USER MANUAL

TrafficView

Flarm and Traffic collision avoidance display

Version 1.07

1 Important Notices

The LXNAV TrafficView system is designed for VFR use only as an aid to prudent navigation. All information is presented for reference only. Traffic data and Collision warnings are provided only as an aid to situation awareness.

Information in this document is subject to change without notice. LXNAV reserves the right to change or improve their products and to make changes in the content of this material without obligation to notify any person or organisation of such changes or improvements.

A Yellow triangle is shown for parts of the manual which should be read carefully and are important for operating the LXNAV TrafficView system.

Notes with a red triangle describe procedures that are critical and may result in loss of data or any other critical situation.

A bulb icon is shown when a useful hint is provided to the reader.

1.1 Limited Warranty

This LXNAV TrafficView product is warranted to be free from defects in materials or workmanship for two years from the date of purchase. Within this period, LXNAV will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts and labour, the customer shall be responsible for any transportation cost. This warranty does not cover failures due to abuse, misuse, accident, or unauthorised alterations or repairs.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED OR STATUTORY, INCLUDING ANY LIABILITY ARISING UNDER ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, WHICH MAY VARY FROM STATE TO STATE.

IN NO EVENT SHALL LXNAV BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE, OR INABILITY TO USE THIS PRODUCT OR FROM DEFECTS IN THE PRODUCT. Some states do not allow the exclusion of incidental or consequential damages, so the above limitations may not apply to you. LXNAV retains the exclusive right to repair or replace the unit or software, or to offer a full refund of the purchase price, at its sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

To obtain warranty service, contact your local LXNAV dealer or contact LXNAV directly.

1.2 General information about FLARM

For years, general Aviation has been confronted with dramatic mid-air collision accidents. With the extreme fine shape and relatively high cruise speed of modern airplanes, the human vision has reached its limit of detection. Another aspect is airspace restrictions for VFR traffic that create an augmentation of traffic density in certain areas, and the associated airspace complexity that requires more pilot attention to the navigation material. These have a direct impact on the probability of a collision affecting powered aircraft, gliders, and rotorcraft operations.

This type of equipment in General Aviation is not required by technical specifications or by operational regulations but is recognized by the regulators as an important step toward improved aviation safety. Therefore, it is not considered as essential for flight and may be used for **situation awareness only** on basis of non-interference with certified equipment necessary for safe flight and no hazard to persons on board.
A correct antenna installation has a great effect on the transmission/receiving range. The pilot shall ensure that no masking of the antenna occurs, especially when the antennas are located in the cockpit.

FLARM will only warn about other aircraft that are likewise equipped with a compatible device.

The firmware must be updated to the latest version at least every 12 months. Failure to do so can lead to the device not being able to communicate with other aircraft or not operate at all.

By using FLARM you agree to the **End User License Agreement (EULA)** and **Terms of use of FLARM** (part of the EULA) valid at time of use. This can be found in the next chapter.

1.3 Flarm end user license agreement

This section contains the End User License Agreement issued by FLARM Technology Ltd, the licensor of FLARM devices.

END USER LICENSE AGREEMENT

By purchasing or using a FLARM device or by downloading, installing, copying, accessing, or using any FLARM Technology Ltd, Cham, Switzerland (hereafter "FLARM Technology") software, firmware, license key, or data, you agree to the following terms and conditions. If you do not agree with the terms and conditions do not purchase or use the FLARM device and do not download, install, copy, access, or use the software, firmware, license key, or data. If you are accepting these terms and conditions on behalf of another person, company, or other legal entity, you represent and warrant that you have full authority to bind that person, company, or legal entity to these terms and conditions.
If you are purchasing or using a FLARM device, the terms "firmware", "license key", and "data" refer to such items installed or available in the FLARM device at time of purchase or use, as applicable.

1.   License and Limitation of use

1.1. **License.** Subject to the terms and conditions of this Agreement, FLARM Technology hereby grants to you a non-exclusive, non-transferable right to download, install, copy, access, and use the software, firmware, license key, or data in binary executable form solely for your own personal or internal business operations. You acknowledge that the software, firmware, algorithms, license key, or data and all related information are proprietary to FLARM Technology and its suppliers.

1.2. **Limitation of use.** Firmware, license keys, and data may only be used as embedded in and for execution on devices manufactured by or under license from FLARM Technology. License keys and data may only be used in the specific devices, by serial number, for which they were sold or intended. Software, firmware, license keys, and data with an expiration date may not be used after the expiration date. Right to download, install, copy, access, or use software, firmware, license key, or data with an expiration date does not imply right to upgrade or extension of the license beyond the expiration date. No other licenses are granted by implication, estoppel or otherwise.

2. Terms of use of FLARM

2.1. Every FLARM installation must be approved by licensed Part-66 certifying staff or the national equivalent. A FLARM installation requires an EASA Minor Change Approval or the national equivalent.

2.2. FLARM must be installed according to the Installation Instructions and the EASA Minor Change Approval, or the national equivalent.

2.3. FLARM cannot warn in all situations. In particular warnings may be incorrect, late, missing, not being issued at all, show other threats than the most dangerous or distract the pilot's attention. FLARM does not issue resolution advisories. FLARM can only warn of aircraft that are equipped with FLARM, SSR transponders (in specific FLARM devices), or of up-to-date obstacles stored in its database. The use of FLARM does not allow a change of flight tactics or pilot behaviour. It is the sole responsibility of the pilot in command to decide upon the use of FLARM.

2.4. FLARM may not be used for navigation, separation, or under IMC.

2.5. FLARM does not work if GPS is inoperative, degraded, or unavailable for any reason.

2.6. The most recent Operating Manual must be read, understood and followed at all times.

2.7. The firmware must be replaced once per year (every 12 months). The firmware must also be replaced earlier if a Service Bulletin or other information is published with such instruction. Failure to replace the firmware may render the device inoperable or incompatible with other devices, with or without warning or notice thereof.

2.8. Service Bulletins are published as a Newsletter by FLARM Technology. You are required to sign up for the Newsletter on www.flarm.com to ensure that you are informed of published Service Bulletins. If you are entering into this agreement in a form where your email address is available (e.g. online shop) you may be automatically signed up for the Newsletter.

2.9. After power-up, FLARM performs a self-test which must be monitored by the pilots. If a malfunction or defect is observed or suspected, FLARM must be disconnected from the aircraft by maintenance before the next flight and the device inspected and repaired, as applicable.

2.10. The pilot in command is solely responsible to operate FLARM according to applicable national regulations. Regulations might include, but are not limited to, airborne usage of radio frequencies, aircraft installation, safety regulations, or regulations for sports competitions.

3. **Intellectual Property.** No part of the software, firmware, license keys, data (including obstacle databases), the FLARM radio protocol and messages, and the FLARM hardware and design may be copied, altered, reverse engineered, decompiled or disassembled

without an explicit and written approval by FLARM Technology. Software, firmware, license keys, data (including obstacle databases), the FLARM radio protocol and messages, the FLARM hardware and design, and the FLARM logos and name are protected by copyright, trademark and patent laws.

4.   Manipulation. It is forbidden to intentionally feed artificially generated signals to the FLARM device, its GPS antenna or the external/internal GPS antenna connections, unless agreed with FLARM Technology in writing for limited R&D activities.

5.   FLARM Data and Privacy
5.1.   FLARM devices receive, collect, store, use, send, and broadcast data to enable the system to work, improve the system, and to enable troubleshooting. This data may include, but is not limited to, configuration items, aircraft identification, own positions, and such data of other aircraft. FLARM Technology may receive, collect, store, and use this data for said or other purposes including Search and Rescue (SAR).
5.2.   FLARM Technology may share data with its partners for aforementioned or other purposes. FLARM Technology may in addition publicly make available data from a FLARM device (Flight Tracking). If a FLARM device has been configured to limit tracking, SAR and other services may not be available.
5.3.   Data sent or broadcast by FLARM devices may only be used at own risk and under the same conditions as the FLARM device itself, and is encrypted partially to ensure message integrity, system safety and provide protection for the relevant content against eavesdropping, namely by article 3 of the Budapest Convention on Cybercrime as signed and ratified by most countries respectively its national implementations. FLARM Technology is not responsible for any third party device, software, or service receiving, collecting, storing, using, sending, broadcasting, or making publicly available data regardless of whether legally or illegally.

6.   Warranty, Limitation of Liability, and Indemnification
6.1.   Warranty. FLARM devices, software, firmware, license keys, and data are provided on an "as is" basis without warranty of any kind — either expressed or implied — including, without limitation, any implied warranties of merchantability or fitness for a particular purpose. FLARM Technology does not warrant the performance of the device, software, firmware, license key, or data or that the device, software, firmware, license key, or data will meet your requirements or operate error free.
6.2.   Limitation of Liability. In no event shall FLARM Technology be liable to you or any party related to you for any indirect, incidental, consequential, special, exemplary, or punitive damages (including, without limitation, damages for loss of business profits, business interruption, loss of business information, loss of data or other such pecuniary loss), whether under a theory of contract, warranty, tort (including negligence), products liability, or otherwise, even if FLARM Technology has been advised of the possibility of such damages. In no event will FLARM Technology's total aggregate and cumulative liability to you for any and all claims of any kind arising hereunder exceed the amount of fees actually paid by you for the device, license keys or data giving rise to the claim in the twelve months preceding the claim. The foregoing limitations will apply even if the above stated remedy fails of its essential purpose.
6.3.   Indemnification. You will, at your own expense, indemnify and hold FLARM Technology, and all officers, directors, and employees thereof, harmless from and against any and all claims, actions, liabilities, losses, damages, judgments, grants, costs, and expenses, including reasonable attorneys' fees (collectively, "Claims"), arising out of any use of a FLARM device, software, firmware, license key, or data by you, any party related to you, or any party acting upon your authorization.

7. General terms

7.1. Governing Law. This Agreement shall be governed by and construed in accordance with the internal law of Switzerland (to the exclusion of Swiss Private International Law and of international treaties, in particular the Vienna Convention on the International Sale of Goods dated April 11, 1980).

7.2. Severability. If any term or provision of this Agreement is declared void or unenforceable in a particular situation, by any judicial or administrative authority, this declaration shall not affect the validity or enforceability of the remaining terms and provisions hereof or the validity or enforceability of the offending term or provision in any other situation. To the extent possible the provision will be interpreted and enforced to the greatest extent legally permissible in order to effectuate the original intent, and if no such interpretation or enforcement is legally permissible, shall be deemed severed from the Agreement.

7.3. No Waiver. The failure of either party to enforce any rights granted hereunder or to take action against the other party in the event of any breach hereunder shall not be deemed a waiver by that party as to subsequent enforcement of rights or subsequent actions in the event of future breaches.

7.4. Amendments. FLARM Technology reserves the right, in its sole discretion, to amend this Agreement from time to time by posting an updated version of the Agreement on www.flarm.com, provided that disputes arising hereunder will be resolved in accordance with the terms of the Agreement in effect at the time the dispute arose. We encourage you to review the published Agreement from time to time to make yourself aware of changes. Material changes to these terms will be effective upon the earlier of (i) your first use of the FLARM device, software, firmware, license key, or data with actual knowledge of such change, or (ii) 30 days from publishing the amended Agreement on www.flarm.com. If there is a conflict between this Agreement and the most current version of this Agreement, posted at www.flarm.com, the most current version will prevail. Your use of the FLARM device, software, firmware, license key, or data after the amended Agreement becomes effective constitutes your acceptance of the amended Agreement. If you do not accept amendments made to this Agreement, then it is your responsibility to stop using the FLARM device, software, firmware, license key, and data.

7.5.Governing Language. Any translation of this Agreement is done for local requirements and in the event of a dispute between the English and any non-English versions, the English version of this Agreement shall govern.

2 Packing Lists

- LXNAV TrafficView/TrafficView80
- TrafficView cable

3   Basics

3.1   LXNAV TrafficView at a Glance

LXNAV TrafficView is Flarm and ADS-B traffic and collision warning display with preloaded FlarmNet database. The 3,5" QVGA sunlight readable display has 320*240 RGB pixels resolution. For simple and quick manipulation one rotary push button and three push buttons are used. TrafficView monitors vertical speed and altitude of each object on the screen. The device is certified as integrated primary display and as of writing of this manual support Flarm protocol version 7.

3.1.1   Features

- An Extremely bright 3,5"/8,9cm (TrafficView80) or 2.5"/6,4cm (TrafficView) colour display readable in all sunlight conditions with the ability to adjust the backlight.
- Three push buttons and one rotary knob with a push button for user input
- A Pre-loaded FlarmNet database on a removable SD card.
- A Standard Flarm RS232 input
- A Micro SD card for data transfer

3.1.2   Interfaces

- Flarm / ADS-B port input/output on RS232 level (Standard IGC RJ12 connector)

3.1.3 Technical Data

TrafficView80:
- Power input 9V-16V DC input. For HW1,2,3
- Power input 9V-32V DC input. For HW4 or higher
- Consumption: (2.4W) 200mA@12V
- Weight: 256g
- Dimensions: 80.2mm x 80.9mm x 45mm
- Operating temperature: -20°C to +70°C
- Storage temperature: -30°C to +85°C
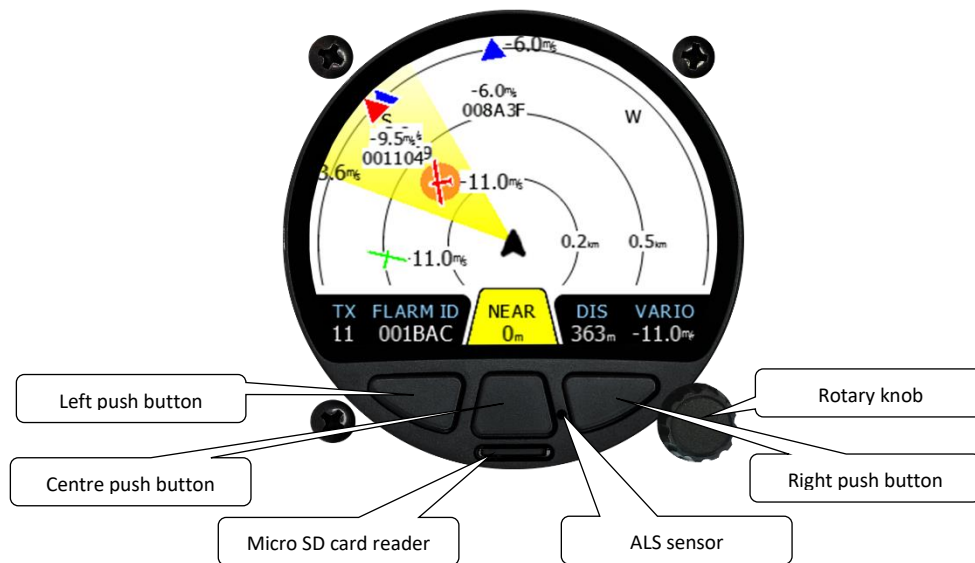- RH: 0% to 95%
- Vibration +-50m/s2 at 500Hz
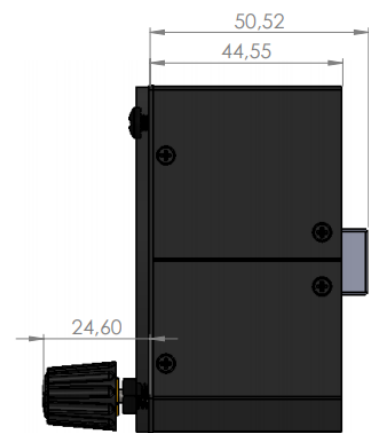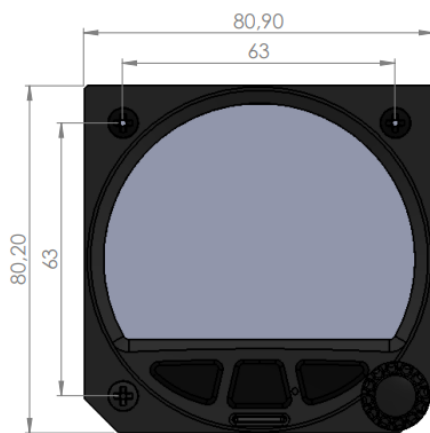
TrafficView57:
- Power input 9V-16V DC input. For HW1,2,3,4,5
- Power input 9V-32V DC input. For HW6 or higher
- Consumption: (2.2W) 190mA@12V
- Weight: 215g
- Dimensions: 61mm x 61mm x 48mm
- Operating temperature: -20°C to +70°C
- Storage temperature: -30°C to +85°C
- RH: 0% to 95%
- Vibration +-50m/s2 at 500Hz
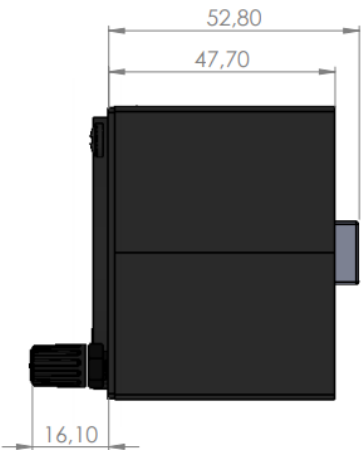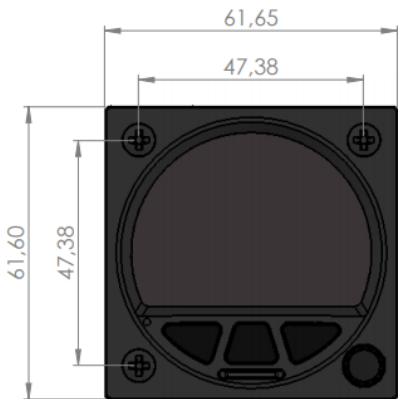
4   System Description

4.1   Push buttons

Left and **Right push buttons** are used to choose between targets and to adjust TrafficView settings. In some cases, a long press has some additional function. In some menus, outer buttons are used to shift cursor. **Centre button** is used for switching between modes. In the setup menu, with **centre button** it is possible to exit to the higher level of the menu.

4.2   Rotary encoder with push button

The Rotary knob is used for zooming function, scrolling and selecting items. **The Rotary push** button accesses the control that is displayed, if possible.

4.3   Micro SD card reader

Is used for data transfer. Micro SD cards up to 32Gb.

4.4   ALS sensor

An Ambient light sensor can automatically adjust the screen brightness in relation to (depending on) sunlight which helps to save battery.

4.5   User Input

The LXNAV TrafficView user interface consists of many dialogues, which have different input controls. They are designed to make input of names, parameters, etc., as easy as possible. Input controls can be summarised as:
- Text editor
- Spin controls (Selection control)
- Checkboxes
- Slider control

4.5.1 Text Edit Control

The Text Editor is used to input an alphanumeric string; the picture below shows typical options when editing text. Use the rotary knob to change the value at the current cursor position.

Pressing the **right push button** will move the cursor right. **The left push button** will move the cursor left. At the last character position, the right push button will confirm the edited value, a long press to the **rotary push button** will cancel editing and exit that control. **Middle push button** will delete selected character.

4.5.2 Spin Control (Selection Control)

Selection boxes, also known as combo boxes, are used to select a value from a list of predefined values. Use the rotary knob to select the appropriate value.
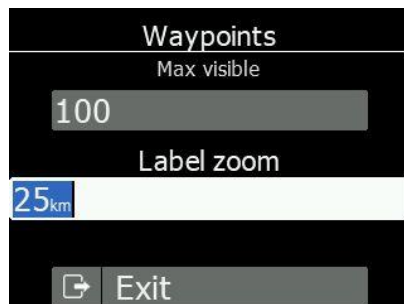

4.5.3 Checkbox and Checkbox List

A checkbox enables or disables a parameter. Push **the rotary knob** button to toggle the value. If an option is enabled a check mark will be shown, otherwise an empty square will be displayed.
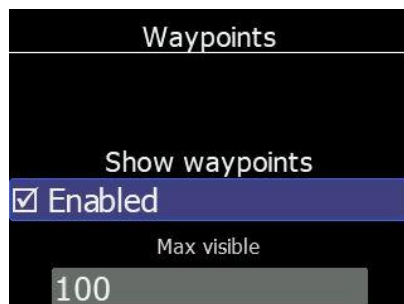
4.5.4 Slider selector

Some values like volume and brightness are displayed as a slider. Push the rotary knob to activate the slider control, then rotate it to set the value.
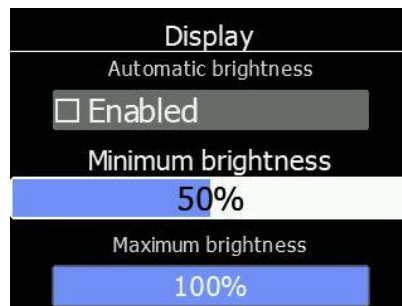
4.6 Start-up procedure

After the device is powered on you, will immediately see the LXNAV logo. Underneath you will find information about the bootloader and the application version. After a moment this screen will disappear, and device will be at normal operation mode. It will start receiving FLARM information after about 8 seconds after the power is turned on.

4.7 Operating Modes

LXNAV TrafficView has four operating pages. The main radar screen with different zoom levels, Flarm traffic list and Setting Page. The fourth page (**Flarm watch**) is displayed automatically if Flarm detects a potential collision situation and issues a warning.


- **The main radar screen**, shows all visible objects and their information (ID, distance, vertical speed and altitude), status of Flarm (TX/2).
- **The Flarm Traffic list** displays traffic in textual format.
- **The Waypoint screen** navigates you to a selected waypoint
- **The Task screen** is used for task navigation
- **Settings**, setup of the whole system

- **GPS info** page
- **Flarm Watch** shows the direction of any threat.

4.8 Main screen

A description of LXNAV TrafficView Main Screen is shown on the following picture.
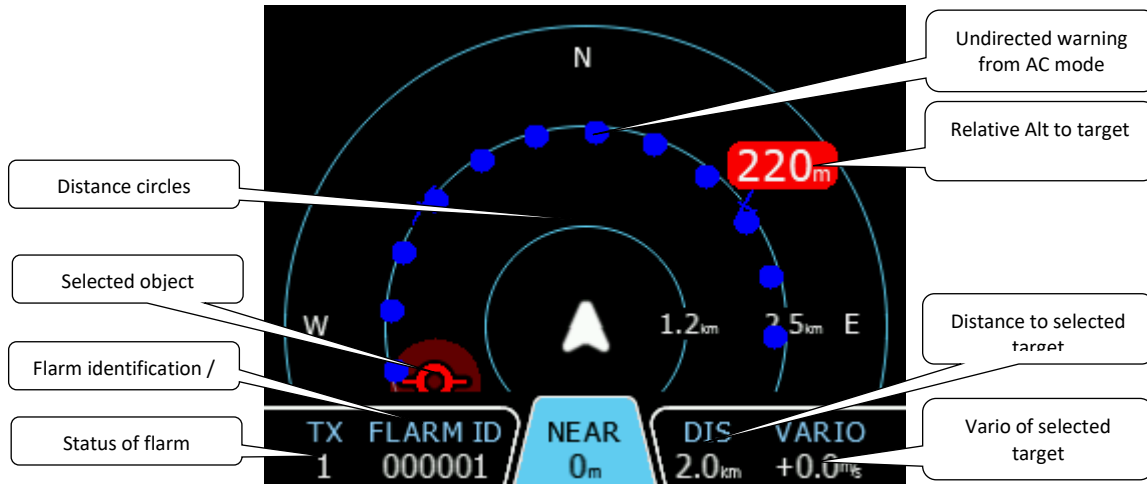
Relative altitude shows the vertical distance to the target. If there is a – symbol in front of the target, the target is below you (e.g. -200), if not it is above you (e.g. 200m).

Status of Flarm means, that the Flarm device receives data from the other Flarm device.

Flarm identification is 6-digit hexadecimal number, in case that competition sign exists for that ID, it will be displayed instead of the number.

In case undirected warning is so close, that it can't be displayed as described above, the warning looks like in the following picture:
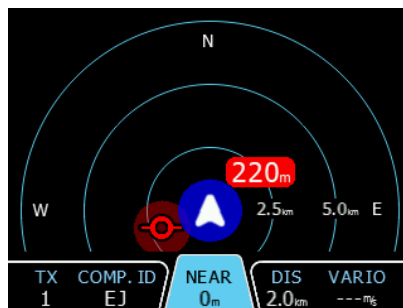
Targets are displayed as a series of symbols, as shown in the table below. It's also possible to change the object colour, depending on the relative altitude to the airplane. You can do this by going to Setup-> Graphic-> Traffic. All received targets (Flarm or PCAS) are marked with the same type of symbol except undirected targets, for which we don't know what direction they are travelling to. Flarm targets can be separated only by their ID.

4.8.1 Flarm symbols

Unknown		Para Glider	
Glider		Powered Aircraft	
Tow plane		Jet Aircraft	
Helicopter		Balloon	
Parachute		Airship	
Drop plane		UAV	
Hang glider			

4.8.2 Selecting and switching between targets

A target could be selected using left and right push buttons. If a target disappears when it's selected, TrafficView will still indicate some information about its last known location. Information about distance, altitude and vario will disappear. If a target will appear back, it will be traced again. In case the function "**Lock to nearest target**" is enabled, a selection of targets will not be possible.

4.8.3 Quick menu

By pressing the rotary button while on radar, traffic or waypoint screen, you can access the quick menu. Inside you find the following options:

```
         Start
      Edit task
        Night
        Cancel
```
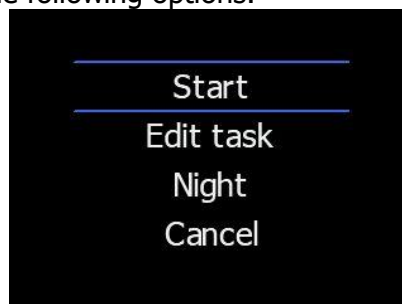
4.8.3.1 Edit target (radar screen only)

Edit Flarm target's parameters. You can enter Flarm ID, gliders callsign, pilots neme, aircraft type, registration, home airfield and communication frequency.

```
              Edit traffic
                Flarm ID
    444221
               Callsign ID
 DB
                  Pilot
    Sebasti
```

4.8.3.2 Select (waypoint screen only)

Select the waypoint from all of the waypoint files loaded to the unit. Use rotary knob to cycle beetween letters and use left and right push buttons to move to previus/next letter. Once you have selected the desired waypoint pres the rotary button to navigate to it.

4.8.3.3 Select near (waypoint screen only)

Select near allows you to navigate to the nearest waypoint. Waypoins are displayed in the list sorted by disatnce from the glider. Use rotary knob to select desired one and short press it to navigate to it.

4.8.3.4 Start (task screen only)

Start the task. This option is only valid if you have prepared task in the "Edit" quick acces manu option.

4.8.3.5 Edit (task screen only)

In thes manu item you can prepare your task. Once task is generated it is also sent to the Flarm device automatically. By short presing the knob an additional sub manu will open with following options:

4.8.3.5.1 Edit

This option allows you to edit the curenly selected waypoint. To select the turnpoint use the knob to choose the letter and left/right push buttons to select the previus/next character. Short clik the knob to confirm

4.8.3.5.2 Insert

Insert allows you to add (insert) a new turnpoint after the selected turnpoint. This can be done in the middle of the currently edited task or at the end.

4.8.3.5.3 Delete

Delete the currently selected turnpoint.

4.8.3.5.4 Zone

Edit the turnpoint zone. Following options are awailible to edit:
- **Direction:** Options include Start, Previous, Next, Symmetrical or Fixed angle.
- **Angle 12**: is greyed out unless fixed angle is specified in Direction.
- **Line Check Box**; typically used for Start and Finish. If line is checked then Angle 1, Angle 2 and Radius 2 are greyed out.
- **Angle 1**: Sets the angle of the Turn Point Zone.
- **Radius 1**: Sets the radius of the Turn Point Zone.
- **Angle 2**: Sets angle 2 for complex Turn Points and Assigned Area Tasks.
- **Radius 2**: Sets the radius for complex Turn Points and Assigned Area Tasks.
- **Auto Next**: Typically used in racing tasks, this will change the navigation of the TrafficView to the next turn point when a single fix is made within the Turn Point Zone.

4.8.3.6 Sounds

Adjust the sound levels. This menu is the same as the one found in Setup->Hardware->Traffic sounds.

4.8.3.7 Night

Once night mode is activated the instrument screen will go darker to adjust for low ambient light in night conditions. Clicking night mode again will return to normal mode.

4.8.3.8 Cancel

Close the manu and return to the previous screen.
Inside, you can quickly edit target (callsign, pilot, aircraft type, registration…), adjust sound levels, and switch brightness to night mode.

4.9 Flarm Warning

If Flarm warnings are enabled, (the following is) a typical screen display is as follows. The first (Classic view) is for normal Flarm warnings, the second one is for undirected/PCAS warnings, the third one is for obstacle warnings.

The screen indicates the relative position of the threat. In the first image, one glider is approaching from right side (two o'clock) and from 120m above.
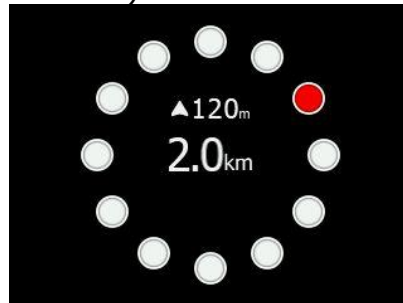
If "modern view" is chosen, warnings will be displayed as a 3D visualisation of the approaching threat. This is for the highest alarm level (level 3) and indicates that impact is 0-8 second (s) away. The example picture shows (us) an airplane approaching (us) you from front left (11 o'clock) 40m below us. This screen will only be displayed if the airplane is approaching head-on (from the front).
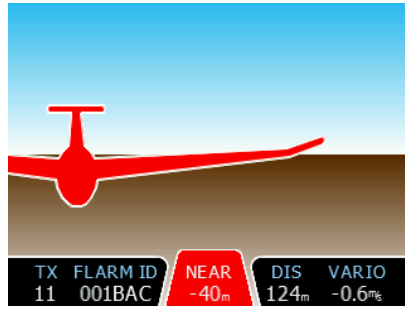
Obstacle warning, the upper number indicates the distance to object. The smaller lower number indicates the relative altitude.
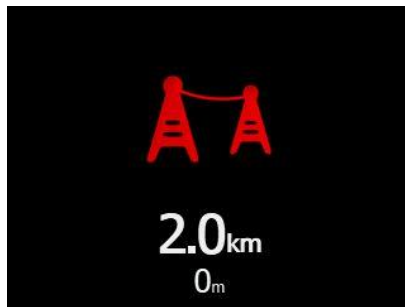
Alert zone warning, the upper text is a description of the zone (e.g. military zone, parachute drop zone…). The lower number is a distance to the zone. The arrow at the bottom of the screen displays the direction to the zone.

Non-directional warnings are shown as (seen) on the picture bellow. The upper number represents the relative altitude, and the big number represents the distance. Circles are coloured red if it is a level 3 alarm and yellow if it is a level 2. This warning screen is only shown when Classic view is selected. Non-directional alarms will be displayed on the map in all views in the form of circles around the aircraft (as seen in the first picture of chapter 4.8). Circles on the map are coloured based on targets relative altitude.
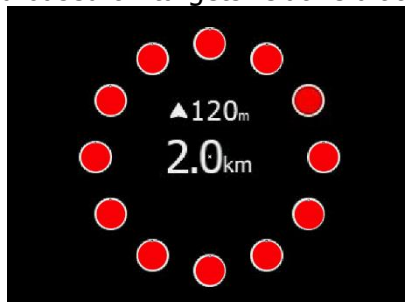
4.10 Traffic list mode

On this page, all traffics are displayed in a list form. Buttons have similar functionality as on the main page. In this lit,) we can also see inactive targets, (this) these are targets, (which) whose signal was lost. They will remain on the list for the time set in setup as **target inactive.** If a target is included in FlarmNet database or UserDatabase, it will appear with a friendly name (ex. Competition sign); otherwise it will be displayed with its Flarm ID code.

4.11 Settings Mode

In the setup menu, users can configure the LXNAV TrafficView. Use the rotary knob to select the desired setup item, and press enter with the **Select** button (to enter). A dialogue or sub-menu will open.

4.11.1 Display

The display menu is used to adjust the screen brightness parameters
Brightness setting is to adjust the brightness of the screen. If **automatic brightness** is enabled, this screen will indicate (us) the brightness at the moment, which depends on ALS sensor readings.
When **Automatic brightness** is enabled, the brightness can (move) change between **Minimum** and **Maximum brightness** setting. When the ambient light is changing, the response time to **get brighter** or **to get darker** (in specified time) can be set at a special time.
Night mode brightness is a setting where (we) you can set an extremely low brightness, for when Traffic View is used under (the) night conditions.

4.11.2 Graphics

4.11.2.1 Traffic

In this menu, (we) one can choose between three different layouts for critical warnings: Modern, Classic and TCAS layout. Other non-critical objects will always be displayed as seen in the chapter 4.8.
The modern Layout enables a 3D visualisation of the warning.
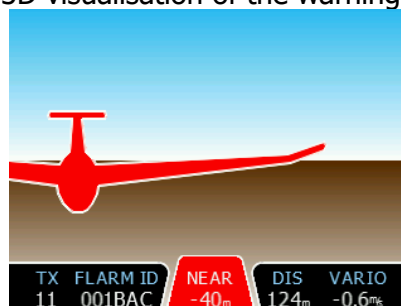
The Classic Layout uses a classic Flarm watch warning.

The TCAS layout looks like a classic TCAS displays.

Active timeout adjusts the remaining time for a glider on the map after last seen.

Inactive timeout adjusts the remaining time of inactive gliders on the list. Inactive gliders are gliders, (which) whose signal was lost. After Active timeout, they became inactive and remain(s) only on the list.

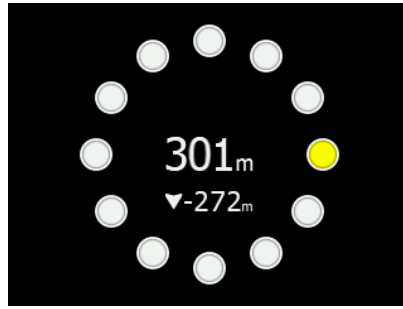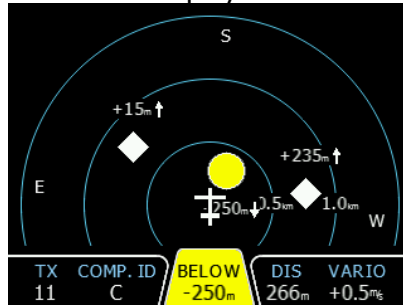The line to **selected target and selected waypoint** can be enabled or disabled in this menu.

If the glider vertical distance is less than 100m (330ft), then this glider will be painted with **near glider colour**. Gliders with vertical distances above that, will be painted with **above** setting, and **below** 100m (330ft), they will be painted with below setting.

Zoom mode can be set to automatic (zoom to the target), or manual.

If Target **label text** is selected, a near glider will display a chosen value.

Lock on nearest automatically selects the nearest target, and displays its data. In case, (that) you want to select another target, it'(s) is possible. After 10 seconds, TrafficView will automatically switch back to the nearest target.

If no target is selected, **Auto select** will select to any new incoming target. **Lock on nearest** has a higher priority.

If **Draw history** is enabled, paths of the Flarm objects will be seen on the screen for the last 60 points.

The **size** of the **plane** and **Flarm objects** can be adjusted.

4.11.2.2   Airspace

In airspace setup, a user can globally enable **showing airspace,** do some adjustment to **filter** airspace below selected altitude, define **colour** of each type of the airspace zone.

4.11.2.3   Waypoints

In waypoints setup, a user can globally enable **showing waypoints,** limit the **maximum number of visible waypoints,** and set the **zoom level** up (to which we) the one that will display the **name** of the waypoint. **Draw line** to waypoint can be enabled in this menu as well.

4.11.2.4   Theme

Dark and Light themes are available and can be switched here.

4.11.2.5   Modes

If (we) you want to skip some modes from the main screen, (we) you can do that in this setup menu.

At the moment, only task and waypoint modes can be hidden.

4.11.3 Warnings

In this menu, (we) one can manage (with) all warnings. (We) One can globally **enable** or **disable** all warnings. And enable individually **urgent, important** and **low-level alarms**.

Beware that, if you disable warnings globally, you (wont) will not see them (nor hear alarms), even if individual warnings are enabled.

Dismiss time is a time in seconds, when the same warning (will) appears again after dismissing it.

If (we) you do(n't) not want any Flarm warnings immediately after take-off, (we) you can check **no warnings for first 3 minutes**.

The warnings are classified into three levels:
- First level (Low) approximately 18 seconds before predicted collision.
- Second level (Important) approximately 13 seconds before predicted collision.
- Third level (Urgent) approximately 8 seconds before predicted collision.

4.11.4 Obs. Zones

This menu is for setting start, finish and waypoint sectors, their shapes and other properties.

4.11.5 Hardware

4.11.5.1   Communication

(Only) Communication speed can be set only in this menu. The default setting for all Flarm units is 19200bps. The value can be set between 4800bps and 115200bps. It is recommended to use the highest baud rate supported by your FLARM device.

4.11.5.2   Traffic sounds

In the Sounds setup menu, one can set the volume and the alarms settings for the LXNAV TrafficView.
- **Volume** The sounds slider changes the alarm volume.
- **Beep on traffic,** TrafficView will notify with a short beep (a), the presence of a new Flarm object.
- **Beep on low alarm** TrafficView will beep on a low level alarms triggered by Flarm.
- **Beep on important alarm** TrafficView will beep on an important level alarms triggered by Flarm.
- **Beep on urgent alarm** TrafficView will beep on a critical level alarms (collision) triggered by Flarm.

4.11.5.3   Flarm

On this page, (we) one can see information about the Flarm device, and do some configuration of the flight recorder, Flarm and aircraft.

Those settings will work only if TrafficView is the only device communicating with the Flarm. If other devices are connected (Oudie for example), there will be a conflict between transmit lines of RS232 from the Oudie and the FlarmView, and communication will not work.

4.11.5.3.1   Flarm config

In this menu, one will find all range setups for Flarm receiver. Here you can also enable ADSB warnings and configure them.

4.11.5.3.2   Aircraft config

In the Aircraft config menu, the user can change the type of aircraft and ICAO address.

4.11.5.3.3   Flight recorder

If the Flarm has a flight recorder, TrafficView can send to Flarm all information about pilot and aircraft. This data will be included in the header of an IGC file from Flarm.

4.11.5.3.4   PF IGC readout

Pressing to this menu, TrafficView will send a command to PowerFlarm, to copy the IGC file to a USB stick that is plugged in PowerFlarm.

This function works only when PowerFlarm is connected.

4.11.5.3.5   PF pilot event

Pressing to this menu, TrafficView will send command to the Flarm with a pilot event message, which will be recorder in the IGC file

This function works only with a Flarm connected, and with an IGC option.

4.11.5.3.6   FLARM info

All available information about a connected Flarm unit.

4.11.5.3.7   FLARM licenses

In this page user can see all options that are active or available for connected Flarm device.

Value	Description
AUD	Audio output connection
AZN	Alert Zone Generator
BARO	Barometric sensor
BAT	Battery compartment or built in batteries
DP2	Second Data Port
ENL	Engine noise level sensor
IGC	Device can be IGC approved
OBST	Device can give obstacle warnings if the database is installed and the license is valid
TIS	Interface for Garmin TIS

SD	Slot for SD cards
UI	Built-in UI (display, possibly button/knob)
USB	Slot for USB sticks
XPDR	SSR/ADS-B receiver
RFB	Second radio channel for antenna diversity
GND	Device can operate as a receiver-only ground station

4.11.5.4   NMEA test

This screen is only for troubleshooting, so that the user can identify the communication problem. If at least one indicator is green, communication is ok. To get all green, please check in Flarm configuration, if the NMEA output is configured properly.

> In case (you are) one is using a 1st generation FLARM device, beware that if you connect TrafficView to an external port, the device will only receive PFLAU sentences, and will not show traffic. Please connect TrafficView to a primary port of your FLARM device.

4.11.6 Files

In this menu, the user can transfer files between an SD card and TrafficView.
The user can load **waypoints** and **airspaces**. Only one waypoint or airspace file can be loaded in TrafficView. TrafficView is capable of **downloading an IGC flight** from a connected Flarm device, and store (ing) it on a micro SD card. IGC files stored on a micro SD card can be **converted to KML** file format, which can be viewed on Google Earth. **FlarmNet** files can also be loaded on to TrafficView.

4.11.7 Units

Units for **distance, speed, vertical speed, altitude, latitude and longitude** format can be set in this menu. In this menu, one (we) can also set (also) an **UTC offset**.

4.11.8 Password

There are several passwords which run specific procedures as listed below:
- **00666**   Resets all settings on TrafficView to factory default
- **99999**   Will erase all data on Flarm device
- **30000**   Will delete Flarmnet user file on TrafficView

4.11.9 About

In the "about screen", there is an information about the firmware and hardware **versions** of the TrafficView and their (its) **serial numbers**.

4.11.10   Exit setup

When pressing this item, (we) one will exit from this setup menu to one level higher. The same thing can be done with pressing the middle push button.

5 Installation

LXNAV TrafficView should be installed in a standard 57 mm and TrafficView80 in standard 80 mm hole.
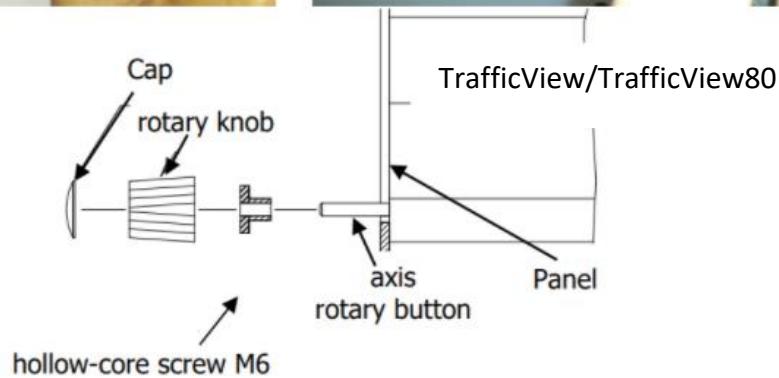
Remove the two rotary knob caps with a knife or a flat screwdriver, then hold each knob and unscrew it. Remove the remaining two screws and the two M6 threaded nuts. Install the knobs and the panel there is sufficient space so that the button can be pushed.

5.1 Installing the TrafficView80

The TrafficView is installed in one standard 80mm (3,15") cut-out. If there is none, prepare it according to the picture below.
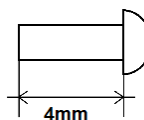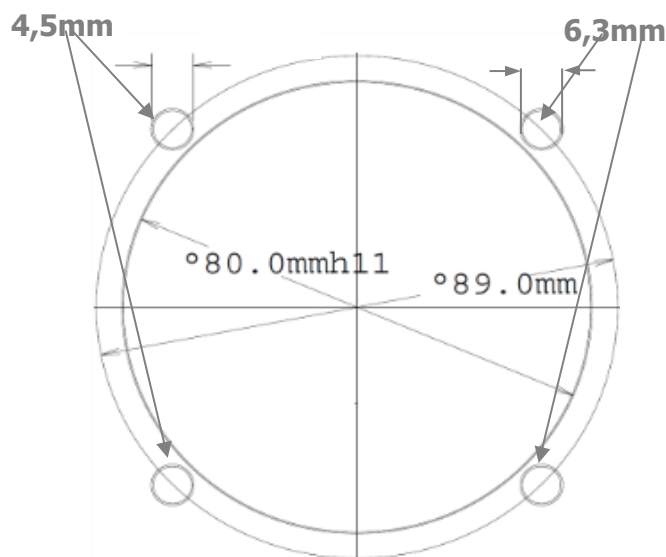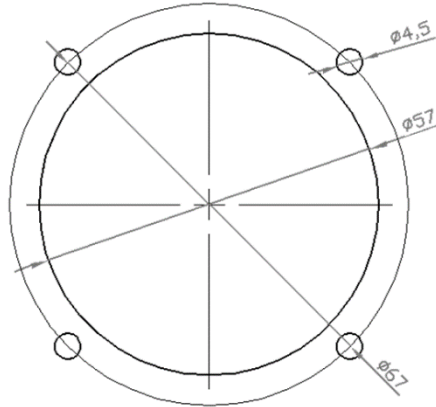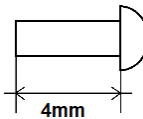
⚠️ The length of the M4 screws is limited to **4mm!!!!**

5.2 Installing the TrafficView

The TrafficView is installed in one standard 57mm (2,5") cut-out. If there is none, prepare it according to the picture below.

⚠️ The length of the M4 screws is limited to **4mm!!!!**
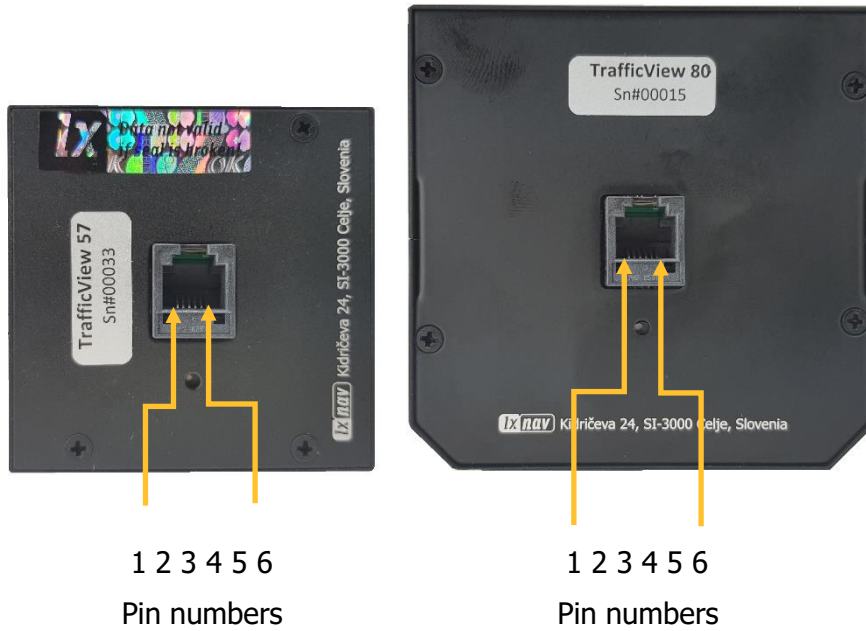
5.3 Connecting LXNAV TrafficView

TrafficView can be connected to any Flarm or ADS-B device with TrafficView cable.

5.4 Installation of options

Optionally, more TrafficView devices can be connected through a Flarm Splitter.

5.4.1 Ports and Wiring

5.4.1.1 LXNAV TrafficView port (RJ12)

1 2 3 4 5 6

Pin numbers

1 2 3 4 5 6

Pin numbers

Pin number	Description
1	(Power input) 12VDC
2	
3	GND
4	(input) Data in RS232 – receive line
5	(output) Data out RS232 – transmit line
6	Ground

5.4.1.2 LXNAV TrafficView wiring
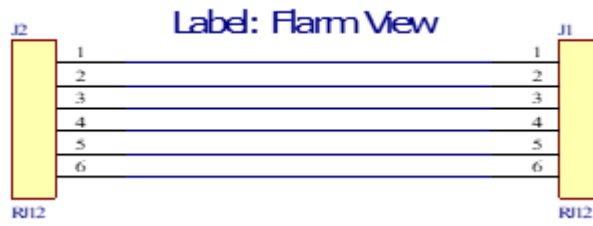
6   Flarmnet Update

Flarm net database can be updated very easily.

- Please, visit http://www.flarmnet.org
- Download the file for LXNAV
- An FLN type file will be downloaded.
- Copy the file to an SD card, and check it in the Setup-Files-Flarmnet menu

7 Firmware Update

Firmware updates of the LXNAV TrafficView can be easily carried out using the SD card. Please visit our webpage www.lxnav.com and check for the updates.
You can also subscribe to a newsletter to receive news about the LXNAV TrafficView updates automatically. Information about new version, including changes to ICD protocol, can be found in release notes at https://gliding.lxnav.com/lxdownloads/firmware/.

7.1 Updating LXNAV TrafficView

- Download the latest firmware from our web site, section downloads/firmware http://www.lxnav.com/download/firmware.html.
- Copy the **ZFW** file to TrafficView's SD card.
- TrafficView will ask you to confirm the update.
- After confirmation, the firmware update will take a few seconds, then TrafficView will restart.

8 Troubleshooting

8.1 Flash integrity failed

If the update procedure is interrupted of any (case) way, LXNAV TrafficView will not start. It will cycle in the bootloader application with a red message "Flash integrity failed". Bootloader application is waiting to read the right firmware from an SD card. After a successful firmware update, LXNAV TrafficView will start again.
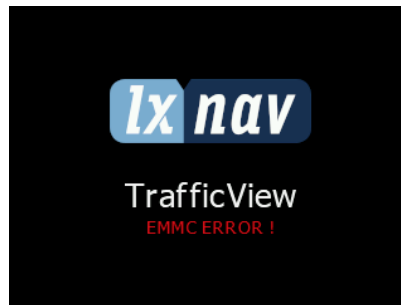

8.2 Incomplete update

One update file is missing. Please try to rename the ZFW file to ZIP file, extract the content directly to the SD card of the TrafficView.
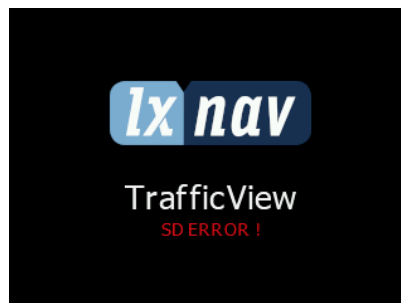
8.3 EMMC Error

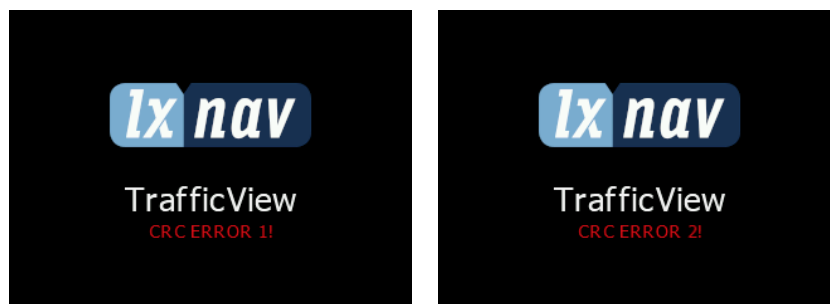There is probably a fault in the device. Please contact LXNAV support.

8.4 SD Error

There is a fault in your SD card. Please replace your micro SD card with a new one.

8.5 CRC Error 1&2

Something is wrong with the .bin file (one of the two files that are included in .zfw). Please find a new .zfw file. The easiest way is to simply download a new version from our website.

8.6 No communication

If FlarmView is not cummunicating with the FLARM device, make sure (shurre) to check that the set baund rate is the same as the one on the Flarm device. In case you are using a 1st generation FLARM device, beware that if you connect TrafficView to an external port, the device will only receive PFLAU sentences, and will not show traffic. Please connect TrafficView to a primary port of your FLARM device. To test if communication is working properly, go to Setup->Hardware->NMEA Test.

8.7 Flarm errors

If you see Error screen during normal operation starting with "Flarm:" the problem (is related) has to be with your Flarm device, and not TrafficView. In this case, please refer to the troubleshooting section of your Flarm device manual. For easier identification of an error, you will see a short description of the error, or an error code if the description is not available.

9 Revision History

Rev	Date	Comments
1	August 2019	Initial release of the manual
2	September 2019	Updated chapters: 4.8, 4.9, 4.11.5.4, 5.4.1.1, 8 added chapters 1.2, 1.3, 4.6, 4.8.3, 7.2
3	January 2020	Review of English language content
4	April 2020	Minor changes (TrafficView and TrafficView80)
5	July 2020	Updated chapters: 4.8.3
6	September 2020	Style update
7	November 2020	Updated chapter 5
8	December 2020	Updated chapter 3.1.3
9	December 2020	RJ11 replaced with RJ12
10	February 2021	Style update and minor fixes
11	April 2021	Minor fixes
12	September 2021	Updated chapter 3.1.3
13	May 2023	Updated chapter 3.1.3
14	December 2023	Updated chapter 4.11.6

The pilot's choice

LXNAV d.o.o.
Kidričeva 24, SI-3000 Celje, Slovenia
T: +386 592 334 00 I F:+386 599 335 22 I info@lxnav.com
www.lxnav.com