LX navigation

528 user`s manual

version 1.0.3

CONTENTS

PART ONE – Introduction

1.1 Preamble

Why LX Navigation?

LX Navigation is one of the oldest gliding navigation brands. Its founders started experimenting with glider computers way back in the '70-ies and the Company has been working on improving your flight performance ever since.

Throughout the last 40 years or so it has been working on instruments that most pilots will have used at some time. In fact our equipment can be found in almost any aeroclub!

The only natural move was to move to motorplane navigation as well.

Our equipment has always been ground-breaking.

Our motto?

Be the first. Be the best. Be different.

Why LX 528?

Because LX 528 is our top of the line motorplane navigation product. ***Crème de la crème*.**

Used by pilots from all over the world, our instruments offer the best for both aerodrome flying, cross-country flights and route flying. The LX 528 is the latest in this tradition, following the already established LX 500 line.

Devices

We offer a wide range of instruments suitable for both club and private flying.

From full-navigation systems, like the LX 528, to Vario, Alti and IAS systems (like the AirDat II), to all-in-one instruments with pressure information, basic navigation and adjustable navboxes (like the LX Salus).

System accessories (second seat unit, remote control (LX Joy), compass, NavBox, MOP, Flap sensor, AHRS ...) are also available. Everything is connected using a CAN bus (single cable for power and data). All connections are plug and play, which means no specialist is required to install the system.

1.2 Name philosophy

The LX 528 continues the well established tradition of the LX 500.

LX 528 stands for the 2.8'' screen diagonale model. The larger, 4.3'' diagonale model is called the 543, and the same logic is used with the 5.5'' screen model and 7.0'' model, the LX 555 and LX 570.

To simplify matters, all of them will be covered in this manual under the name 'LX 528'.

There is no other difference in function in functionalities between the models.

1.3 Operation

Front panel interface

Communications between the pilot and the instrument is done via two rotary knobs and 8 push buttons.

All buttons and rotary switches have a double push function (short and long press). All buttons are labelled, which makes unit manipulation very easy. The top labels are selected with a short press. Bottom labels are selected with a long press. On LX 528 and LX 543 there is a 4-4 button arrangement. On larger screen sizes, the button arrangement is 5-3.

Both rotary knobs are multifunctional as follows:

Default functions:

- Volume rotary knob
  - Volume adjustment function – scroll (by 10 fold or by whole page)
  - Select (WP, APT, Route) - short press
  - Shortcuts - long press
- Zoom rotary knob
  - Zoom adjustment function – scroll
  - Open more options (WP, APT, Route) - short press
  - Edit NavBoxes – long press

In edit:

- Volume rotary knob: bigger steps when selecting values and escape/cancel by pressing it
- Zoom rotary knob: scrolling and press confirmation

USB/SD

There are two ways of transferring files: either via USB or via SD port. A standard USB-A female port is available on each device (on LX 528 2.8 slim USB keys should be used). The port is exclusively used for data transfer and firmware updates. The micro SD port is only used when Flarm is connected (Flarm Red Box, Swiss Flarm and optionally Flarm Mini Box). The micro SD port is used for direct communication with Flarm, which means downloading flights stored on Flarm, uploading declaration and Flarm firmware updates.

Note!
New hardware models do not incorporate the microSD card reader, in it's place an ambient light sensor is installed

Back panel interface

On the back side of the unit there are the following connectors:

- 2x CAN bus*
- 2x User ports
- Flarm port (12 V power and data) *
- Flarm display output
- USB – A port

* CAN bus connects LX 528 to:

- LX Salus (57/80)
- Second seat unit
- LX Joy
- LX NavBox
- LX Flaps sensor
- LX AHRS

1.4 Installation procedure (LX 528)

Installation of LX 528

The dimensions of larger units (4.3, 5.5 and 7.0) do not match air norm standards (57 or 80mm). A new cut out in the panel is necessary. There are two ways to prepare the panel:

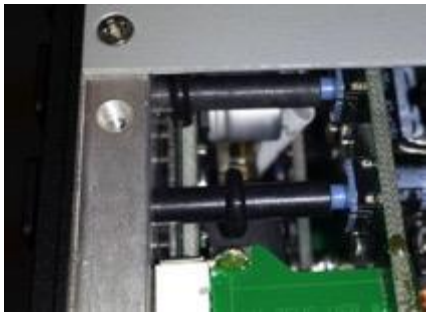
The first option is to buy a new panel from the Airplane manufacturer and the second is to upgrade the existing panel. The user can also do a panel upgrade and, in that case, basic experience in fiberglass technology will help. (LX Navigation can provide additional instructions on how to rebuild the panel by yourself – just ask!)

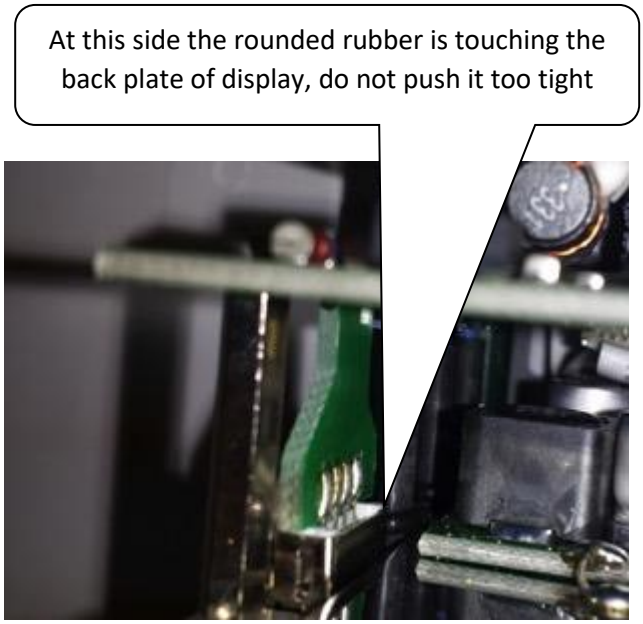
Every unit (except the 2.8 inch, which fits an 80mm instrument hole) is supplied with a template which makes it possible to make the LX 528 cut out by hand. If a CNC solution is planned, then please ask for .dwg file.

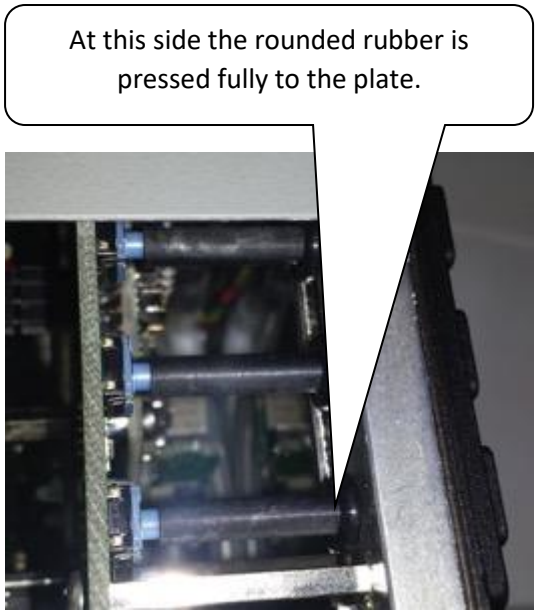
1.4.1 Screen rotation

The screen can be rotated by using password 9109 under Setup > Service > Admin password. The buttons must be rotated by hand. Follow the procedure below:

1. Open the unit (remove all screws and cover)
2. Move rounded rubber to the middle
3. Take out the button and rotate it to the proper position
4. Put button back on blue button (be careful that blue button is inside the black hose)
5. Put rounded rubber back to the first position (be careful with the Rotary knobs as the rubber must not be pushed all the way in)







1.4.2 Connecting LX 528 accessories

This part of the installation is easy and doesn't require any specialists. LX 528 and LX accessories are connected via a CAN bus cable. Connect one end of the cable into Salus CAN bus port and the other into any of the CAN bus ports on the LX 528. LX 528 receives power from it's power cables and supplies it to all CAN connected devices. All data from and to LX 528 and LX accessories goes via a single CAN cable.

The red wire is +12V and blue wire is Ground.

Important!

When LX Salus is connected, the **terminator must not be connected to the system,** because there is a terminator integrated in LX Eos. Only one terminator should be used at once.

LX 528 is turned ON by holding the A-W-E (power button).

1.5 Update procedure

LX 528 software is constantly being updated. Please contact your local dealer for the latest upgrade.
The latest version, together with a change log, is always available on our website (www.lxnavigation.com).

The update procedure is very simple, just follow these steps:

- Put the upgrade file (LX 528-x.y.z.kus) onto a USB stick
- Insert USB stick into LX 528
- Turn on LX 528 (If it is already powered on it should be restarted)
- Hold QNH/FLARM button until the blue window opens
- Select upgrade with a push on the Zoom rotary knob
- Find the update on the USB stick
- Select the file with a push on the Zoom rotary knob
- Wait for installation, when an Initial setup screen shows then the update is finished
- All devices connected to CAN bus will be automatically updated
- In a Double-seater configuration the system may ask if this is FIRST or SECOND seat (confirm correct one)
- In case of Double-seater configuration repeat the whole procedure on the second seat LX 528

1.6 Technical specifications

LX 528

This version of LX 528 can be installed into any standard 80 mm panel cut out and therefore does not require an instrument panel upgrade. Display orientation is only landscape.

- 82x82x52 mm

LX 543

This version has a 4.3-inch display with 800x480px resolution and has the following outline dimensions:

- 83x136x52 mm

LX 555

This version has a 5.5-inch display with 640x480px resolution and has the following outline dimensions:

- 106x146x52 mm

LX 570

This version has a 7.0-inch display with 800x480px resolution and has the following outline dimensions:

- 110x190x52 mm

PART TWO - Software

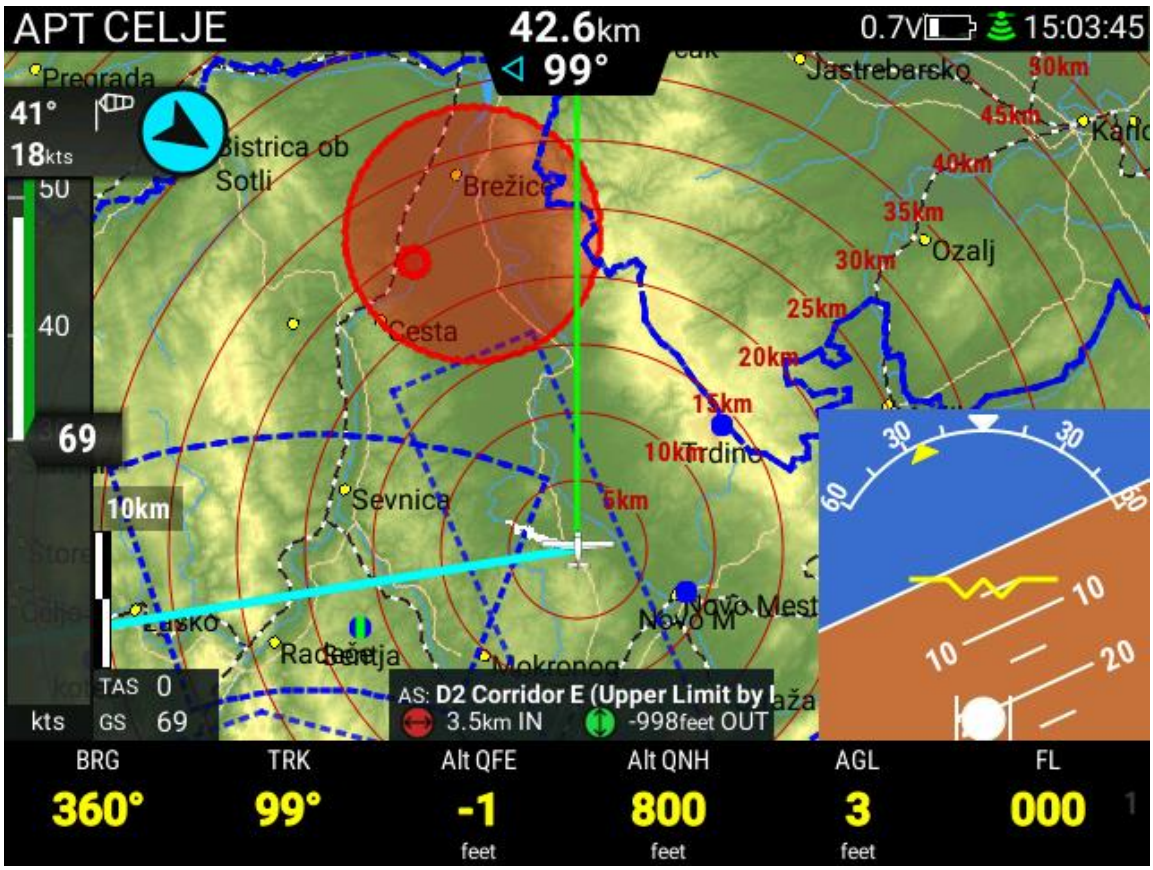
2.1 Display organization and management

The available information can be personalized and adjusted to meet the user's requirements and is set out in the following paragraphs.

2.1.1 Display organization

LX 528 display consists of the following:

- Geographic map.
- Bottom row (NavBox line).
- Header.
- Indicators.

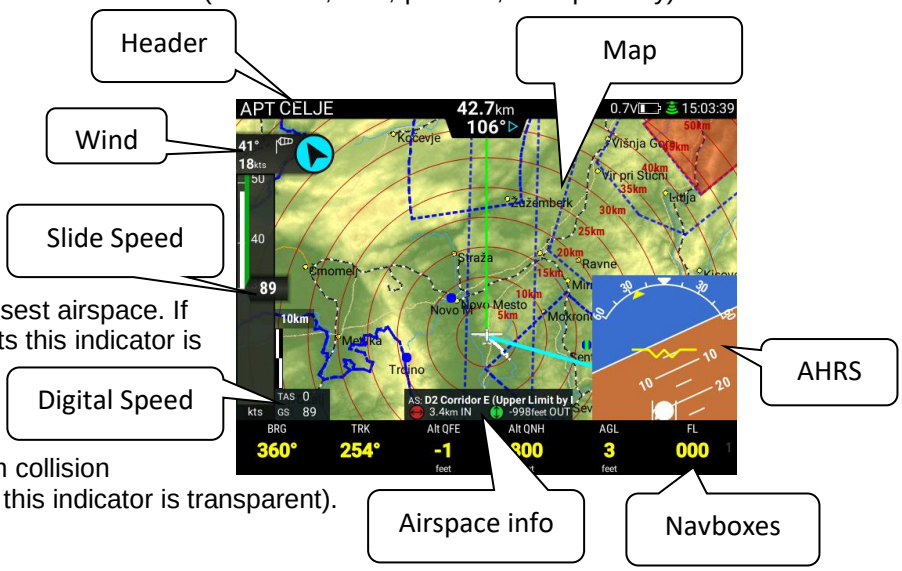


2.1.1.1 Indicators

Indicators are elements on the display which can be edited (existence, size, position, transparency). See **Setup/Layout** for details.

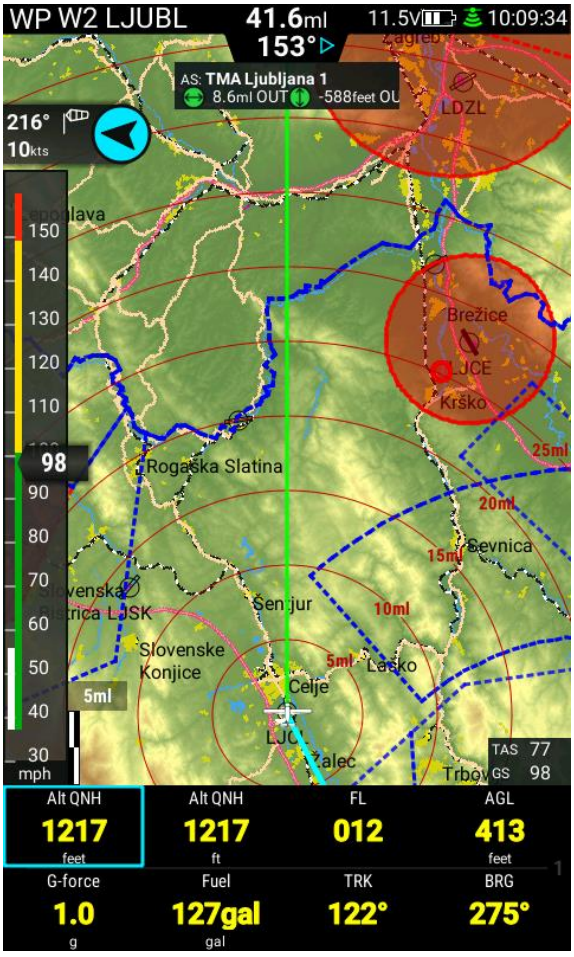
Here is a list of available indicators:

- Header
- Speed indicator (GS)
- Sliding speed indicator (GS)
- Speed indicator classic (GS)
- Digital speed indicator
- Wind indicator
- Airspace info (information about closest airspace. If no airspace is within selectable limits this indicator is transparent.)
- Map scale
- AHRS
- Flarm indicator (used to show Flarm collision warnings. If no warning is available this indicator is transparent).



2.1.1.2 NavBox line customization

The bottom row consists of customisable NavBoxes. This means that the pilot is able to create his own configuration. This simple procedure is also available during flight. The user can set different configurations for WP, APT and RTE navigation. It is possible to copy configurations from one page to another. (Done under Setup>Layout). The procedure starts with a long press on the Zoom rotary knob. After the long press a frame appears around the first NavBox. Rotating the Zoom rotary knob positions the frame. When the desired frame position is reached, a short press of the Zoom rotary knob again will open a list of available NavBoxes.



2.1.1.3 Header

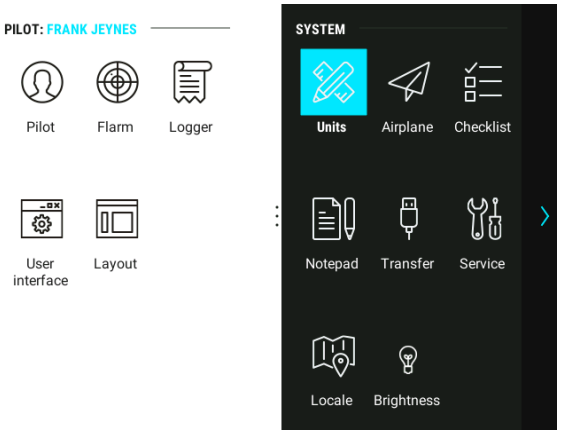
The header cannot be customized. Only the transparency can be set: go to Setup>Layout. From left to right there is information about:

- Current navigation page (RTE, WP or APT)
- Current navigation turn-point
- Distance and steering information to get to the navigation point
- LX Joy status (N = normal, Z = zoom, P = pan)
- Battery status
- GPS signal status
- Current time in selected format (hh:mm:ss)

2.2 Setup

2.2.1 Setup

The setup menu is available after a short press on the push button labelled **SETUP**. The menu is divided into two sections (Pilot and System settings). **System settings** are settings that are valid for the whole system and are not pilot specific settings. Pilot settings may vary from pilot to pilot according to individual requirements. Icons with text will help in finding the menu of interest.



- Use Zoom rotary knob and rotate it to find the menu of interest (selected icon is highlighted)
- Use push function of Zoom rotary knob to enter menu

2.2.1.1 Pilot specific settings

The data stored in this part of Setup is pilot specific data. After pilot selection on initial setup, the data of an individual pilot becomes active. All settings are saved to the pilot profile and are active when the pilot is selected (reserve altitude, logger settings, NavBox container, layout settings, Route colours etc.) It is possible to export/import user profile settings with a USB stick.

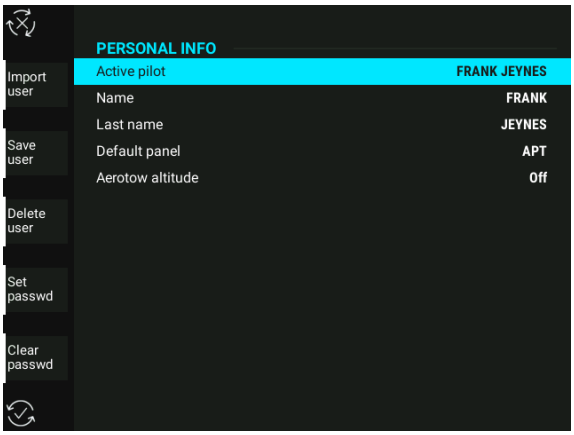
Note!

All settings active at the moment of new pilot creation under “Pilot” will be adopted.

2.2.2 Pilot

Pilot

The Pilots **name** and certain personal data can be stored. All stored pilot names will be offered during initial setup and selecting a pilot is mandatory. The system offers a default user profile with the name **DEFAULT** which can be used as a default pilot. Furthermore, plenty of empty positions are offered and this can be used for another pilot using the instrument. Some additional parameters can be entered, such as pilot's **weight, default ballast** and **reserve altitude** – all settings are used for final glide calculation.



Aerotow altitude

Aerotow altitude means altitude limit set that will turn on the aerotow altitude warning alert.

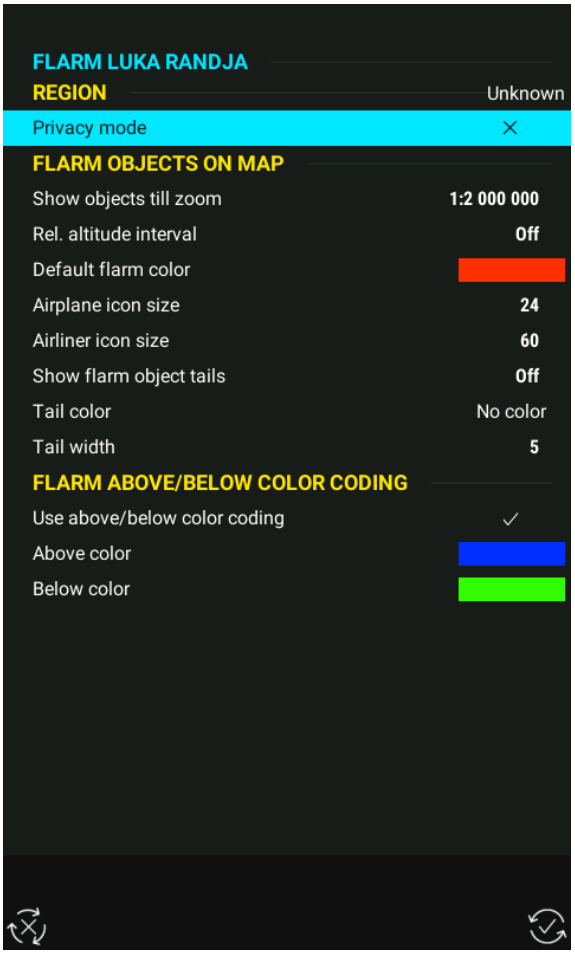
Other useful information

User (pilot) settings can also be saved to the USB stick and importing a user done by pressing the buttons: **Import user** (VARIO/FLARM) and **Save user** (RTE/MOVE). There is also an option to a **set password** to each pilot profile to prevent other pilots flying with the same unit and changing the pilot settings (this function was specially developed for flying in clubs). After a press on **clear password** the password will be removed. To delete a user, simply select **delete user**.

2.2.3 Flarm

Flarm

This menu is used for changing the Flarm visualisation parameters. The only executive command which can be sent to Flarm unit is privacy mode.



Activation of privacy mode will send the Flarm unit into "stealth mode", which means that the data transmitted to and from Flarm unit is limited.

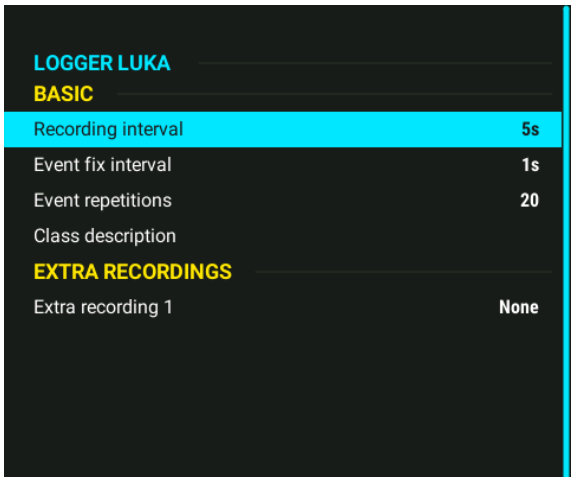
Others commands are:

- Show objects till zoom defines the distance at which a Flarm object appears on the map
- Rel. altitude interval sets the altitude difference for a Flarm object to appear
- Airplane icon size
- Airliner icon size (any powered aircraft)
- Show Flarm tails
- Tail colour
- Tail width
- Use above/below colour coding (makes it possible to define the colour for above and below Flarm objects)

Logger

2.2.4 Logger

LX 528 uses acts as a flight recorder. It records in the standard .igc file type, which can be analysed by multiple programs.



Recording interval is set to 5 seconds by default. Event repetitions are set to 20 and event fix interval to 1 second. This means that when press "Event" button is executed the logger will create 20 records in 20 seconds (one per second).

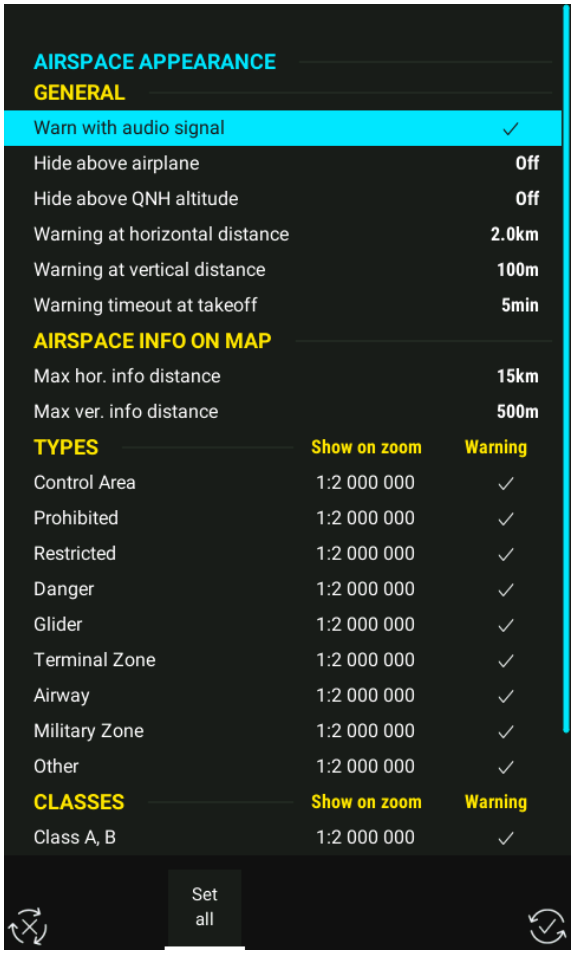
The extra recording option means that you can select the recording of Ground speed into log file.

In a double seat configuration, the second seat pilot is also able to change flight recorder settings. The process is the same as for the first seat.

Airspaces

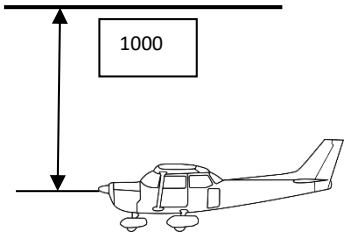
2.2.5 Airspace

All settings connected to Airspace management are available in this menu.



Note!

Hide above airplane option will remove airspace sections which are higher than the setting. This will reduce the clutter on the graphic page significantly.



Example of Hide airspace above:

- The maximum vertical and horizontal distance to which airspace in Airspace info box on map is displayed can be set. If there isn't any airspace that fulfil these conditions the Airspace info box will not appear
- Hide above QNH altitude to disable airspace that is above set QNH altitude
- Audio warnings (on vario) when airspace warning appears on the LX 528 can be dismissed (dismiss buttons)

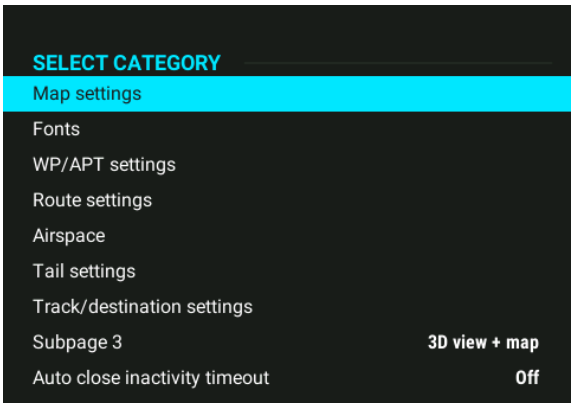
Default warnings for airspace are set to 2 km horizontally and 100 m vertically but these warning settings can be adjusted. Warning timeout at takeoff is pre-set to 5 minutes, which means, that during the first 5 minutes after takeoff there will not be any airspace warnings.

Show on zoom, defines appearance of particular airspace sections on the display. Appearance is connected to zoom. Airspace warning can be set as active (☑) or as not active (☒).

User interface

2.2.6 User interface

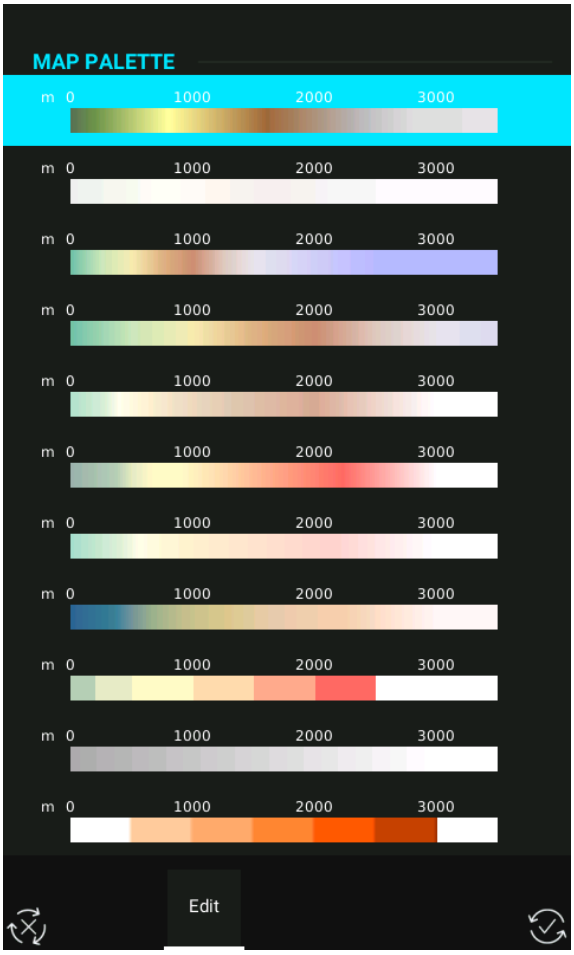
In the User interface menu, the pilot can adjust most of the graphic options apart from layout, which has its own menu. All settings are saved to currently selected pilot profile.



2.2.6.1 Map settings

All settings regarding map appearance (map palette colours, Airplane image, orientation, distance circles etc.) can be adjusted in the Map settings menu.

The pilot can select the zoom level used once circling has been detected under the field A**t circling switch to**.



Map palette

The Map palette menu is used for adjusting colour schemes used for terrain display on the map.

Personal colour schemes can be created.

The last option allows the disabling of map appearance features, which is useful in situations when only airspace and Route data is required.

The map can be temporarily disabled under shortcuts (long press on Zoom rotary knob).

Airplane image

Airplane image icon can be sized and colourized by choice.

Default:

- Colour white
- Size 25 (maximum size can be 60)

Map Orientation

The map orientation of LX 528 can be used in three different ways:

- Track up: Airplane always points to the top of the screen
- North up: North is always on the top of the screen
- Track circ. North: Combination of track up and north up related to flight status (circling, straight flight)

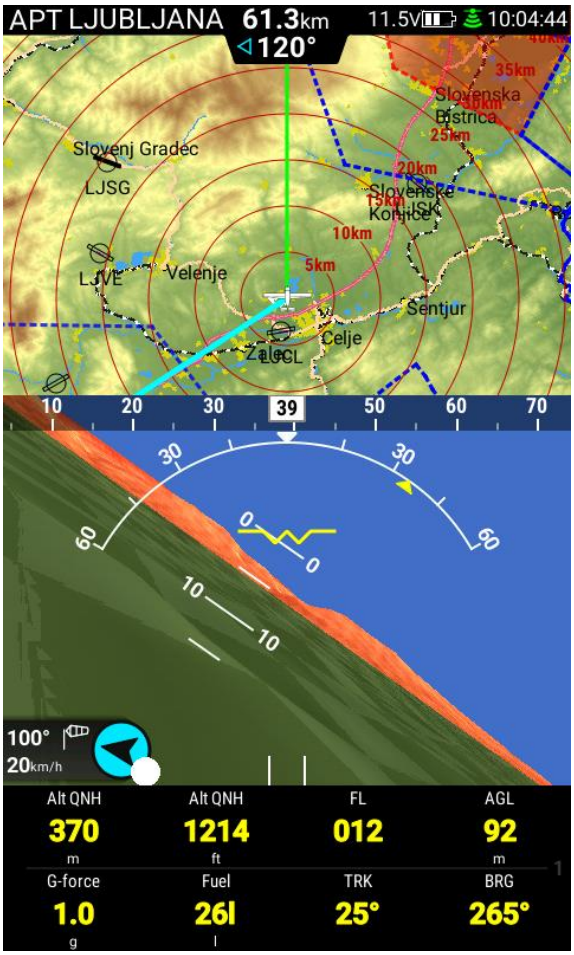
Distance circles

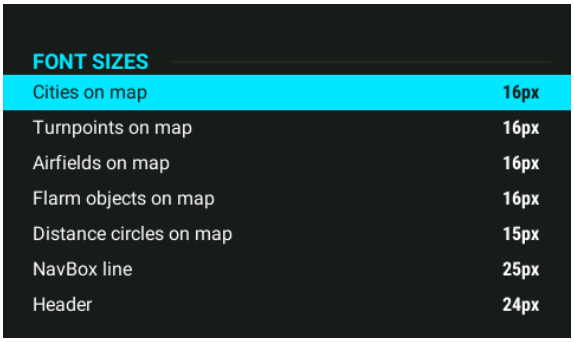
In this section, it is possible to select the number, size and colour of distance circles on the map. Distance circles are a useful tool for getting a feel about the distance to certain objects on the map.

2.2.6.2 Fonts

The font system is fully adjustable:

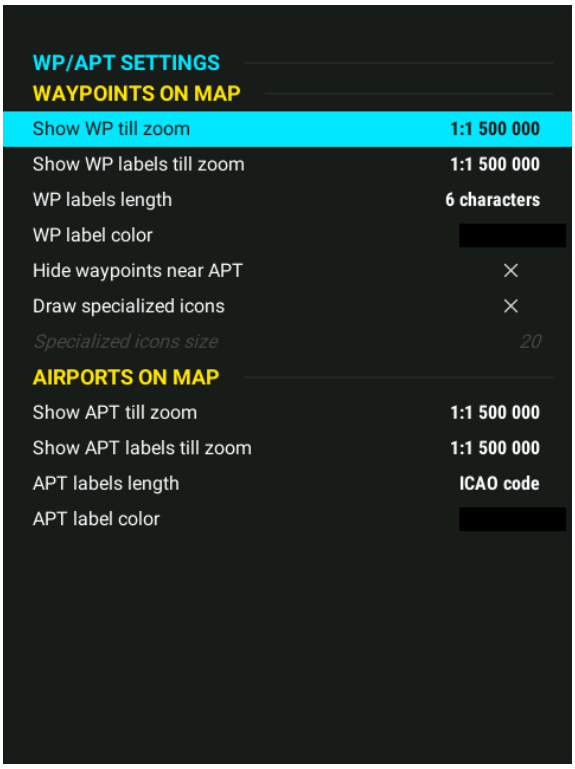
- Cities on map (default 15px)
  If this is set to 0px, there will be no city names on the map
- Waypoint on map (default 15px)
- Airports on map (default 15px)
- Flarm objects on map (default 17px)
- Distance circles on map (15px)
- NavBox line (default 30px)
- Header (default 24px)





2.2.6.3 WP/APT settings

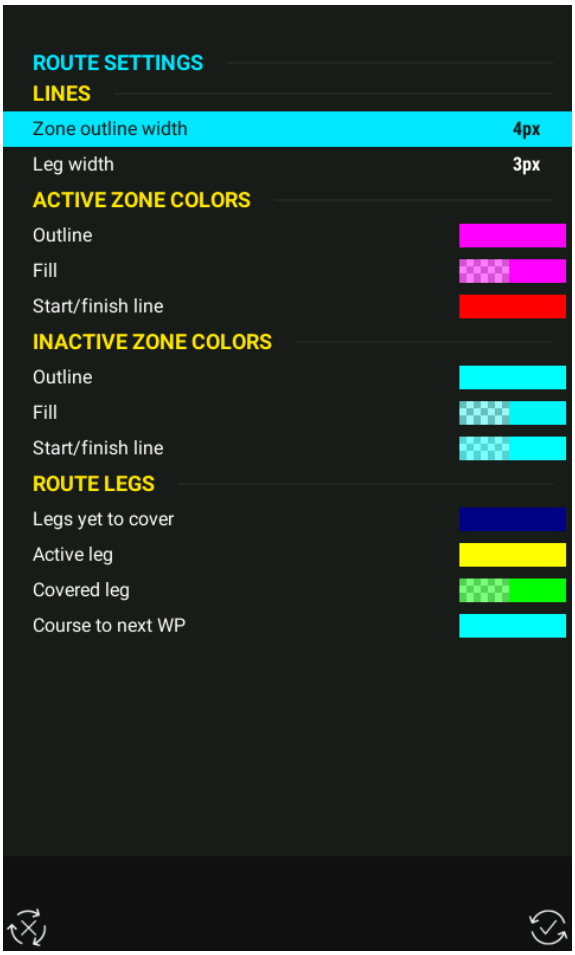
In this menu, the appearance and length of WP and APT labels on the map can be adjusted at different zoom levels:



- **Show WP till zoom:** Adjust visibility of WP at given zoom
- **Show WP labels till zoom:** Adjust visibility of WP labels at given zoom
- **WP labels length:** Set number of label characters shown on the map
- **WP label colour:** Select label colour
- **Hide turn-points near APT**
- **Draw specialized icons**
- **Specialized icons size**
- **Show APT till zoom:** Adjust visibility of APT at given zoom
- **Show APT labels till zoom:** Adjust visibility of APT labels at given zoom
- **APT labels length:** Adjust the number of label characters shown on the map, ICAO code can be selected
- **APT label colour:** Select label colour

2.2.6.4 Route settings

This menu is used for personalizing start, finish and turn-point lines/zones. It is also possible to change their outline colours, fills and outline widths.



Show equidistant lines is a neat feature which enables the pilot to know in which direction no speed is being gained in an AAT zone. It is always best to fly perpendicular to the lines.

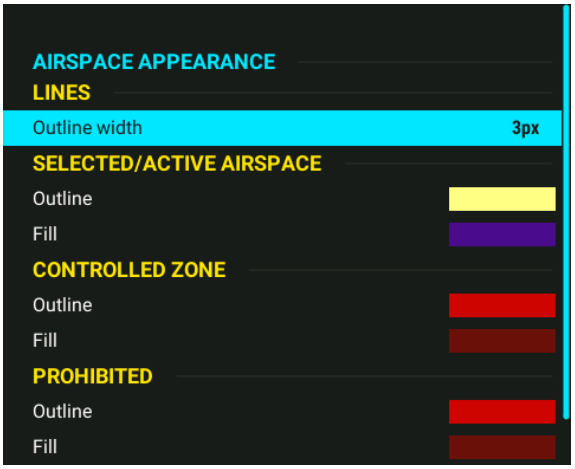
Default Route colours:

- Active zone: Pink
- Active start/finish line: Red
- Inactive zone: Cyan
- Inactive start/finish line: Teal
- Legs yet to cover: Royal blue
- Active leg: Yellow
- Covered leg: Green
- Course to next WP: Cyan

Transparency can be set for all colours.

2.2.6.5 Airspace

The colours and width of airspace sections to meet personal preferences can be set.



Default colours are:

- Selected/active airspace: Blue
- Controlled area: Red
- Prohibited area: Red
- All other: Blue

2.2.6.6 Tail settings

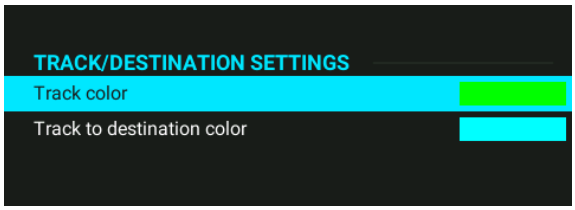
This page is used for adjusting the tail parameters.

Draw tail for last setting is used for determining how long the tail should be.

The width of the tail depends on the strength of the thermal in that moment.

The stronger the thermal, the wider the tail. The default tail width is 10px (2 pixels per 1m/s).

2.2.6.7 Track/destination settings



- Track colour shows the vector of current movement. The default colour is green. It can be changed by setting the transparency to 100%.
- Track to destination colour page sets the colour of the vector line that connects the Airplane with the destination point. Default track colour is Cyan.

2.2.6.8 Subpage 3

Subpage number 3 can be enabled or disabled. It can set so that it only shows a 3D view or a 3D view + map.

2.2.6.9 Auto close inactivity time out

LX 528 monitors the push buttons and rotary knobs during the editing process. If no action is detected the program will change back to the previously used navigation page after a predefined time period. The time is flexible and can be chosen in a range from 6 to 60 seconds. It is also possible to disable the auto close function. If the time is set to off, than the page will disappear only if the Volume rotary knob is pressed (“escape” / ”go back” button). The default time is 30 seconds.

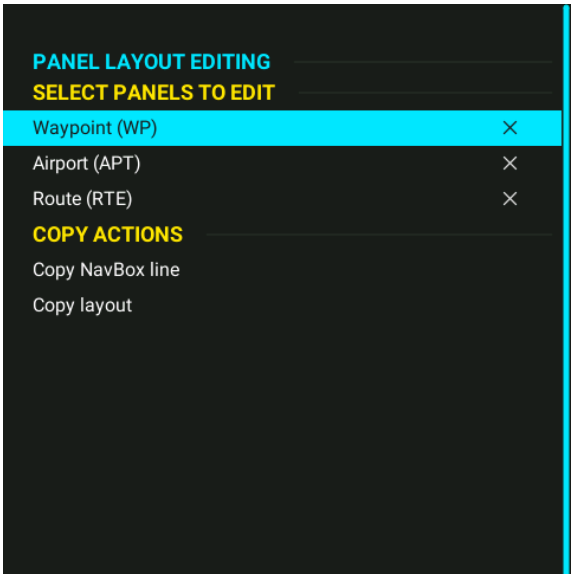
Layout

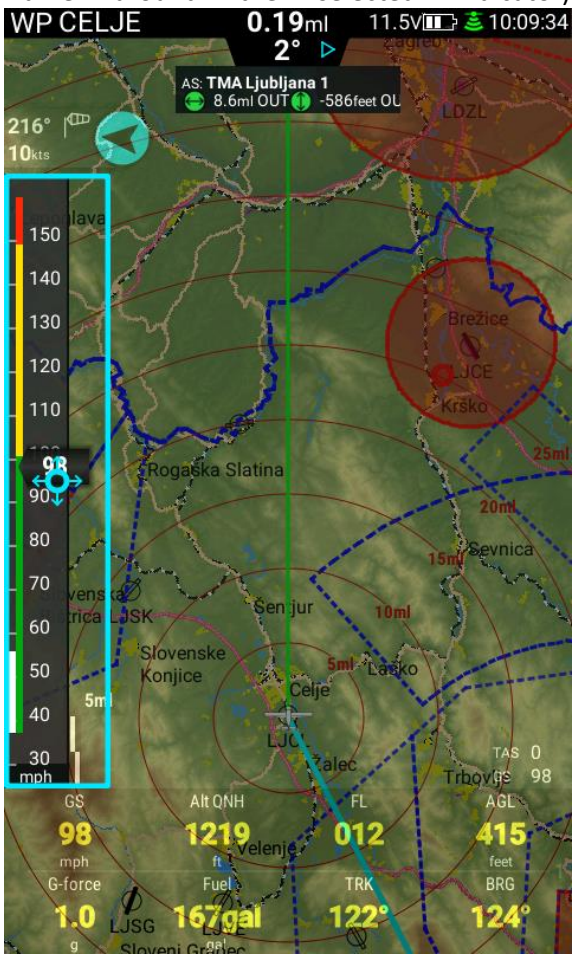
2.2.6.10 Layout

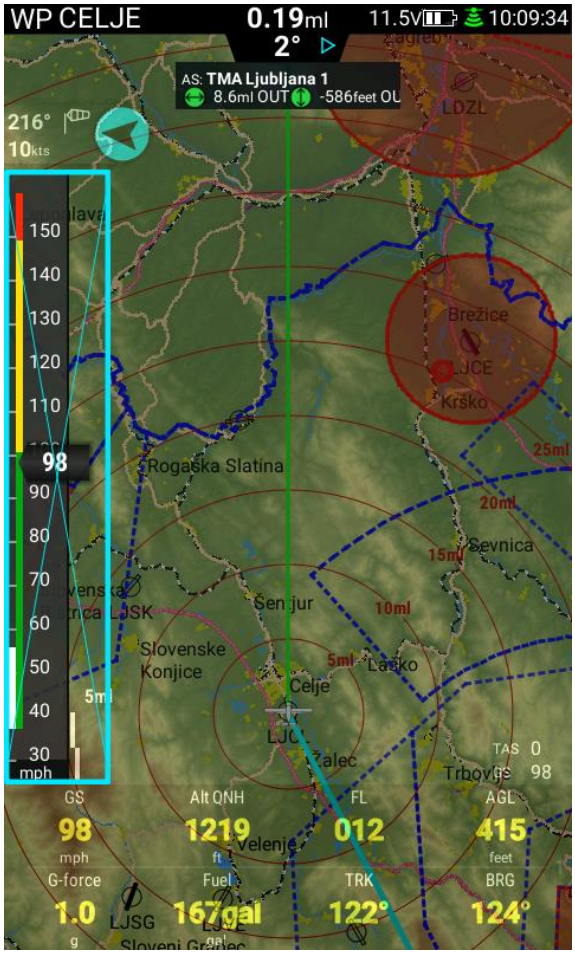
The LX 528 home screen can be customised. Which NavBoxes are shown can be changed as well as their size, order and where they are placed. The same can be done with the map as well as other indicators.

2.2.6.11 Layout edit procedure:

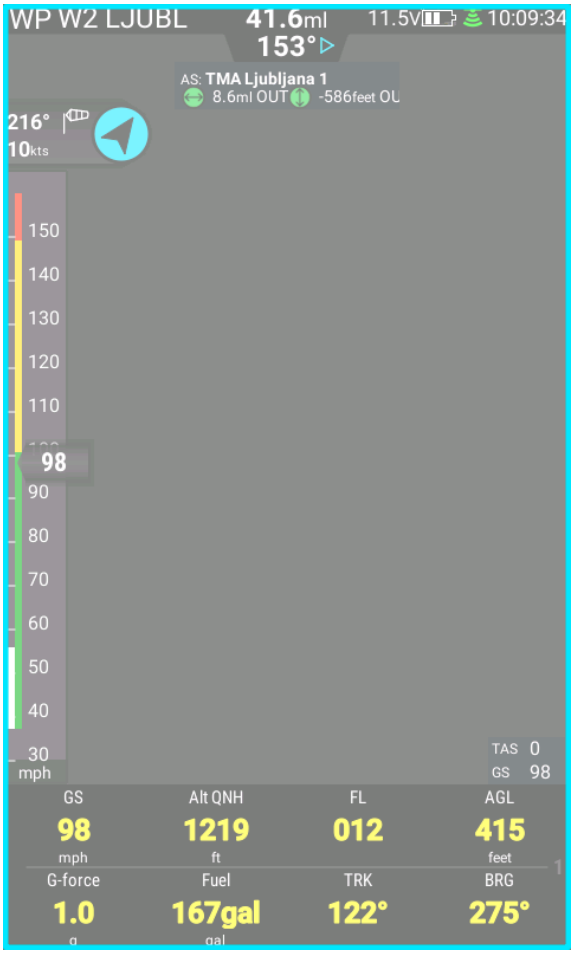
- Go to setup / **Layout**
- **Press Zoom** rotary knob on Layout
- **Check** which panels are to be edited (WP, APT, RTE)
- Rotate zoom rotary knob to select **Edit** and **press Zoom rotary knob.**
- Press the **Edit layout** button
- Main screen will open with a blue frame (**blue frame** shows what has been selected, eg: map, NavBox container or another indicator)
- **Select the indicator, NavBox container or map** to be edited by **rotating** the Zoom rotary knob (the current selection will be displayed with a frame around the selected indicator)







Moving and resizing



How to move selected element:

- **Select** indicator to be moved
- **Short press Zoom rotary knob** (a large cursor symbol will appear in the middle of the indicator)
- Use **Zoom** and **Volume** rotary knob to move the indicator
- Press Zoom rotary knob to stop the move procedure and start the resize procedure

How to resize (expand or compress):

- **Next press** the Zoom rotary knob and it 1will open a similar window but now with a **cross** through the selected indicator.
- Use **Zoom** and **Volume** rotary knobs to resize it.
- Press Zoom rotary knob to stop the resizing process.

The customisation process terminates when the Volume rotary knob is pressed.

(**layout saved** message will appear)

Note!

After saving the new layout it may appear that nothing changed on the screen, this is because you are at the wrong navigation screen (if you changed the WP and you are in the APT screen then it seems that nothing has changed). Press an APT button to select the customized screen.

2.2.6.11.1 Selecting/Deselecting and editing

Editing process:

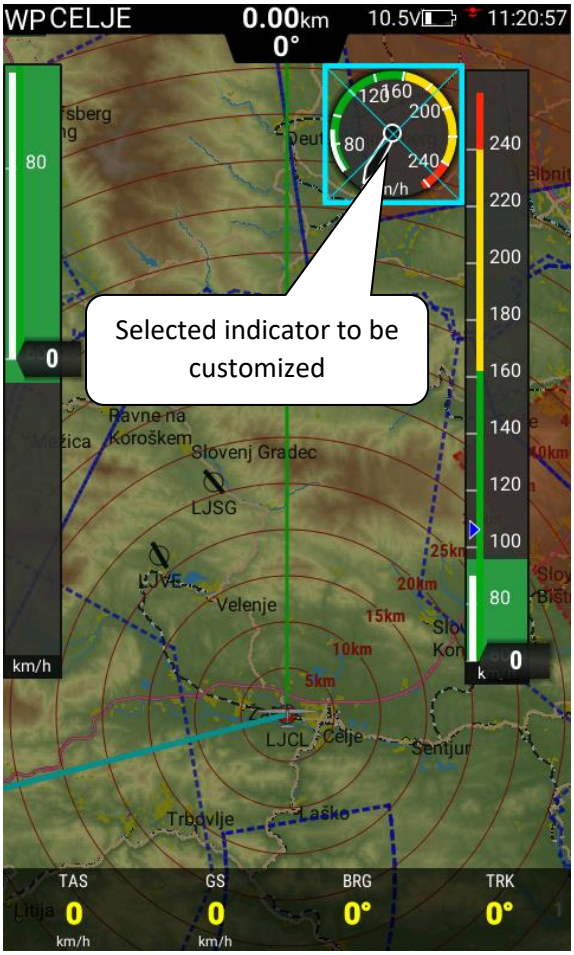
- Select the indicator to be customized (a blue frame will appear).
- **LONG** press the **Zoom** rotary knob (if a long press is not made then there will still be an option to move or resize it)

- Select the colour to be changed (rotate Zoom rotary knob) and give a **SHORT** press of the **Zoom rotary knob** - a new window (Edit Background colour) will open

- Now the colour can be changed simply by picking one from the palette and **pressing the Zoom rotary knob**. If one has been picked from the palette, but transparency is required, just go back again. Edit Background colour window (**press Zoom**) and go to transparency (**press Zoom**)

  Rotate Zoom rotary knob to set the transparency required, confirm it by **pressing Zoom rotary knob** and then **pressing Volume** to escape.

- To terminate the customization process, **press the Volume** rotary knob once to escape from Edit Background menu and then again **press the Volume rotary knob** to escape from Properties/Actions menu. An edited indicator will appear on the screen that you have customized

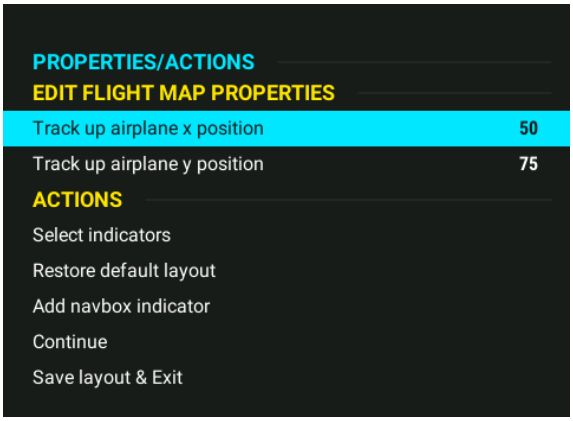


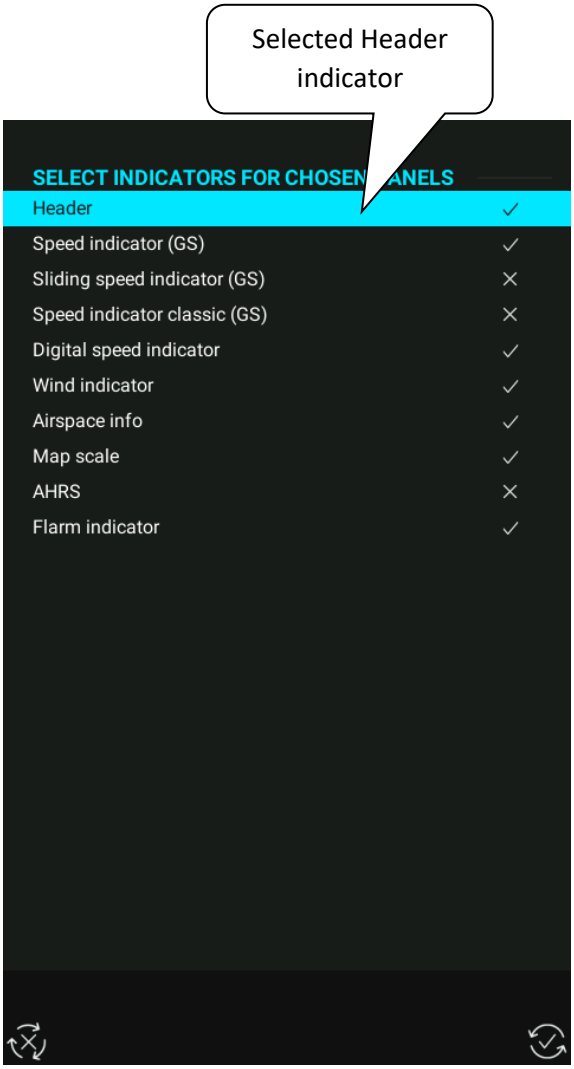
Note!

To escape from Edit Background colour menu you don't necessarily have to press **Volume rotary knob**, you can simply wait 15 seconds and the screen will go back to the first (Properties/actions) menu.

Selecting/deselecting process:

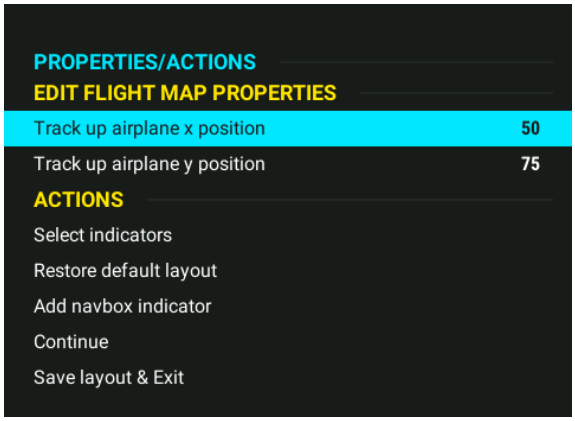
- Go to Setup > Layout, press Zoom rotary knob, select the screen to be edited and go to Edit (press Zoom rotary knob)
- Make a LONG press on Zoom rotary knob and the window Properties/Actions will open
- **Edit flight map properties**
- Select row: **Select Indicators** and press Zoom rotary knob and a window **Select indicators for chosen panels** will open
- Now select/deselect indicators that are not wanted on the screen. Select and deselect them by rotating and pressing the Zoom rotary knob
- To get out of edit mode, press Volume rotary knob and the selected indicator will appear on the screen





Properties/Actions window

This window is activated by a LONG press of the Zoom rotary knob. In this window, colours can be adjusted for the selected indicator as well as other setting such as:

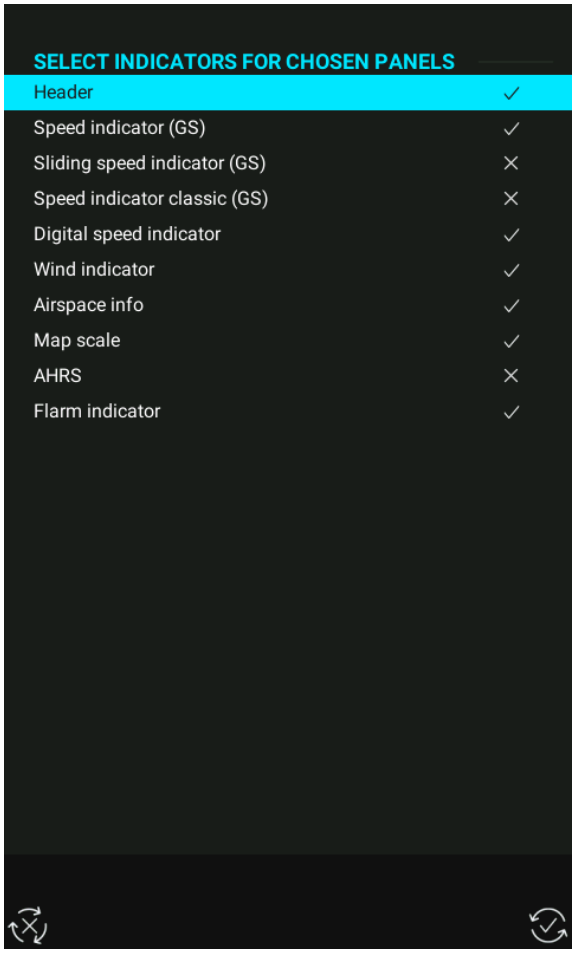


- Number of rows for NavBox container
- Scale size for Sliding speed indicator

By selecting one of the **Action** rows one can:

- Select indicators to be seen on the screen
- Restore the layout to default settings
- Continue with editing indicators
- Save layout and exit with new settings

Map and NavBox container are not indicators.



Indicators

The following indicators can be selected:

- Header
- Speed indicator (GS)
- Sliding speed indicator (GS)
- Speed indicator classic (GS)
- Digital speed indicator
- Wind indicator
- Airspace info (information about closest airspace. If no airspace is within selectable limits this indicator is transparent.)
- Map scale
- AHRS
- Flarm indicator (used to show Flarm collision warnings. If no warning is available this indicator is transparent).
- Header
- Speed indicator (GS)
- Sliding speed indicator (GS)
- Speed indicator classic (GS)
- Digital speed indicator
- Wind indicator
- Airspace info (information about closest airspace. If no airspace is within selectable limits this indicator is transparent.)
- Map scale
- AHRS

Note!

Restore to default will restore back to factory settings.

Map – NavBox container transparency

If it is required to have a NavBox container transparent, then **the map should be stretched over the whole screen** and background colour for the NavBox container should be set to transparent.

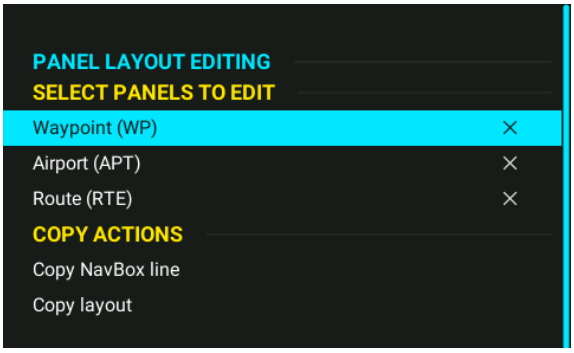
2.2.6.12 Copy NavBoxes

The whole NavBox container can be copied from one panel to another (WP/APT/RTE) via Layout. Always prepare NavBoxes on one panel to be used as a reference for other panels. Once a reference panel is selected, should check the destination panels into which NavBoxes are to be copied. After that, select Copy from `reference` to `destination` to complete the procedure.

2.2.6.13 Copy layout

Copy of one layout can be copied to one or both remaining screens.

Under **Reference panel** choose the layout to be copied. Under **Destination panels** choose which layout to copy the reference layout to. After selection press **Copy from reference to destination** to **c**omplete the procedure**.** A green message will appear to confirm that the layout was successfully copied and saved.

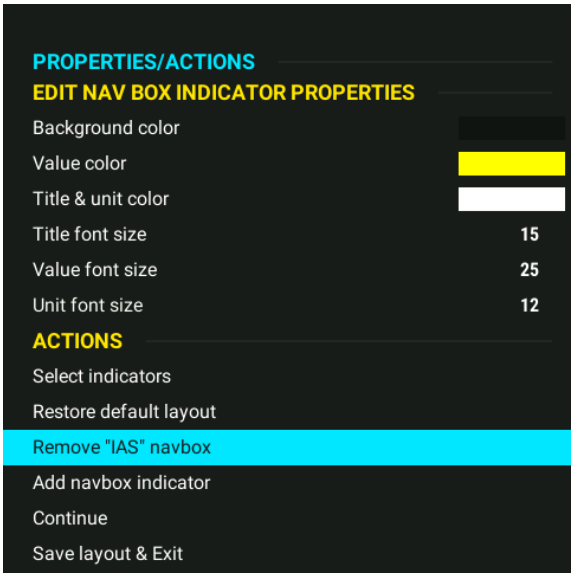


2.2.6.14 NavBox as indicator

A NavBox as an indicator can be added to the map. There is no limitation on the quantity of NavBox indicators on the map. Each NavBox can be customized (different colour, transparency, size, position).

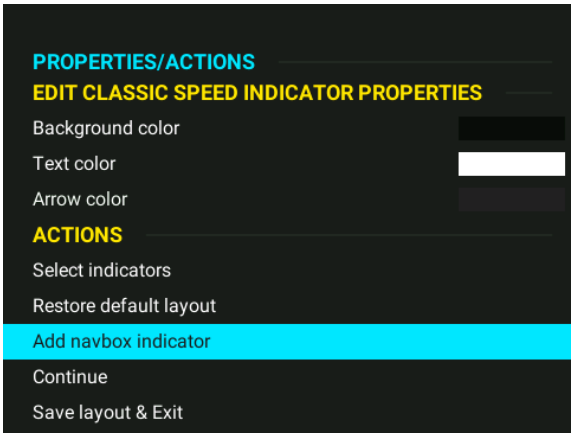
Procedure for adding new NavBox indicators:

- Go to Layout and select the screen to be adjusted, press EDIT
- A long press on Zoom rotary knob will open the Properties/Actions window
- Move down to “Add NavBox indicator” and select this line with a short press on the Zoom rotary knob
- A list of all available NavBoxes will appear. Select the NavBox required and position it on the map in the same way as moving/resizing other indicators



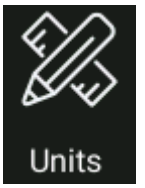
Procedure for removing NavBox indicators:

- Go to Layout and select the screen to be adjusted, press EDIT
- A long press on the Zoom rotary knob will open a Properties/Actions window
- Select “Remove “xy” NavBox”



2.3 System Setup

The parameters set in this section are valid for all pilots (and are not saved to a specific user profile).

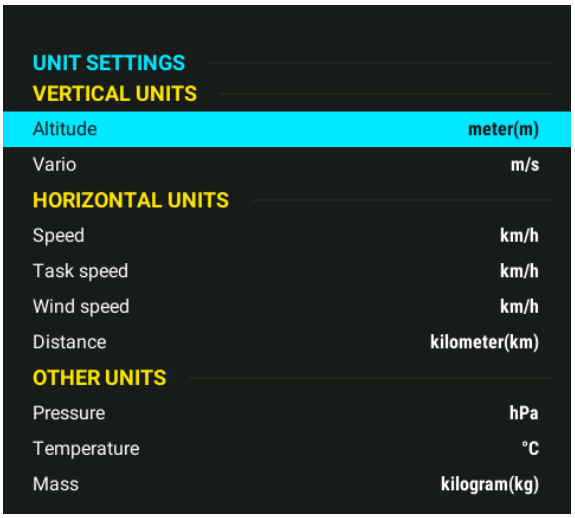


2.3.1 Units

A large selection of units can be defined in this menu.

Units can be defined for: Altitude, Vario (rate of climb), Speed, Route speed, Wind speed, Distance, Pressure, Temperature, and Mass.

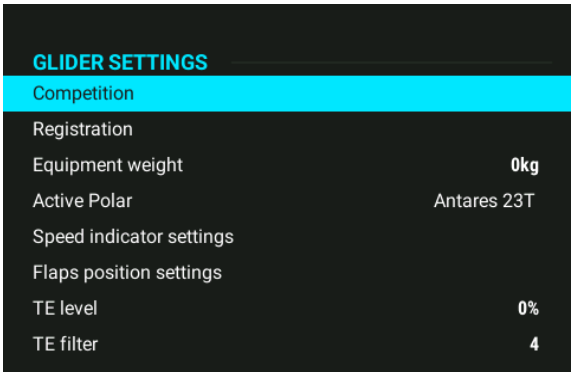
Pre-set metric, imperial or UK units can be set.

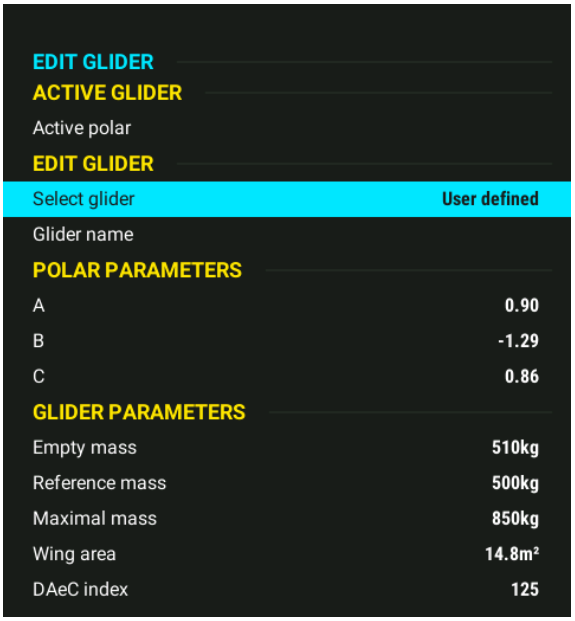


2.3.2 Airplane

In the Airplane menu, it is possible to set all Airplane related information, such as:

- Call sign
- Registration
- Speed indicator settings
- Flap position settings
- Fuel consumption
- Fuel tank capacity



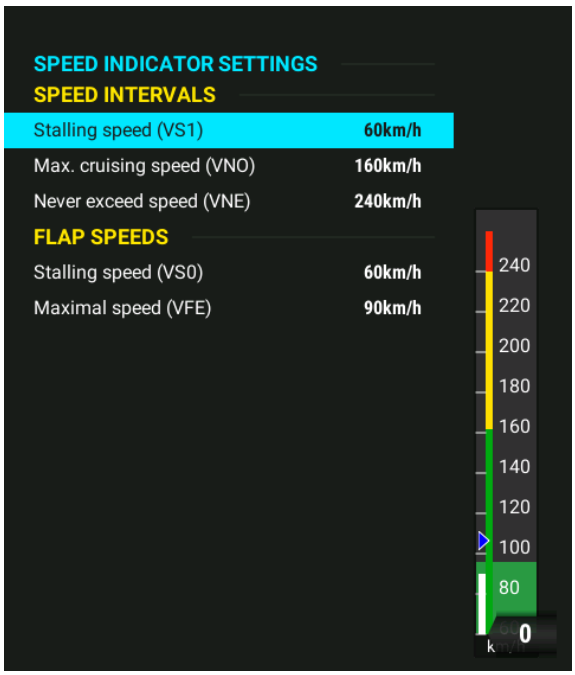


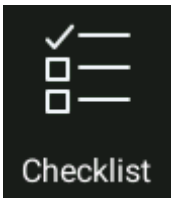
2.3.2.1 Speed indicator settings

The speed markings of the sliding IAS indicator colours on the LX 528 can be adjusted.

2.3.2.2 Flaps position settings

For Airplanes with flaps, LX 528 offers an indicator that will remind the pilot to change flaps to the recommended position. The speeds and position numbers must be defined. Recommended flaps position is available as an indicator in Layout (Flap position indicator) or as a NavBox (Recommended flap position). If a Flaps sensor is connected to the CAN bus then please check the calibration procedure below. Using sensors enables the current flap position to be shown alongside the recommended position. This information is available as an Indicator, NavBox and on a stand-alone LX NavBox device connected to the CAN bus.





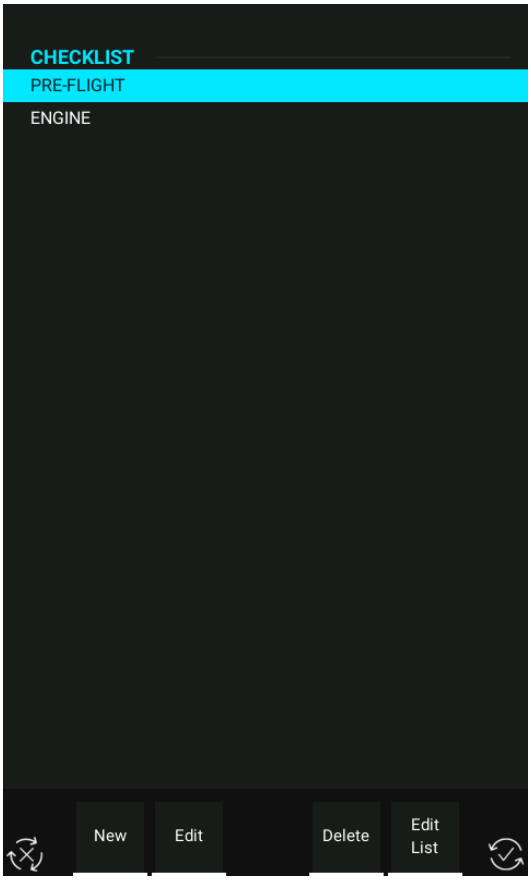
2.3.3 Checklist

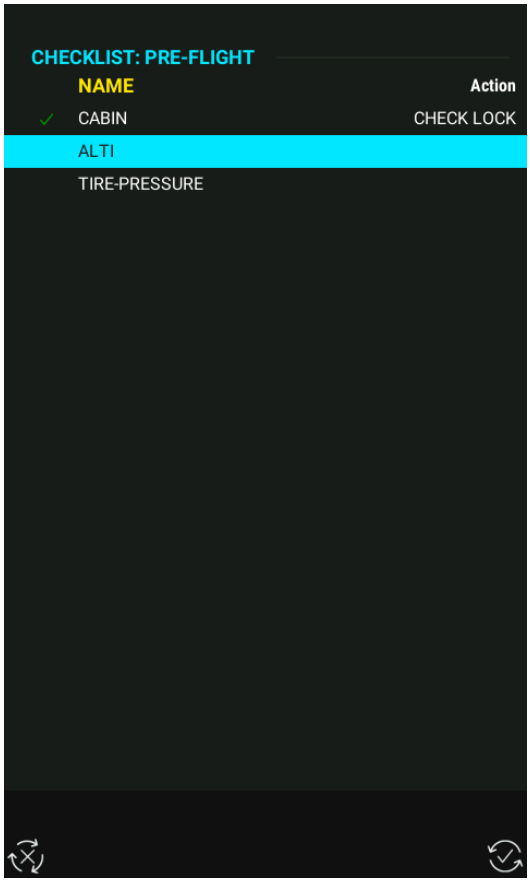
Checklists are available under Setup > Checklist or by a long press of the SUBP button.

Once a checklist is open, keep pressing the Zoom rotary knob to complete the written actions as per the checklist.

To create a new checklist, got to the Checklist menu and click New. After writing the checklist name, choose the Edit button to edit name or Edit list to write the list itself.

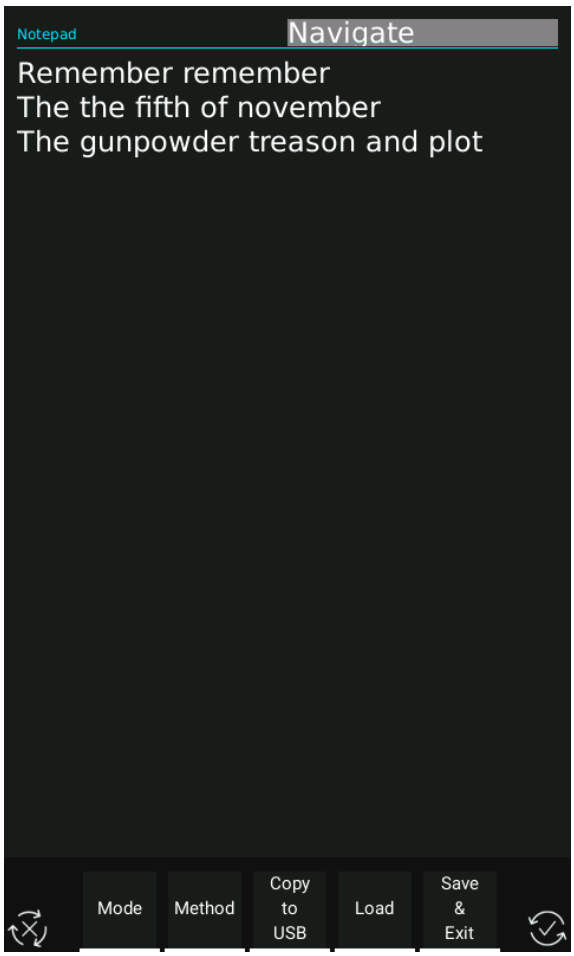
A checklist can also be created on a computer which should be quicker. It can be imported via USB key to the LX 528. To import/export a checklist go to Setup>Transfer>Checklist. Use **Checklist editor software for LX 528** available free on www.lxnavigation.com under the software section.





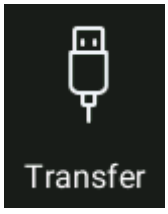
2.3.4 Notepad

In the Notepad menu, a bespoke .txt file with whatever content is required can be prepared. Checklists, notes, input frequencies etc. can all be included



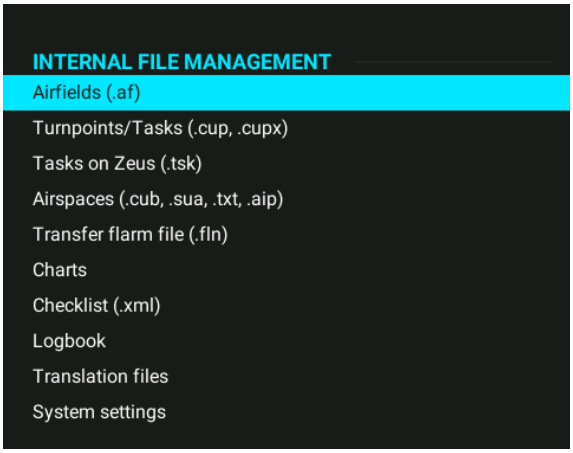
.txt files can be uploaded with the USB stick by pressing the screen button LOAD (button SELECT/NEAR). Notes can be also written directly into the LX 528 by using the Zoom and Volume rotary knobs.

- Screen button MODE is used to change between uppercase letters, lowercase letters, numbers, symbols, navigate etc.
- Using NAVIGATE enables moving the text by using both rotary switches. Characters can be deleted by pressing the Volume rotary knob. To confirm the written text, press mode, change to symbols, find enter symbol and then confirm it by pressing Zoom rotary knob.
- Screen button METHOD is used to change between `replace` and `insert` characters into the written text.
- Copy to USB is used to copy a current note to USB stick and the file will appear on the stick in .txt format.
- Load is to upload .txt file from USB stick.
- Save & Exit – is used to save the current notes and also exit back to the setup menu.

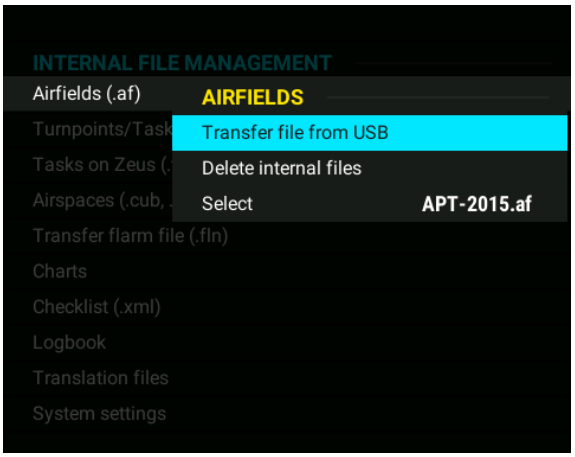


2.3.5 Transfer

The only way to transfer data from and to LX 528 is via USB stick. Any regular regular USB stick formatted in FAT file system format can be used. One such USB stick is delivered with each LX 528 and is already formatted. (use a slim USB stick for LX 528 2.8). After selecting the item of interest, by a press on the Zoom rotary knob, the procedure will start.



The transfer procedure is as follows:



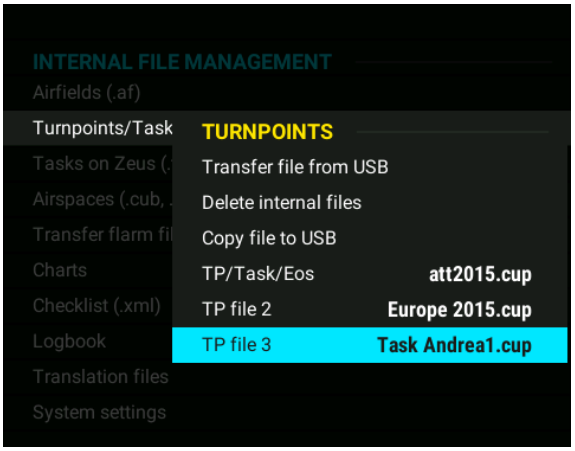
- Insert USB stick
- Press SETUP button
- Select Transfer
- Press Zoom rotary knob
- Select what is to be transferred (example airfields), and press Zoom rotary knob
- Select "transfer file from USB" and press the Zoom rotary knob
- Example: all .af files stored on the USB stick will be shown
- Select the **file of interest** and press on the Zoom rotary knob
- The transfer will follow and a window and a **green check** will show
- Go to **Select**, press Zoom rotary knob and select the file
- The file is now activated (green check at select row)

Important!

Only one .af file can be active at a time. After the transfer has finished you should **activate** using **Select** function. A green check means the file is active.

How to delete files (APT, WP, AS):

Files can be removed from the LX 528 using the **Delete internal files** command. The command is executable for Airports, Turn points and Airspace.



2.3.5.1 Transfer Airport data

The airport database in **.af** format for the LX 528 is at webpage www.lxnavigation.com**.** It is free of charge with no code required.

2.3.5.2 Transfer Waypoint data

The Waypoint data should be included in a file with extension **.cup or .cupx**.

Three WP files can be active at the same time. Turn-points of any of the three files will be available for navigation without any limitations.

Transfer specific Routes

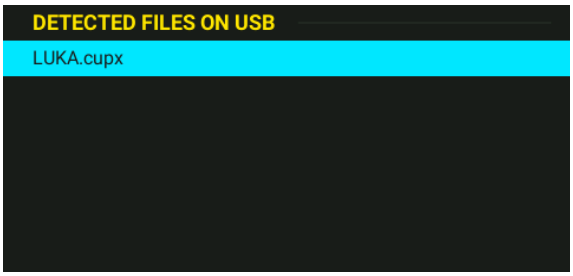
Routes can be uploaded to LX 528 via a USB key.

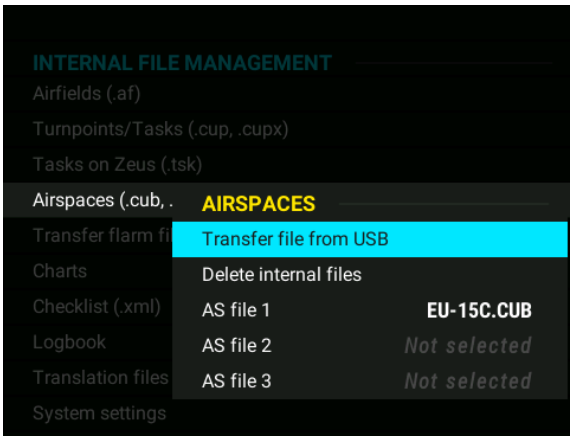
Note!

The first WP file is also called ROUTE file, which means, if you want to import Routes from file, that you have to select your file at **WP/Route/Eos**. This file is also sent to LX Eos. In backup mode, you can use points from this file to navigate. Note that only the first 1000 points are sent to LX Eos.

To transfer a specific Route, follow these steps:

- **Export:**
  - Insert USB stick
  - Press RTE button and select Save to USB. This will save the Route which is active in **.cup** format, together with turn-points used in this Routes
  - Remove USB stick
- **Import:**
  - Insert USB stick
  - Press SETUP button and go to Transfer
  - Go to Turn-points/Routes (.cup, .cupx)
  - Go to transfer file from USB
  - Select the intended Route
  - Go to the WP/Route/Salus file window and activate the intended Route

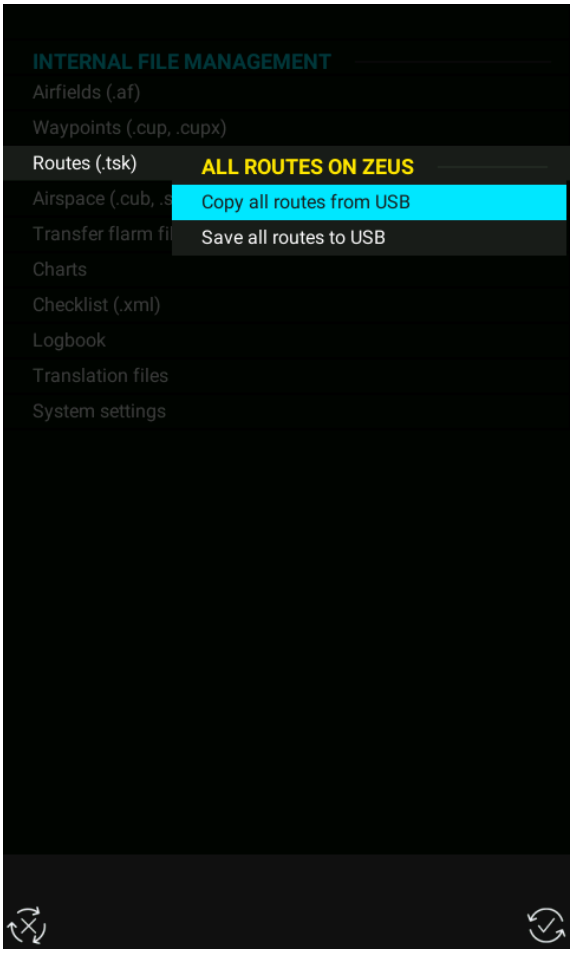




Transfer all Routes

This is used to transfer all Routes from one LX 528 to another
LX 528 device.

- **Export:**
  - Insert USB stick
  - Press SETUP button and go to Transfer
  - Go to Routes on LX 528 (.RTE)
  - Select Save all Routes to USB (this will save all Routes as one file in **.RTE** format)
  - Remove USB
- **Import**
  - Insert USB
  - Press SETUP button and go to Transfer
  - Go to Route on LX 528 (.RTE)
  - Select Copy all Routes from USB



This is valid only for Routes made on LX 528, Routes made on SeeYou or Strepla have to be uploaded as WP (WP/Route file) using .cup format.

2.3.5.3 Transfer Airspace files

To transfer airspace data, use the Airspace option in the Transfer menu. The files should be in **.cub, .sua or OpenTXT** format. The latest known airspace data is

available free on www.lxnavigation.com. The airspace files normally cover the whole continent.

Three **airspace** sections can be active at the same time. Special event airspace, such as for competitions, can also be loaded.

2.3.5.4 Transfer Flarmnet files

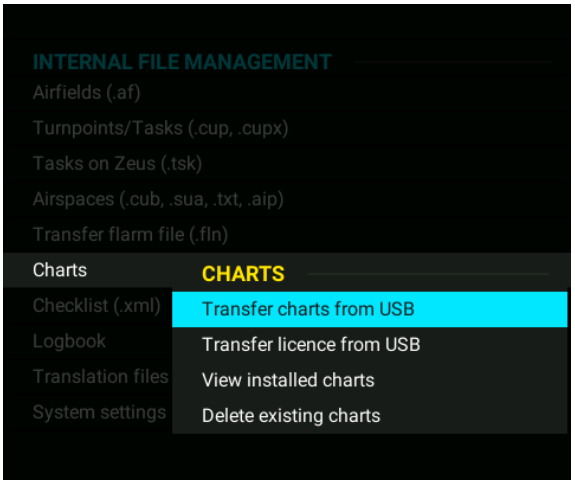
Files with extension **.fln** include Flarm customized IDs and some added data about flarm objects which makes it possible to identify Airplanes in the vicinity with their original IDs (usually competition ID). The file is available on htWP://www.flarmnet.org

2.3.5.5 Transfer Charts

ICAO charts can also be used on the LX 528. The file for the charts has to be .ras format. The ICAO charts can be activated after importing a license file which must be purchased from LX Navigation. The license file should be transferred via USB stick.

A chart license can be transferred by going to Charts and selecting Transfer licence from USB. Current charts can be checked and deleted in the same window.

LX Navigation supports ICAO charts from Deutsche Flugsicherung and Rogers Data.



2.3.5.6 Transfer Checklist

Checklists can be prepared on a personal computer using the special PC software available free from the LX Navigation website. Files must be written in .xml format. They can be uploaded into LX 528 by choosing Checklist (.xml) in this menu. It is also possible to transfer checklists from LX 528 to USB.

2.3.5.7 Transfer Logbook

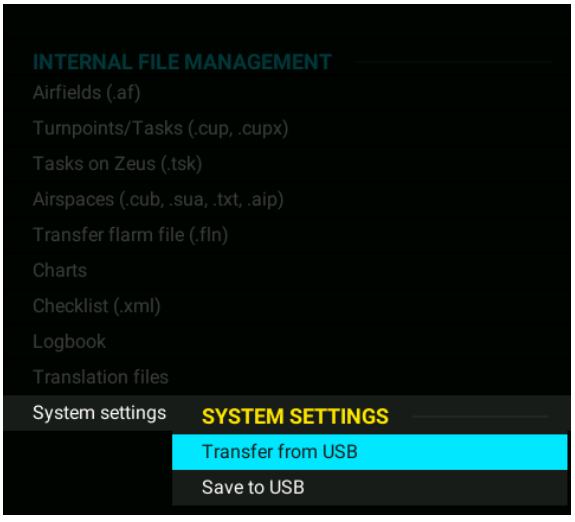
Flights can be transferred from the Logbook under the Statistics page or from this menu.

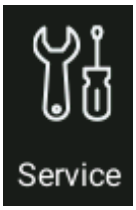
2.3.5.8 Transfer translation files

A file can be translated via special software from LX Navigation (free on request). Once a file is completed it can be transferred into LX 528 using this menu.

2.3.5.9 System settings

This option should be used to transfer the complete system settings from one LX 528 to another.





2.3.6 Service

Useful tools can be accessed under this section, such as:

- Compass calibration
- Level adjustment of units with AHRS
- Detected hardware

With the use of **admin passwords,** the LX 528 can be set back to factory settings with the password 46486. This will also delete all flights from Colibri II and Salus if they are connected to the system.

Useful passwords:

- Factory reset _____46486
- Grab image _____315
- Delete all flights_____99999
- AHRS disable _____2478
- Voltage offset _____8658
- Screen rotate _____9109
- Saving crash report ____27274
- Audio player on Salus__28346

2.3.6.1 Screen rotation

The screen can be rotated after inserting the correct password. When a password is entered a reboot of the unit is needed.

Use Password: 9109

Factory reset WARNING!

All files (WP, AS, APT) will be deleted and also pilots will be set to UNKNOWN – all pilot settings will go back to factory settings (save current settings before doing factory reset to USB stick at Setup>Pilot> Save user.)

Note

If LX Joy is not working after an update, use password 569 to force update.

2.3.6.2 Crash report

Saving a LX 528 system crash report to a USB stick can be done by using admin password "27274".

If a system crash occurs, please send LX Navigation the file.

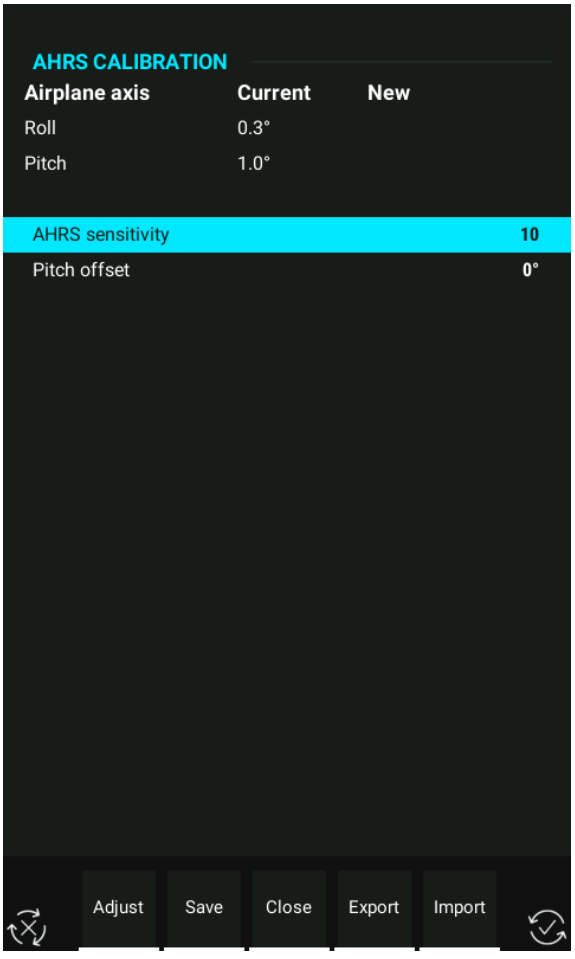
Once safely on the ground, put a USB stick into the LX 528 and use the password in Settings->Service->Admin password to save crash report to USB key. This will help us to solve the problem and unwanted restarts.

2.3.6.3 Compass calibration

The compass module has to be connected to the main unit via the 485 bus (in the case of a double seater, connect to first seat). The module has to be installed horizontally without any pitch and, once done, enter the compass calibration menu. Position the Airplane to north and press SET, after that the Airplane will need to be positioned in all main magnetic directions as seen on the screen. When the Airplane is aligned correctly press SET. When a window with the sentence 'Calibration completed' is displayed, press 'SAVE' using the screen button and the system will exit back to the setup menu.

2.3.6.4 AHRS Level adjust (Pitch and Roll)

If the AHRS is not correctly aligned with the Airplane, then it has to be adjusted.



Changes in pitch in flight are influenced by changes of aircraft mass and changes of airspeed. This reference pitch corresponds to a single airspeed (indicated airspeed actually) and one aircraft mass. When the Airplane flies faster or slower, or if the Airplane is heavier or lighter, then the pitch angle deviates from the reference.

Adjustment procedure is:

- The internal reference level of LX 528 instrument is most likely not to be ideal; therefore, adjustment will be needed. On the ground, put the Airplane fuselage in the position which best matches the angle of incidence for the reference airspeed. (Do not worry, if this is slightly wrong.) Adjust the LX 528 to this level.

- Make a test flight with the Airplane. The aircraft mass should be as close to the reference mass as possible. Fly at the reference airspeed and observe the pitch indicated by LX 528. Record this pitch on paper. This observed pitch is the error, which needs to be corrected.

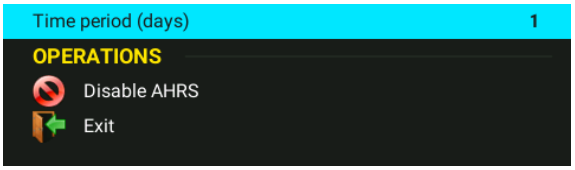
- Repeat the LX 528 level adjustment, but now put the Airplane in such a position (lift or lower nose or tail wheel) that the pitch on the LX 528 indicates the same angle as observed during the previous flight. Be careful to keep the wings level. This is now the reference position.

- Do not move the aircraft and adjust the LX 528 to be perfectly levelled, as follows, under Instrument Procedure

Instrument procedure:

Go to SETUP / SERVICE / Level adjust

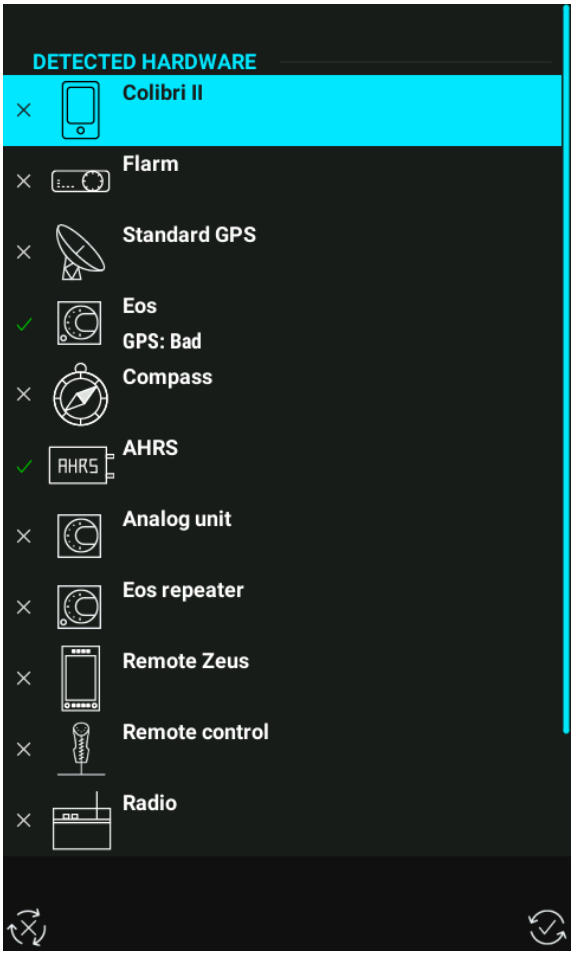
- When the Airplane is ready to have its AHRS calibrated press the on-screen button **adjust** (VARIO/FLARM)
- Wait until status bar reaches 100 %
- A message stating SUCCESS will appear
- If satisfied with the new settings press the **save** (RTE/MOVE) screen button
- A message stating Parameters Saved will appear



Disable AHRS

To disable AHRS simply do as follows:

- Push on zoom rotary switch
- Go to setup
- Go to Admin password
- Enter password 2478 and confirm with a push on the Zoom rotary knob
- A disable AIRU window will open, there can be set:
    - Choose a **time period** (in days) for how long you wish to disable AHRS
    - **Disable AIRU** (AHRS) until next activation

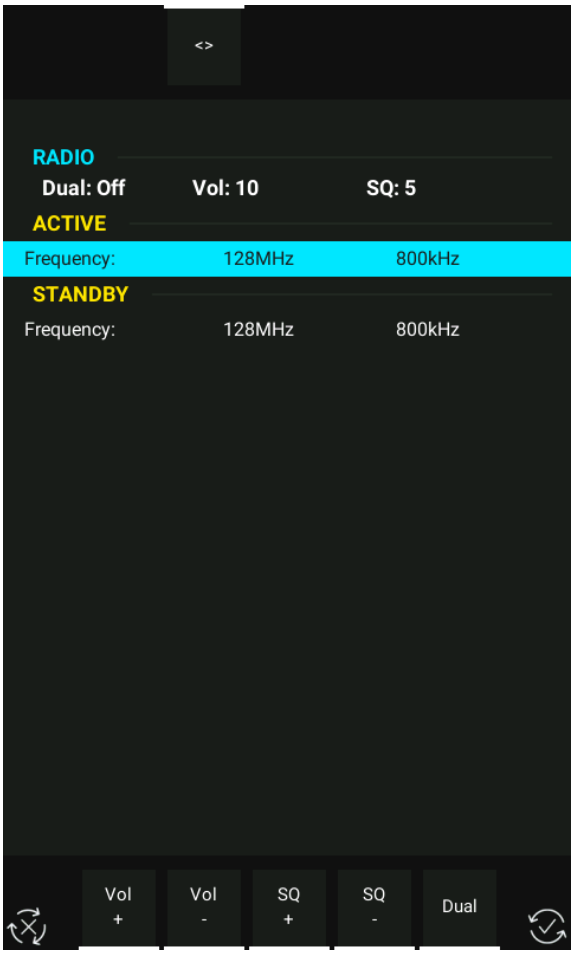


2.3.6.5 Detected hardware

In this section is shown what hardware is connected (recognized) by the LX 528 system.

2.3.6.6 Radio (KRT2, ATR833)

KRT2 or ATR833 radios can be controlled from LX 528. It is possible to adjust some functions (this is the dialog available from the shortcuts menu):



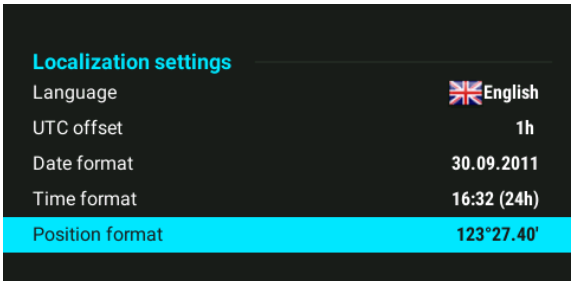
- Volume
- Squelch
- Dual: If it is ON the radio listens to 2 frequencies at once. The Active one has the priority. This means that the radio will receive and transmit from the active frequency and only receive from the passive frequency (active one is priority receiver)
- Switch between Active and Passive frequency
- Set Active or Passive frequency values
- Set Active or Passive frequency name (only available when KRT2 is connected)

> **Radio wiring diagram:**
>
> Please check LX Eos manual for wiring diagram. For easy installation, it is possible to get a special LX Eos-Radio cable from LX Navigation.

(Note: other radio types will be added in due course)

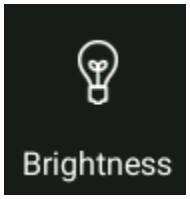
2.3.7 Localization Settings

The following settings can be adjusted:



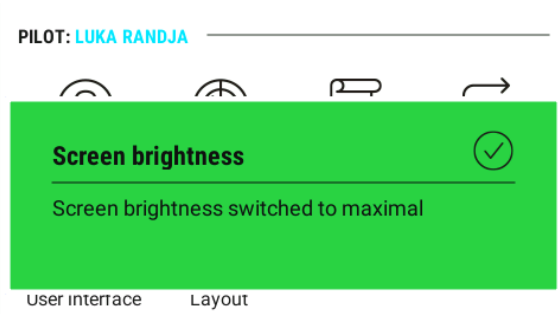
- Language
- UTC offset to get local time
- Date format
- Time format
- Position format

A restart is needed once any changes have been made.



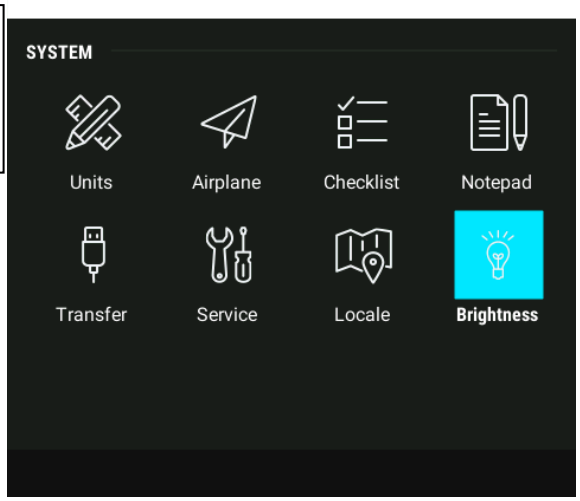
2.3.8 Brightness

The display used in LX 528 is a high-quality sunshine readable display and its backlight will satisfy the pilot's requirements in all flying conditions. In the special case of increased backlight being needed, the pilot is able to increase the intensity for a limited time (30 minutes). After 30 minutes the backlight will go back to the default brightness. Brightness can be set by pressing the brightness icon in System settings.



Note!

Not valid for LX Zeus 4.3 and LX Zeus 2.8. They do not have the brightness adjustment option.



3 Navigation modes

LX 528 offers three modes for navigation. These modes are:

- **APT**: navigation to airports stored in APT memory
- **WP**: navigation to Waypoints (WP)
- **RTE**: Route navigation after Route has been entered.

Switch between modes by pressing the **A-W-R** push button.

3.1 Navigation in APT / WP or RTE mode

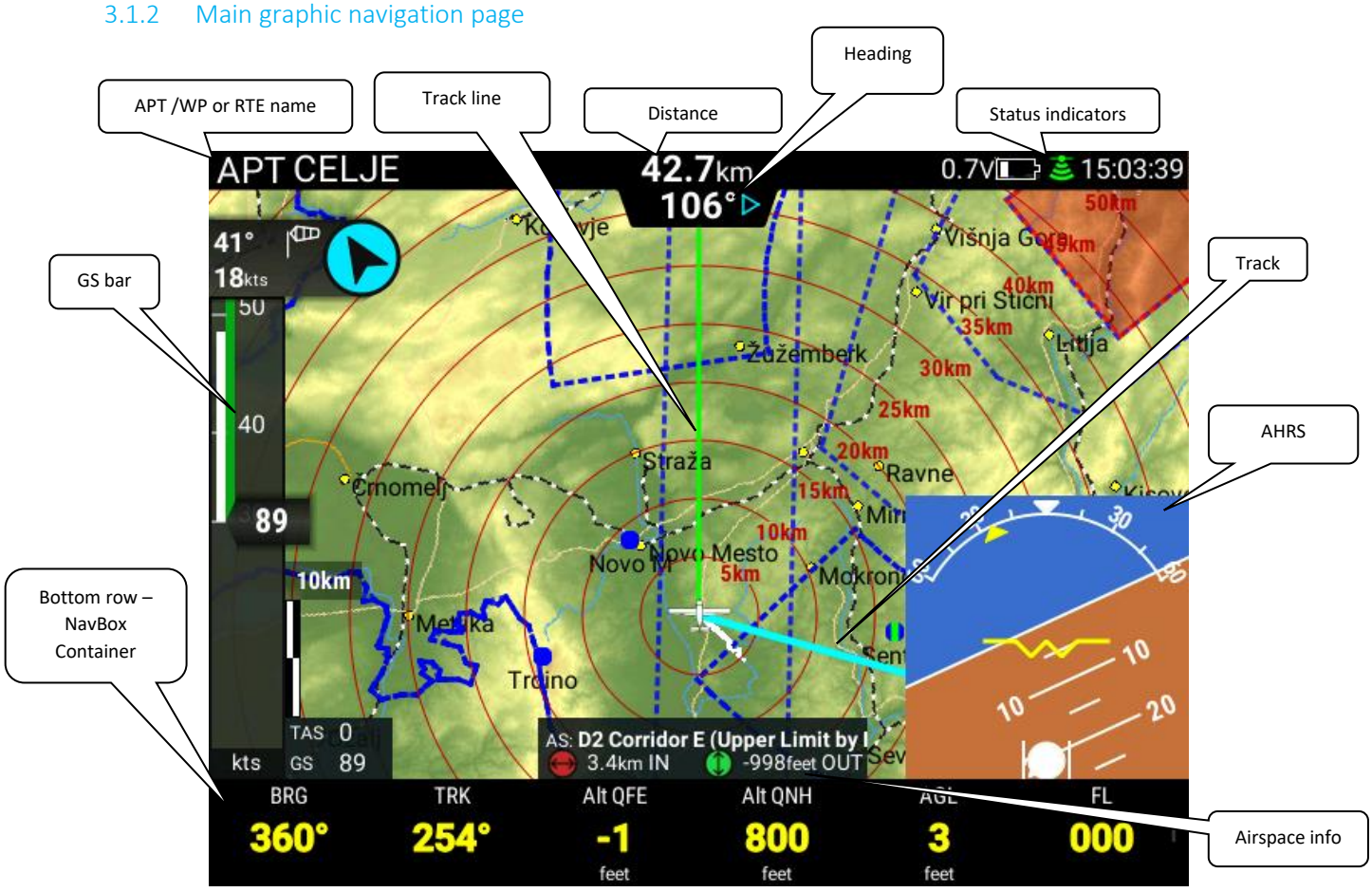
There are three navigation pages possible (APT, WP or ROUTE) and also 2 subpages are possible and all are selectable using the **SUBP** button.

3.1.1 Sort by filter

In every selection, the following filters can be used to find the desired airport or turn-point:

- Name (alphabetical sorted from number-A-Z)
- Distance (closest WP will be shown as the first)
- Track (WPs -30 to +30 degrees from current track will be shown sorted by distance)
- Arrival Altitude

3.1.2 Main graphic navigation page



The bottom row consists of **NavBoxes**. Bottom rows are selectable by pushing button **NAVBOX**. All NavBox positions are customisable by following the simple procedure set out below.

Editing NavBox:

- Give a long press on the Zoom rotary knob **(blue frame will appear)**
- Select the desired NavBox position by moving the blue frame using the Zoom rotary Select position to be edited followed by a short press of the Zoom rotary knob
- Select the desired NavBox from the list. Confirm selection by pressing the Zoom rotary knob or cancel the procedure by pressing the Volume rotary knob
- If the row is full, press the NAVBOX push button and add to a new empty NavBox container that will appear. Use the same procedure for adding/editing described above
- To finish the editing process, press Volume rotary knob

3.1.3 Second navigation page (1st subpage)

The second navigation page is divided into two sections. The upper section consists of a vertical profile showing the terrain, glide path distance, airspace, selected WP/APT and cone.

The cone depends on the MacCready (MC) settings. The lower line is a MC setting of 0.0 and upper the line represents the selected MC value. If the Airplane icon is between the upper and lower lines it means that it is still below glide path for the selected MC, but that it could still reach its destination if a lower MC setting was set. If the Airplane is below the lower line it is too low and it will not reach the intended destination.

The lower section shows additional APT / WP data such as:

- Grass or asphalt runway with directions
- Elevation
- QNH alt
- Flight level
- QFE alt
- Frequency of the APT
- Your current radial
- Your current distance from selected APT / WP

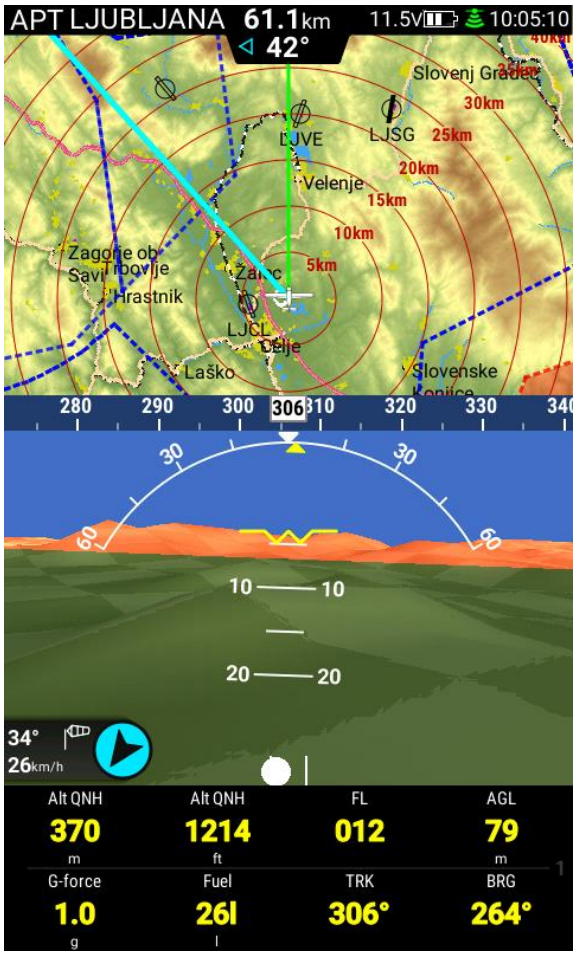
The lower section in RTE mode shows a circling log page, wind profile page and a statistics page. Use the **NAVBOX** button to switch between information pages on this subpage.

Statistics contain:

- Legs
- Speed
- Distance flown
- Duration
- Vario average
- Circling on Route in percentage

3.1.4 Third navigation page (2nd subpage)

The third navigation page shows terrain data that is split between a map and an AHRS (artificial horizon and reference system). If the LX AHRS is not connected to the LX 528 system, only the terrain profile is shown.



The pilot can select full or half screen for 3D view with AHRS.

> **Note!**
>
> This 2nd subpage can be disabled under Setup>User Interface.

3.2 APT mode (navigation to airports)

LX 528' airport database is stored in a special **.af file** format (LX Navigation **a**irport **f**ormat). Only one .af can be active at the same time. To transfer and/or select new .af file go to Setup>Transfer>Airports.

APT mode consists of three navigation pages:

- main page is map navigation page,
- 1st page is a subpage with information about selected airport and glide path,
- 2nd page is a subpage with a map and a 3D view (with AHRS) or vertical profile.

Switch between pages by pressing the **SUBP** button.

Note: The second subpage (3D terrain) can be disabled (see Setup>User interface).

Airports are marked with a symbol (filled black line means airport with asphalt, a line without fill is a grass runway):

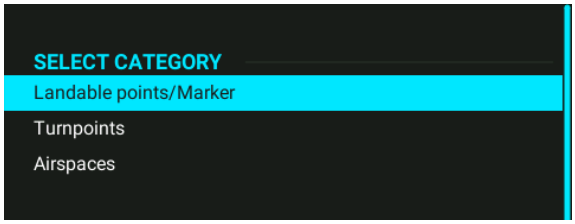
The RWY orientation shown matches the real situation. Extended Airport data is available in the lower section of the second subpage. Pressing the **NAVBOX** button on the second subpage will bring up some additional screens (wind profile, thermal history, etc.).

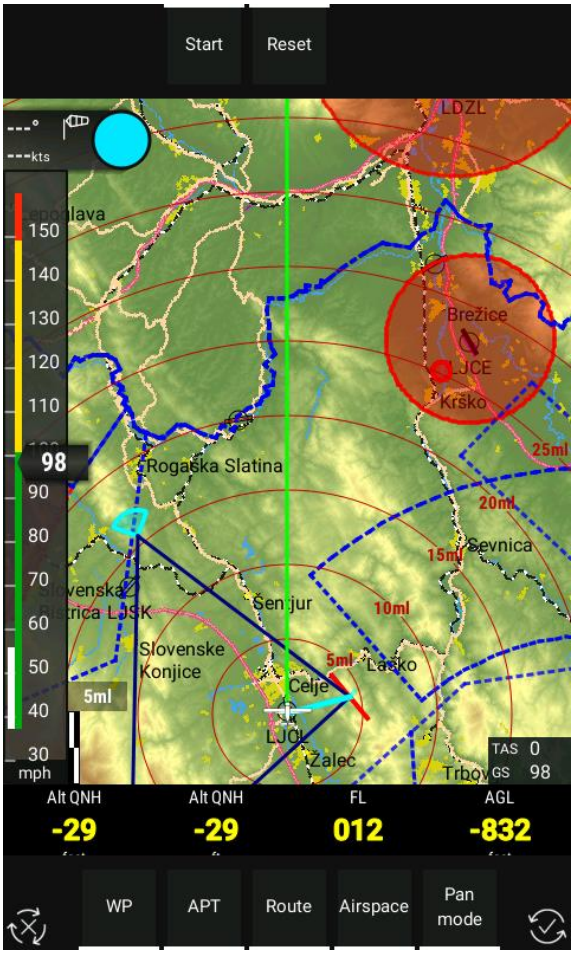
3.3 How to select an airport?

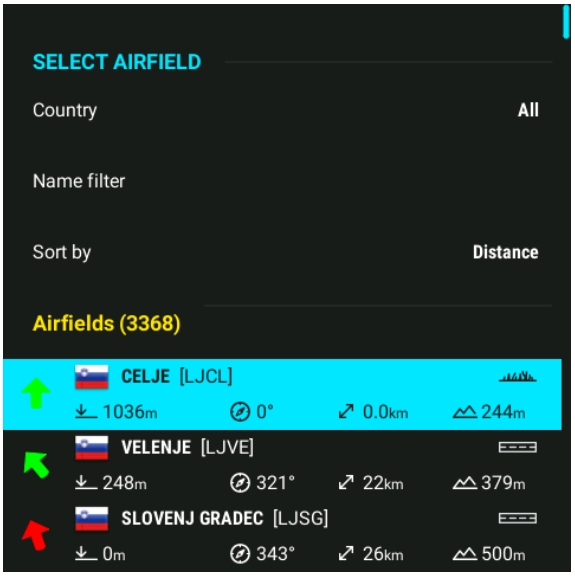
Airport selection is available from any mode of operation and also from any subpage. Press the **SELECT** button (short press) and the selected menu will open. Use screen button **APT** with a short press of **RTE/MOVE** to start the selection dialogue. If already on the RTE navigation page, give a short press on the Volume rotary knob which is a shortcut to the APT selection menu.

Reachable APTs from the current position are shown in green, non-reachable are labelled red.

Scroll with the **Zoom** rotary knob to select a filter such as: **Country, Name, Distance, and Track or Arrival altitude** to reduce the number of offered Airports. If using a **sort by distance** filter, then it is not possible to use a named filter. Using a country filter will show airports only from the selected country. After the airport of interest is found confirm the choice with a short press on the Zoom rotary knob. The APT screen will open giving navigation to the chosen destination.





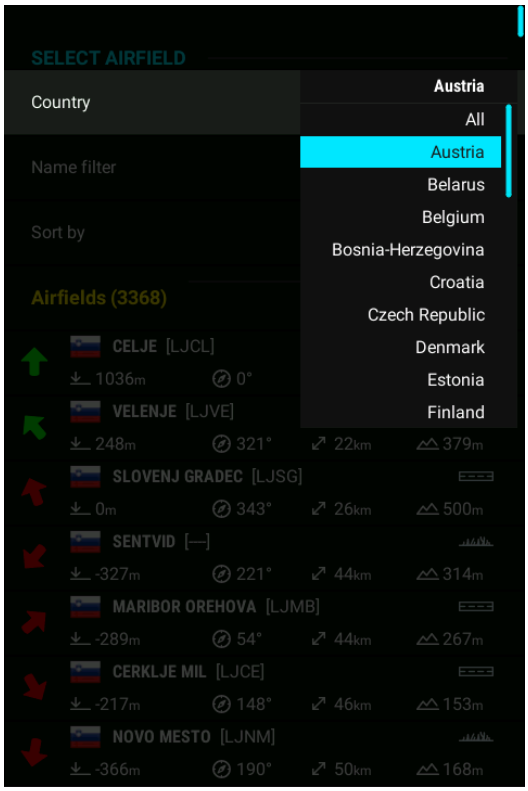


Note!

When using the **Name** filter, input first letters of the airport name. Use the Zoom rotary knob to scroll and press it for confirmation. You don't need to input all characters, just first two or three and after that you can go on by pressing the Zoom rotary knob. Input of more characters reduces the number of possible airports.

3.3.1 APT selection from NEAR function

LX 528 also offers **NEAR** function. After a long press on the **SELECT/NEAR** button, the nearest **Landable points and User markers** will be offered. The list includes airports from the airport database, turn-points that are declared as landable and Markers.



Note!

Selection is limited to 200 nearest points

3.4 WP mode (navigation to Waypoints)

WP and APT modes are similar in structure. The only important difference is that the navigation is towards turn-points that are stored in the turn-point files. Turn-point files (.cup or .cupx) should be uploaded via a USB stick. (See **Setup**>**Transfer** for details.) An almost unlimited number of .cup/.cupx files can be uploaded. Because turn-points can have different **attributes,** the symbols that represent the various types are different.

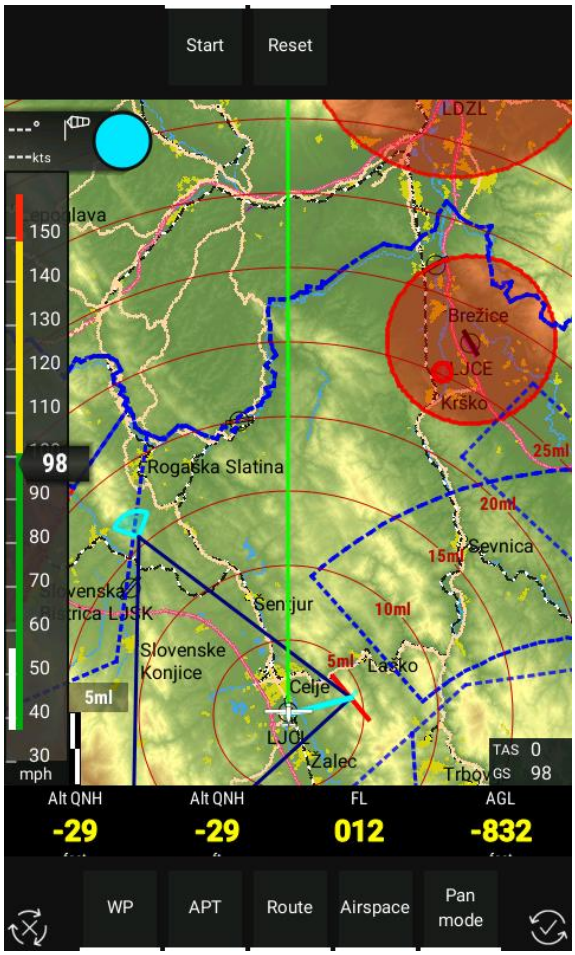
WP mode consists of three navigation pages (main page is map navigation page, 1st subpage with information about selected airport and glide path, 2nd subpage with a map and a 3D view (with AHRS) or vertical profile. Switch between pages by pressing the **SUBP** button.

If using **.cupx** files turn-point images are shown on 1st subpage. A .cupx file can be prepared on a PC or on LX 528. To add pictures to turn-points use Select WP menu. On the bottom of the menu is shown the **Upload photo** screen button. Use it to transfer pictures from an USB stick to the selected turn-point.

Note: The second subpage (3D terrain) can be disabled (see Setup>User interface).

Extended WP data is available in the lower section of the first subpage. The upper part of the display (1st subpage) is vertical terrain profile.

To activate the screen buttons for the WP options the Zoom rotary knob should be pressed when on WP screen (not at APT or RTE).

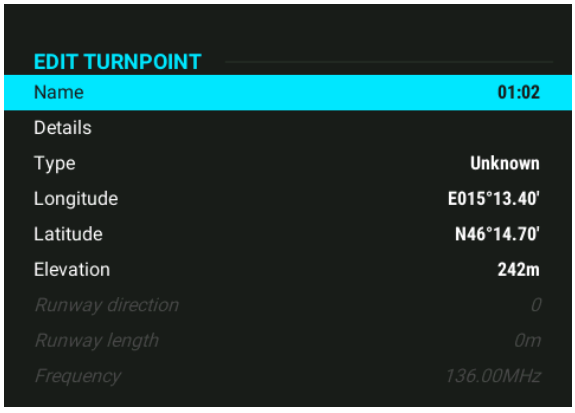


Note!

Up to **three** turn-point files can be active at the same time. The activation should be performed under Setup>Transfer. Turn-points included in all three files will be available for navigation. The first file (WP/RTE/Eos) will import Routes. Imported Routes are available in RTE navigation mode.

3.4.1.1 Edit WP

Press Zoom rotary knob on main WP navigation screen, select screen button **Edit WP** and a new window called Edit turn point will open.



3.4.1.2 Create User Waypoints

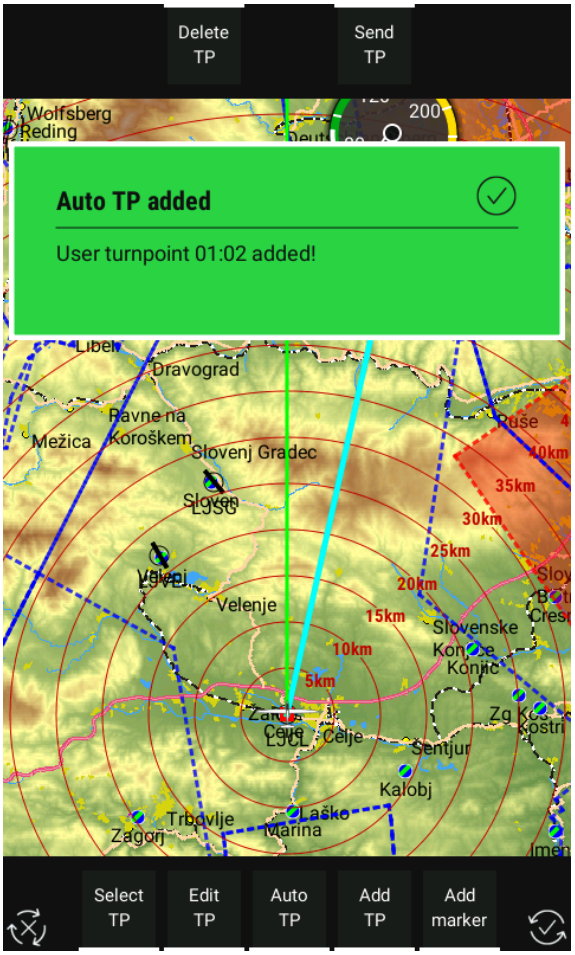
User turn-points are turn-points that are created by the pilot on LX 528

Auto WP

If Auto WP is selected, a user WP will be created, with the current position and the current time as its name. To edit an Auto created WP use the Edit WP function.

By hand

Press the **Zoom** rotary knob on the main WP navigation page and a menu with screen buttons will open. Press **Add WP.**



The following information can be entered:

- Name.
- Details (not obligatory).
- Type (grass, field, tower…).
- Longitude, Latitude.
- Elevation.

Other input fields may not be highlighted due to the turn-point type being added. **Finish** the process with **Add** turn-point.

Note!

Type option offers plenty of turn-point designators. The designator defines the symbol that will appear on the display. A landable point will be shown on the list in NEAR function.

3.4.1.3 Add Marker

The philosophy of having a marker is to mark a position, to which the pilot might need navigation assistance (landable field, etc.).

For example, if flying towards a non-landable area, and the last landable field is seen below, then, over this landable field, a marker can be created. It would then be easy to navigate back to that marker, which can be selected at NEAR/WP, or at select WP.

There can only be one marker at a time. If another marker is created, the first one will be replaced by it. The marker can be changed to a regular more permanent WP via EDIT WP. Such a turn-point can be deleted via DELETE WP.

3.4.1.4 Delete WP

Only user created turn-points and markers can be deleted. To delete a WP the Zoom rotary knob should be pressed, then select screen button DELETE WP and a new window will open. Select the WP by rotating the Zoom rotary knob and confirm it with a short press.

3.4.1.5 Send WP

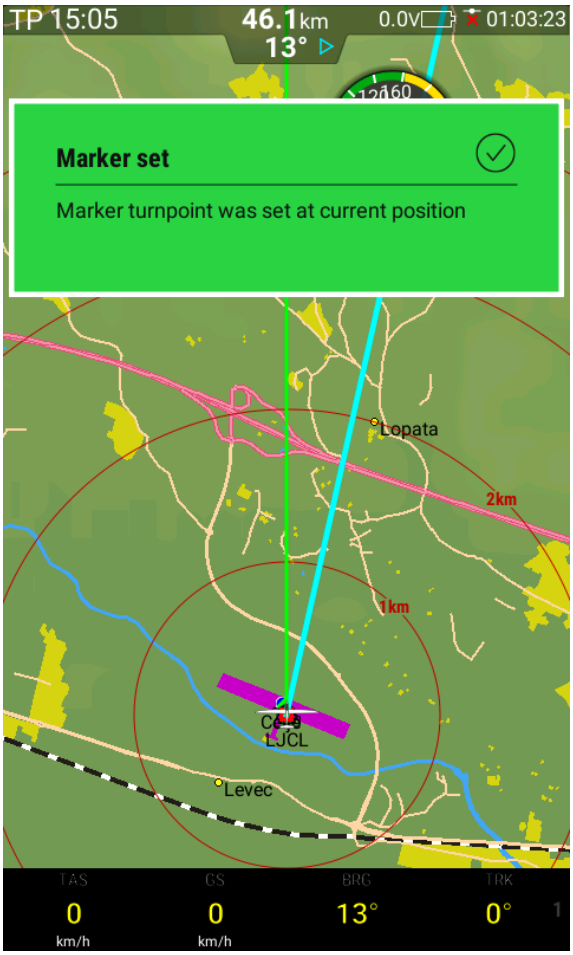
If Send WP is selected, then the current selected WP will be sent to the second seat (all info about the WP will be sent).

3.4.2 Selecting Turn-points

The selection process is similar to APT. Use **SELECT** button to start the process and press on-screen button **WP**. Country, Name and sort by distance, track, arrival altitude filters will expedite selection. Turn-points are displayed by symbols. If on a WP navigation main page the shortcut (press Volume rotary knob) can be used.

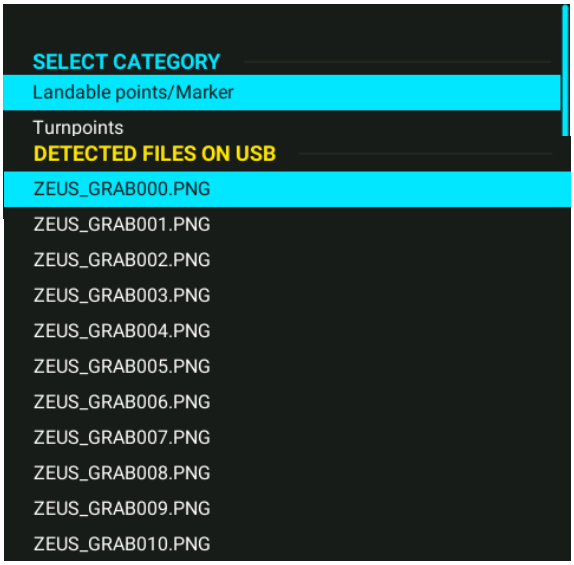
Important!

Turn-points without **country designators** are selectable only when using **Country "All"** option. This is also valid for user turn-points. Check and correct all files manually before uploading them to LX Zeus.



3.4.2.1 Selection from Near

LX 528 Near function offers Turn-point selection based on distance. It is also uses a Country filter, use **All** if you want to select from all turn-points.



3.4.3 Uploading WP photo

It is possible to upload a photo and assign it to a WP. The procedure to upload a photo:Insert USB stick

- Press SELECT button
- Select WP
- Choose with the Zoom rotary knob to display the
  WP you wish to assign new photo to
- Select - Upload photo
- Choose the photo on USB stick
- Confirm with a push on the Zoom rotary knob

3.5 RTE mode (navigation on Route)

Every Route consists of at least a start point and the finish point. There may be multiple turn-points between the start and finish point. Take-off and landing points can be added (this doesn't have any influence on Route statistics).

Note!

Routes that you want to upload to LX Zeus should be a part of a .cup file and should be selected under SETUP>TRANSFER as **WP/RTE/Eos file. It is very important that you name Routes, otherwise the Zeus won't recognize them.**

3.5.1 Route organization

LX 528 has a storing capacity for 100 Routes. 51 Routes can be imported from one **.cup** file and such Routes are called **imported** (IMP), the user of LX 528 can create another 49 Routes. They are called User (USR) Routes. After creating or selecting RTE, the RTE will be automatically declared (and sent to all connected flight recorders).

To delete all existing USR Routes go to Select RTE dialog and then select Clear all. LX 528 then asks confirmation and deletes all USR Routes.

3.5.1.1 Route declaration

Declaring the Route is an automatic process. After a Route is constructed, and exit is pressed (Volume rotary knob), a message on the LX 528 screen appears: ROUTE DECLARED! This means that LX 528 will start sending the declaration data to connected flight recorders. The declaration is sent to Salus, Colibri II, Colibri X, Era etc. automatically – with all WPs, edited zones, limitations etc...

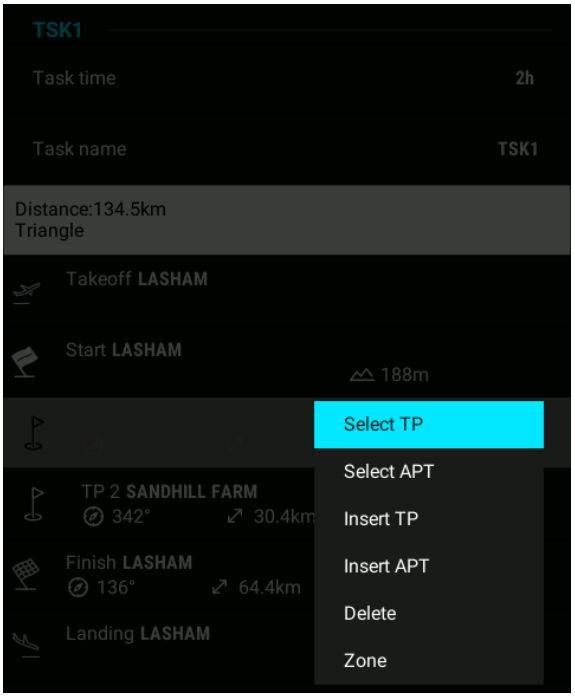
Salus and Colibri II have the priority and will receive the data first. After this, the declaration data will be sent to FLARM. This process will take about 30 seconds. After the process is finished all LED lights will switch off on the FLARM display and the red POWER light will start blinking. This means that the process of sending Route declaration to FLARM is finished.

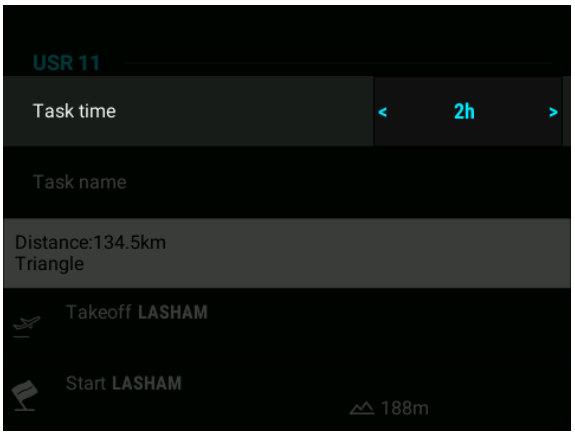
3.5.2 Route selection

To select a Route from the LX 528 internal Route database, the pilot should use the **SELECT** button and then select the screen button **RTE**. Use the Zoom rotary knob to select the Route of interest. Confirm selected Route by pressing the Zoom rotary knob and another window with Route details will be shown. Choose the option for the Finish altitude of the Route to be less than 1000m below the altitude at which start line was crossed. (as appropriate). The Final Glide will be calculated in correspondence with this altitude, but only if the option is selected. Exit by pressing the Volume rotary knob twice, or wait until the window closes automatically (if auto close inactivity timeout is enabled).

3.5.3 Route creation by hand

To create a new Route press **RTE/MOVE (short press)** or give a short press on the **Zoom** rotary knob if you are on RTE main navigation page**.** The Route can be created by hand by using **NEW** or **EDIT** screen buttons. Edit will make it possible to edit an existing Route and New will offer the creation of a new Route. Both Routes will be saved under the USER part of the Route internal database (if editing an IMP Route, it will automatically change from IMP to USR).





The procedure:

- Press RTE/MOVE button
- Select screen button NEW (RTE/MOVE) or EDIT Route (VARIO/FLARM)
- If an AAT Route, then add time by pressing the Zoom rotary knob and rotate Zoom/Volume rotary knob, terminate by pressing Zoom rotary knob
- Rotate Zoom rotary knob to add Route name – press Zoom rotary knob and add name
- Rotate Zoom rotary knob to WPs – press Zoom rotary knob and Select/Insert WP or APT
- To finish the Route creation procedure, press the Volume rotary knob – a message informing that the Route is declared will be shown

3.5.3.1 Creating a Route in Pan mode

It is possible to create a Route in Pan mode by following these steps:

- Press SELECT button on RTE screen
- Select Pan mode on screen button
- Navigate to the point on the map using the Zoom/Volume rotary knobs
- Select New Route
- Select Add WP (the first WP you select will be your Start and Finish point)
- Add as many WPs as required
- When adding WP's has been completed select Finish Route
- The Route can be edited in edit mode - Start, finish, WP's, zones

Note!

An active zone has a different colour to an inactive zone (colours can be adjusted under Setup / User Interface / Route Colours.)

Note!

You can see the entire Route on the map at once by using ROUTE ZOOM. Access ROUTE ZOOM by rotating Zoom rotary knob. The Route zoom is active only on the ground!

3.5.3.2 Create and Edit Zones

The ZONE function makes it possible to create any known geometry for Waypoints, start and finish point. The zone can be edited by selecting **RTE EDIT/ select WP / ZONE**.

After a press on the Next zone or Previous zone buttons, the pilot can change zone settings quickly without any additional actions.

For START and FINISH zones the pilot can select if this zone is a straight line or not.

Auto next option enables the LX 528 automatically to switch to the next Waypoint once the sector has been reached. This function is active by default if the **sector's radius is below 10 km (racing Route)**. Larger sectors do not have this option as a default. If **Auto next NO** is active, **MOVE** function (for AAT) will become active and that makes it possible to modify the Route distance even before flight.

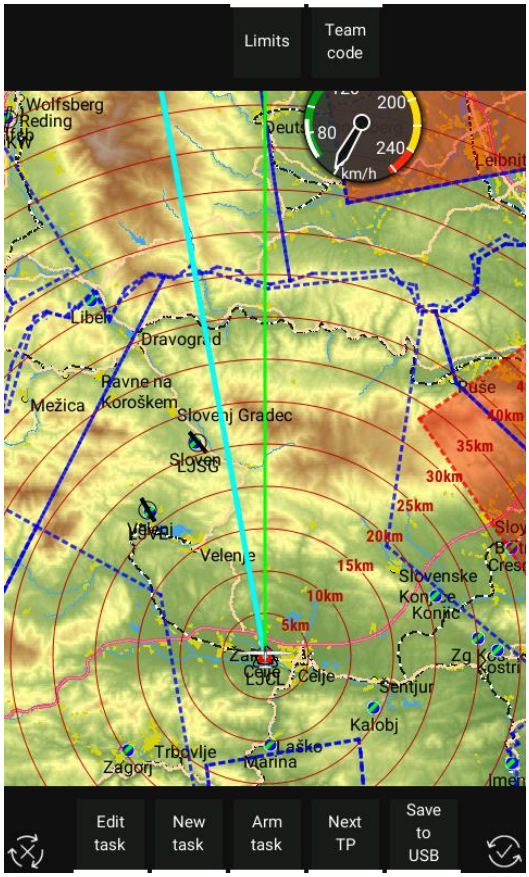
MOVE during an active RTE is also possible. A long press on the push button **RTE/MOVE** will open a Move window. The 'custom Waypoint' can then be moved by rotating the Zoom and Volume rotary knobs. The important information is displayed next to the moved Waypoint (Total distance, Required speed, final glide at MC 0.0 and selected MC).

Note!
Default Route zones can be adjusted under Setup / User Interface. You are able to adjust default start, waypoint and finish zone to make Route creation easier.

Note!
AAT Route – if the sector is bigger than 10 km, then AUTO next won't be active. If the sector is smaller than 10 km, then you have to uncheck MOVE in the ZONE menu

3.5.4 Route Functions

Automatic and manual starts are possible by using functions ARM and NEXT WP. All functions are available by pressing the Zoom rotary knob when on the RTE navigation page or by pressing the **RTE/MOVE** button on other pages.



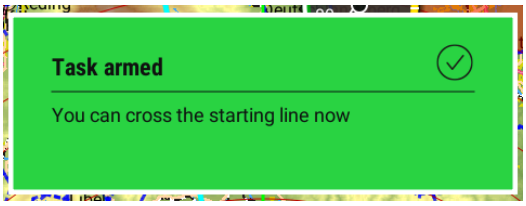
3.5.4.1 Route Start

To start a Route automatically use the ARM command which is displayed after a press of the RTE button. Arm means that the Route will be started automatically after crossing the start line.

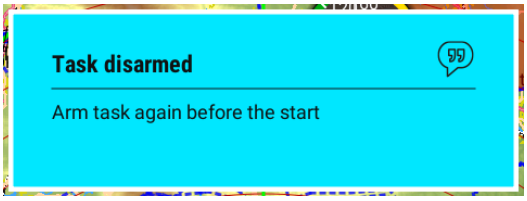
The start line can be crossed multiple times, the time of the last valid start will be used for calculation of statistics. Every valid start is indicated by a green message on the screen.

Under Settings>User Interface>Track/destination settings can be selected whether navigation is aimed at the zone's center or the zone`s closest point.

During flight the Route can be disarmed. Activation of ARM and DISARM are clearly shown on the display in a message and by an ARMED icon.

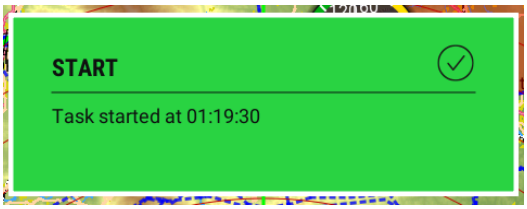


If pressing ARM before crossing the start line is forgetten, and the Airplane is already on the Route, then the second option is to press Next WP. Next WP command will change over to next WP every time when activated, regardless of whether the Airplane is in the sector or not. It will also take the latest start line crossing time, to ensure that Route statistics will be correct.



3.5.4.2 Route Restart

After a Route has been started a restart can be done at any time. Use the **Restart** button in the RTE menu. The **Restart button** will become active once the Route has started. After restarting all Route statistics data will be deleted and ARM status will become active again making it possible to do another automatic start.



Note!

In later versions of lx 528 software 'Task' was changed to 'Route' and 'Turnpoint' to 'Waypoint'.

3.5.4.3 Saving RTE to USB

LX 528 offers the option to save created or edited Routes to a USB. A USB stick has to be inserted into the USB port. After the creation of a Route, press the Volume rotary knob to get out of edit menu and declare the Route. After that, press RTE button and press Save to USB using the screen button. The Route will be saved to the USB stick as a .cup file with current Route and all WPs and zones on this Route.

3.5.4.4 Clear RTE

When in Route editing menu, the whole Route can be erased. First press Clear Route screen button, then press YES to confirm the choice or NO to terminate the process without erasing the Route.

3.5.5 Desired track (DTK) (during flight)

When flying an AAT, big sectors are set and therefore the pilot has to decide where to turn to the next turn-point. The MOVE function helps the pilot to find an optimum solution. After a long press on the **RTE/MOVE** button the MOVE function will become active. Use Zoom and Volume rotary knobs to move the turn-point. All Route relevant data that is affected by the move is displayed next to the zone.

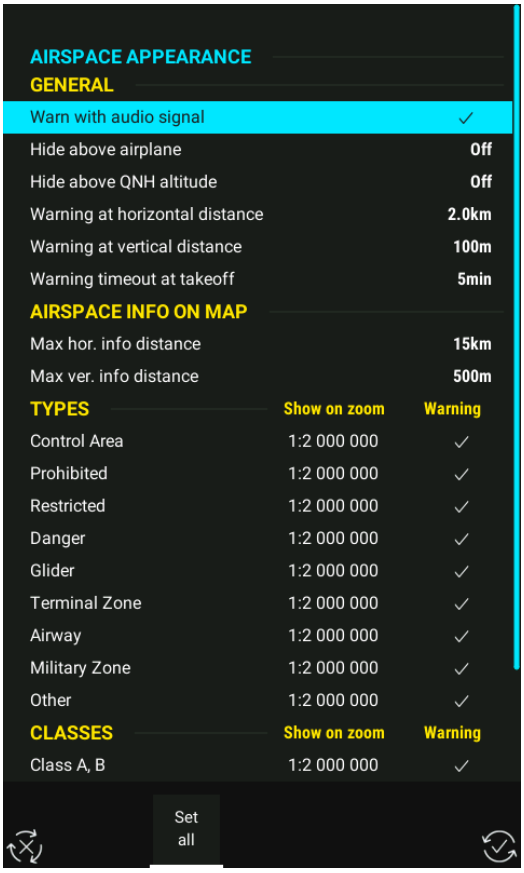
During straight flight, when far from the zone, the track will appear in the zone in the MOVE function. When the Airplane is in the zone, the real-time picture (Airplane with its track), will also be shown on the MOVE dialog.

3.5.6 Route Zoom

By rotating the Zoom rotary knob to the left the Route zoom will be activated which will show the whole Route on the screen. Route zoom will show all turn-points (moved and modified) with airspace. Route zoom is not visible while flying, only on the ground.

4 Airspace Management

Airspace on LX 528 can be managed by the pilot to achieve the optimum relationship between loading the display and its readability. Too much information will reduce the readability of the display.



1.1 Basic airspace settings

Settings are available under **Setup > Airspaces.** The user can select warnings and appearances related to the zoom level.

4.1.1 Hide airspace above

The airspace sections that are much higher than the altitude of the Airplane are not relevant. Disabling them will significantly reduce the density of information on the display. Use **Hide airspaces above airplane** to define the altitude margin that considered to be required for a safe flight.

4.1.2 Other settings

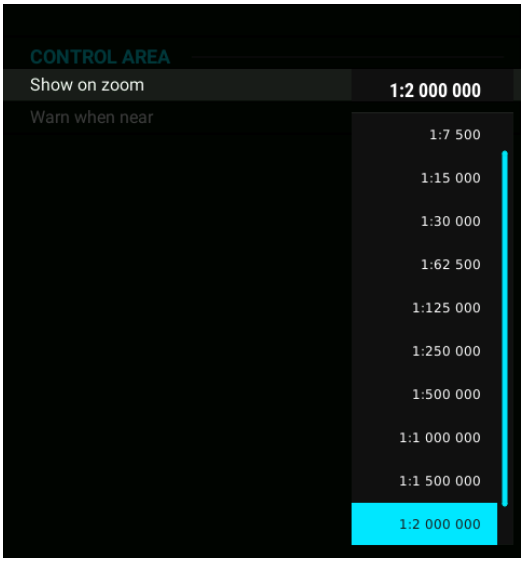
Hide above QNH altitude allows a selection of the QNH altitude above which the airspace should be hidden.

Horizontal and **vertical distance** warnings can be set also in this section. LX 528 will warn a user at a predefined warning distance. Default settings are 100m vertically and 2 km horizontally.

Warning timeout at takeoff allows a choice as to how long after the take-off there won't be any airspace warnings.

4.1.3 Define appearance of airspace related to zoom level

Zoom levels can be selected at which different airspace types will be visible. Use the **Show on zoom** function to define to which zoom level the airspace type is to be visible on the display. Two extreme situations are described with **always** and **never**. Factory default settings for all airspace types are **always**.



4.1.3.1

If set to disabled (☒) the airspace info box for this airspace type will not appear on the screen. Setting checked (☑) will produce airspace info box information.

The airspace info box is an indicator on the main screen. The pilot is able to move/resize the box and also to customize colours. This can be done under **Setup > Layout.**

The airspace info box contains airspace name, horizontal and vertical distance and is by default positioned in the upper section of the display. The nearest point to entering the airspace becomes visible on the display. As long as the warning isn't critical the text colour is blue.

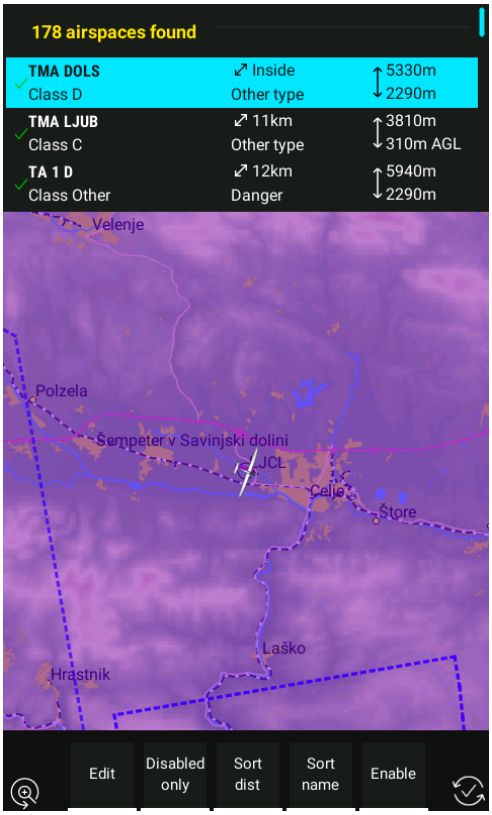
Airspace is displayed at 1st subpage in different colours (yellow and red). Airspace is also seen in a 2nd subpage, where the page is split between a map and a vertical profile (but only if AHRS is not connected to the system).

Explanation of airspace info box

The picture shows that the Airplane is in the CTR MARI airspace. It shows that the Airplane is horizontally 11.2 km inside and vertically 82 m outside. The red warning confirms that the Airplane is inside, the yellow that it is close and the green warning means it is outside.

4.1.4 Disabling airspace sections

During flight, airspace warnings may appear on the screen (picture on the right). Pressing on one of the screen buttons can easily disable the warning. Airspace warnings can be disabled for specific amounts of time (5 minutes, 10 minutes, 30 minutes, 1 hour, 3 hours or for whole day).

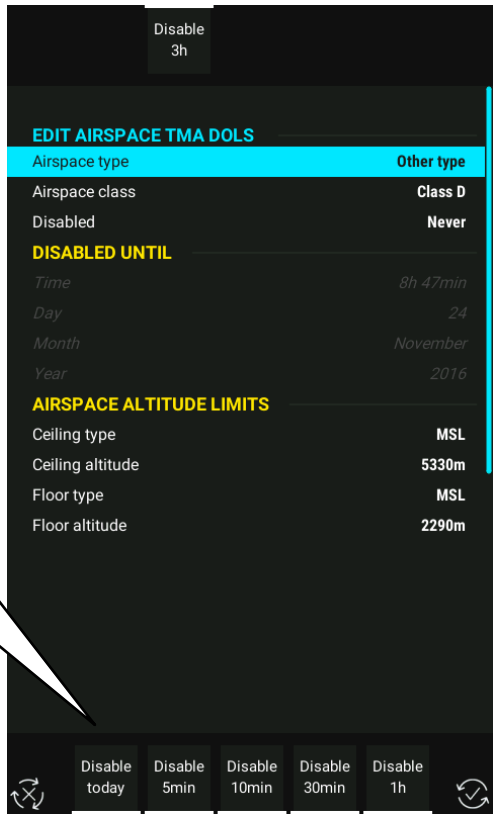


Airspace can also be disabled whilst on the ground. Press SELECT button to open airspace dialog. Airspace is sorted by distance. In the upper part of dialog there is a list of airspace with name of the airspace, horizontal distance and operating altitude from and to in meters/feet and also as a Flight level. The bottom part of dialog shows airspace around the Airplane. The colour of the currently selected airspace is blue.

Different airspace can be selected with the Zoom rotary knob. By rotating the Volume rotary knob the zoom level can be changed. After a press of the Zoom rotary knob or a press on the EDIT screen button, a dialog with additional options for selected airspace will appear, as follows:

- Airspace type
- Airspace class
- Disable airspace until specified date

A screen button DISABLED ONLY will show only disabled airspaces.



Edit airspace dialog after a press on EDIT button

5 GPS signal management

LX 528 has three GPS signal inputs, they are on the back of the unit. The following devices can be connected:

- **Colibri II**
- **Flarm or any device with NMEA ouWPut**
- **LX Salus via CAN bus**

5.1 Flarm plug

A **Flarm** marked input is a plug and play solution for connecting any unit that has 6-pin RJ11 IGC compatible connector. **This port also delivers 12V.**

The following units can be connected without any additional adaptor:

- Colibri, LX 20 – 2000, VL, LX Flarm RB, LX Flarm MB, Flarm (Swiss)

Note!

LX 528 can adapt baud rate to any value between 4800 and 38400 automatically, so baud rate of GPS source connected to Flarm input does not matter as long as it is in the range (4800-38400).

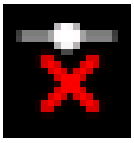
5.2 LX Salus – CAN plug

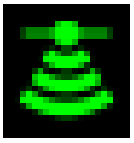
LX Salus connects to a CAN port, it doesn't matter which one is used. If an Salus is connected to the system, please check that there is no CAN terminator used on the CAN bus (CAN terminator is already built-in to the inside of a LX Salus device).

5.3 GPS signal for navigation

All GPS inputs are used on LX 528. This means that LX 528 is supplied with valid GPS signal as long as at least one connected GPS receiver delivers valid data. A symbol positioned in the right upper corner of the display shows GPS signal status:

- red GPS BAD
- green GPS OK
- white symbol with ☒ means no GPS data is present





6 LX 528 and LX Salus

LX Salus and LX 528 together create a very compact and robust system. They are connected with a single CAN cable (use CAN port on both devices).

All the data and power supply is transmitted through this cable. LX 528 and LX Salus transfer all the necessary data from one to another. When LX Salus is connected to LX 528 all settings for LX Salus are made on LX 528 and transferred to LX Salus.

When LX Salus and LX 528 are connected, the setup screen cannot be seen on LX Salus, because the setup is done on LX 528. If the main power supply fails (ie.: LX 528 does not work anymore), and it is still in flight mode, LX Salus will keep working as it has an integrated battery with about a three hour duration. In such

cases the Setup page will appear on LX Salus and there is an option to set all important parameters on LX Salus device. To see LX Salus setup structure, please check LX Salus manual.

LX Salus has an integrated ENL sensor.

6.1 LX Salus power management

Connect the main power cable with a switch to LX Salus. Immediately after LX Salus receives power, the LX 528 will automatically switch **ON**, without any pilot interaction. When the main power from LX Salus is cut, LX Salus will start a 3 second countdown before it turns OFF. LX 528 and other CAN devices are turned off immediately. When for some reason the main power supply is lost during flight, LX Salus will continue to record the flight for about 3 more hours.

The internal battery inside LX Salus is automatically charged when there is a 12V power supply and this means that it is always available to provide internal backup power supply for LX Salus. The charging process of an empty battery takes around 2 hours.

6.2 LX Salus – LX 528 interaction

After connection between LX Salus and LX 528 is established, both units will start to communicate over the CAN bus. The connection is established automatically without any pilot interaction.

7 LX 528 and Flarm

Flarm should be connected to the FLARM port on the back of the LX 528; Flarm will also receive power via this port. If Flarm is connected to the aircraft power network via its own power input wires, a short-circuit problem does not occur due to a built-in diode. This separates both power supplies. Up to two Flarm external displays can be connected to ports marked as Flarm external display. The SD card slot on the LX 528 front unit is directly connected to Flarm SD interface (valid for RB), without LX 528 interaction.

The SD card may be used for:

- Flarm firmware update (Red Box or Mini Box)
- Downloading of flights stored on Flarm (Red Box or Mini Box)

On the rear of the LX 528 5.5 and 7.0 there is enough space to install LX Flarm Red Box as an integral part of the system. All connections are plug and play. It is also possible to install any other Flarm compatible devices.

Original Flarm (Swiss) can be used as well. LX 528 will show objects from Flarm on the display and provide power for Flarm. Route declaration with pilot information is automatically sent from LX 528 to any Flarm with a flight recorder once the Route has been declared on LX 528.

The SD card slot cannot be used for Original Flarm (Swiss).

Note!

In the case of LX Flarm Red Box there must be only 1 SD card inserted at once; either in LX 528 micro SD card reader on the front of the unit or in LX Flarm Red Box unit, but not in both at once.

GPS signal priority

If there are more units (LX Salus, and/or Flarm) connected to LX 528, LX 528 will use best GPS signal reception.

7.1 Flarm external displays

LX 528 makes it possible to connect up to two Flarm external displays. Both connections are controlled from Flarm directly without any LX 528 influence. LX 528 system also provides 3V power for Flarm displays.

7.2 Transferring files from Flarm

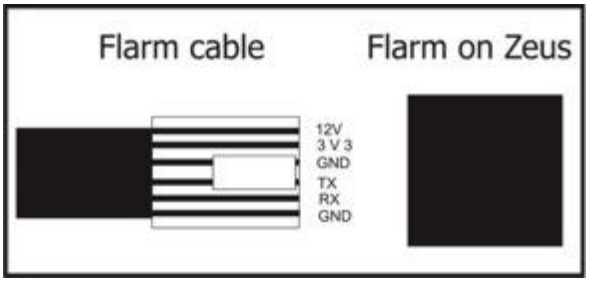
On older hardware versions, there is a microSD adapter on the front panel, used for communicationwith Flarm devices. Transferring files from Flarm to a micro SD card is a very easy process. The micro SD card has to be inserted into the micro SD port, on the front of the unit (in case of LX Flarm Red Box). After the flight is completed, wait for around three minutes, then turn LX 528 OFF and ON again. After switching on, a red POWER LED light on the Flarm display starts blinking. All other LED lights should be off. This means that all the flights that were not already on the micro SD card are now transferring to the SD card. After the red POWER LED light stops blinking the process is finished. The micro SD card, which will now contain all the flights from Flarm, can now be removed.

If the micro SD card has not been used for a while Flarm will automatically transfer all flights, that are not already on the micro SD card, from its internal memory to the micro SD card. If there are a lot of flights to transfer, the process may take up to 20 minutes! Flarm will always store a maximum 20 flights, so, if a 21st flight is recorded, then the oldest flight will be removed automatically.

7.3 LX Flarm RedBox / LX Flarm MiniBox update

LX Flarm RedBox and LX Flarm MiniBox can be updated via SD card or PC by using Flarm Tool software. Read update procedure at: www.lxnavigation.com – section SUPPORT / MANUALS: LX Flarm update instructions.

7.4 Flarm PINOUT

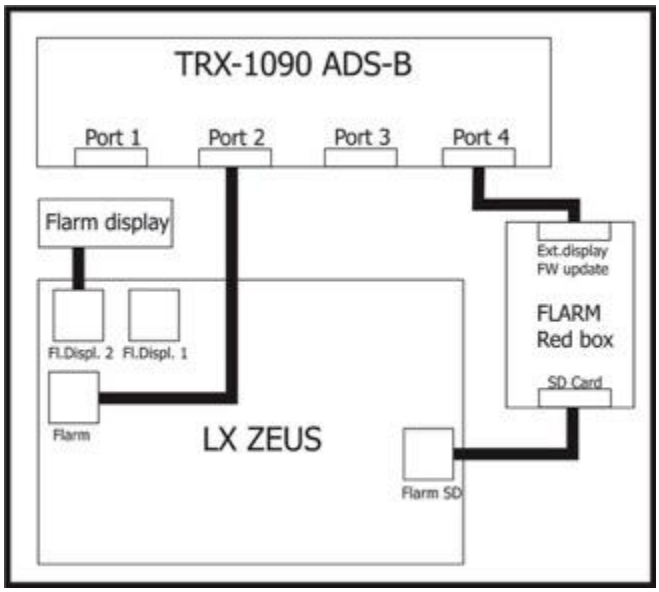


8 LX 528 and Garrecht

Garrecht units can be connected to LX 528 using supplied cables. A declaration to Flarm will be sent directly from LX 528**.**

Updating Garrecht units is not possible via LX 528. The connection schematic is shown below.

8.1 LX 528 and Garrecht TRX-1090 ADSB / TRX-2000



8.2 LX 528 and Garrecht TRX-1500

A special cable is needed for this connection. This cable can be ordered from LX Navigation under the following code: LX-TRX1500.

9 LX Joy

9.1 General

LX Joy is an ergonomically designed, leather covered remote stick handle for Airplanes. As seen by the pilot, it consists of 5 buttons and a navigation switch on the front side, one button on the rear side, a built-in electronic circuit and wiring.

The internal diameter of the bore can be 19,1 mm, 20,1 mm or 24,3 mm. It is important to point out the dimension when ordering your remote stick. (If the Airplane type is specified when ordering LXN will know what size is required)

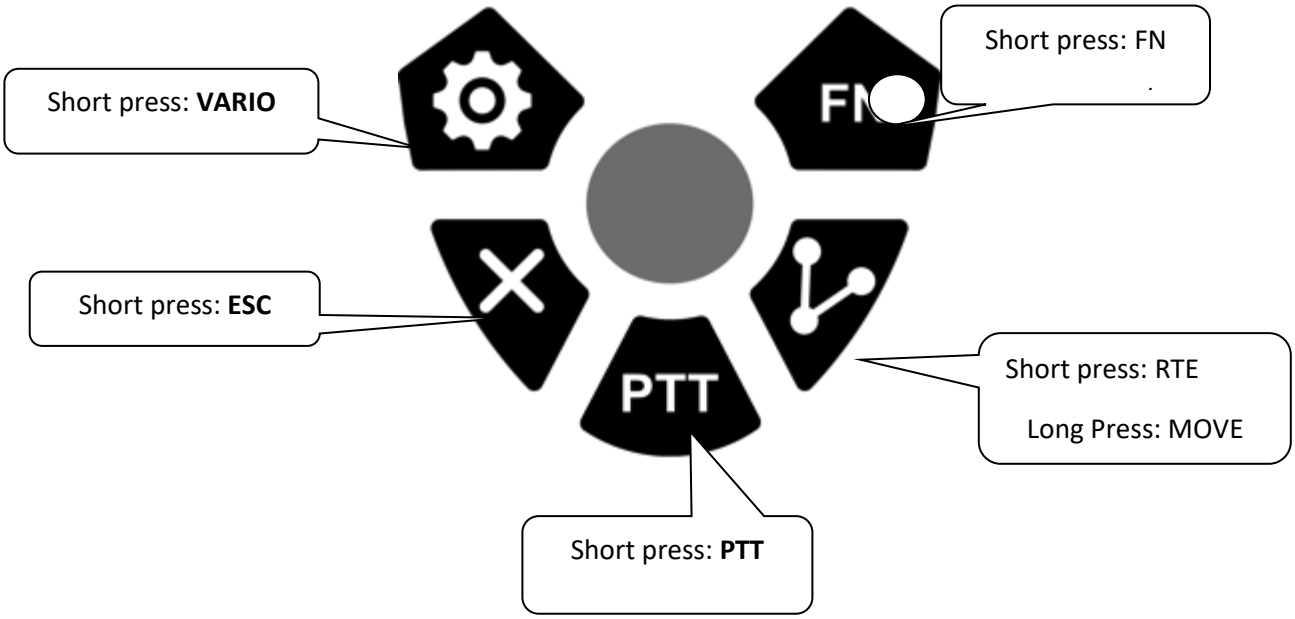
NOTE!!

In order for LX 528 to work with LX Joy, the software version on LX 528 should be at least **3.2.2** or higher.

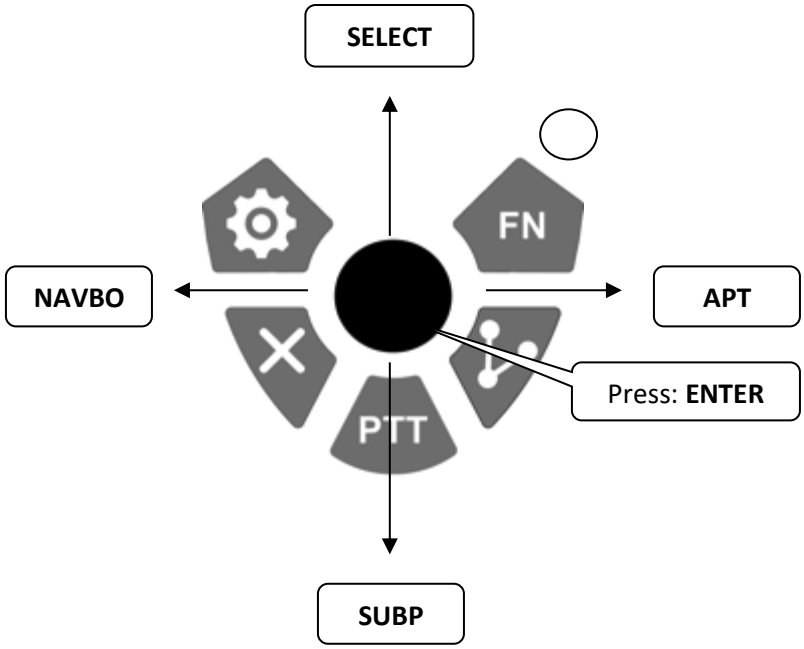
9.2 Button description

NORMAL MODE (LED OFF)

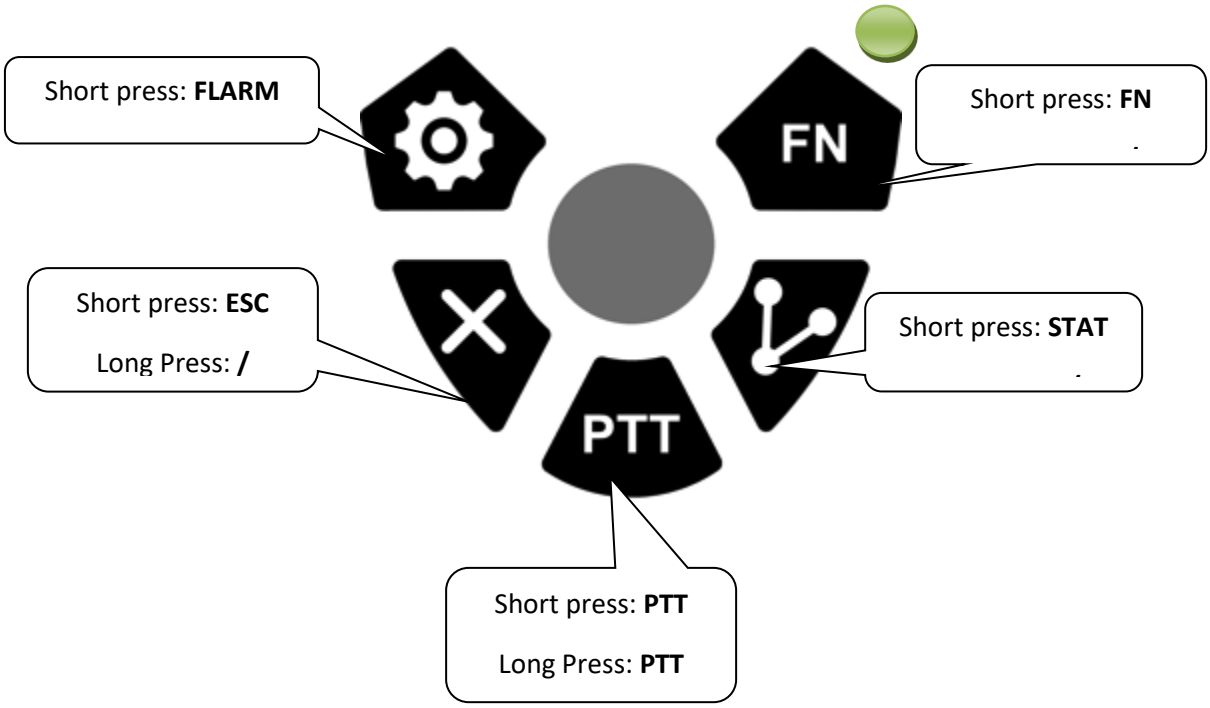
(as seen by the pilot)



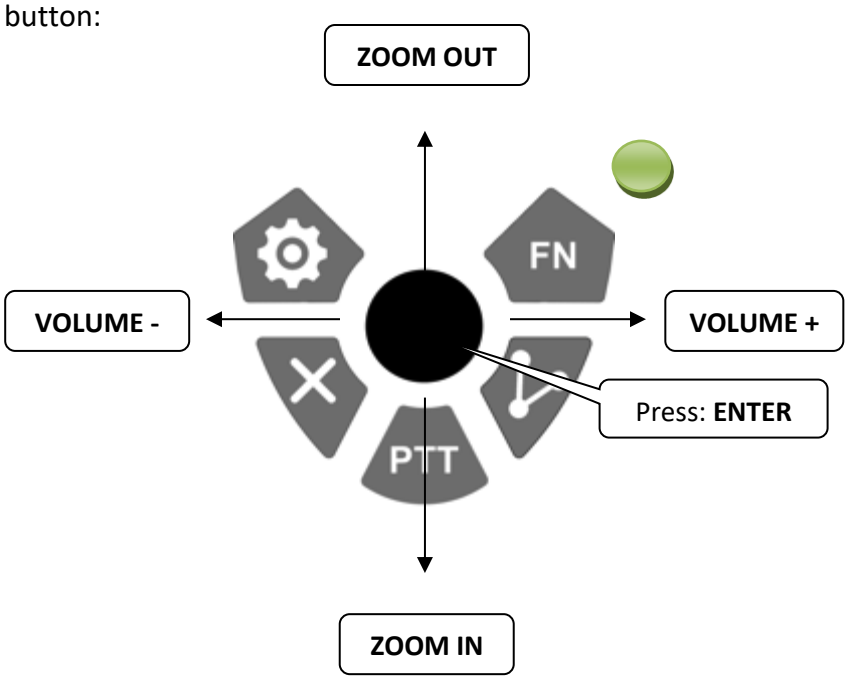
LX Joy middle button:



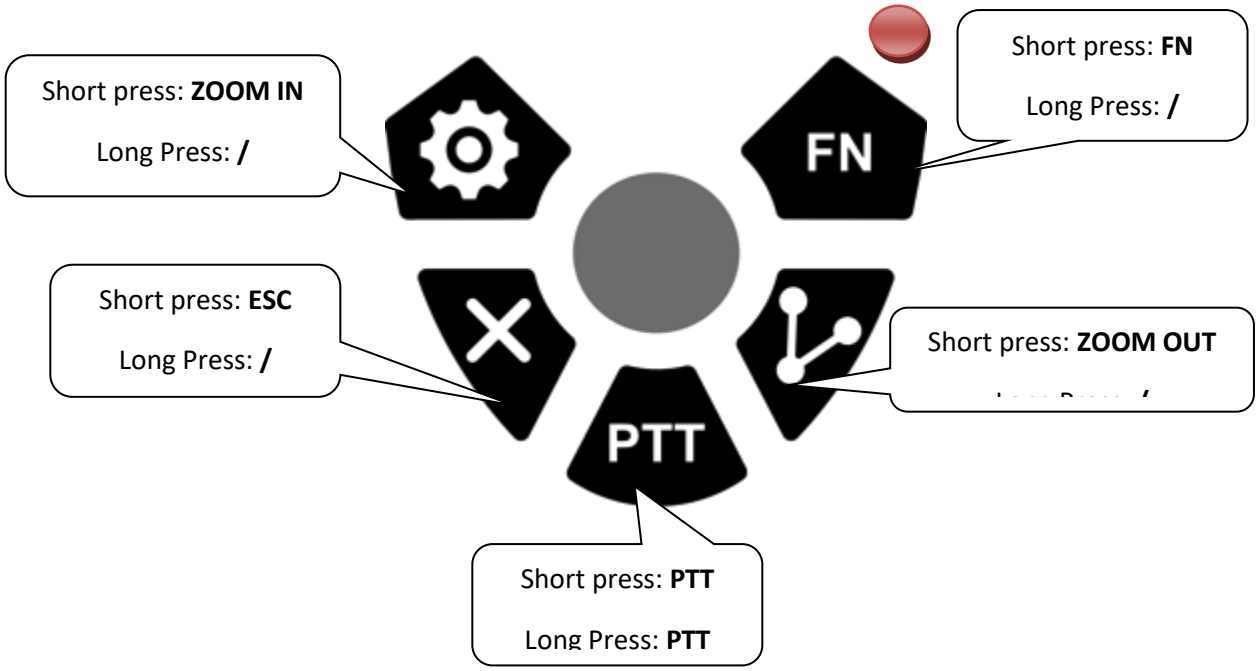
ZOOM/VOLUME MODE (LED GREEN)



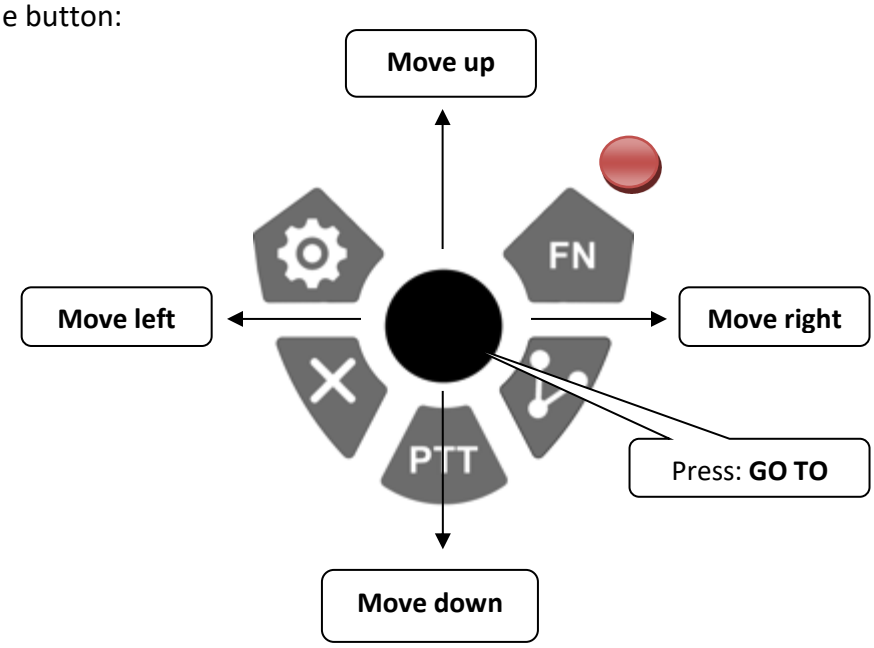
LX Joy middle button:



PAN MODE (LED RED)



LX Joy middle button:



11 Second seat unit

The second seat device is connected to the master unit via the **CAN bus** (it does not matter which connector on LX 528 is used**)**. The connection includes power and data communication for the second seat. This means that the second seat unit does not need an additional power supply. An external toggle switch makes it possible to switch off the unit during single pilot operation. Otherwise all commands are the same as for the main unit. GPS inputs on the second seat unit do not work and so *DO NOT* connect GPS sources to the sockets on the second seat (Colibri II, Flarm). Also, the Flarm display connectors are not used.

All LX 528 sizes (2.8, 4.3, 5.5 and 7.0) can be used as second seat units. The first and second seat units can have different screen sizes.

Note!

Flarm, LX Salus, Voice module, AHRS and Magnetic Compass should be connected to the first seat.

11.2Connecting LX Salus repeater to LX 528 on second seat

To connect a LX Salus repeater to a LX 528 in the second seat, simply connect units with the CAN cable, which is supplied with LX Salus repeater unit, using the CAN ports on both units.

11.3 Interaction LX 528 – LX 528 Second seat

LX 528 fitted in the front seat and LX 528 situated in second seat are two units with identical HW configuration, but the second seat unit is prepared to play a slave role in most cases. (The initialization of the second seat system is done during the production process at the factory.) The units are connected via a CAN bus using a single CAN cable. In general, the second seat unit does more or less an independent job but it receives all navigation and air data from the master. All secondary interfaces relating to the second unit, such as a LX Remote Stick, etc., should be connected to the second seat unit.

The following parameters are exchanged between both units:

Item	To first seat	To second seat	Automatic	Manual
Sec. pilot name	Y		Y	
Sec. pilot mass	Y		Y	
RTE /WP/APT exchange	Y	Y		Y
Team code	Y	Y		Y
Logger setting	Y		Y	

11.3.1 RTE / WP / APT exchange

The RTE / WP / AWP information can be exchanged from first to second seat and vice versa. The pilot, who wants to send the Route / Waypoint / airport, should press the Zoom rotary knob and then select screen button Send Route / Send WP / Send APT. The other LX 528 will receive it immediately. Also, LX 528 will send the whole Route with its statistics, moved zones, limitations etc. When a Route is sent from second seat to first seat the declaration is also sent to LX Salus, Colibri II.

11.3.2 Downloading flights from Second seat

Downloading flights is possible only from the first seat unit.

PART THREE – Flying

12 Flying with LX 528

It is recommended that the unit is set up for every flight before take-off to ensure a stress-free and enjoyable flight. This is especially important before any contest, record attempt or badge flight.

12.1 Flight preparation on the ground

It is suggested that the following be checked:

- Database status
- Prepare Route (use new or edit options, or select imported Route)
- Selected pilot profile with important settings

12.1.1 Before take off

- Switch the unit ON at least **3 minutes** before take-off (this will ensure sufficient GPS reception and will create a base line for the baro trace)
- Select correct **pilot** (there will be many settings specific to each pilot)
- Check whether the Route entered is correct by using **Route edit**
- Declaration: A Route selected and active before take-off will be **declared** automatically to connected flight recorders (LX Salus, Colibri II and/or Flarm)
- Switch on **second seat** unit if in a double seater

12.1.1.1 Initial setup procedure

LX 528 requires the User to select **take off elevation** during the Initial Setup procedure. The elevation set must be correct. If the take-off point is not in the database, then the elevation of the closest Airfield could be used. If the airport database is empty, or there is no closest airfield available, current elevation could be used with QNH set at 1013 hPa but if this doesn't match the elevation of the actual take off point then it should be changed. The User can also set QNH, select pilot (profile settings), active polar and set ballast. Settings inside Setup menu can always be changed (apart from elevation setting).

On the second seat unit, it is possible to select only the pilot doing the flying; other data can only be selected on the first (main) seat unit.

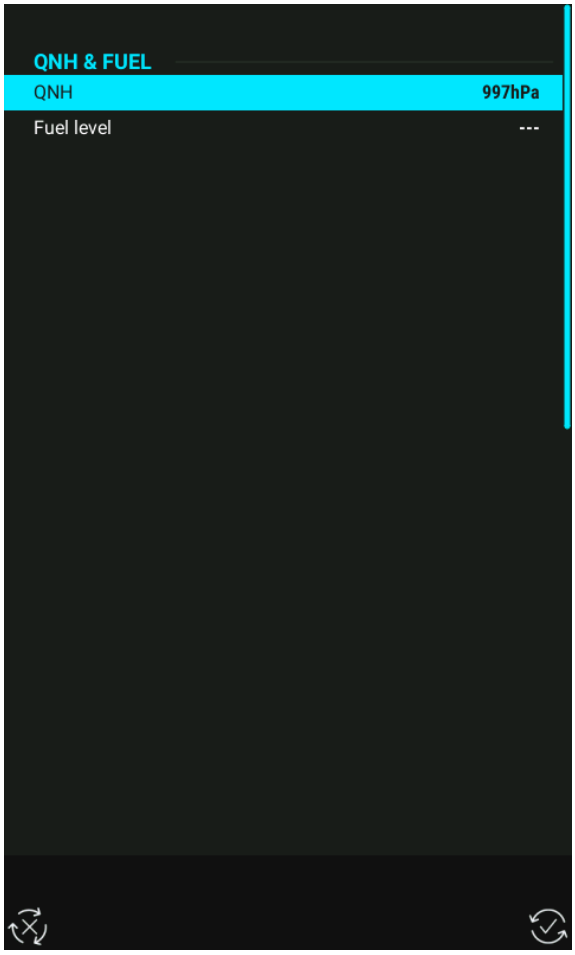
Once the elevation has been entered, LX 528 will suggest that the current QNH value be used. If the User knows the QNH of the day it should be entered. If not, then an approximate value should be entered. QNH can be changed by pressing the VARIO button. After the input of QNH on the ground the pilot will be able to adjust altitude reading during flight if the QNH changes.

Note!

QNH setting doesn't replace **setting of elevation** during booting which should be carried out every time otherwise the unit will not switch to navigation mode. QNH setting isn't obligatory and may be omitted.

12.2 During flight

The LX 528 HW and SW concept is combined in such a way that pilot input during flight is cut down to the minimum, enabling the pilot to give full attention to piloting. It is important to point out that there are many shortcuts which enable direct and fast access to most important functions. If confused, just wait for around 15 seconds and the Auto close feature should close the current dialog. A clear indication that the unit is in flying mode can be determined by checking that the Logbook page is replaced by the Statistics page when the **STAT** button is pressed.



12.2.1 Set QNH and Fuel level

After a short press on the QNH button a new window will appear – QNH and Fuel level

QNH setting:

The pilot should input the actual QNH value of the airport being used for take-off during the initial setup process. This action should be carried out on the ground; after take off the menu will not open any more. After input of QNH on the ground the pilot will be able to adjust the altitude reading during flight, if the QNH changes.

12.2.2 Statistics

The statistics page will open after a press on the STAT button.

The statistics page offers the following statistics data:

- **Baro**: Shows baro trace from take off until present position
- **Stat**: Presents Route statistics data divided by legs
- **Route**: Shows Route and flown distance on a map
- **End flight**: Ends flight
- **Timer**: Starts timer

Note!

When the Route has not been started yet, the statistics data is limited to take-off and flight

The statistics page colour structure can be adapted to suit a pilot`s personal requirements. This can be done under: **Setup > User Interface > Statistics colours.**

Note!

If the Route consists of more than three legs, use **zoom** to select legs of interest.

12.2.2.1 Baro trace graph

A baro trace from take-off to the current position will be opened by pressing the button next to **Baro**. Route Statistics

This page will open after pressing Route screen button. Route statistics are shown for the whole Route and for individual legs.

- **Speed**: Average speed
- **Dist**: Flown distance
- **Dur**: Duration
- **V Avg**: Average value of vario in thermals (circling)

Note!

Use Zoom rotary knob to scroll through the legs, as the display is capable of showing only 4 legs at once.

Statistics are also available on 1st subpage on Route (RTE) navigation page.

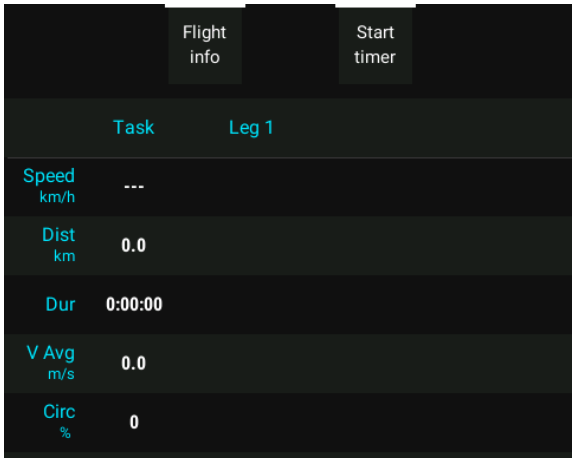
12.2.2.2 Route

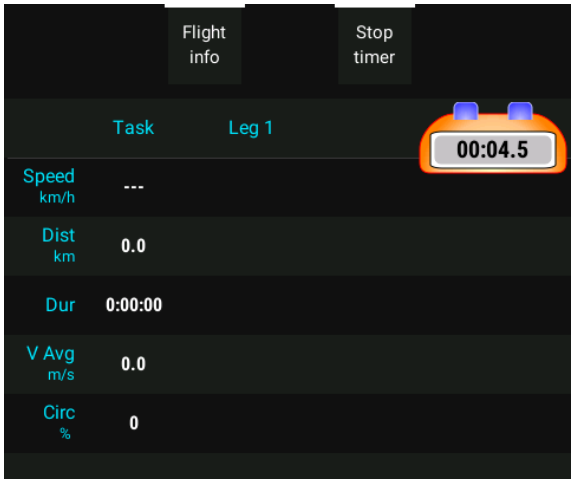
Route option is a feature showing the track already flown and the current Route on the map. This enables the pilot to see how precise the flying was and where detours were made.

12.2.2.3 Stopwatch

To use a stopwatch, the timer function can be used which is located in Statistics. Timer manipulation is as follows:

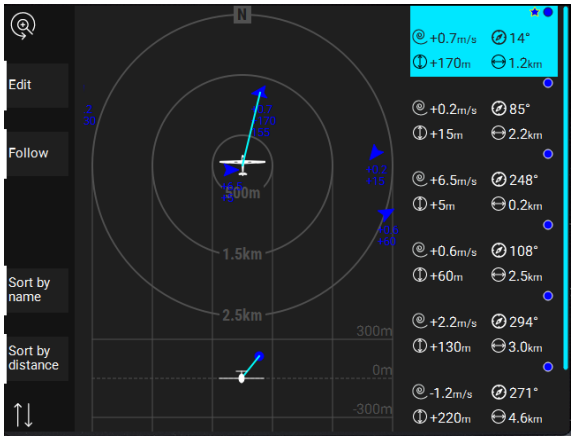
- Select Start timer screen button and timer will start.
- Stop timer by pressing Stop timer screen button.
- Reset timer.





12.2.3 Follow me

The Follow me function can be accessed by long pressing the Vario/Flarm button (the Flarm menu), selecting the Flarm object we want to follow using the zoom rotary knob and pressing the RTE/Move button, which selects the highlighted Flarm object.



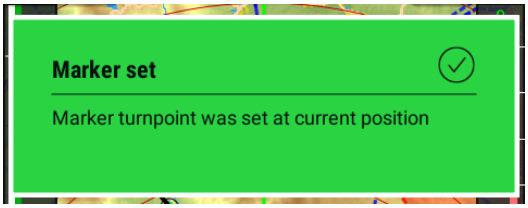
12.2.4 Special functions.

12.2.4.1 Marker setting

If the pilot wants to mark a position of interest, for example a suitable out-landing place, thermal hot spot…), this can be done by activating the **Marker function**. The process is very simple and doesn't require much attention by the pilot.

To mark a position the pilot should do as follows:

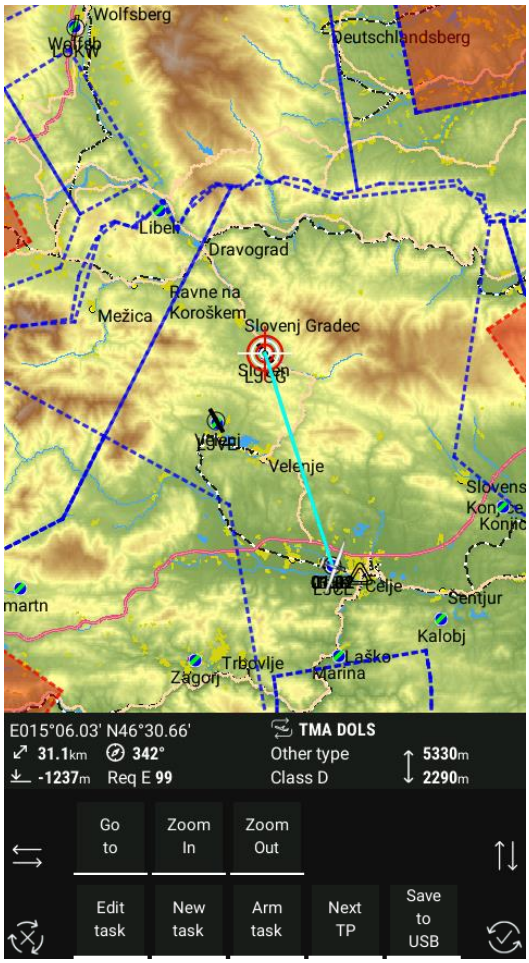
- On **WP** navigation page, press **Zoom** rotary knob
- Select screen button **Add marker**



The marker is shown as a yellow triangle on the map. Only one marker can be active at any one time. To set a new one simply repeat the procedure.

The marker is stored as user turn-point designated as **#MARKER.** If edit WP function is used the #MARKER can

be converted into a normal WP. #MARKER can also be deleted after using the **Delete WP** command. To navigate to #MARKER point, simply select #MARKER under Select WP dialog.



NOTE:

Marker function is possible only in WP navigation

12.2.4.2 Pan mode

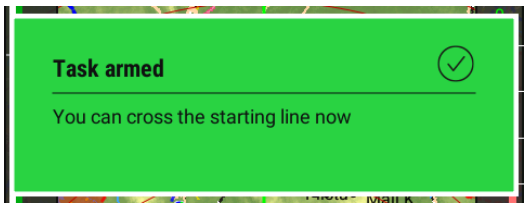
It is possible to move the position on the map using the Volume and Zoom rotary knobs. Pan mode is available on all three navigation pages (WP/APT/RTE). During the flight, the tail and Flarm objects are displayed on the map in pan mode.

To activate the mode, press button SELECT and choose Pan mode screen button. It will then be possible to move to the desired location on the map and, if GO TO is used, the system will start navigation to a selected position on the WP navigation page. The name of this selected point is displayed as the current time.

A Route in Pan mode can be created by accessing Pan mode from the RTE navigation page. For more information see chapter *Creating a Route in Pan mode.*

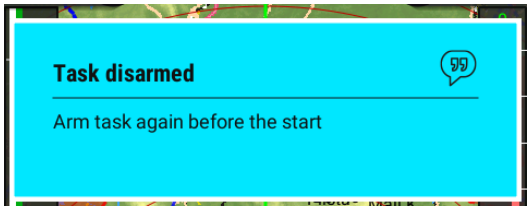
12.2.5 Route Start

Route start is quite a complex procedure, especially with a high density of Airplanes where many of them intend to start at nearly the same time. When the pilot intends to cross the start line, a simple operation should be carried out:



Press on **RTE** button and press **ARM** screen button.

A message **ARMED** will appear on the display. The word Armed will remain until the **first line crossing**. After crossing the line the Route will start automatically without any further pilot interaction.



Note!

ARM command can be executed at any time, even on the ground.

If the start line is crossed multiple times, the time of the last valid start will be used for statistics calculation. Every next start is also displayed by a green message Route started at...

Under Settings > User interface > Track/destination settings the pilot can choose whether navigation is aimed at the zone center or the zone closest point.

Disarm function will disable the Arm command.

Note!

In the event that the pilot crossed the start line and forgot to execute ARM before that, execution of **NEXT WP function** will solve the problem. Navigation to the first turn point will then be offered and the statistics page will become available. LX Zeus will find last valid start line- cross and use it for

12.2.5.1 Route Restart

If the pilot decides to restart the Route, having already started, it is possible to do this by executing the **Restart** function. It is accessed by pressing RTE/MOVE button and then pressing the Restart screen button. After pressing Restart, the Route will be reset (doesn't matter on which leg) and a new start can be performed. Also, the Route statistics will be reset.

Note!

After Restart, the unit will change immediately into **ARM** status, which means ready for next start.

12.2.5.2 Restart Leg

Restarting a leg is possible during an active leg. After pressing the RTE/MOVE button the screen button Restart leg will be displayed.

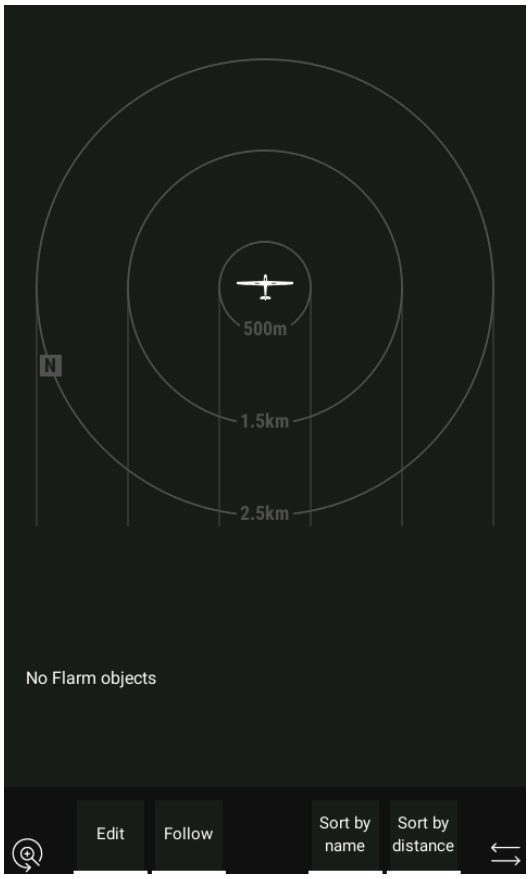
12.2.6 Route Finish

A Route finish will be detected after the Airplane has passed the finish line / cylinder. The event will be displayed by a very clear message showing the achieved Route speed.

12.2.7 Flarm management

The unit will show Flarm objects if a Flarm unit is connected to the system. There are two ways to see Flarm objects on LX 528:

- Objects displayed on the map as Airplane icons for Airplanes, airplane icons for powered planes and circles around you for nondirectional objects.
- Another way to see Flarm objects is via Flarm radar, which can be opened after a long press on the VARIO/FLARM push button. There is no limit to the number of Flarm objects displayed on LX 528.



A default colour can be set in Settings > Flarm. There are some additional settings that are related to displaying Flarm objects on the map. Different colours for objects that are above and below can also be set.

Alongside Flarm objects there is information about relative vertical distance and current climb rate. Climb rate data is not accurate so is should not be trusted.

If FlarmNet list is used, or if objects are customised, it is possible to also see Call signs of Flarm objects.

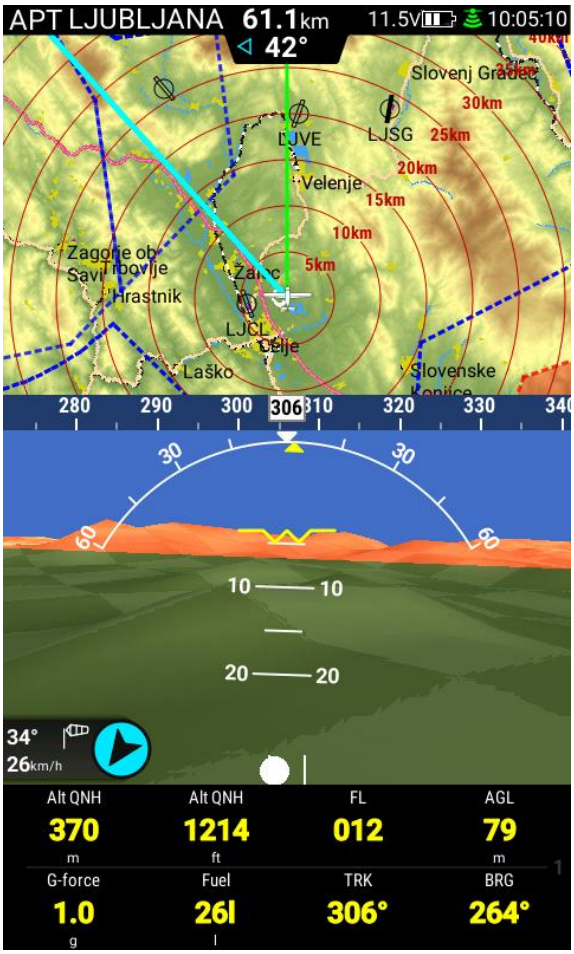
On the Flarm radar page, objects can be customized (Call signs and colour). Three objects can be selected at once. The zoom level on the Flarm radar page can be changed by rotating the Volume rotary knob.

Procedure for customization:

- Long press on VARIO/FLARM will open Flarm radar page
- Rotate Volume rotary knob to adjust Zoom on Flarm radar page
- Rotating Zoom rotary knob will move an orange frame to select/store 3 objects on the bottom in a box
- Press Zoom rotary knob to select the object in range
- Long press on Zoom rotary knob will open a dialog with more details about selected object
- Rotate Zoom rotary knob to select the details you want to see or modify
- Press Volume rotary knob to go back to Flarm radar page

12.2.8 Attitude and heading reference system (AHRS)

An artificial horizon (AHRS) box can be connected to LX 528 simply by connecting it via a CAN cable (Plug and Play). It can be connected to the first or second seat LX 528.



There are 2 ways to display AHRS on LX 528:

- 3D Synthetic vision displayed together with split screen map. Press SUBP button to access 2nd subpage. One can also set it so that 3D view covers the whole screen (under Setup > User interface)
- AHRS Indicator on the map. Add/edit/move AHRS indicator can be done Under Setup > Layout

If AHRS is connected to the system, it is possible to see AHRS on LX Salus or NavBox units connected via the CAN.

Important!

Orientation of AHRS box is very important. It has to be installed as it is shown on the label on AHRS unit (little white Motorplane icon)

Pressure connection:

- Pst – connect static pressure
- Ptot – connect dynamic pressure

12.3 After landing

The LX 528 should be kept ON for a few minutes after landing in order to ensure that a baseline for the baro trace is generated. There will be a small window showing: **Flight will end in** xx:yy this being the time left until the flight recorder stops recording**.** When flight recording is complete the recorders will start to calculate the security signature of the IGC file (Calculating security message). When this message disappears, it means that connected flight recorders have stopped recording and that the IGC file is ready for download. If the STAT button is pressed the Logbook will be accessed instead of flight statistics. The LX 528 can now be switched off and/or the flight downloaded.

12.3.1 Downloading flights

It is possible to download flights from LX 528 directly from any or all connected flight recorders (LX Salus, Colibri II, Flarm).

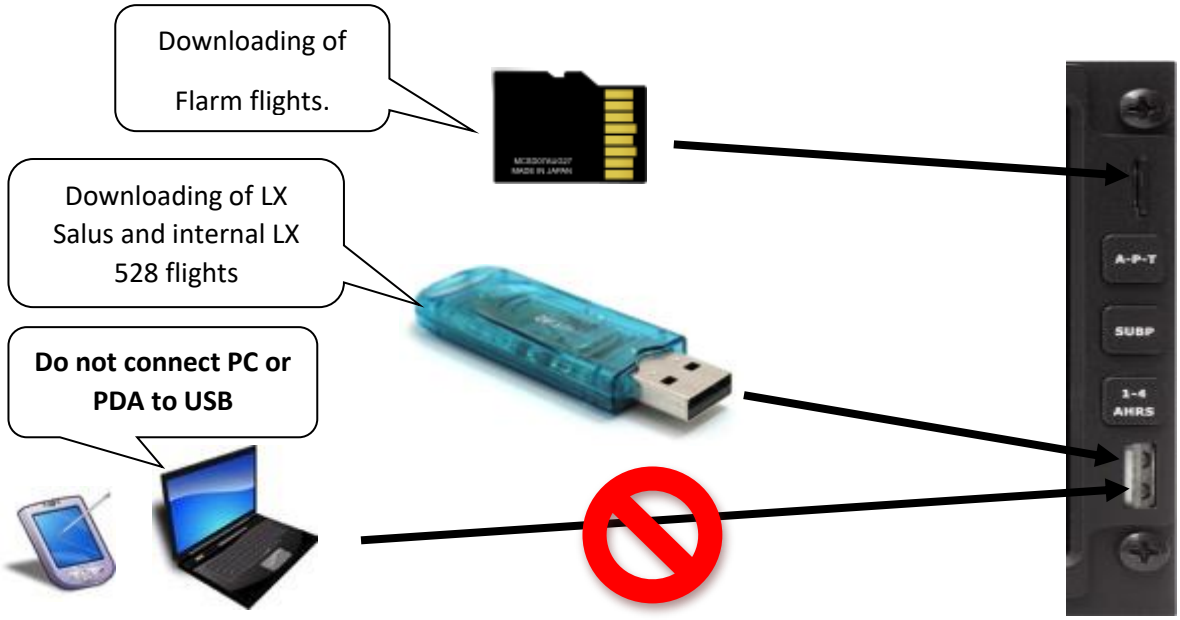
Flights from LX Salus and Colibri II can be downloaded to a USB stick. Flarm flights are downloaded with a SD card.

The flight file structure meets IGC standards and therefore such flights can be evaluated by any program that accepts. IGC data format.

In the case of a Flarm (RB IGC version) connected to LX 528, its flights will be stored to the inserted micro SD card without any LX 528 interaction. The procedure is automatic, and the new flight will be stored ***after next power on.***

Note!

In the case of LX Flarm Red Box, it is only possible to download flights by SD card



Note!

Downloading flights from second seat is not possible – only from 1st seat.

12.3.1.1 Downloading LX Salus flights

Once the security calculation is finished it is possible to start the flight download procedure. Downloading flights stored in LX Salus is done using a USB stick.

Download procedure:

- **Insert USB** stick
- Press **STAT** button (logbook will open)
- With Volume rotary knob **select** flight of interest
- Press **Save to USB** screen button to start downloading flight to USB

The process will take a couple of seconds or perhaps minutes depending on flight time and recording interval. When the transfer is finished a confirmation message will appear.

Note!

In case of troubles (error messages USB not detected, etc.), switch LX 528 OFF, remove USB stick, switch LX 528 ON and try again.

Password 46486

This password will delete all flights stored in LX Salus II and also all pilot history in LX 528!

The flight is now available on the USB stick in the LX folder **Flights**. Flight data is stored in .IGC format and is therefore immediately ready for evaluation. The data security level meets the **IGC high level** approval standard.

12.3.1.2Downloading Flarm flights

If an IGC approved LX Flarm Red Box unit is connected to LX 528, it is possible to download a flight directly via the SD card slot, which is positioned on the front panel of LX 528. The SD card slot is wired directly to the LX Flarm Red Box SD card reader without any LX 528 interaction. The general rule with Flarm is that a flight will be stored to SD card *after next power on*. So, power LX 528 off and on to download the latest flight. It is suggested that the SD card is kept in the LX 528 SD slot all the time in order to avoid long waiting times from the downloading of many flights that are not yet on the SD card.

If the card is empty, then the first power ON will download ALL FLIGHTS stored in the Flarm and this will take a long time. It will download the last 20 flights stored in Flarm. Flarm will always store a maximum 20 flights, so, if a 21st flight is made, the oldest flight will be removed automatically.

12.3.1.3LX Salus – LX 528 interaction after landing

After a landing is detected the LX 528 will wait for **2 minutes** and, if during this period no movement (high GS, etc.) is detected, the procedure to close the flight will start. After the time-out (2 minutes) the unit will be ready to start the download procedure for flights stored in LX Salus and Colibri II.

Recommended!
Keep LX 528 powered on until 2 minutes have passed from the flight`s finish.

Note!
Separate switching off of Salus isn't necessary.

Note!
If LX 528 **loses power during flight** this will not switch off LX Salus. The flight recorder has an internal backup battery for such occasions.

12.4 ICAO charts

LX 528 offers the use of ICAO charts from Rogersdata and Deutsche Flugsicherung. Charts can be ordered via update-service@lxnavigation.si. Please read **Data transfer** for the installation process.

Rotating Zoom rotary knob to the left will show ICAO charts. There are 3 zoom steps available for ICAO charts.

Zoom steps from left to right:

- Route zoom (vector map)
- ICAO zoom 1
- ICAO zoom 2
- ICAO zoom 3
- Map zoom 1:2500000
- Map zoom 1:2000000
- Map zoom 1:1000000
- Map zoom 1:500000
- Map zoom 1:250000
- Map zoom 1:125000
- Map zoom 1:62500
- Map zoom 1:30000
- Map zoom 1:15000

Note!
End of the chart will be shown as white background on the screen. If the Motorplane is located out of the chart`s area the ICAO chart won't appear – vector maps will replace it.

PART FOUR - Miscellaneous

13 Installation (Other components)

13.1Installation of LX Flaps sensor

The unit is capable of detecting longitudinal movement of the flap lever command rod. The device, which converts longitudinal movement into an electrical signal, is a high-quality wire-wound multi-turn potentiometer. A spring based self-retracting system returns the cord in case of backward movement of the flap lever rod. The high-quality cord allows control rod movement of up to 300 mm, which enables the unit to be used for all Airplanes currently available. For installation purposes, only two wires are used to connect the electronic device LX CanAD, which converts resistance data into digital signal. The electronic device is a part of the CAN system bus.

For complete mechanical installation see the LX Flaps sensor manual, for sensor calibration see chapter Flaps sensor calibration.

13.2Installation of second seat units

The second seat unit shares the same logic as the master LX 528. There is no difference in mechanical installation.

13.2.1 Electrical installation

The second seat unit doesn't need external power as it is powered via the system bus (CAN). For CAN connection two 8P connectors are provided on both the master and the repeater. The connection of both units is simple and easy, all that is necessary is to insert CAN marked cable into one of two CAN marked plugs. The same is valid for first and for second seat. The second seat unit comes with two red wires which are terminated with a toggle switch. It is recommended that this switch is installed somewhere on the rear panel, as this will make to possible to switch off the second seat unit during single pilot operation in order to reduce power consumption.


LX
navigation