



# DEUTSCHER AERO CLUB E.V.

MITGLIED DER FÉDÉRATION AÉRONAUTIQUE INTERNATIONALE  
UND DES DEUTSCHEN OLYMPISCHEN SPORTBUNDES

Deutscher Aero Club e.V. • Hermann-Blenk-Straße 28 • 38108 Braunschweig

Ansprechpartner:  
Reinhard Heineking  
Referent BuKo Segelflug

Telefon +49(0)531 23540-53  
E-Mail r.heineking@daec.de

## Approval document for a compatible FLARM unit to be used as an IGC Position Recorder for IGC Silver and Gold Badge Flights

**Issuing Authority:** Deutscher Aero Club e.V.  
Bundeskommision Segelflug/Motorsegelflug  
Hermann-Blenk-Str. 28  
38108 Braunschweig  
Phone: +49 5 31 2 35 40 – 0  
Fax: 05 31 - 2 35 40 - 11  
<http://www.daec.de> - [segelflug@daec.de](mailto:segelflug@daec.de)

**Date of effect:** 1 July 2010

### References:

FAI Sporting Code Section 3 (Gliders and Motor Gliders) (SC3)  
Particularly: SC3 Appendix A to Chapter 4 on Position Recorders  
Annex B to the Code (SC3B), Glossary on Position Recorder and Validation,  
and paras 1.7, 2.1.1.2, 2.2.2.  
Annex C to the Code (SC3C), particularly para 6.1, also 1.1, 1.5, 3.3.

### Introduction

1.1. This document authorises the use of the GPS recording device described in para 2 for use as an IGC Position Recorder for flights under the jurisdiction of the above DAeC under the rules and procedures specified in the FAI Sporting Code Section 3, in particular under the References above. These specify when an IGC "Position Recorder" may be used for the validation of flights for IGC Silver and Gold Badge performances. In addition, for such flights, evidence from an IGC-approved GNSS Flight Recorder may also be used if one is available.

1.2. This approval covers only the Position Recorder itself and its operation. The detailed process for making a badge flight and providing evidence to the DAeC, is contained in the Sporting Code for Gliding (SC3 and its Annexes).

## Type of Position Recorder

2.1. Name of Position Recorder: compatible FLARM units not covered by the IGC Flight Recorder approval but capable of downloading data after flight in the IGC file format. Compatible FLARM units are devices built by FLARM technology or by other manufacturers having a licence for the core FLARM hardware and software.

2.2. Units concerned by this approval : (unless the unit already has IGC Flight Recorder approval)

<b>FLARM technology</b>	Original FLARM units built or updated after the 1 <sup>st</sup> of January 2005	<a href="http://www.flarm.com">www.flarm.com</a>
<b>LX Navigation</b>	LXN-Redbox, LXN-Mini Box	<a href="http://www.lxnavigation.si">www.lxnavigation.si</a>
<b>Triadis</b>	Floice	<a href="http://www.triadis.ch">www.triadis.ch</a>
<b>Ediatec</b>	ECW 100	<a href="http://www.ediatec.ch">www.ediatec.ch</a>
<b>Swift Avionics</b>	OzFLARM, MiniOZ	<a href="http://www.swiftavionics.com.au">www.swiftavionics.com.au</a>

In the rest of the document, "FLARM" means any of these devices.

### Manufacturer of the internal firmware and software :

FLARM Technology GmbH, Heischerstrasse 1,  
CH-8915 Hausen am Albis, Switzerland  
Email-web: [info@flarm.com](mailto:info@flarm.com) - <http://www.flarm.com>  
Fax +1 435 203 12 24  
Contact: Andrea Schlapbach

2.2. This approval applies to the flight data recorded internally in the instrument and downloaded in the form of a file in IGC format with a verifiable security record (3.3 below).

## 3. Compliance with Sporting Code

To comply with the Sporting Code requirements for Position Recorders, the following sub-paragraphs apply. References below are to paragraphs in Appendix A to SC3 Chapter 4.

3.1. The WGS84 datum (ellipsoid Earth Model) is used for all fixes in the IGC file (Para A2 refers).

3.2. Fixes in the downloaded IGC file are obtained from real-time GPS data (Para A3 refers). No predictive fixes are recorded without GPS data.

3.3. The downloaded IGC file can be electronically validated at any time to ensure that the file is identical to when it was initially downloaded (para A6 refers).

3.3.1 A download program can be found on <http://www.flarm.com> in the section support subsection updates under the heading IGC-Tools.

3.3.2 The file validation program to be used with downloaded IGC files is < vali-flarm-nonigc.exe >. The latest version of this program can be found at the same location as motioned in section 3.3.1.

3.4. Pressure Altitude calibrated to the ICAO ISA. The Pressure Altitude function of the FLARM unit may be calibrated to IGC standards, or a separate barograph may be carried.

3.4.1 Calibrating the FLARM pressure altitude data.

The FLARM is configured to output NMEA navigation data every second. Pressure altitude at a particular time is in the NMEA data on lines headed "\$PGRMZ" and after the pressure altitude figures, the letter F or M shows whether they are in feet or metres.

## Approval Limitations

4.1. General. This equipment is approved as a Position Recorder for flights for IGC Silver Badge, Gold Badges, as specified in the references above para 1, mainly Appendix A to Chapter 4 of SC3. In addition FLARM is approved as backup for Zentrale Meisterschaften.

4.2. Altitude for IGC Measurement Purposes. For the accurate measurement of altitude for Gain-of-Height, start and finish altitudes, and the 1:50 requirement for Silver distance, evidence of pressure altitude is required. Such evidence must be from a system that can be calibrated before the flight to IGC standards and at the intervals required by the Sporting Code. The IGC calibration datum is the International Standard Atmosphere of the International Civil Aviation Organisation (the ICAO ISA).

4.2.1 Other Altitude Data. GPS altitude, or pressure altitude that is not calibrated to IGC standards, must only be used to demonstrate flight continuity, not for the IGC measurement purposes referred to in 4.2 above.

4.2.2. Pressure Altitude Calibration. For a flight performance to be validated using Position Recorder evidence, in addition a current Calibration Certificate must be produced for the system that is used to provide the pressure altitude data for the flight. For calibration of FLARM recorders, see para 3.4 above. IGC calibration procedures apply to Position Recorder evidence and are given mainly in Appendix 5 to Annex C to the Sporting Code (SC3C). References to Calibration are also in the main volume of SC3, Chapters 4 and 5 (particularly para 5.3.2), Annex B (SC3B) Chapter 2, and Annex C (SC3C) Chapter 5, para 6.7 and chapter 11.

4.3. Motor Glider Means of Propulsion (MoP) Recording. Where this equipment is not able to detect the operation of a Means of Propulsion (MoP), SC3 4.5.4 and SC3C 12.1 apply. For gliders with a functioning MoP, one of the following must be carried out:

4.3.1. Carry a separate device that records MoP use and is acceptable to the Official Observer and the DAEC, or

4.3.2. Seal the MoP in such a way that the Official Observer can detect if it has been operated.

4.3.3. Disable the MoP prior to flight to the satisfaction of the Official Observer and DAEC.

### **Operating Requirements**

5.1. This Position Recorder may be mounted anywhere in the glider, but the Official Observer must be able to show that it was present in the glider throughout the flight for which the performance is claimed, and that the downloaded IGC file used to assess the flight came directly from it.

5.2. Files downloaded from this Position Recorder must be in the IGC file format, so that they can be read by analysis programs designed for the IGC format, without modification to the file. It must be possible to carry out a Validation check (see 3.3.2 above) that ensures that the IGC file used for assessment of the flight performance is the same as the file that was originally downloaded from this type of Position Recorder.

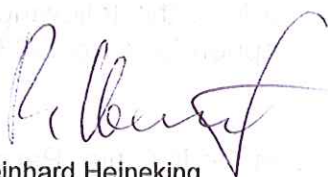
### **Authority**

6. This approval document has been issued by the Bundeskommission Segelflug/Motorsegelflug of the DAEC to permit evidence from this Position Recorder to be used for the validation of claims for Silver and Gold Badges (for which an IGC-approved Flight Recorder may also be used).

### **Questions**

7. Any questions about the contents of this document should be sent to the Chairperson of the Bundeskommission Segelflug/Motorsegelflug of the DAEC [segelflug@daec.de](mailto:segelflug@daec.de).

---



Reinhard Heineking

Referat Segelflug  
Deutscher Aero Club e.V.  
Bundesgeschäftsstelle  
Hermann-Blenk-Straße 28  
38108 Braunschweig  
Tel. +49 (0) 531/23540-53  
Fax. +49 (0) 531/23540-55  
[www.daec.de](http://www.daec.de)

---