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External FLARM™ / PowerFLARM™ Display V3+



Manual V3+

Software Version 5.71

18th July 2013 (a)



Legal Aspects

This external display V3+ is designed as a non-essential “situation awareness only” device solely for pilot support and is not always in a position to warn reliably. This manual is not certified and is not a definite guarantee for flight safety. The use of the device does not allow under any circumstances for a change of flight tactics or pilot procedure and conduct.

The development of the display is based on methods and in accordance with common standards and procedures required in the electronic industry. Program failure such as incompatibility with Software or Hardware cannot be ruled out. This device has not undergone conventional aviation certification. The use of the display strictly applies to non-commercial flights in daylight under VFR(Visual Flight Rules) and should not be used for navigation.

The pilot remains solely responsible and liable for the safety of all passengers and other aircraft. The device is only to be operated by pilots with sufficient knowledge of all of the following user instructions.

This external display when attached to FLARM™ can only detect and alert the presence of another moving aircraft if the aircraft is equipped either with FLARM-compatible systems, ADS-B-OUT (1090ES) on 1090MHz or an interrogated transponder Mode C or S. As FLARM™ main device neither interrogates nor operates as a transponder the displayV3+ as well cannot be detected by TCAS or air traffic control.

Warranty

The period of the warranty ceases immediately in all of the following cases: the unauthorized opening of the unit, improper use, faulty installation, damage/false indications caused by incorrect connections and any breach of copyright.

Legal Restrictions

We reserve all rights to this manual and its contents. The sufficiency and accuracy of this manual's contents cannot be guaranteed. Specifications and product descriptions can be changed at any time without advanced notice.

Legal Liability

Developers, suppliers, manufacturers and distributors do not accept any responsibilities and/or liability for damage or legal claims.

Trademark protection reference

FLARM® is a trademark registered in the EU and other countries.
FLARM and PowerFLARM logos are protected trademarks.

For further information <http://flarm.com>

The FLARM™ logo on our displays and documents is used with explicit permission of the license holder and only in connection with the FLARM™ technology.

This manual uses other trademarks that are all the property of their respective legal owners.



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Display

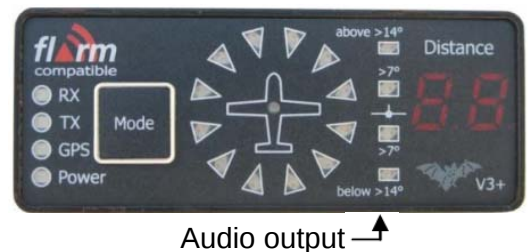
The “External Display for FLARM – Version V3+” is a step-by-step display unit and operator control module for FLARM™; functions and operations are generally identical with the original.

Due to the frame size of the step-by-step display, the V3+ can be installed in small and/or full instrument panels – by narrower panels the main device, the FLARM™ can be installed hidden in the fuselage.

The external display has no own FLARM™ functions and cannot replace the main device. For further information regarding the principles of function, range and norms of main device, please consult the original FLARM™ documentation.

Operator control and indication units

- o [Mode] button
- o 4 vertically situated status-LED's (green)
- o 12 circular situated status-LED's (red/green)
- o 4 LED's for relative height indication (red/green)
- o 2-digit distance display (red)
- o brightness sensor (centered in airplane symbol)
- o buzzer for acoustic alarms (underside)



[Mode] button

The operating of all functions occurs simply with the “mode”-button. During construction significant importance was given to tactile feedback and the possibility to operate the display while also wearing gloves without restrictions.

Status-LED's

4 status-LED's (green) situated vertically indicate operating status of FLARM™.

Direction and height indicators

12 circular-placed LED's for the direction and 4 LED's for the traffic height indication.

The indication appears as relative direction indication which means from the point of pilot/flight direction and detects an approaching threat rapidly.

Using the 2-colour display the objects can also be recorded automatically: safe objects are shown as **green** (Nearest-Mode). If there is a nearby threat on the basis of calculation there will be an indication in **red** in addition to an acoustic alarm.

Distance indicator

In order to locate the indicated objects quicker the distance indicator can be very helpful. The indicating range extends from 0.1 to 99 and the values > 9.9 may occur only in connection with ADSB transponder receivers. The display can be configured with the indicator in KM (kilometers) or NM (naval miles); the adjusted measurement module is not indicated constantly but only shown as a symbol for a short time when switching unit on.

Brightness sensor

The indicator is designed to be effective even in difficult conditions, e.g. direct sunlight on the display, adequate readability of the indicator is guaranteed.

To ensure that blindness by diffuse light does not occur, the brightness of the display can be modified. Along with the fixed level of brightness, adjustments are automatically made for different degrees of light – the specific brightness sensor is centered in the airplane symbol.



Acoustic signal (buzzer)

There is a sound source on the lower edge of the display for an acoustic warning. In the case of an approaching threat the acoustic alarm sounds in addition to the red indicator.

The volume can be adjusted into 4 levels. The signal can be muted for a 5-minute period in order to consciously eliminate acoustic noise while thermal-circling with other glider aircraft.

For more detailed instructions refer to the chapter “Operation”.

Installation

General

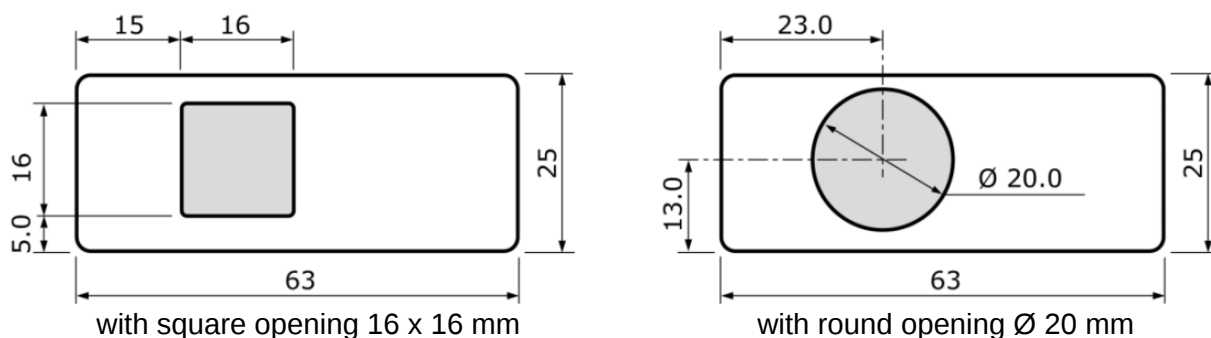
The display should be installed in the airplane in a manner that the pilot can read the indicators and operate the Mode button. The illuminated LED's enable optimal readings of the indicators when direct sunlight falls onto the display.

There is a small opening on the lower edge for the sound source – it is forbidden to close the opening with glue or other foreign objects. In order to ensure a full volume signal, a distance of minimum 10mm is required from other objects/instruments.

In order to avoid possible influences on the magnetic compass the display should be installed at least 25cm away.

Plug opening

In order to fit the external display onto the instrument panel an appropriate opening for the plug is necessary. (front view dimensional drawings of the display)



Adhesive attachment

For installation of the display an adhesive attachment proves to be the most practical method. For this purpose two pre-cut double-sided mounting adhesives are included.

For clean smooth surfaces the thinner adhesive should be used; for rougher surfaces the foam adhesive is the preferred choice.

Attention: in order to guarantee optimal adhesion, the surface must be absolutely clean and free from oil when applying the adhesive. The adhesion strengthens further within 24h after application.

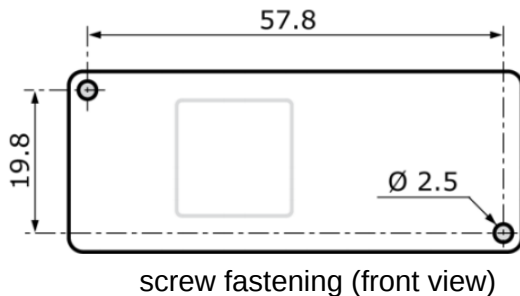
Tip: to remove the sticker from display, manual force should be avoided. Also not recommended is raising the sticker from one side with a metal object (e.g. screwdriver) – these actions can result in mechanical pressure being applied directly to the electronic display panel which can lead to cracks and damage of the unit.

It is recommended instead to use a knife, cut all around under the display until it can be lifted away from adhesive sticker with minimal force. Afterwards the adhesive sticker can be easily removed by hand – do not use any solvents on the display to avoid penetration and possible damage to display.

Adhesive sticker sets for new installations are available from the distributor.

Screw Attachment

When the adhesive method proves unsuitable, attaching the unit with screws is possible; for this purpose there are two M2 screw holes present in unit.



Attention:

The M2 screws must not enter further than 3 mm into the display – shorten screws if necessary!

Important: when the screws penetrate too far into the casing, damage to the electronics of the display can occur. It is mandatory to measure the length of the screws beforehand!

Tip: influences on the compass, other magnetic-influenced instruments and sensors can be reduced by using (non-magnetic) brass screws.

Power supply

There are power sockets on the display that connect to the mainframe. In addition to data communication the FLARM™ instruments have a “non-stabilized” battery supply available on their interface. This enables the peripheral device’s power supply through simple wiring.

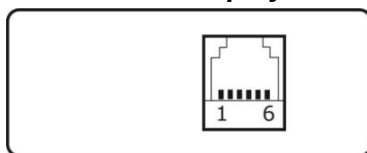
Non-stabilized means the FLARM-device supply is connected without voltage control and without internal fuse protection to the interface. Strictly adhere to the manufacturer’s references regarding the connection and fuse protection of the mainframe.

The display V3+ has its own voltage stabilizer for its electronics – with an allowed input voltage range from 6 to 25V DC – and was developed for the nominal (battery) supply of 12V.

Tip: This range is not identical to the range of the mainframe that allows a higher supply!

A connection to the on-board power supply 24V or even 48V is only possible with an additional voltage stabilizer.

Pin allocation display



Display rear view

- 1: +12 VDC (battery supply from FLARM)
- 2: not connected (3.3V from FLARM)
- 3: RS232-GND, internally connected to pin 6
- 4: RS232-RX: display receives data from FLARM
- 5: RS232-TX: display sends data to FLARM
- 6: GND, internally connected to pin 3

The 6-core connecting cable provided and optional Y-adaptor are wired 1:1. (Pin 1 of plug 1 goes to pin 1 of plug 2 etc.)

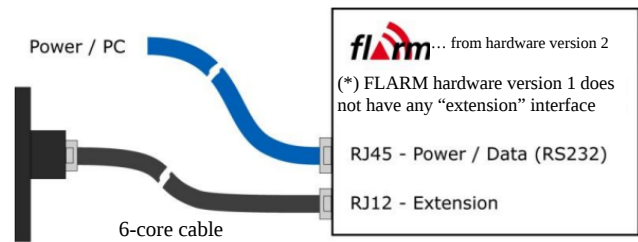
Any warranty legal claim through improper installation/wiring will be explicitly declined.

External FLARM™/PowrFLARM™ Display V3+ with Software-version 4.20



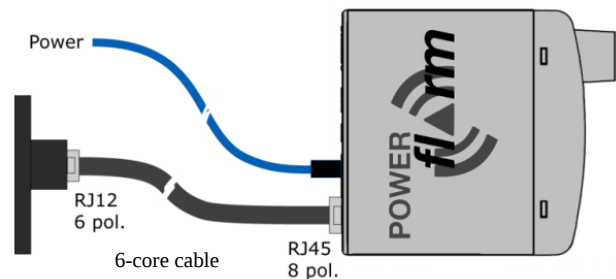
Wiring to “FLARM™”

For electrical connection the provided cable is connected to the jack of the external display and RJ12-jack of FLARM.
To connect FLARM with the Hardware version 1 (2004), only one jack (RJ45) is on the rear side. In order to connect the power supply cable along with the connection to the external display, a Y-adapter (RJ45, 8-pole) is required.



Wiring to “PowerFLARM™ PORTABLE”

The V3+ display has a 6-pole RJ12-jack, PowerFLARM™ has a 8-pole RJ45-jack. Signal allocation of both jacks is compatible with the 6-core cable from the display and can be attached in the RJ45 plug; this means that the RJ45 plug pins 1 and 8 are rendered free.

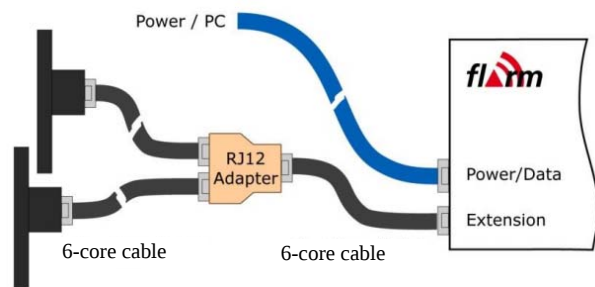


Wiring to “PowerFLARM™ CORE”

The PowerFLARM™ CORE is connected in similar fashion as the portable PowerFLARM™. The CORE has another independent data interface at the DSUB-9 jack; this allows a possible connection to the display.

Two-seater version

Using the Y-adapter (RJ12, 6-pole) two external displays can be operated on FLARM™ or PowerFLARM™.
In order to avoid data collisions while operating both displays, one of the displays must be configured as “PAX” (refer to operation manual).
All FLARM and display versions function in combination with each other.



Other variations...

The connection options are versified, apart from the displays to FLARM™ which can be connected to PDA or navigation computers. If uncertain with connections, consult the manuals of the FLARM™-devices or contact their distributor.

Tip: The Y-adapter RJ12 (3 jacks) and RJ45 (2 jacks / 1 plug) are normally found as commercial phone accessories; please note with RJ12 that all 6 poles have their contacts. In commercial use the 4-pole RJ11 versions are often only found.

Configuration

The display V3+ allows adjustments of diverse parameters as basic settings; these adjusted parameters then act as standard settings.

To reach the setup mode the display must be disconnected from power (remove connector) and then reconnected **with Mode button pressed momentarily** and this will then allow you to configure the display as in the table below. A short confirmation beep as well as flashing decimal points on the distance indicator will appear until leaving this mode.

-> The status-LED's indicate the selected parameters along with the LED's of the compass rose showing corresponding values.

-> On the distance indicator the direct numerical values are indicated: 10th = parameter number, 1st = value

Operating in configuration mode:

- o A short press of the Mode button changes (increases) the value of the chosen parameter. All changes are saved and immediately valid.
- o In order to change the next parameter the button must be pressed for a period of 1-2 s.
- o To leave the setup mode and/or an activation of new adjustments the button must be pressed longer than 3 s or FLARM, including the display, must be restarted (cut power supply and power up again).

Parameter No.	1.-	2.-	3.-	4.-	5.-	6.-
Parameter	brightness indicator	parallel operation	FLARM™ mainframe	interface	unit of measurement	compatibility mode
Status LED	RX	TX	GPS	Power	RX + TX	TX + GPS
Value 1 – 15°	strongly dimmed	display PIC	LED: on signal: on	4800 Baud	KM indication	OFF direction 1 LED
Value 2 – 45°	dimmed	display PAX	LED: off signal: off	9600 Baud	NM indication	ON direction 1..3 LED
Value 3 – 75°	normal		LED: off signal: on	19 200 Baud		
Value 4 – 105°	bright		LED: on signal: off	28 800 Baud		
Value 5 – 135°	very bright (max)			38 400 Baud		
Value 6 – 165°	sensor adjustment - dimmed -			57 600 Baud		
Value 7 – 195°	sensor adjustment - normal -					
Value 8 – 225°	sensor adjustment - bright -					

bold print/underlined = standard settings

Tip: A parallel operation with devices/displays from other companies on the same interface requires the transfer speed to be set to 4,800 Baud as a standard setting. We strongly recommend not using the display V3+ in combination with other brands of devices on the same interface – a parallel operation with two V3+/V3+ displays (e.g. two-seater) was specifically designed during development and operate optimally together at 4,800 Baud, with the configuration PIC/PAX (parameter 2).

Operating with a parallel connection to the display with other products cannot be guaranteed and related service support will be denied.



Tips for different configuration settings:

Parameter 1 – Indicator Brightness:

- o Values 1-5 adjust a fixed LED-brightness, there is no automatic alignment
- o Values 6-8 readjust automatically the brightness of LED's by means of a sensor.
6 = rather dim / 7 = normal / 8 = rather bright

Parameter 2 – Parallel Operation of Several Displays:

If two displays are needed e.g. in a two-seater, they can be connected parallel; an appropriate correct configuration prevents blockage of the interfaces.

- o Value 1: main indicator (PIC/Master) in case of parallel operation resp. with only one connected display.
- o Value 2: additional indicator (COPI/Slave) in case of parallel operation with a second display.

Parameter 3 – Indicator FLARM™ Mainframe:

- o Values 1-4 define how the FLARM™ mainframe operates. If it is built in, for example hidden in fuselage, it can create disturbances, when the acoustic alarms (buzzers) sound off from behind – the display has its own built-in signal, hence the signal of the FLARM™ can then be switched off.

Parameter 4 – Interface Transmission Rate:

- o Values 1-6 according to the table.
The extension interface of FLARM™ operates normally with 4800 Baud. If the display is operated on data interface, alignment of the baud rate of the display is possible.
As no high-quality cables with protective shielding are used, we recommend always using the smallest possible baud rate.
(see tips for parallel operations on page 9)

Parameter 5 – Distance Indicator Measurement Unit:

- o Value 1: the distance indicated in KM.
- o Value 2: the distance in KM from FLARM™ is recalculated and indicated in NM.

Parameter 6 –compatibility modus:

- o Value 1: Off = direction indication is given using one LED.
- o Value 2: On = direction indication is given like FLARM™ according to danger level with 1, 2 or 3 LED's.

NOTE: All configuration settings apply to the specific indicators being adjusted. By parallel operation using 2 displays the adjustment settings must be undertaken on both displays.

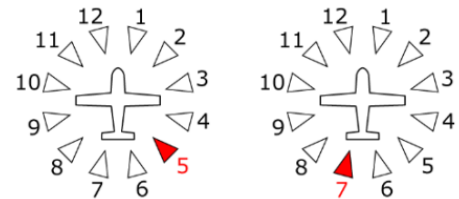
An exception is with Parameter 2 (parallel operation) and Parameter 4 (interface transmission rate) where both displays can be adjusted differently, using different settings.



Start-up

The display is normally provided with power directly from the mainframe and operates with this source. The V3+ display carries out a short self-test after receiving power and for a short time illustrates the software version of the display; a LED-test follows and then the display is ready for use.

1. Switch on
2. Short internal functional test (not shown)
3. Display software version indication: Stand V 5.71
(the third position, the number "1" represents an internal progressive numerical system and is not shown)



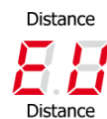
4. LED-test – one by one and in groups all LED's are switched on for a short time; this allows a visual test to check if all indicators function correctly. (due to power consumption not all LED's are illuminated simultaneously, for this reason testing occurs in groups)

5. On the distance indicator a control symbol appears briefly for the adjusted measuring unit. The distance depends on the adjusted configuration and is indicated in KM or NM – afterwards the measuring unit is no longer visible.

Please ensure:

The distance indicator is given in KM:

-> There is no conversion of the given value
(symbol refers to European metric system)



The distance indicator is given in NM:

-> There is a conversion of the received metric value in NM (symbol refers to "nn" of nautical miles)



6. In some mainframes the version number of the installed FLARM™ software version is briefly shown in sequence three times (see Start-up 3.).

7. The display resp. the complete FLARM™ system is now ready for use. Normally only the Power LED flashes and the GPS-LED blinks until the system orientates itself and defines its actual position.

NOTE: After installation an inspection must be made to ensure that the displayV3+ and FLARM™ main device do not interfere with any mechanical, electrical, electronic (radio) or magnetic (compass) system. This check should be recorded in aircraft documents.



Status indicators

4 vertical situated status-LED's (green) indicate information regarding the condition of the system:

LED	Operation	Configuration (setup)
RX	Only flashes by reception of other devices in defined distance range, otherwise RX-LED is not illuminate.	In configuration modus the status-LED's indicate which parameter is actually indicated and its (adjusted) value. (refer to separate chapter in this manual)
TX	Only flashes during operation, when own signals/positions are being sent (requires correct GPS-reception).	
GPS	<u>Flashes constantly during operation</u> (interruption once /sec). When the LED is not illuminated and flashes only once/sec, then no GPS-reception exists; during start-up this condition can last several minutes until FLARM™ can define its exact position.	
Power	illuminated constantly during operation. The Power-LED blinks when voltage is below 8 VDC as FLARM will not function with low voltage.	

Communication failure:

If data communication is interrupted with the mainframe (no data received for more than 3 seconds) the status-LED's will show as follows:

Power-LED is constantly on, RX, TX and GPS LED's all flash together.

-> Check wiring to mainframe.

-> Is FLARM-mainframe in operation?

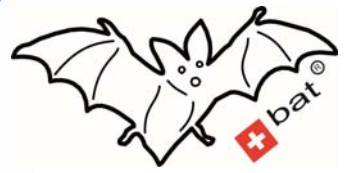
“Mode” Button

With the push button the pilot can activate diverse functions:

Short press (<0.8 s) changes the volume from <loud> to <medium> to <silent> to <mute> (and again to <loud>). A short acoustic confirmation occurs with each adjusted volume.
Default value after start-up is always <loud> (for safety reasons).

Press (> 2 s) changes between <Nearest> and <Warning> modus.
Default value after start-up is always < Nearest >.
(See also extended description in chapter “Operation modes”)

Double click mutes visual and acoustic warnings for 5 minutes. This suppression is confirmed with a decreasing sound sequence, when returned to normal setting an increasing sound sequence will occur.
A new double click cancels the mute mode immediately.



Operation modes

FLARM can be operated in two operation modes “Nearest” and “Warning”.

The “Warning-Mode” appears identically in both and indicates in most cases an immediate threat that requires prompt and appropriate reaction.

When starting-up the device the “Nearest-Mode” is always active.

Nearest-Mode

In “**Nearest-Mode**” other aircraft in nearby surroundings are indicated, if they represent no threat after evaluation. Such traffic information is limited to a diameter of 3 km and a vertical separation of 500 m. The nearest airplane is always indicated.

The visual indication appears in **green and static** (without flashing) and there is no sound; if no airplane has been indicated. When an airplane is received, a clicking sound will begin as a reference.

As soon as FLARM confirms the airplane as a threat it will automatically change to “Warning”-Mode. When the threat has disappeared it returns back to “Nearest”-Mode.

The selection of this mode is shown after a button press (> 2 s) with a “downwards” symbol ⤵ indicated on the display.

Warning-Mode

In “**Warning-Mode**” the signal occurs only after an evaluation confirms an approaching threat.

Warnings are always shown with **red flashing** and are accompanied by an acoustic signal. Depending on the threat

(3 threat levels) the flashing and buzzing frequencies will change.

The selection of this mode is shown after a button press (> 2 s) with an “upwards” symbol ⤴ indicated on the display.

Traffic Functions

Aircraft Warning

The LED which is illuminated corresponds best to the direction of the actual position of the most dangerous airplane *relative to own movement direction compared with the earth bound coordinate system (Ground Track)*. This signal can be distorted under strong winds, pushing the airplane relative to side winds in flight(side flight) or air speed is too low with respect to the coordinate system (Ground Speed) (e.g. hovering of the helicopter). The indicator updates every second.

Both the **red flashing** visual warning and the acoustic warning (buzzing) appear at the same time.

The early-warning period is brief, it is given only for a few seconds and is even shorter by fixed-obstacle warnings.



Horizontal Bearings

Twelve 2-colour LED illustrate the rose of the compass – “Above” conforms to the actual flight direction. Each LED entails an identically large horizontal section of 30°.

During warnings with FLARM™ either 1, 2 or 3 LED’s flash depending on the threat level, the external display V3+ always shows only one LED.

Recently it is possible to show the warnings on the V3+ analog to the FLARM™ indicators. Information to enable this function “Compatibility Mode” is found in the chart “Configuration”.

Relevant direction is shown as the center of the illuminated LED’s.

Threat levels:

Moderate threat (less than approximately 19 – 25 s until possible collision)
-> red LED & buzzer interval slow (~ 2 Hz)

Severe threat (less than approximately 14 – 18 s until possible collision)
-> red LED & buzzer interval middle (~ 4 Hz)

Immediate threat (less than approximately 6 – 8 s until possible collision)
-> red LED & buzzer interval rapid (~ 6 Hz)

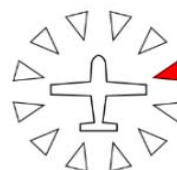
Indicator examples

V3+ Display Mode

FLARM Compatibility Mode

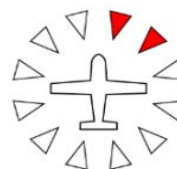
Moderate threat
from approximately
3 o'clock

flashing &
buzzing
slow 2 Hz



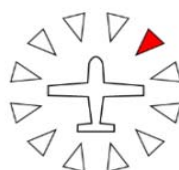
Severe threat
from approximately
1 o'clock

flashing &
buzzing
middle 4 Hz



Immediate threat
from
1 to 2 o'clock

flashing &
buzzing
rapid 6 Hz



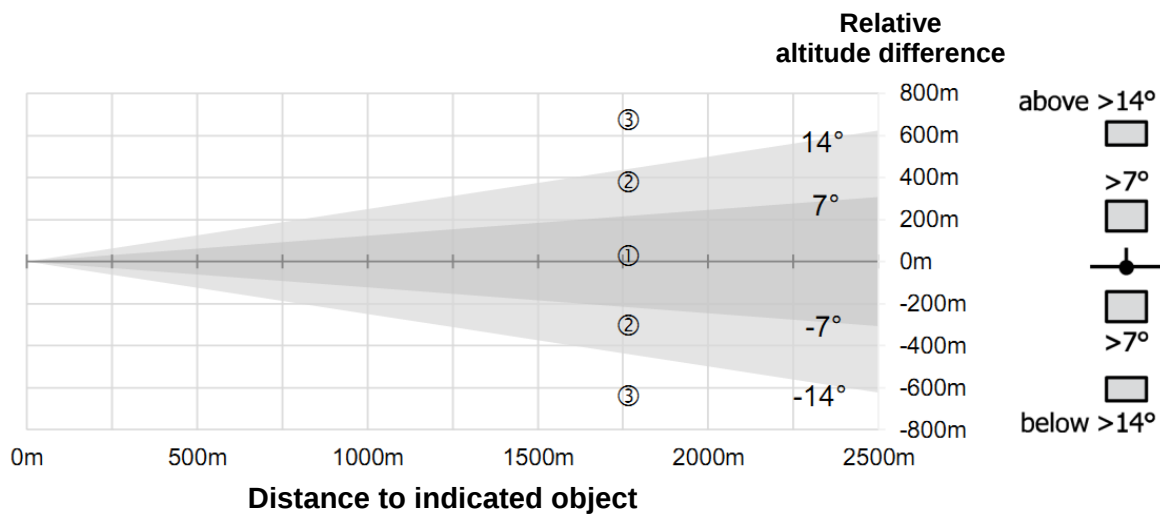
Vertical Bearings

The vertical bearing to another airplane operates relative to own flight altitude – independent of own position – and is indicated on the vertical LED’s.

The indication is not determined by the absolute altitude difference but considers the distance as follows:

- (1) no LED illuminated, by a vertical bearing angle less than 7°
- (2) inner LED’s illuminated by a vertical bearing angle of 7 to 14°
- (3) outer LED’s illuminated by a vertical bearing angle more than 14°

The flashing frequency is the same and synchronous to horizontal indicators.



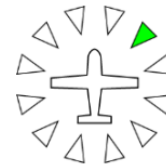
Forecasting Traffic

In **Nearest-Mode** the nearest received aircraft is shown– as long as no warning is required.

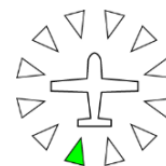
Objects without predictable threat which are recognized by FLARM are indicated on the V3+ display in **green** and without any sound.

The indicator does not flash, but updates itself every second; therefore by several received objects a flashing-like indication effect is possible.

Traffic at approx. 2 o'clock no flashing,
no buzzing



Traffic at approx. 7 o'clock no flashing,
no buzzing



Transponder Object Indication

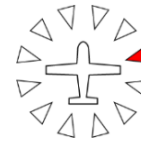
The new FLARM™ devices or compatible external receivers (e.g. TRX 1090 from GARRECHT) are additionally capable of receiving and evaluating signals from transponders.

- > Signals from a transponder featuring ADS-B-OUT include the GPS-coordinates of the sending aircraft; therefore FLARM™ can evaluate the received signals, calculate and recognize a possible collision threat. The indication on the external display V3+ is the same as the indication of "Airplane Warning", the indicator cannot differ between a FLARM™ warning or a transponder signal (with ADS-B-OUT).
- > Signals from a transponder without an ADS-B-OUT feature (airplanes with mode-C/S transponders) do not send any GPS-coordinates. FLARM™ is not able to calculate the distance and direction of the received signals, but can determine on behalf of the signal strength, if the aircraft is in nearby surroundings -> distance indication.



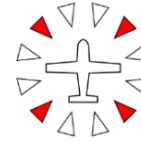
**ADS-B-OUT traffic at approx.
3 o'clock with moderate threat**
identical indication as
"Aircraft Warning"

flashing &
buzzing
slow 2 Hz



**Receiving a strong transponder
Mode-C/S signal**
direction is not defined -> 4 LED's in
cross (4-corner position)
threat level responds to signal strength -
>
flashing frequency

flashing &
buzzing
rapid 6 Hz



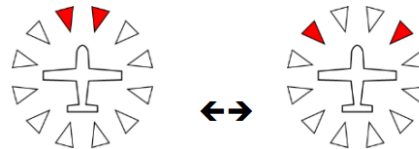
Fixed-Obstacle Warning

Many FLARM™ systems and compatible devices also include a fixed-obstacles database. Since February 2011 systems include approx. 35 000 coordinates of over 11,000 geographical obstacles in the Alpine regions.

Check if mainframe to which the display is linked has such (actual) a database – only then can the external display V3+ illustrate the appropriate traffic information and warnings.

When FLARM™ calculates the collision threat with the fixed-obstacle, the system will warn as follows:

simultaneous flashing of two LED's,
flashing and buzzing rate depends on threat.
(same as "Aircraft Warning")



Comment:

- > A fixed-obstacle is always in the moving direction; there is no specific direction indication.
- > There is no vertical position indication.
- > There is a warning given when the aircraft flies underneath power transmission lines and cable car wiring.
- > The indicator updates every second.

Indicator "Mute-mode"

Independent from the actual operation mode a temporary **indicator and buzzer mute-mode** can be chosen:

After a double click FLARM suppresses for a 5-minute period all visual and acoustic traffic, fixed-obstacle and threat information.

The suppression is confirmed with a decreasing sound sequence. With an additional double click this suppression- function is immediately terminated and reconfirmed by an increasing sound sequence.

The Mute-mode can interrupt frequent alarming by thermal circling with several aircraft – but can no longer give a warning in the case of the actual threat!

For safety reasons the Mute-mode is automatically canceled after the 5-minute period – this is confirmed by the increasing sound sequence.



Maintenance

The V3+ display itself is maintenance-free, however it is recommended to perform the following checks, if problems are suspected and/or general maintenance check-ups are planned:

- o Do all LED's illuminate during the start-up test?
- o Does the Mode button function correctly; dirt/dust particles can obstruct its function?
- o Is the buzzer opening (display lower edge) free from dirt or adhesive residues?
- o Are all 4 levels by volume adjustment (short push, < 0.8 s) audible?

Do not forget the FLARM™ mainframe during the same check-up:

- o Is the software & fixed-obstacle database up-to-date?
- o Are the antennas undamaged and properly installed?
- o Are the cables/plugs undamaged and properly installed?

Software Update

The V3+ display is equipped with a boot-loader – this allows updating of integrated display software.

Should FLARM™ make changes/additions on current data communication or adjustments to the operating/indication of different warning levels, the display software can be updated.

Only in exceptional cases is the update of the display consequent to a FLARM™ update mandatory. As a rule FLARM™ updates are compatible with current peripheral devices – but can include new functions and operations.

Further information regarding updates is located on: <http://www.flarm.com/support/updates/>

Updated display software is found on our web-site: www.swiss-bat.ch;

Included on website are steps for software updates for the display.

Technical data

Dimensions:	25 * 63 * 5.6 mm excl. RJ12-jack (Jack additional app. 10 mm backwards)
Weight:	11.6 g (display without cable and adapter)
Supply voltage:	+12V DC directly from FLARM,
Power consumption:	average consumption 12 mA by 12V (144 mW)
Protection class:	IP52
Attachment:	Panel attachment (adhesion or screw)
Temperature range:	-20°C...60°C
Humidity:	10-90%, no condensation
Vibrations:	For applications in strong vibrating conditions (e.g. helicopter) appropriate modified displays are available – contact us for more information
Manufacturing country:	Switzerland



Further technical information, tips and problem solving are located on our homepage www.swiss-bat.ch



Frequently Asked Questions (FAQ)

RX, TX and GPS-LED are flashing constantly

The data communication to mainframe is interrupted – the display is not receiving data for more than 3 seconds (data communication normally occurs every second).

- > Check wiring and plugs to mainframe.
- > In case of newly-installed display, check adjustment/configuration of the transmission rate of the interface; the mainframe possibly sends correctly – but too rapidly (see also tips in chapter “Configuration”)

The “adjusted” volume level is not saved as setting; after start-up the buzzer is always set on “loud”.

- > This function operates intentionally for safety reasons; at the beginning of each flight day FLARM™ must be adequately audible. The buzzer can be intentionally adjusted afterwards to a lower volume level or even disabled completely.

After a change-over from older V2 display to the new V3+ display, the display is not illuminated

The first display generation – the V2 –operates with a 3.3V supply from FLARM™; a connecting cable a 4-pole cable is used.

The new displays (V3+) need a 12V power supply provided from FLARM™ mainframe requiring a 6-pole connecting cable.

Both systems need the same 6-pole plug – by older displays both outer pins are not connected!

- > By a system change-over from V2 to V3+ displays a new 6-pole connecting cable is required.

Further tips on FLARM™ functions, features and failure analysis of our display series are found at:
www.swiss-bat.ch

External FLARM™/PowrFLARM™ Display V3+
with Software-version 4.20



Notes:

