PowerFLARM Eagle 2022

Installation manual

- LX navigation -

May, 2025

LXNAVIGATION

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Document information

0.1 Abstract

This document represents the installation manual for the PowerFLARM Eagle 2022. The user manual, release notes, dataport and additional info can be found on **www.lxnavigation.com**.

0.2 Document status

Document status: PUBLIC

Document status	Explanation
Internal	Intended only for LX navigation staff
Public	Available publicly to all
Personal	Intended for a specific person and/or company, noted on this page
Dealer	Intended for a specific dealer, noted on this page
Manufacturer	Intended for a specific manufacturer, noted on this page

0.3 List of applicable products

Device	HW Version
LX Flarm Eagle 2022	1.0
LX Flarm Eagle 2022	2.0

0.4 Revision history

Document name	Document revision	Date	Revised by	Approved by	Notes
LX_FEIM	R1	22.12.2022	A.S.	N.S.	initial release

Overview

PowerFLARM Eagle is the latest PowerFLARM OEM product designed and manufactured by LX navigation with full functionality and connectivity. It has the smallest dimensions on the market.

FLARM is the traffic awareness and collision avoidance technology with over 50.000 active aircrafts. In Europe, essentially 100 % of gliders have FLARM® and would never fly without it.

FLARM® works by calculating and broadcasting its own future flight path to nearby aircraft. At the same time, it receives the future flight path from surrounding aircraft. An intelligent motion prediction algorithm calculates a collision risk for each aircraft based on an integrated risk model. When a collision is imminent, the pilots are alerted with the relative position of the intruder, enabling them to avoid a collision.

Each FLARM® system determines its position and altitude with a sensitive GPS receiver. Based on speed, acceleration, track, turn radius, wind, altitude, vertical speed, aircraft type, and other parameters, a precise projected flight path can be calculated. The flight path, together with additional information such as a unique identification number, is encoded before being broadcast over an encrypted radio channel twice per second.

FLARM® is approved by EASA for fixed installation in certified aircraft. EASA supports FLARM® as it significantly decreases the risk of a mid-air collision between participating aircraft. FLARM® has been referenced in several EASA publications, including being approved as a Standard Change.

PowerFLARM Eagle fetures:

- IGC + ENL flight recorder
- Second FLARM® antenna (Diversity module)
- ADS-B in (With ADS-B collision warnings)
- External USB A port for data transfer
- WiFi ® connectivity
- Bluetooth ® connectivity
- FLARM Configurator WiFi Portal accessible with your smartphone for configuring your FLARM device and displayable data, export and import various files and connect with LX Cloud.

Mounting

PowerFLARM Eagle is designed with two brackets with holes that server as mounting points for the installation. It can be mounted securely via these two holes onto a flat surface with any screw. PowerFLARM Eagle is designed to be mounted in the avionics compartment or behind the instrument panel of the aircraft. Depending on the aircraft's individual requirements other locations may be suitable as well.

PowerFLARM Eagle does not require additional external cooling. Make sure that installation is performed behind the engine firewall.

Two mounting options in remote locations are possible:

- directly to a flat surface via two eyelets with M3 screw (DIN 7985),
- with usage of mounting frame (PN LX02167) sold separately.

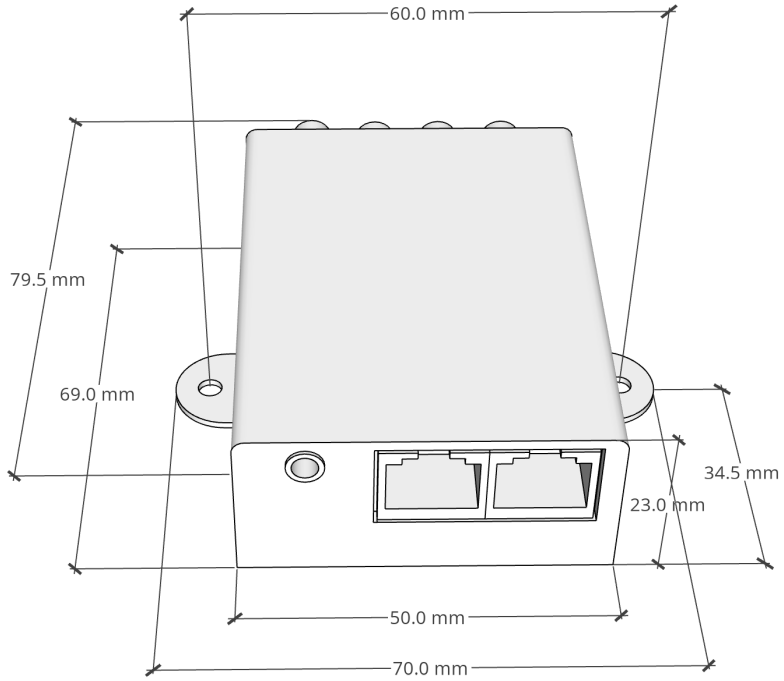

Figure 1. Device overview

Mounting frame (PN LX02167)

The mounting frame has two M3 tap holes for PowerFLARM Eagle mounting. The mounting frame must be fixed on a flat surface with at least four screws. There are two possible mounting options. Inner holes are 4 mm countersunk holes allowing use of M3/M4 DIN 965 screws while outer holes allow mounting with M3/M4 DIN 7985 screws.

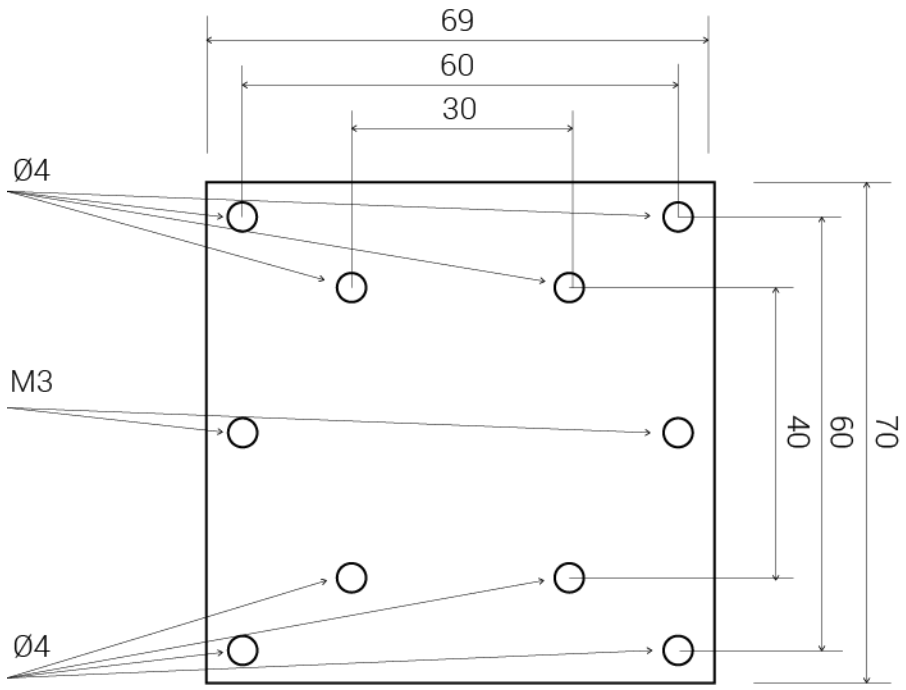

Figure 2. Mounting frame

All dimensions are in milimeters.

Compass consideration

Make sure that PowerFLARM Eagle is mounted more than 25 cm from the compass. When installation is completed a fresh compass calibration is recommended (in some installation cases required).

Wiring

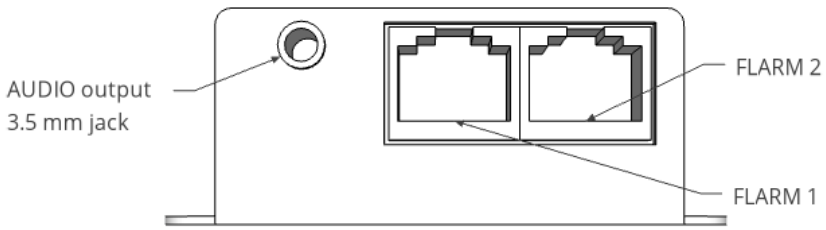

Figure 3. Front side connections

3.1 Power supply

System requires DC power input in a range between 9 and 32 V DC. Power is supplied via any of the two FLARM data/power ports (RJ45). Check figure 4 for pinout or use provided Power adapter.

Use external fuse or circuit breaker, as there is no fuse inside the unit. Manually resetable circuit breakers are strongly recommended. These circuit breakers allow for individual devices to be switched without compromising other systems on the same power bus. 3 Amp circuit breaker is recommended.

Prior to connecting the power to the device make sure that cables are tight and there is not short-circuits between wires. Plug the connector to the device. The device will turn on as soon as the main power supply is available.

3.2 FLARM power and data ports

PowerFLARM Eagle is capable of interfacing with other FLARM compatible devices via two power and data ports.

FLARM 1 supports two-way NMEA communication and can be used both for connecting to compatible display or for configuration of the FLARM itself.
FLARM 2 supports only data out features and can be used for connecting to compatible display only.

The serial inputs/outputs conform to RS-232C (EIA Standard) with a positive and a negative output voltage of at least 5V when driving a standard RS-232 load.

It is not sufficient that power supply ground on both devices is connected to aircraft ground. An additional direct ground connection is mandatory.

Although any 6 or 8 pin 1:1 FLARM cable may be used, the use of a 4 twisted pair shielded cable, is highly recommended. With this cable both data wires, GND reference and power supply can be connected using a single cable.

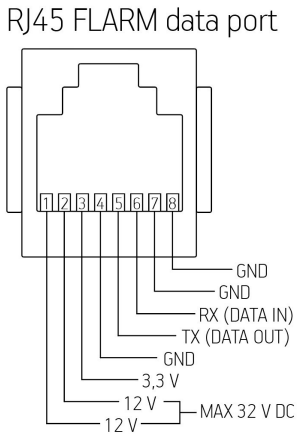

Figure 4. RJ45 FLARM 1 and FLARM 2 port pinout

WARNING
Do not connect any CAN bus cables or CAN devices to FLARM 1/FLARM 2 RJ45 ports as it can damage the PowerFLARM Eagle unit.

3.3 Audio

PowerFLARM Eagle audio output is available on the 3.5 mm standard audio jack. This provides an audio signal to an audio panel, an intercom or an external speaker (max power 5W).

The audio output volume level is adjustable via WiFi portal (permanently configured to certain level).

In some installations, for example if connecting to an avionics audio panel (input impedance typically 500 ohm), it may be required to install an impedance matching transformer 1:4, 1:1 or similar.

LX navigation provides an optional 1:1 transformer (sold separately).

3.4 FLARM RF and ADS-B antennas

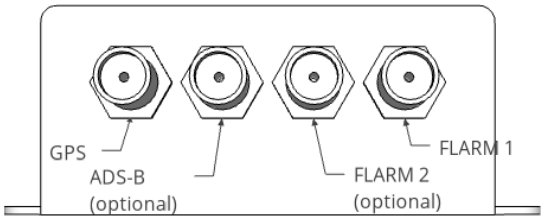

Figure 5. Back side (antenna) connections

PowerFLARM Eagle rely on the performance of the antennas. Proper antenna installation is essential for a proper system operation. For more details on antenna installation and selection please advice document FTD-041-Application-Note-FLARM-Antenna-Installation (www.flarm.com).

Use a provided, marked antenna and screw the connector on the antenna to the same marked connector on the device.
FLARM 1 is main FLARM antenna, while FLARM 2 is optional additional FLARM antenna for Diversity feature.

3.5 GPS antenna

Connect GPS receiver antenna to the SMA connector on the back of the main unit marked with GPS underneath.

Install supplied antenna horizontally with “GPS” sign pointing to the sky.

We supply high gain active antenna with superb reception. Despite that be careful with the placement. Do not install antenna under metal or carbon fiber instrument panel/cover. The antenna should have clear “sight” to the satellites. It can be covered with non-conductive material (eq. Glass fibber, glass, wood, cloth, etc.).

NOTE

Route the wiring bundle as appropriate. Avoid sharp bends. Secure all wires in order to minimize vibration damage. Do not route cable near high voltage sources and alongside Radio and Transponder antennas.

NOTE

After finishing the installation, check that the device is completely working, prior to closing the instrument panel cover.

NOTE

If you run into any issues, contact us at info@lxnavigation.com for assistance.

Update

Please refer to the PowerFLARM Eagle user manual.

Technical specification

Description	Unit	Value
Dimensions	[mm]	23 x 70 x 79.5
Power supply	[V DC]	9.0 - 32.0
Nominal Voltage	[V DC]	13.8
Average Power Consumption	[W]	2.35
Mass	[g]	102
Ground Survival Temperature	[°C]	-55 - +85
Operating Temperature	[°C]	-20 - +55
Relative Humidity	[%]	0 - 98
Max. Operational Altitude	[ft]	45,000
Operational Shock		10 g
Crash Safety Shock		20 g
Vibration		DO-160D U F/F1

NOTE

This specification applies to all variants pf Flarm Eagle

Environmental data

Description	Section	Category	Conditions
Temperature / Altitude	4.0	D1	
Low Ground Survival Temperature	4.5.1	D1	-55℃
Low Operating Temperature	4.5.1	D1	-40℃
High Ground Survival Temperature	4.5.2	D1	+85℃
High Short Time Operating Temperature	4.5.2	D1	+70℃
High Operating Temperature	4.5.3	D1	+55℃
In Flight Loss of Cooling	4.5.4	Z	No auxiliary cooling required
Altitude	4.6.1	D1	45,000 ft
Temperature Variation	5.0	B	
Humidity	6.0	A	
Shock	7.0	B	
Vibration	8.0	U/U2	Vibration curve F/F1 (robust vibration, helicopter)
Explosion Proofness	9.0	X	not tested
Water Proofness	10.0	X	not tested
Fluids Susceptibilities	11.0	X	not tested
Sand and Dust	12.0	X	not tested
Fungus Resistance	13.0	X	not tested
Salt Spray	14.0	X	not tested
Magnetic Effect	15.0	Z	less than 0.3m
Power Input (DC)	16.0	B	
Voltage Spike Conducted	17.0	B	
Audio Frequency Conducted Susceptibility	18.0	B	
Induced Signal Susceptibility	19.0	X	not tested
Radio Frequency Susceptibility	20.0	T	Radiated Susceptibility T
Conducted Susceptibility Emission of RF	21.0	M	Except intended operating frequencies (868/915 MHz 6 and 2.4/5 GHz)
Lightning Induced Transient Susceptibility	22.0	A2XXX	
Lightning Direct Effects	23.0	X	not tested
Icing	24.0	X	not tested
Electrostatic Discharge (ESD)	25.0	A	
Fire, Flammability	26.0	X	enclosure made of aluminum (Al) sheet

Environmental tests are performed in accordance with RTCA DO-160.

Conformity

Declaration of CE Conformity

Identification of product
Flarm eagle 2022 (all variants)

Manufacturer
LX navigation d.o.o.
Tkalska ulica 10
SI-3000 Celje
Slovenia

Related standards
EMC directive 2004/108/EC

This product is designed to comply with standards/regulations and technical specifications stated above. This certificate is granted subject to the LX navigation quality rules on product certification.

Remark
The product is designed to comply with LX navigation standards and standards harmonized with directive 2004/108/EC: EN 55022:1998+A1:2000+A2:2003, class A; EN 55024:1998+A1:2001+A2:2003; EN 61000-3-2:2000+A2:2005; EN61000-3-3:1995+A1:2001+A2:2005

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