- Birrfeld (CH), June 6, 2013: **A glider and a Mooney collide, no fatalities.** Mooney was not FLARM equipped.

Since the introduction of FLARM in 2004, there have been only a handful of mid-air collisions where both aircraft have a FLARM installed. In most of these cases, the accident investigation revealed that one device was **not switched on**, had **no antenna** installed or didn't work for other reasons (E.g., Stemme vs. ASH25 near Samedan, April 2007).

FLARM, if professionally installed and serviced, **virtually eliminates the risk of mid-air collisions.**

Who's using it

- 25'000 units installed worldwide
- Virtually all gliders in central Europe are equipped
- About half of the cross country pilot in Region 11
- A growing number of PowerFLARM installations in powered aircraft
- A growing number of paragliders
- Many commercial heli operators
- Swiss SPHAIR program (military pilot training) plans to equip the entire basic training fleet

Misconceptions

- Midairs are rare
- It is not effective since most pilots fly without Powerflarm
- There are other bigger risks
- I don't need flarm – I have transponder.
- I don't need flarm – I have Zaon MRX
- I don't need flarm – I can use See and Avoid effectively.

More Myth and Misconceptions

- The big sky theory
- I don't need PF since I don't fly contest
- I am willing to take the collision risk
- It is complicated to install, no place, antenna location, will drain battery etc
- Powerflarms do not work well, have issues

Issues

- Poor reception or transmission (range less than a mile)
- False PCAS alarms
- PCAS reception issues
- Hard to see the display with polarized glasses
- Flarm vertical range limited to 1600 feet
- Bearing to target may be off with strong wind
- Climb rate inaccurate
- Cant differentiate ADSB target from flarm target

Zaon MRX vs PF

- PF has better reception most of the time in latest firmware
- Altitude difference much more accurate in PF
- PF has better audio alert
- MRX had reliability issues
- MRX detects mode C/S Only. PF also detects ADS-B which provides bearing and altitude difference.

PF Benefits

- May save yours and others lives
- Situational awareness
- Find where to tow to
- Find thermals
- Decide where to go next
- Compare climb rates
- Buddy flying

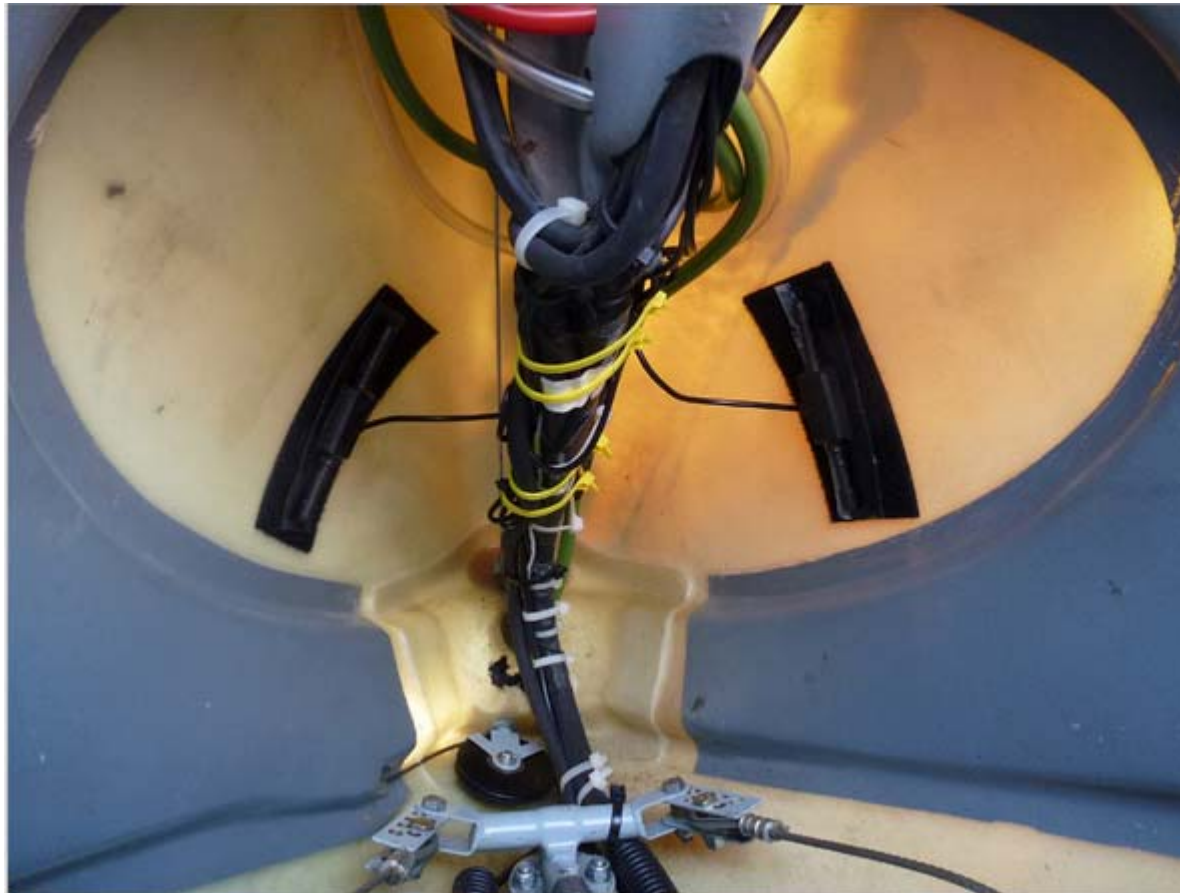
Recomendations

- Get a brick (core) unless you need a portable device
- Get the 57mm display if you have space. LXNAV FlarmView is another option.
- Get latest firmware for both PF (3.31) and Butterfly display (3.22)
- Stealth mode not recommended
- Read both manuals

Installation

- Antenna installation is not as critical as many believes
- Other more elegant antennas are available
- Brick can be installed anywhere behind panel.
- Rectangular display can be mounted many ways

Antennas in the nose



Configuration

- PF brick and butterfly configuration via single memory stick (separate firmwares)
- Use online configuration tool. Recommending max range but no more than 2-3000 feet ver range.
- Set Volume to Max
- Set correct aircraft and transponder
- Enable tranponder alert
- Enable short beep for new target
- Upgrade to latest firmwares
- Register on FlarmNet and download latest flarmnet database (keep updating it)

Display Alternatives

- 57mm butterfly display
- LXNAV Flarmview (rectangular and 57 mm)
- Some flight computers

Performance

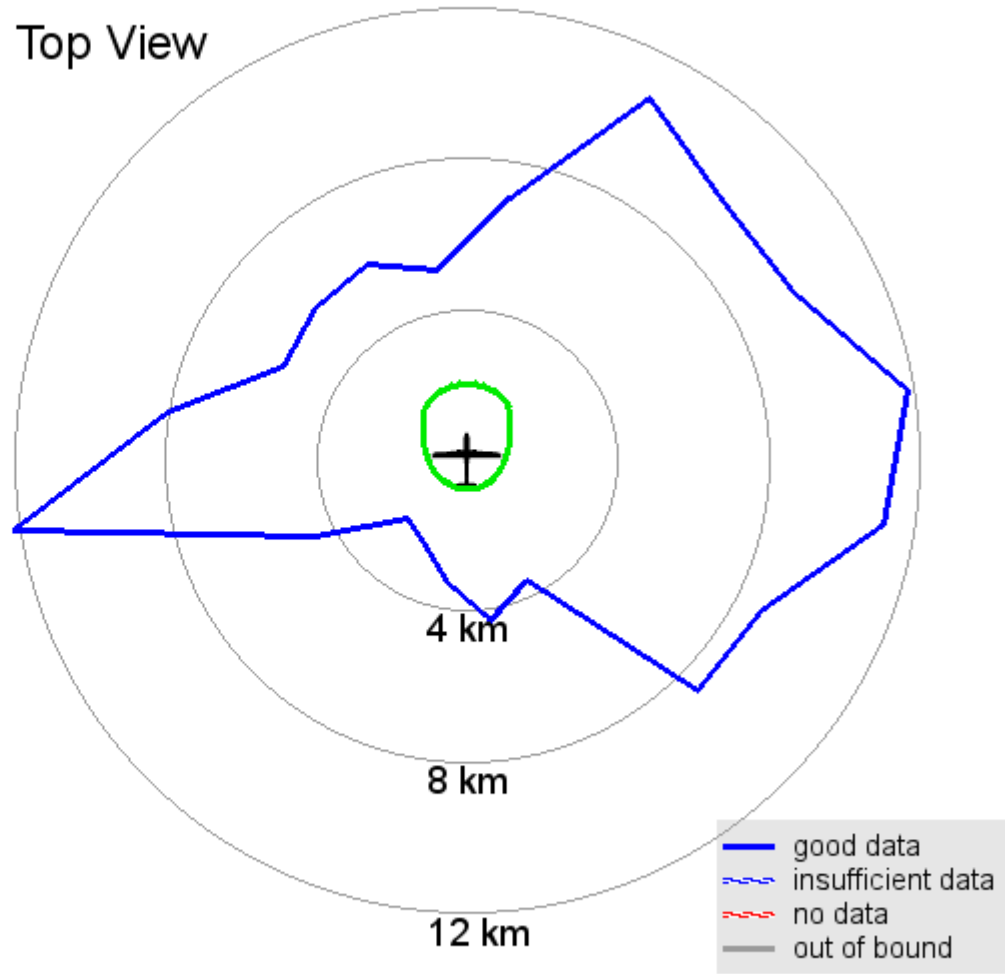
- When installed and configured correctly, most pilots report 2-4 miles on average in front (occasionally up to 10 miles) and 1-2 miles behind
- Use the FlarmRange online tool with your recorded IGC file to analyze your range

FLARM / POWERflarm Radio Range Analysis

The green area is the minimum recommended range for speeds up to 200km/h
The blue area is the average receive range of the submitted flightdata

File : 37KG8HQ1.IGC
Pilot : Ramy Yanetz
Radio ID: AB07F2
Recorder: PowerFLARM-IGC
HW Type : 1.0
FW Vers : 3.21
Stealth : OFF

Top View



Total points: 1012
Average distance: 7911m
Maximum distance: 33247m



Cockpit procedures

- Maintain a good visual scan for other traffic. Power Flarm is an aid, not a solution. We must not rely solely on Power Flarm to “see and avoid” other gliders
- Recommending 1-2 miles zoom
- On FLARM/ADS-B alarm (directed target, with bearing):
 - Brief glance at FLARM display to determine bearing to target
 - Make visual contact
 - Take evasive action.
 - If no visual contact - push or pull

Additional Resources

- Official PF US web site but notoriously outdated <http://powerflarm.us/>
- Official European web site <http://powerflarm.aero/index.php/en/>
- Butterfly web site <http://www.butterfly-avionics.com/butterfly/index.php/en/products>
- Latest firmwares and manuals <http://powerflarm.aero/index.php/en/knowledge-and-support>
- Latest Butterfly display software <http://www.butterfly-avionics.com/butterfly/index.php/en/customer-support>
- Configuration tool <http://www.butterfly-avionics.com/butterfly/index.php/DE/powerflarm-core-configurator>
- Good web sites tips on installation, configuration, upgrade etc:
 - PK blog: http://www.valleysoaring.net/?page_id=1487
 - 3U blog: <https://sites.google.com/site/threeuniform/powerflarm>
- Flarmnet: <http://www.flarmnet.org/index.php/en/>
- Flarmrange: http://www.flarm.com/support/analyze/index_en.html