

# S8x & S10x

Digital speed-to-fly variometer, final glide calculator and navigation system with simple moving map.

Manual Version 6.25



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<b>1</b>	<b>Important Notices</b>	<b>7</b>
1.1	Limited Warranty	7
<b>2</b>	<b>Packing Lists</b>	<b>8</b>
2.1	S80 (80mm) Variometer Unit	9
2.2	S8 (57mm) Variometer Unit	10
2.3	S10 (57mm) Variometer Unit	11
2.4	S100 (80mm) Variometer Unit	12
2.5	S8D Repeater Unit	13
2.6	S80D Repeater Unit	14
<b>3</b>	<b>Basics</b>	<b>15</b>
3.1	LXNAV S8x/S10x at a Glance	15
3.2	LXNAV S8x/S10x Features	16
3.2.1	Interfaces	16
3.2.2	Options	16
3.2.3	S8/S80 Club	16
3.2.4	Technical Data	17
3.2.4.1	Power Consumption	17
3.2.4.2	Size and Weight	17
<b>4</b>	<b>System Description</b>	<b>18</b>
4.1	Push Button – Rotary Switches	18
4.1.1	Power Button	18
4.2	Rotary Switches	18
4.3	Buttons (Three)	19
4.4	Switching on the Unit	19
4.5	User Input	20
4.5.1	Text Edit Control	20
4.5.2	“Spin” Control	21
4.5.3	Selection Control	21
4.5.4	Checkbox and Checkbox List	21
4.5.5	Slider Selector	22
4.6	Switching Off	22
<b>5</b>	<b>Operating Modes</b>	<b>23</b>
5.1	Quick Access Menus	23
5.1.1	MC/BAL	24
5.1.2	Reset G	24
5.1.3	Navboxes Option	24
5.1.3.1	Editing navboxes	25
5.1.3.2	Navboxes with description	25
5.1.4	Select / Select Near (Only in WPT mode)	26
5.1.5	Edit Target	27
5.1.6	Flarm Traffic	27
5.1.7	Event	27
5.1.8	Night	27
5.1.9	Edit Task (Only in Task Mode)	27
5.1.10	Start Task (only in Task Mode)	28
5.1.11	Restart Task (only in Task Mode)	28
5.1.12	Next Waypoint (only in Task Mode)	28
5.1.13	Send WPT	28
5.1.14	Sidebar	28
5.2	Info Mode	29
5.2.1	Quick Access Menu	29
5.3	Flarm Mode	30

5.3.1	Quick Access Menu	30
5.3.1.1	Edit Target	30
5.3.1.2	Flarm Traffic	31
5.3.2	Flarm Warnings	31
<b>5.4</b>	<b>Thermal Assistant Mode</b>	<b>32</b>
5.4.1	Quick Access Menu	32
<b>5.5</b>	<b>Waypoint Mode</b>	<b>33</b>
5.5.1	Quick Access Menu	33
5.5.2	Second Page Within Waypoint Mode (Numerical Data)	34
5.5.3	Third Page at Waypoint Mode (AHRS page)	35
5.5.4	Quick Access Menu	36
<b>5.6</b>	<b>Task Mode</b>	<b>37</b>
5.6.1	Quick Access Menu	37
5.6.2	Second Page Within Task Mode (Numerical Data)	37
5.6.3	Third Page Within Task Mode (AHRS Page)	38
5.6.4	Quick Access Menu	38
5.6.4.1	Editing navboxes	39
5.6.4.2	Reset G	39
<b>5.7</b>	<b>Setup Mode</b>	<b>40</b>
5.7.1	QNH & RES	41
5.7.1.1	QNH	41
5.7.1.2	Safety Altitude	41
5.7.2	Flight Recorder	42
5.7.2.1	Recording Interval	42
5.7.2.2	Auto Finish	42
5.7.2.3	Finish Before OFF	42
5.7.2.4	Logger Always ON	42
5.7.2.5	Pilot	42
5.7.2.6	Co-pilot	42
5.7.2.7	Competition number	42
5.7.2.8	Registration number	42
5.7.3	Vario Parameters	43
5.7.3.1	Vario Needle Filter	43
5.7.3.2	Vario Sound Filter	43
5.7.3.3	Netto Filter	43
5.7.3.4	Relative Filter	43
5.7.3.5	SC Filter	43
5.7.3.6	Smart Filter	44
5.7.3.7	Needle Range	44
5.7.3.8	Auto SC	44
5.7.3.9	TE Compensation	45
5.7.3.10	Vario Average Time	46
5.7.3.11	Integrator Reset	46
5.7.3.12	Temperature Offset	46
5.7.3.13	Airspeed Offset	47
5.7.3.14	Inertial Assisted Vario	47
5.7.4	Thermal Assistant	47
5.7.4.1	Colour Circles By	47
5.7.4.2	Use active navigation data	47
5.7.4.3	For Manual switching	48
5.7.4.4	Switch to Thermal Assistant Mode	48
5.7.4.5	Thermal Assistant Ping Method	48

5.7.5	Display	48
5.7.5.1	Automatic Brightness	49
5.7.5.2	Minimum Brightness	49
5.7.5.3	Maximum Brightness	49
5.7.5.4	Get Brighter In	49
5.7.5.5	Get Darker In	49
5.7.5.6	Brightness	49
5.7.5.7	Night Mode Darkness	49
5.7.6	Graphics	50
5.7.6.1	Map	50
5.7.6.2	Airspace	50
5.7.6.3	Waypoints	51
5.7.6.4	Glider and Track	52
5.7.6.5	Task	52
5.7.6.6	Flarm	53
5.7.6.7	Theme Setup	54
5.7.6.8	Modes	55
5.7.7	Sounds	55
5.7.7.1	Equalizer Option	55
5.7.7.2	Vario Sounds	56
5.7.7.3	Flarm Sounds	58
5.7.8	Warnings	59
5.7.8.1	Enable Flarm Warnings	59
5.7.8.2	Flarm Warnings	59
5.7.8.3	Visual Messages/Warnings	60
5.7.8.4	Voice Warnings	61
5.7.9	Obs. Zones	61
5.7.10	Units	62
5.7.11	Hardware	63
5.7.11.1	Digital inputs	63
5.7.11.2	Indicator Setup	65
5.7.11.3	Communication Setup	66
5.7.11.4	Battery Setup	67
5.7.11.5	Remote Stick (NEW)	69
5.7.11.6	Compass Module	70
5.7.11.7	CAN Bridge	70
5.7.11.8	Flaps	72
5.7.11.9	AHRS	72
5.7.12	Profiles	73
5.7.13	Files	74
5.7.13.1	Waypoints File	74
5.7.13.2	Airspace File	75
5.7.13.3	Flarmnet file	76
5.7.14	Polar and Glider	76
5.7.14.1	Polar	76
5.7.14.2	Speeds	77
5.7.14.3	Flaps	78
5.7.15	Logbook	78
5.7.16	Admin mode	79
5.7.17	Password	79
5.7.17.1	List of Password Functions	79
5.7.18	About	80

<b>6</b>	<b>Variometer and Altimeter</b>	<b>81</b>
6.1	<b>Altimeter</b>	<b>81</b>
6.2	<b>Speed Command</b>	<b>81</b>
<b>7</b>	<b>Flying with the LXNAV S8x/S10x</b>	<b>82</b>
7.1	<b>On the Ground</b>	<b>82</b>
7.1.1	Power on Procedure	82
7.1.2	Set Elevation and QNH	82
7.1.3	Pre-flight Check	83
7.2	<b>Airborne</b>	<b>84</b>
7.2.1	Final Glide Calculation	84
<b>8</b>	<b>Installation</b>	<b>85</b>
8.1	<b>Installing the LXNAV S8x/S10x</b>	<b>86</b>
8.2	<b>Connecting the LXNAV S8x/S10x</b>	<b>86</b>
8.3	<b>Cut-outs</b>	<b>87</b>
8.3.1	Cut-out for S8 and S10	87
8.3.2	Cut-out for S80 and S100	87
8.4	<b>Available Cables for GPS/Flarm and PDA Ports</b>	<b>88</b>
8.5	<b>Installation of Options</b>	<b>89</b>
8.5.1	S8xD Option (Repeater)	89
8.5.1.1	Data Exchange	90
8.5.2	Magnetic Compass (Compass – CAN)	91
8.5.3	Flap sensor (Flap – CAN)	91
8.5.4	Remote Stick (Remote-CAN)	91
8.5.5	AHRS Option	92
8.6	<b>Ports and Wiring</b>	<b>93</b>
8.6.1	LXNAV S8x Ports	93
8.6.1.1	PDA Port (RJ45)	93
8.6.1.2	GPS Port (RJ12)	94
8.6.1.3	Main Port	94
8.6.1.4	Audio Port	94
8.6.2	Wirings	95
8.6.2.1	LXNAV S8X Wiring	95
8.6.2.2	LXNAV S10x Wiring	95
8.6.2.3	LXNAV S8xD Wiring	96
8.7	<b>S8x/S10x Configurations</b>	<b>97</b>
8.7.1	Symbols	97
8.7.2	Nano/Nano3 – Sxxx - MiniMap	97
8.7.3	Nano3 - Sxxx - Oudie	97
8.7.4	Colibri II – Sxxx - Oudie	98
8.7.5	Colibri/Volkslogger - Sxxx - Oudie	98
8.7.6	Flarm – Sxxx - FlarmViewX - Oudie	99
8.7.7	FlarmMouse - ADSB – Sxxx - FlarmView - Oudie	99
8.7.8	FlarmMouse – Sxxx - Oudie	100
8.7.9	FlarmMouse - Nano3 - Sxxx - Oudie	100
8.7.10	PowerMouse + (Nano3) - Sxxx - Oudie	101
8.7.11	S8x/S10x– S8xD	101
8.8	<b>Data Transfer</b>	<b>102</b>
8.8.1	S8x/S10x	102
8.8.2	Other Data Transfers	102
<b>9</b>	<b>Firmware Update</b>	<b>103</b>
8.1	<b>Updating LXNAV S10x and S8x Firmware Using a Micro SD Card</b>	<b>103</b>

9.2	Updating LXNAV S8x Firmware Using a Micro SD Card (up to fw. 5.43)	103
9.3	Updating LXNAV S8x Firmware Using a Micro SD Card (OLD Method)	103
9.4	Incomplete update message (OLD version)	104
10	FAQ	105
11	Revision History	106

## 1 Important Notices

The LXNAV S8x/S10x system is designed for VFR use only as an aid to prudent navigation. All information is presented for reference only. Terrain, airports and airspace data are provided only as an aid to situation awareness.

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



A Yellow triangle is shown for parts of the manual which should be read carefully and are important for operating the LXNAV S8x/S10xsystem.



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



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



A cloud icon is shown when this functionality is supported only on S10x-systems.

### 1.1 Limited Warranty




This LXNAV S8x/S10x product is warranted to be free from defects in materials or workmanship for two years from the date of purchase. Within this period, LXNAV will, at its sole discretion, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts and labour, the customer shall be responsible for any transportation cost. This warranty does not cover failures due to abuse, misuse, accident, or unauthorized alterations or repairs.

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

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

## 2 Packing Lists

- LXNAV S8x or S10x main unit
- Main power cable for S8x/S10x + CAN terminator
- Speaker
- GPS cable (S7-GPS-IGC included, other types optional, this cable is included only with the S8x device)
- PDA cable (optional)
- 2x6 mm screw
- Bluetooth antenna 
- GPS antenna 
- Barogram calibration chart 

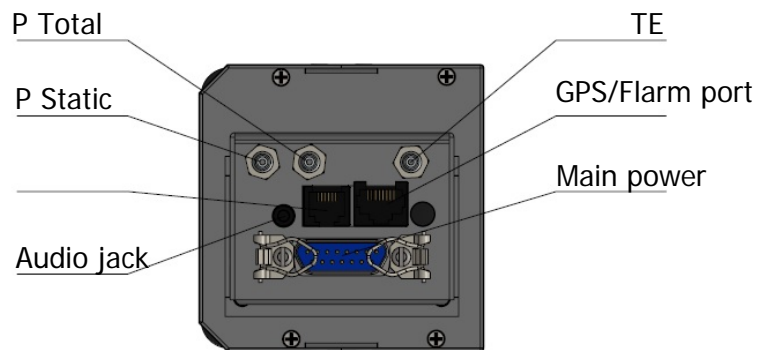
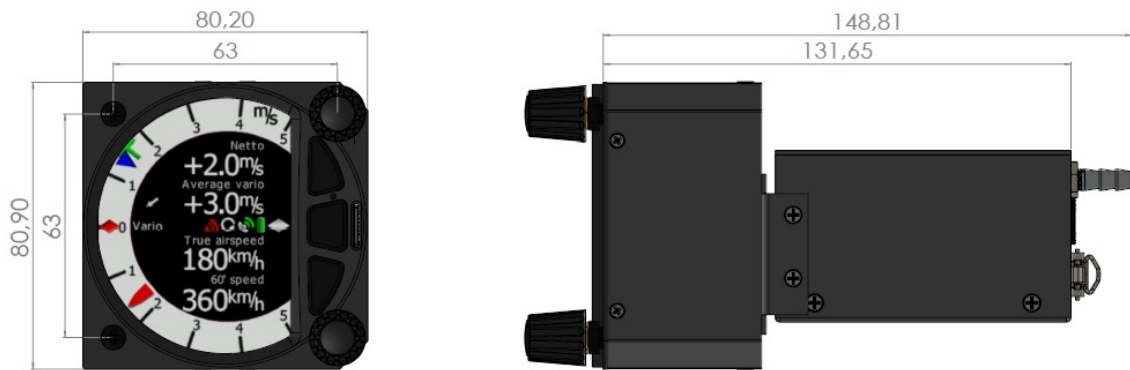


### Second Seat:

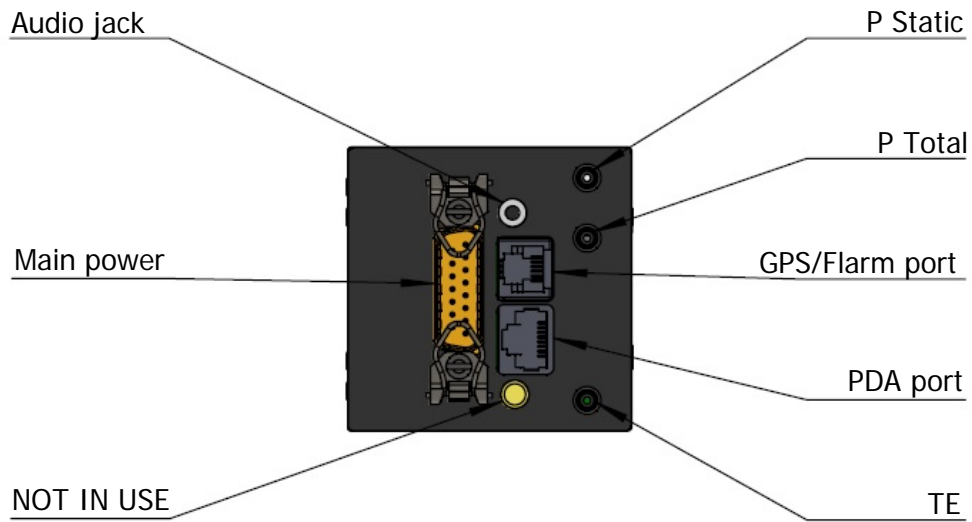
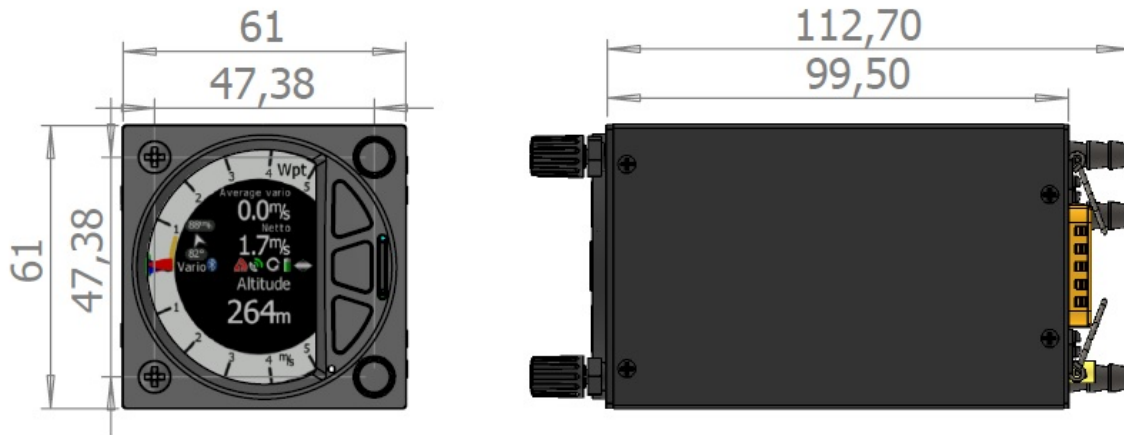
- Main S8xD unit
- Y cable splitter (optional, only with compass or remote stick)
- Main 3m CAN cable



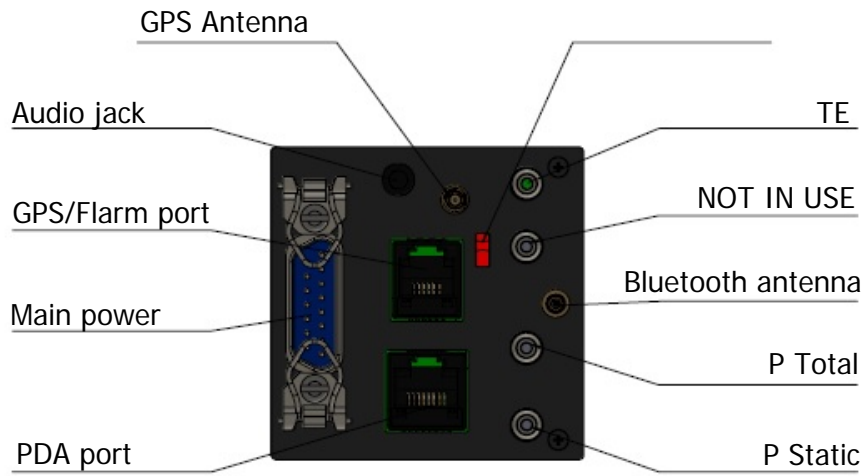
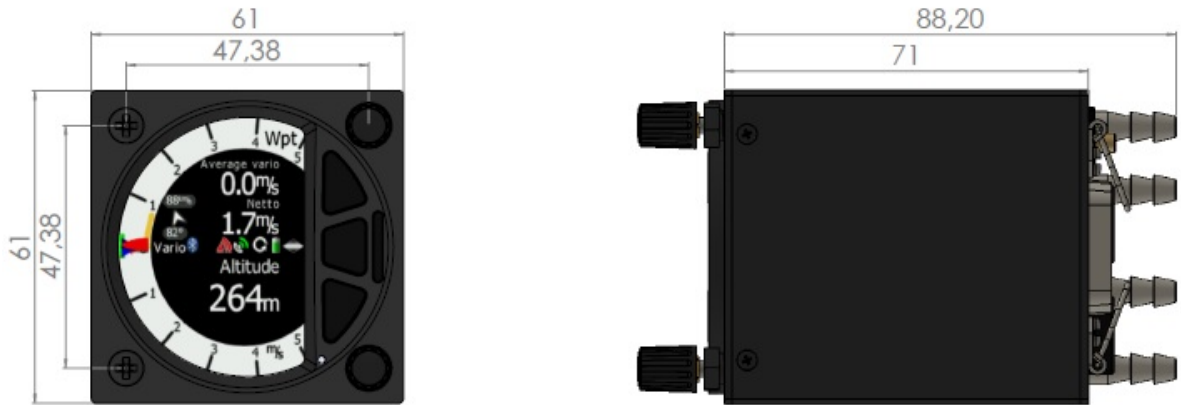
## 2.1 S80 (80mm) Variometer Unit



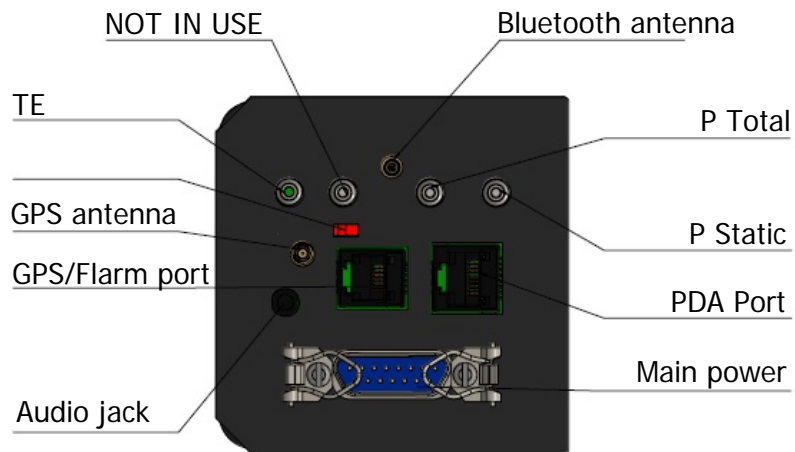
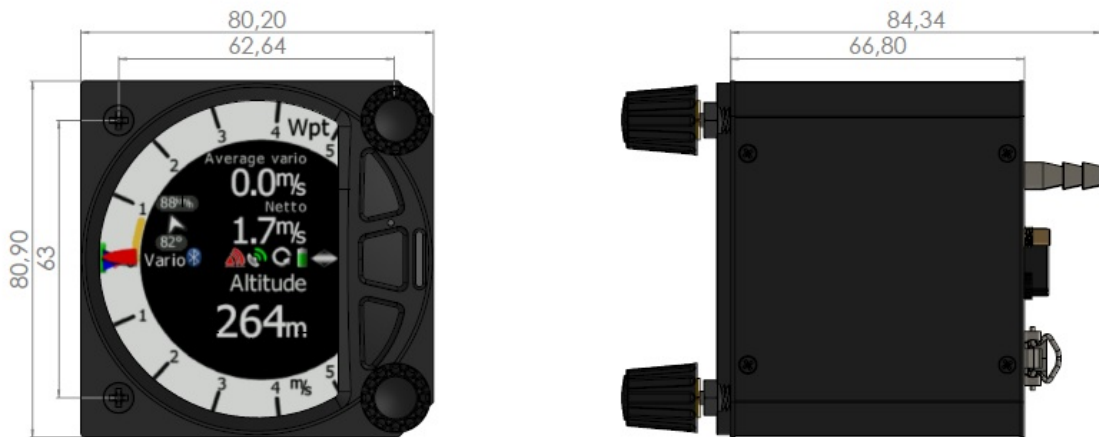
## 2.2 S8 (57mm) Variometer Unit



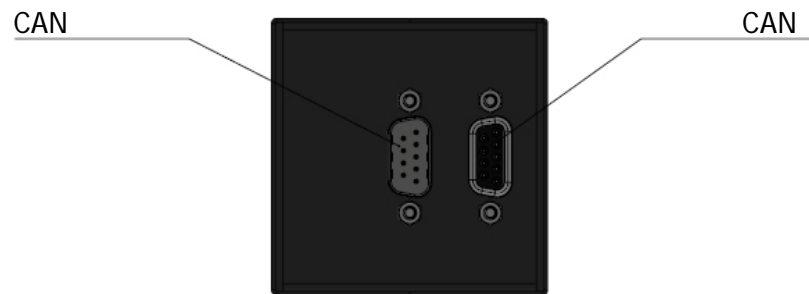
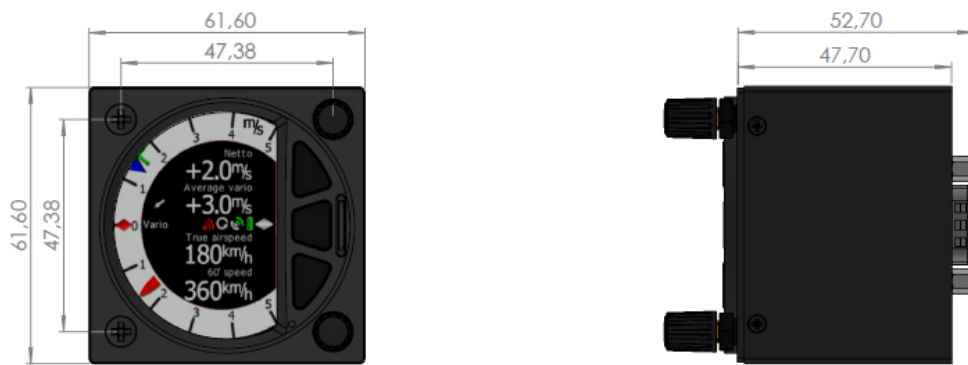
### 2.3 S10 (57mm) Variometer Unit



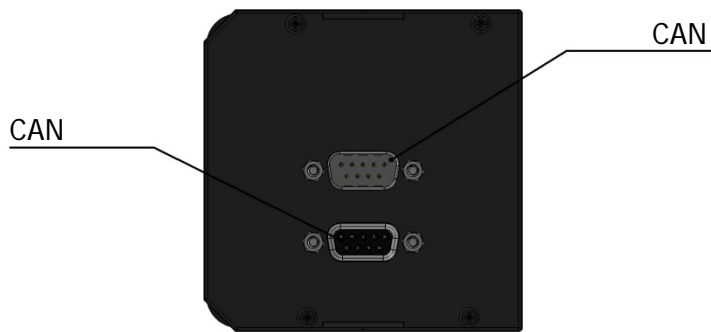
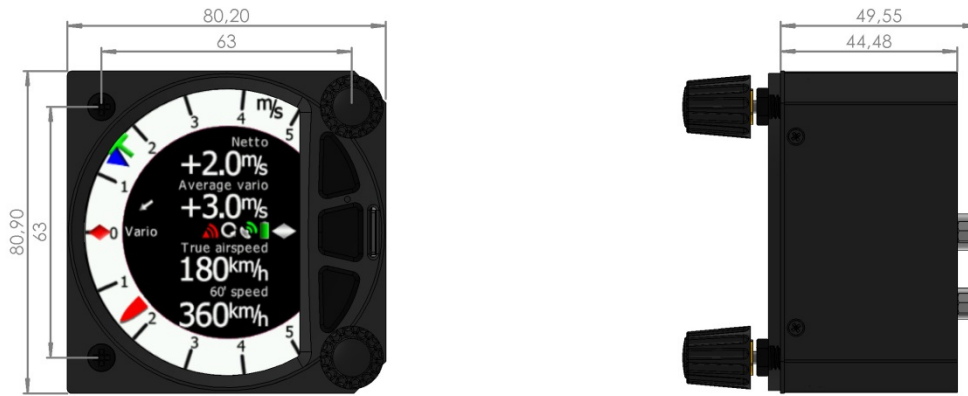
## 2.4 S100 (80mm) Variometer Unit



## 2.5 S8D Repeater Unit



## 2.6 S80D Repeater Unit



## 3 Basics

### 3.1 LXNAV S8x/S10x at a Glance






The LXNAV S8x/S10X is a standalone digital variometer, final glide calculator and navigation system with a simple moving map. The LXNAV S8x/S10x has both GPS/FIarm and PDA/PNA input/output. The unit has standard dimensions that will fit into a glider panel with an opening of 80 mm diameter (3.15") or 57 mm diameter. It is also able to supply a PDA/PNA with power (5VDC/1A). The unit has an integrated high precision digital pressure sensor and inertial system. The sensors are sampled more than 100 times per second. Real Time Data is displayed via a vario needle, an airspace map and up to 4 variable number fields displayed on a QVGA 320x240 pixel, 3.5-inch (S80/S100) or 2.5-inch (S8/S10), high brightness (1200 nits) colour display. To adjust values and settings the LXNAV S8x/S10x has two rotary push button knobs and three additional push buttons.

The LXNAV S8x/S10x can be expanded with one or more repeaters (LXNAV S8x/S10x) via the CAN bus. This allows both pilots in a two-seat glider to have independent control of all functions of each unit in the front or the rear seat.



The S10x unit includes a built-in IGC-approved flight recorder, a Bluetooth module and its own backup battery which provides from 3 to 4.5 hours of independent operation.

## 3.2 LXNAV S8x/S10x Features

- An extremely bright 3.5" (S80/S100) or 2.5" (S8/S10) QVGA colour display readable in all sunlight conditions with the ability to adjust the backlight.
- Two rotary switches (knobs) with push button function and three push buttons are used for input.
- Pre-loaded polar database for nearly all gliders.
- GPS/Flarm and PDA/PNA input/output.
- Flarm Indication if a Flarm is connected to the GPS/Flarm port.
- Programmable "needles" for selectable data such as netto vertical speed, relative (super netto) and vertical speed (vario).
- 320x240 pixels colour screen for additional information such as average, thermal vario, time, speed etc...
- Many custom audio settings.
- 100Hz sampling rate for very fast response.
- Speed to fly indication.
- TE compensation can be selected to be either pneumatic TE probe or electronic TE.
- Audio equalizer, for custom vario sound performance.
- Audio thermal assistant.
- Built-in high level, IGC-approved flight recorder. 
- Built-in Bluetooth module. 
- Backup battery. 
- Engine noise level sensor (ENL). 
- Built-in GPS module. 

### 3.2.1 Interfaces

- GPS/Flarm port input/output on RS232 level (RJ12 connector, none-Standard IGC) (12V/2A)
- PDA port input/output on RS232 or TTL level for PDA/PNA devices with 5V power supply (8 pin RJ 45, 5V / 1A).
- Audio port (Standard 3mm phone jack).
- 1Mbit CAN bus for extension to S8xD repeater or Remote stick (CAN remote).

### 3.2.2 Options

By using a CAN bus system, a second seat device can be connected. The unit installed in the rear seat of the glider is independently powered and receives all the necessary data from the main unit. The communication between both units is exclusively via the CAN bus system (Remote stick, Compass module, Second seat device).

### 3.2.3 S8/S80 Club

S8 Club and S80 Club are special price performance editions of basic S8 and S80 units. Following features are optional on this device: **Task mode** (see chapter 5.6), **Digital inputs** (see chapter 5.7.11.1), **Pilot profiles** (see chapter 5.7.12) and **Airspaces** (see chapter 5.7.6.2). Every option can be upgraded separately at any time. For purchasing additional options please contact LXNAV.

Device:	S8	S8 Club	S80	S80 Club
TASK mode	Yes	<b>Optional</b>	Yes	<b>Optional</b>
Airspace	Yes	<b>Optional</b>	Yes	<b>Optional</b>
Digital inputs	Yes	<b>Optional</b>	Yes	<b>Optional</b>
Pilot profiles	yes	<b>Optional</b>	Yes	<b>Optional</b>



### 3.2.4 Technical Data

Power input 10-16 V DC.

#### 3.2.4.1 Power Consumption

Device	Min. Brightness (mA)	Max. Brightness (mA)
S8	140	190
S8D	90	140
S80	140	190
S80D	90	140
S10	170	200
S100	190	250

#### 3.2.4.2 Size and Weight

Device	Size	Weight (g)
S8	57 mm cut-out 61x61x95mm	339
S8D	57 mm cut-out 61x61x48	210
S80	80 mm (3.15") standard aircraft cut-out 81x81x132mm	460
S80D	80 mm (3.15") standard aircraft cut-out 81x81x45mm	290
S10	57 mm cut-out 61x61x70mm	348
S100	80 mm (3.15") standard aircraft cut-out 81x81x64mm	515

## 4 System Description

### 4.1 Push Button – Rotary Switches

The two Rotary switches also have a push button function. The LXNAV S8x/S10x detects short or long presses of the push button. A short press means just a click, a long press means pushing the button for more than one second.

#### 4.1.1 Power Button

The system is powered up by pressing any of the push buttons or a press of either of the rotary knobs. A long press of the upper rotary knob will turn the S8x/S10x off. Use this instead of the avionics master switch.

### 4.2 Rotary Switches

The upper rotary knob is designed for direct volume control. A short-press on the upper rotary knob will produce an option to select between options and adjust volumes for the Vario, Speech and Flarm beep.

A long-press on the upper rotary knob will shut down the system cleanly.



The lower rotary knob is used to adjust settings within the current mode or within menus. With the lower rotary push button, it is possible to toggle between the MC and the Ballast and Bugs settings. In all other menus this knob is used for setting values and editing texts.

### 4.3 Buttons (Three)

The three buttons between the two rotary knobs have fixed functions. The top button is ESC (CANCEL), the middle is to switch between modes and the lower button is the ENTER (OK) button. The upper and lower buttons are also to rotate between subpages in the WPT and TSK modes.

Diagram illustrating the functions of the three buttons between the rotary knobs:

- Top Button:** Push button used for:
  - Mode selection
  - Confirm option in some menus
- Middle Button:** Push button used for:
  - Switch between modes
  - Exit from the menu
- Bottom Button:** Push button used for:
  - Mode selection
  - Confirm option in some menus
- Upper Rotary Knob:** Rotary switch with push button. Enter and operate only in the volume menu.
- Lower Rotary Knob:** Rotary switch with push button used for: Adjusting the level of the zoom. Enter/confirm the selection/function.

### 4.4 Switching on the Unit

Pressing any of the buttons or rotary knobs will turn on the S8x/S10x. The first LXNAV welcome screen will appear with the system information (Device name, Version, Serial number...)



The S8xD rear seat unit cannot be powered up before the S8x/S10x has been powered up.

When the boot procedure is completed the setup elevation dialogue will be displayed.



The user must set either the Elevation or the QNH with the lower rotary button. After pressing the lower rotary button, the user can switch between the Elevation and QNH dialogues. As soon as the settings are set the middle button must be pressed to proceed.



The upper push button also has the power OFF function.

## 4.5 User Input

The LXNAV S8x/S10x user interface consists of dialogues which have various input controls. They are designed to make the input of names, parameters, etc., as easy as possible. Input controls can be summarized as:

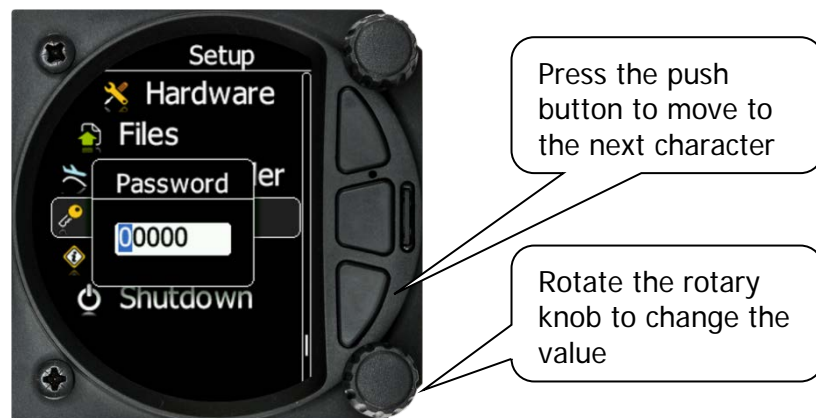
- Text editor
- Spin controls (Selection control)
- Checkboxes
- Slider control

To move the function from one control to another, rotate the lower rotary knob as follows:

- Clockwise rotation will select the next control.
- Counter clockwise rotation will select the previous control. The lower PUSH button enters the selected feature.
- Faster rotation of the rotary knob will increase the rate at which the value changes i.e. bigger steps in value.

### 4.5.1 Text Edit Control

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



Once the required value is selected, press the lower push button to move to the next character selection. To move back to the previous character, press the upper push button. When you have finished editing, press the Enter key – the lower rotary button. A short press of the middle push button exits from the edited field (“control”).

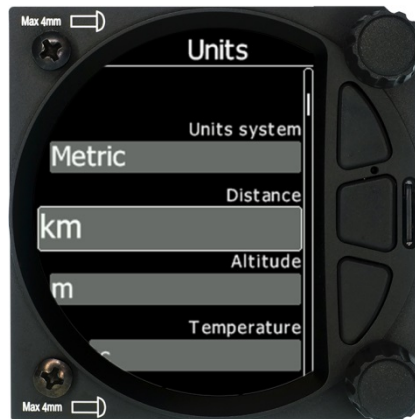
### 4.5.2 "Spin" Control

"Spin" controls are designed for numeric parameters. Rotate the knob to increase/decrease the selected value. To increase a value in larger steps, spin the lower rotary knob faster.



### 4.5.3 Selection Control

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



### 4.5.4 Checkbox and Checkbox List

A checkbox enables or disables a parameter. Press the lower rotary knob to toggle the value. If an option is enabled a check mark will be displayed, otherwise an empty rectangle will be displayed.



### 4.5.5 Slider Selector

Some values, such as volume and brightness, are displayed as a slider icon.



With a push of the lower rotary button you can activate the slide control and then by rotating the knob you can select the preferred value and confirm it via the push button.

## 4.6 Switching Off

You will lose your settings if you power down the S8x via the panel master-power switch. S10x will shut down properly, when switching down master – power switch.

To archive your settings, shut down with a long-press of the volume (top) knob.



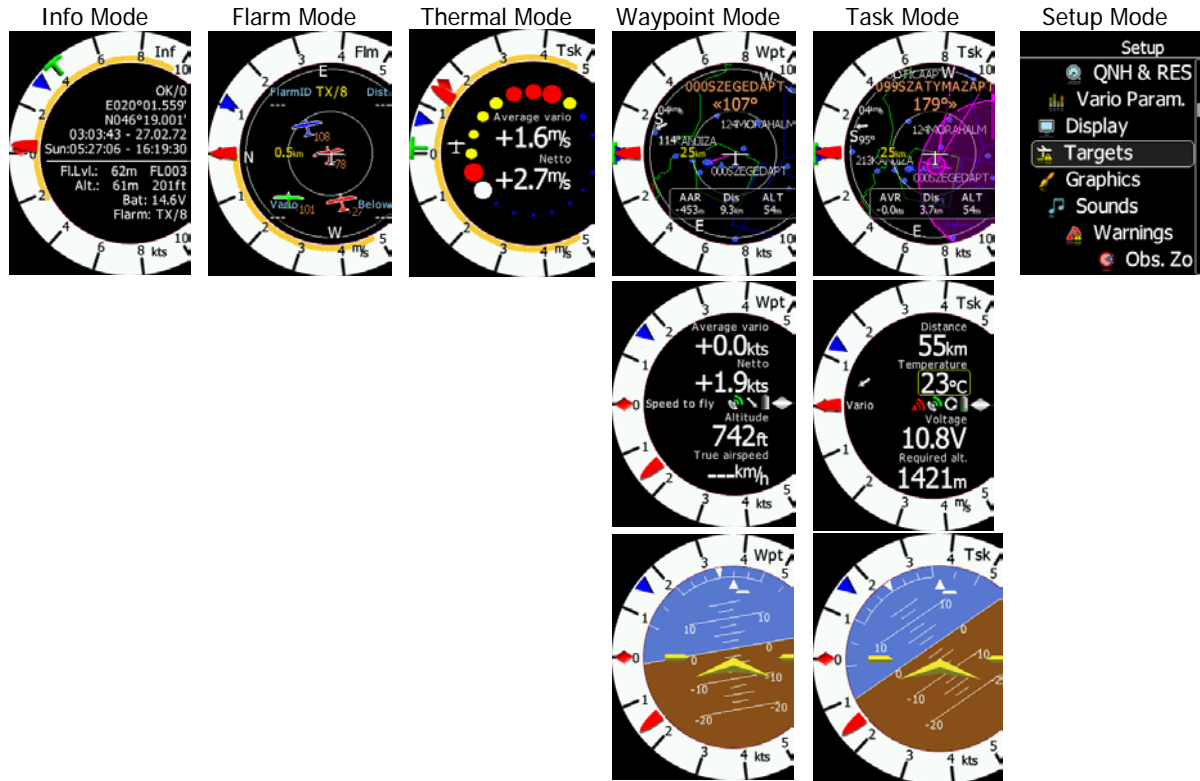
All settings are saved during the power off procedure. We strongly recommend switching off the unit by using a long-press of the (top) knob.



If the system is powered off via the master switch, changed data will not be saved. Flight parameters at take-off such as target altitude and position will remain in the stored memory so that your final glide calculations are not affected.

## 5 Operating Modes

The LXNAV S8x/S10x has five operating modes. The middle (Menu) push button toggles through the 5 display modes in a circular way. The diagram below shows the mode structure of the LXNAV S8x. With the upper and lower buttons, it is also possible to shift between subpages.



- **Info Mode:** Contains the GPS data, Altitude, Battery and Sunset time, OAT.
- **Flarm Mode:** Showing Flarm targets in range (if a Flarm device is connected to the GPS port).
- **Thermal Mode:** Showing a thermal assistant during circling (S8x only if a GPS source is present).
- **Waypoint Mode:** Simple navigation screen to a waypoint plus subpages (S8x only if a GPS source is present).
- **Task Mode:** Task screen showing the task and airspace plus subpages (S8x only if a GPS source is present).
- **Setup Mode:** For all aspects of the setup of the S8x/S10x.

### 5.1 Quick Access Menus

For each mode a quick access menu is available, which varies from mode to mode. Items available in quick access menus are:

- MC/BAL (In all modes)
- Reset G (In all modes)
- Edit target (only Flarm page)
- Flarm traffic (only Flarm page)
- Navboxes (Only in THM, TASK and WPT mode)
- SideBar

- Select (Only in WPT mode)
- Select Near (Only in WPT mode)
- Send WPT
- Event
- Night
- Edit Task (only in task mode)
- Start (only in task mode)
- Next (only in task mode, visible only after pressing start)
- Restart (only in task mode, visible only after pressing start)

### 5.1.1 MC/BAL



To change the MacCready value press the bottom rotary knob and press on MC/BAL. A short press of the lower rotary knob moves from MacCready to the Ballast box and pressing the lower rotary knob again will open the Bugs box. If no action is performed within 3 seconds, the box will close, or you can also press CLOSE anytime (lower push button).

### 5.1.2 Reset G

“Reset G” is a method of re-setting the “G” meter if configured as the yellow bar on the vario scale.

### 5.1.3 Navboxes Option

Open the Quick Access menu by pressing the lower rotary knob and select Navboxes. Then press the same knob to select number of navboxes visible on the screen. Pressing the enter button will produce another option to select the position of navboxes (only in Wpt and Tsk modes), which can be located vertically or horizontally. The final step is a selection of the navbox to be displayed in the selected navbox.





### 5.1.3.1 Editing navboxes

Selecting the navboxes option and then pressing the lower rotary knob will allow you to select one of the three boxes by rotating the same knob followed by a short press. You can then select the required data for the highlighted navbox. A short press of the lower rotary knob selects the desired setting and returns you to the navbox selection.

Pressing the EXIT (middle) button at any time saves the setting and moves to the main mode.



### 5.1.3.2 Navboxes with description

List of available navboxes:

Type	Description
<b>60' speed</b>	Average speed for last hour
<b>Altitude</b>	Altitude in user defined units
<b>Altitude (ft)</b>	Altitude in Feet
<b>Altitude (IGC)</b>	IGC altitude (not available in S8/S80 units)
<b>Arrival altitude</b>	Arrival altitude on target
<b>ArrMc0</b>	Arrival altitude on target with Mc=0
<b>Average Netto</b>	Average vertical movement of air mass
<b>Average vario</b>	Average vario (average vario time can be set)
<b>Bearing</b>	Bearing to the target if GPS is present
<b>Distance</b>	Distance to the target
<b>Emc</b>	Calculated glide ratio at selected McCready value
<b>Flap Current</b>	Current flap position
<b>Flap Requested</b>	Requested flap position
<b>Flight level</b>	Flight level
<b>Flight time</b>	Airborne time
<b>Ground speed</b>	Speed over ground, taken from GPS
<b>Heading</b>	Heading (from compass)
<b>Height</b>	Height is the vertical distance above take off position
<b>Indicated airspeed</b>	IAS
<b>Inverse alt</b>	Altitude in opposite unit
<b>Inverse distance</b>	Distance to the target in opposite unit
<b>McCready</b>	McCready setting
<b>Netto</b>	Vertical speed of air mass
<b>RDL</b>	On radial of selected target
<b>reqE</b>	Required glide ratio to the target

<b>Required alt.</b>	Required altitude to real target elevation (without safety altitude taken in account)
<b>Speed2Fly</b>	Calculated speed to fly from MC setting
<b>Steering course</b>	Steering course to the target
<b>tArrMc0</b>	Arrival altitude on task finish with Mc=0
<b>Task distance</b>	Flown distance on task
<b>Task E</b>	Required glide ratio to task finish
<b>Task remain</b>	Remaining distance of task
<b>Temperature</b>	OAT – Outside air temperature
<b>Thermal vario</b>	Average vario from beginning of circling (Green T)
<b>Time</b>	Local time Offset can be adjusted under Setup-Units
<b>Total Alt.</b>	Altitude which considers also the kinetic energy
<b>Track</b>	Track over ground taken from GPS
<b>True airspeed</b>	TAS
<b>Voltage</b>	Voltage of power supply
<b>Wind</b>	Wind direction and speed
<b>Wind comp.</b>	Wind component
<b>xTrk</b>	Off distance from the task leg



Safety altitude has no influence to required alt calculation!

### 5.1.4 Select / Select Near (Only in WPT mode)

To **Select** a waypoint, rotate the lower rotary knob to highlight the select option and then press once. This will open the Waypoint list.



The waypoint can be selected from the alphabetical list of waypoints (see uploading files section 5.7.13.1). Rotating the lower rotary knob moves you through the waypoint list in alphabetical order, clockwise increases the value, counter-clockwise decreases the value. To select the first letter of the desired waypoint, rotate the lower rotary knob, then press the lower push button to move to the next selection of the letter. Rotate the lower rotary knob until the second letter of the required waypoint is highlighted and then repeat the process until the required waypoint is the only selection available. Press enter (lower rotary button) to select the waypoint. The screen will then change back to the navigation mode and show a line to the waypoint, waypoint name and the relative bearing.

Select **Near** is to select a WPT from the list which is sorted by distance from the current location. Selection of a WPT is the same as described above.


### 5.1.5 Edit Target

The user can edit the Flarm target details.

### 5.1.6 Flarm Traffic

This mode shows all available Flarm traffic around the glider with their FLARM ID codes; the user can also edit all Flarm object data.

### 5.1.7 Event

Event is used to log an event. The recording rate will be increased to 1 second for one minute. A message *"Event marked"* will be displayed on the screen. 

### 5.1.8 Night

Selecting night will cause the unit's brightness to be decreased to its minimum. Pressing again on "night" will reset the brightness to the value defined under **settings**.

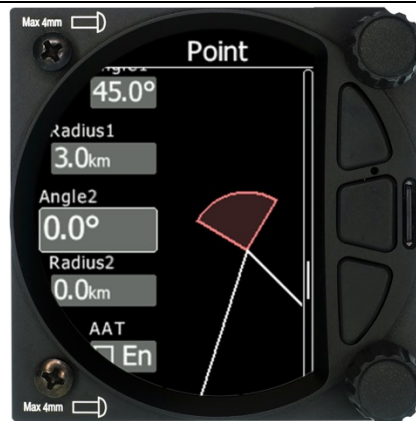
### 5.1.9 Edit Task (Only in Task Mode)

Selecting **edit** task via a short press of the lower rotary knob will enter the task editing screen. The first time you edit a task it will be blank. A short press of the lower rotary knob will open another menu with the option to:

- Insert,
- Edit,
- Delete,
- Zone.

Selecting Insert will allow you to enter a waypoint from the list as a start point. Rotating the lower rotary knob moves you through the waypoint list in alphabetical order, clockwise increases the value, counter-clockwise decreases the value. To select the first letter of the desired waypoint, rotate the lower rotary knob, then press the lower push button to move to the selection of the next letter. Rotate the lower rotary knob until the second letter of the required Waypoint is highlighted and then repeat the process until the required waypoint is the only selection available. Press enter (lower rotary button) to select the Waypoint. Once the start point is selected, rotate the lower rotary knob clockwise and click to select the second turn point. Edit the second turn point as above. Repeat for all the points in the task. When you have completed editing the task, press the (middle) button to save the task and return to the Task navigation mode.

You can also change the Observation zone from the defaults for each Waypoint. To do this select EDIT TASK->select waypoint in the task and then press the lower rotary knob. The quick access menu allows you to insert, edit, delete or change the zone for the Waypoint. If you select **Zone** you can modify the zone for that specific waypoint only.



### 5.1.10 Start Task (only in Task Mode)

Selecting **start** followed by a short press of the lower rotary knob will start a task.

### 5.1.11 Restart Task (only in Task Mode)

Selecting **restart** followed by a short press of the lower rotary knob will restart the task.

### 5.1.12 Next Waypoint (only in Task Mode)

Selecting **next** followed by a short press of the lower rotary knob will advance the task to the next waypoint in the task.

### 5.1.13 Send WPT

With pressing that option, selected waypoint will be sent to SxxxD unit.

### 5.1.14 Sidebar

In the Sidebar menu, a user can select between the different sidebars options that can be displayed on the page. (Classic Speed to Fly-push/pull bar, Flaps tape, Speed tape and combined Speed & Flap tape)

## 5.2 Info Mode

The Info Mode gives you a snapshot of the GPS position, date and time along with Flight level, altitude, Battery and Flarm status. The Flight Level equivalent is also available in meters or feet as is the Altitude navbox.



### Description:

- The GPS status is displayed as OK, BAD, NODATA together with the number of satellites.
- Latitude and longitude
- Local time and date
- Sunrise and sunset time.
- Flight level also in meters
- Altitude in meters and ft
- Battery status
- Flarm status (TX – transmits data / and a number of received Flarms)
- OAT – outside air temperature
- GFL – G-force levels. Minimum and maximum recorded G-force level

### 5.2.1 Quick Access Menu

A short press of the (lower) rotary button activates the Quick Access menu. Refer to Section 5.1 for details of the Quick Access menu.

## 5.3 Flarm Mode

If the S8x/S10x is connected to a Flarm source via the GPS port (in the S10x called the Flarm port) then the Flarm Mode will display a map of the relative positions of Flarm targets that are within range. By rotating the lower rotary knob, you can change the range of the display from 0.5 km to 150 km. Switching between Flarm targets is possible via the up/down button. Data from a selected Flarm object can be seen in 4 corners, such as: Flarm Id, Distance, Vario and Relative altitude (Above / Below). There is also an indication of how many Flarm objects are present displayed as: TX/number.



This mode can be disabled via Setup->graphics->modes->Flarm mode.



Distance, relative altitude and vario indications are related to the selected target.

### 5.3.1 Quick Access Menu

A short press of the lower rotary button activates the Quick Access menu. Refer to Section 5.1 for details of the Quick Access menu.

#### 5.3.1.1 Edit Target

The user can edit the following Flarm objects data:

- Flarm ID
- Competition sign
- Pilot
- Aircraft type
- Registration
- Airfield
- Communication frequency (object's communication frequency)

These settings can be accessed by pressing the lower rotary button, selecting EDIT target and then modifying the data of interest.

### 5.3.1.2 Flarm Traffic

All Flarm objects in range are displayed in this mode. The following details are shown:

- Flarm target ID
- Relative distance
- Vertical speed (vario data from the object)
- Relative altitude

If you press on the selected Flarm target you can enter the edit target menu where you can insert a target's data.

### 5.3.2 Flarm Warnings

Regardless of which Mode you are in, if a Flarm target triggers an urgent (third warning level) or important (second warning level) warning then the screen will change to the Flarm warning mode automatically.

***Extract from the Flarm manual:***

*Warnings are given in order of the time remaining before a potential collision, not the geometrical distance. The first warning level for another aircraft or an obstacle is delivered at less than 19 - 25 seconds before the possible collision; the second warning level is delivered at less than 14 - 18 seconds before; the third level at less than 6 - 8 seconds before.*



*The central number and chevrons indicate if the Flarm target is below or above and by how many meters/feet. The number in the bottom right indicates the range in meters/feet. The numbers are related only to the closest or the most dangerous target.*

## 5.4 Thermal Assistant Mode



The Thermal Assistant mode displays a graphical representation of your location within the thermal. If you are thermaling to the left, there will be an aircraft symbol on the right of the ring of bubbles and the bubbles will appear to rotate clockwise (towards the symbol of the glider). If you are in a right-hand thermal there will be an aircraft symbol on the left and the ring of bubbles will appear to rotate anticlockwise (towards the symbol of the glider). Large red bubbles indicate the strongest lift within the thermal and small blue dots indicate the weakest lift or sink within the thermal. Yellow bubbles indicate lift equal to your MacCready setting, average thermal or average climb rate depending on your preferred setting (refer to Section 5.7.4.1). The point of strongest lift is indicated by a white large bubble.

You can use the thermal assistant, to visually determine which part of the thermal has the strongest lift and adjust your turn accordingly to manoeuvre the glider in the direction of the strongest lift and away from the weakest lift or sink.

The thermaling assistant can be set to automatically change to the Thermal assistant mode or it can be manually selected. See Section 5.7.4.2 for settings.

The two navboxes within the Thermal Assistant Mode can be configured using the quick access menu.



This page can be configured via: Setup->graphics->modes->thermal mode.



Look out of the cockpit!

Looking into thermal assistant might be life threatening for you and other pilots in the thermal.

### 5.4.1 Quick Access Menu

A short press of the (lower) rotary button activates the Quick Access menu. Refer to Section 5.1 for details of the Quick Access menu.



## 5.5 Waypoint Mode

The Waypoint mode is a quick access screen to provide simple navigation to a Waypoint or Airport. By rotating the bottom rotary knob, you can vary the range of the display from 0.5 km to 200 km.



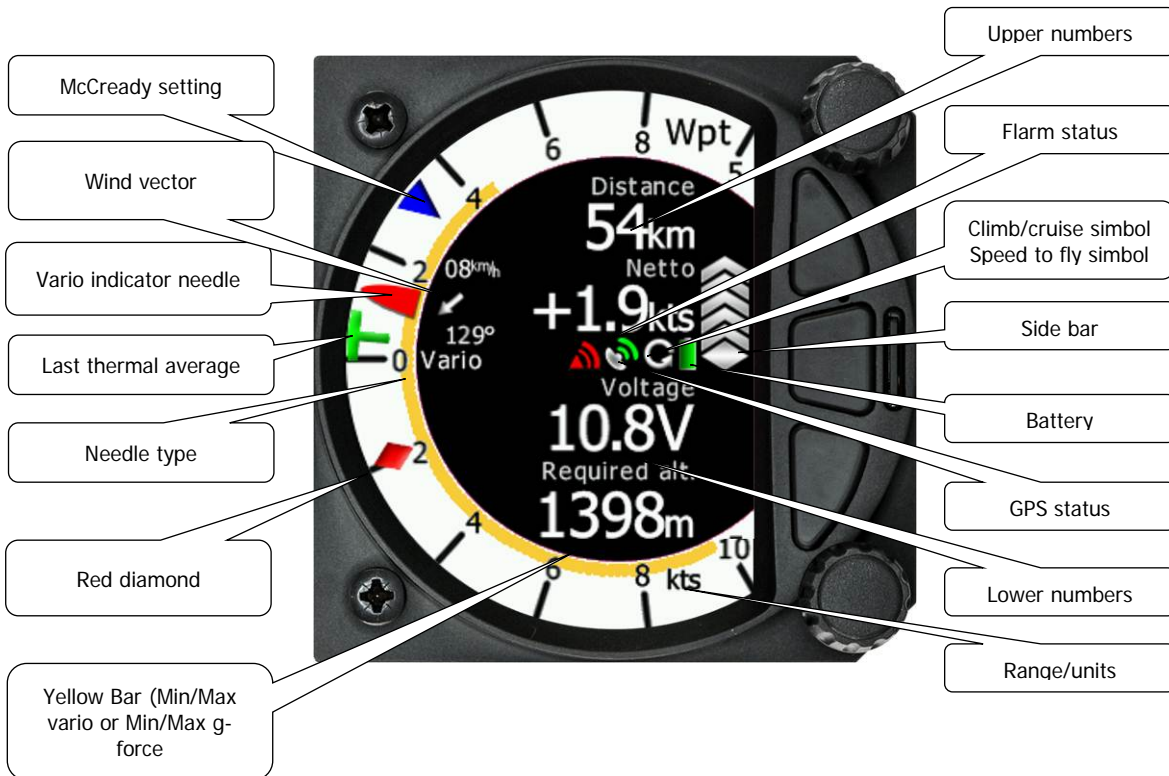
The first page shows a line to a selected waypoint, the name of the selected waypoint at the top of the screen and the relative bearing and chevrons indicating the direction to turn towards the selected waypoint.

### 5.5.1 Quick Access Menu

A short press of the (lower) rotary button activates the Quick Access menu. Refer to Section 5.1 for details of the Quick Access menu.

### 5.5.2 Second Page Within Waypoint Mode (Numerical Data)

The Waypoint mode has a second page which contains numerical data. Defaults are 4 navboxes: Average Vario, Netto, Altitude and True Airspeed. In addition, the central line shows the status of the Flarm, GPS, Cruise/Climb and battery status. This second page can be selected by pressing the lower push button once. You can return to the Waypoint navigation mode by pressing the upper push button (top button of the three).



- The Vario **Needle** can display: the Vario, Netto, Relative or Speed to fly value (Setup->Hardware->Indicator). The scale can be chosen in the range of +/-5 +/-10 or +/-20 (in SETUP-> Vario Parameters). Within the software the range can be set to m/s, kts, km/h, mph or fpm (in Setup, Units, Vertical speed)
- **SideBar** can be configured to display Speed to fly bar, Speed tape or flap tape.
  - The **Speed to fly bar symbol** indicates which speed you must fly relative to the current MacCready setting, sink rate and speed. One arrow means 10 units of speed faster or slower. Up red arrows mean fly slower and down blue arrows mean fly faster.
  - **Speed Tape** represents the Indicated Air Speed (IAS) in speed tape form. Depending on the speed setting's (see Polar & Glider - Speeds). The speed tape will change colour from green, yellow to red depending on the settings and the IAS
  - **Flap Tape** can display recommended flap position. If a Flap sensor is present on the CAN bus, the flap tape will also display the actual flap position.
- The **Red diamond** symbol can show Netto, Average Netto, Average vertical speed or G-force.
- The **Blue arrow** symbol shows the current MacCready value.
- The **Green T** symbol represents last thermal average value.
- The **Yellow Bar** can show Max and Min values of vario over defined time (average vario) or G meter (over whole flight).

- The **Flarm Status** symbol indicates the presence of a Flarm unit (grey), if the Flarm receives any data from other Flarm units, the symbol becomes red.
- The **GPS** symbol is green when GPS status is OK, and red when GPS status is bad. If GPS data is not detected, the symbol will disappear.

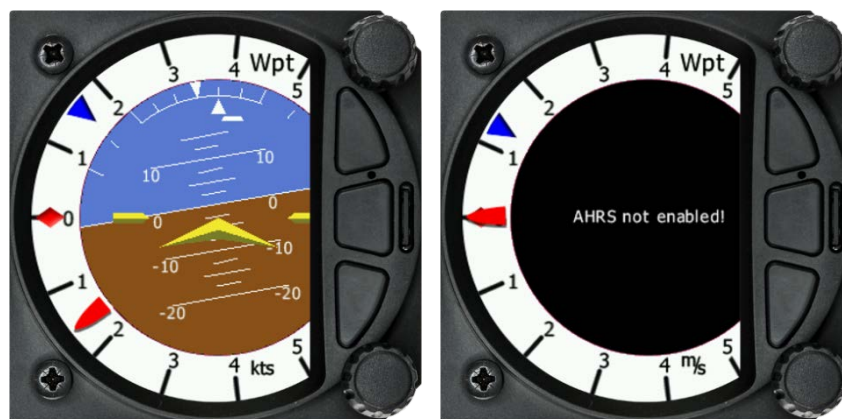
The numerical navboxes can be changed using the Quick Access menu with a short press of the lower rotary knob followed by selecting navbox from the menu and a further short press of the lower rotary knob. With the first navbox highlighted with a yellow border you can scroll through the four navboxes using the lower rotary knob. Select the navbox you wish to change with a short press of the lower rotary knob. This will open a list of available navboxes.



Select the required navbox and then save this with a short press of the lower rotary knob. Repeat the process for any other navbox that needs to be changed.

### 5.5.3 Third Page at Waypoint Mode (AHRS page)

The Waypoint mode has a third page which displays the AHRS (if this feature has been enabled – refer to Section 8.5.5).



The Pitch offset can be adjusted via the lower rotary knob.



For competitions the artificial horizon can be disabled via the Setup>Graphics>Modes menu. See Section (5.7.6) for more details. When the artificial horizon page is active a BFION event is written to recorded flight for verification purposes.

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### **5.5.4 Quick Access Menu**

A short press of the (lower) rotary button activates the Quick Access menu. Refer to Section 5.1 for details of the Quick Access menu.

## 5.6 Task Mode

The task mode can display a navigation page including airspace and a task. By rotating the lower rotary knob, you can change the range of the display from 0.5 km to 200 km.



Task mode is not enabled on S8/S80 Club version. To purchase this option please refer to chapter 3.2.3

### 5.6.1 Quick Access Menu

A short press of the (lower) rotary button activates the Quick Access menu. Refer to Section 5.1 for details about the Quick Access menu.

### 5.6.2 Second Page Within Task Mode (Numerical Data)

The Task mode has a second page which contains numerical data. Defaults are Average Vario, Netto, Altitude and True Airspeed. The central line also displays the status of the Flarm, GPS, Cruise/Climb and battery. This second page can be selected by pressing the lower push button once. You can return to the task navigation page by pressing the upper push button.



The navigation boxes in this second task page can be changed using the Quick Access menu and selecting **navbox**. You can make changes to the navboxes as described in Section 5.1.3.

### 5.6.3 Third Page Within Task Mode (AHRS Page)

The Task mode has a third page which displays the AHRS (if this feature has been enabled, refer to Section 8.5.5 for details).



The pitch offset can be adjusted with the lower rotary knob.



For competitions the artificial horizon can be disabled in the Setup>Graphics>Modes menu. See Section 5.7.6 for more details. When the artificial horizon page is active a BFION event is written to the recorded flight for verification purposes.

### 5.6.4 Quick Access Menu

A short press of the lower rotary knob activates the Quick Access menu. The following menus are available:

- Start
- Edit task
- MC/BAL
- Navboxes
- Reset g
- Event
- Night



Changing the Start, Edit task, MacCready, Ballast & Bugs is the same as Page 1 of the Task mode.



### 5.6.4.1 Editing navboxes

Selecting the navboxes option and then pressing the bottom rotary knob will allow you to select one of the three boxes by rotating the lower rotary knob followed by a short press. You can then select the required data for the highlighted navbox. A short press of the lower rotary knob selects the desired setting and returns you to the navbox selection.

Pressing the EXIT (middle) button at any time saves the setting and moves to the main page.

### 5.6.4.2 Reset G

“Reset G” is a method of re-setting the “G” meter if configured as the yellow bar on the vario scale.



## 5.7 Setup Mode

The setup mode allows you to change the configuration and base settings for the S8x/S10x vario.



Following items are listed in the setup menu:

- QNH & RES
- Flight recorder
- Vario parameters
- Thermal assistant
- Display
- Graphics
- Sounds
- Warnings
- Observatory Zones
- Units
- Hardware
- Files
- Polar & Glider
- Logbook
- Password
- About

You can scroll up and down the list of settings by rotating the lower rotary knob and selecting a setting to change with a short press of the lower rotary knob.



All menus have the EXIT button which will exit to the previous menu. You can also exit from the menu if you press the middle push button.

Some of the options have sub menus and these are selected in the same way.



## 5.7.1 QNH & RES

Turn the lower rotary knob to select the required entry field. Press the lower rotary knob to select it and start editing the value. A further short press will enter the value.



### 5.7.1.1 QNH

This feature may be used to offset the altitude datum as the result of pressure changes during the flight. Since changing the QNH influences the indicated altitude, care should be taken when changing the value as an incorrect setting could upset the final glide calculation.

### 5.7.1.2 Safety Altitude

This setting is the altitude reserve or safety altitude and is the height that the instrument adds to the final glide altitude required so the glider arrives over the final glide destination at the selected safety altitude. Once the safety altitude has been specified, the pilot must keep the final glide indicator on 0 to arrive at the safety altitude (setup one of the navboxes in the primary or secondary pages of waypoint or task modes to be Arrival Altitude).



## 5.7.2 Flight Recorder

The S10x vario system has a built-in IGC-approved flight recorder. In this menu the user can set flight recorder parameters and pilot's data.



S8x version 6 or higher also has a flight recorder which does not have a digital signature and therefore is not approved for badge flights according IGC standards.

### 5.7.2.1 Recording Interval

Set the recording interval from 1 – 20 seconds.

### 5.7.2.2 Auto Finish

If this functionality is enabled, the flight recorder will automatically finish the flight under the following conditions:

- GPS status OK
- Groundspeed lower than 20 km/h
- True airspeed lower than 40km/h
- Absolute vario lower than 1m/s for 300 seconds

### 5.7.2.3 Finish Before OFF

If this setting is enabled the flight will be finished if the user powers down the unit.

### 5.7.2.4 Logger Always ON

This setting will enable logging of flight immediately after power on and will log the flight until the unit is powered down. The only condition to start logging is the presence of a valid time (GPS status BAD or OK). Logging will not start if GPS status is Very Bad (no valid time present).

### 5.7.2.5 Pilot

Insert the pilot's name which will be stored in the declaration.

### 5.7.2.6 Co-pilot

If the system is used in a two-seater the name of the co-pilot may also be entered.

### 5.7.2.7 Competition number

Insert the competition number of the glider which is also stored in the flight file.

### 5.7.2.8 Registration number

Insert the registration number of the glider which is also stored in the flight file.

### 5.7.3 Vario Parameters



#### 5.7.3.1 Vario Needle Filter

Sets a time constant of the **Vario** needle. The value can be adjusted between 0.1 and 5 s with step 1.0s or 0.1s. Default value is 2.0 s.

A lower number (0.1s compared to 5.0 s) means very sensitive (fast vario).

#### 5.7.3.2 Vario Sound Filter

Sets a time constant of the **Vario** sound. The value can be adjusted between 0.1 and 5 s with step 1.0 s or 0.1 s. Default value is 2.0 s.

#### 5.7.3.3 Netto Filter

Sets a time constant of the **Vario Netto** needle. The value can be adjusted between 0.1 and 5 s with step 1.0 s or 0.1 s. Default value is 4.0 s.

#### 5.7.3.4 Relative Filter

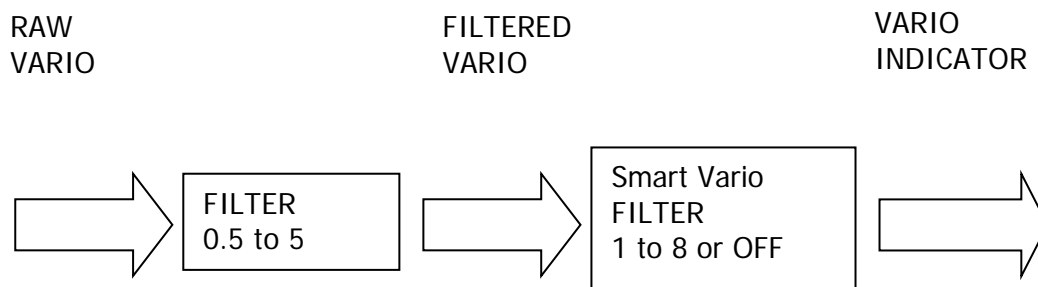
Sets a time constant of the **Vario Relative** needle. The value can be adjusted between 0.1 and 5 s with step 1.0 s or 0.1 s. Default value is 4.0 s.

#### 5.7.3.5 SC Filter

Sets a time constant of the **Speed-To-Fly** needle. The value can be adjusted between 0.1 and 5 s with step 1.0 s or 0.1 s. Default value is 4.0 s.

### 5.7.3.6 Smart Filter

Using the **Smart vario filter** the vertical speed can be further filtered. Smart vario filter defines maximum speed of the vario needle. "1" is the highest damping, "8" the lowest. Off means no additional filtering.



### 5.7.3.7 Needle Range

Sets the full-scale range of the vario (2.5 m/s, 5 m/s or 10 m/s). Default value is 5 m/s (10 kts).

### 5.7.3.8 Auto SC

Defines the conditions when the instrument will switch automatically between vario and speed to fly mode.

- **OFF:** Switching exclusively by means of an external switch connected to the S8x/S10x. With new versions of Remote sticks there is no longer a "physical" switch connection between the Remote stick and the Vario unit – it is a switch on the Remote stick which is connected through the RS485 bus.
- **GPS:** When the GPS detects that the glider is circling an automatic change over to vario will happen after approximately 10 seconds. Detection of straight flight will cause a changeover to speed command.
- **IAS:** When the IAS exceeds a pre-set value. The IAS at which switching occurs can be selected in 5 km/h steps from 100 up to 160 km/h (or the equivalent in knots or mph).
- **G-meter** – for switching between cruise and climb mode based on the G measured by the inertial system. When glider starts circling the S8x/S10x will automatically switch from cruise to climb mode.



The external switch wired to the LXNAV S8x/S10x has absolute priority and will override all other switching methods. VP (Vario priority) input can also override a hard-wired SC switch.



To configure navboxes in SC mode on the ground you must first turn Auto SC off, configure your navboxes and then set Auto SC back to your preferred setting.

### 5.7.3.9 TE Compensation

The LXNAV S8x/S10x offers two methods of vario Total Energy Compensation:

- Pneumatic TE Pitot tube
- Electronic TE compensation



It is important to note that the method of TE compensation is defined when the instrument is installed by virtue of the pneumatic connections made to the TE and static ports. Changing the compensation type in the setup mode below WILL NOT change the method of compensation – the pneumatic plumbing must be changed first.



If the TE pitot tube has been connected, TE compensation should be set to 0%. No further adjustment of the TE compensation is possible. Quality of the TE tube is the one and **only** factor.



For *electronic* TE compensation, connect the TE port to *static*. Set the Vario Param TE compensation *initially* to 100% and then adjust this with flight testing as described below.

### 5.7.3.9.1 TE-Fine Tuning

The electronic TE compensation can be fine-tuned during flight using the following procedure: It is essential that this is only done in smooth air; it is not possible to tune the TE accurately in turbulent air.

- Set TE compensation to 100%.
- Accelerate up to approximately 160 km/h (75 kts) and keep the speed stable for a few seconds.
- Gently reduce the speed to 80 km/h (45 kts).
- Observe the vario indicator during the manoeuvre. At 160 km/h the vario will indicate about -2 m/s (-4 kts). During the speed reduction the vario should move towards zero and should never exceed zero.
- If the vario shows a climb the compensation is too low; increase the TE% and vice versa.
- Try another "zoom" to assess the change and make further adjustments if necessary.

Electronic TE compensation is only effective when the Pitot tube and static sources are co-located and the pneumatic lines to the instrument are approximately the same length. The best sensor to use is the combined pitot/static Prandtl tube. If problems are experienced with the electronic TE compensation the most likely cause is the glider's static source.

The static source can be checked by plumbing the pneumatic tubes for electronic compensation and then setting the TE: to 0%. In still air accelerate to approximately 160 km/h (75kts) and slowly reduce the speed to 80km/h (45kts). Observe the vario indicator. If the static source is good the vario should immediately start to move to show a climb. If the needle initially shows increased sink and then moves to a climb, the static source of the glider is unsuitable and there is no way to provide successful TE compensation electronically. The use of a dedicated and accurate fin-mounted pitot/static source such as a Prandtl tube might help.

### 5.7.3.10 Vario Average Time

Defines the integration period for the average netto vario in seconds. The default is 20 seconds.

### 5.7.3.11 Integrator Reset

If this item is enabled the average vario (integrator) will be reset to 0 when switching from SC to Vario mode.

### 5.7.3.12 Temperature Offset

The LXNAV S8x/S10x is supplied with an external outside air temperature (OAT) sensor. With the offset setting it will correct static errors of temperature measurement.

### 5.7.3.13 Airspeed Offset

The user has the possibility to make an airspeed offset if the measurement is not correct.

### 5.7.3.14 Inertial Assisted Vario

With the LXNAV S8x/S10x, it is possible to adjust the influence of g-force on the vario. This influence is very small and can be set to OFF or between 0 and 4.

0 means no inertial assistance.

4 is the highest influence of the inertial platform to vario.

## 5.7.4 Thermal Assistant



### 5.7.4.1 Colour Circles By

There are three options for the thermal assistant, Auto Span, MacCready and Average Vario.



The colours in the thermal assistant indicate below average (blue), average (yellow), above average (red) and the strongest point of thermal (white).

- If **Auto Span** is selected then the Thermal Assistant will use the average performance of the last circle to calculate below, average and above average climb and indicate accordingly i.e. red bubbles for strongest lift and blue dots for weakest lift or sink.
- If **MacCready** is selected then the Thermal Assistant will use the current MacCready setting to show rate of climb below, MacCready and above the MacCready setting
- If **Average Vario** is selected then the Thermal Assistant will use the average vario for the flight to show the rate of climb below average vario, average vario and above average vario.

### 5.7.4.2 Use active navigation data

If this item is checked, all the data relating to navigation will be calculated to either Wpt or Task, depending on which page the thermal mode was switched from.

### 5.7.4.3 For Manual switching

In you manually switch to thermal mode, all navigation data will be related to the setting you have selected.

### 5.7.4.4 Switch to Thermal Assistant Mode

With this box ticked the S8x/S10x will change to the Thermal Assistant mode when the glider starts turning in a climb. If the box is left un-ticked, then the thermal assistant mode can be accessed manually.



The S8x will only detect turning if a GPS or Flarm device is attached. The S8x uses a combination of change of speed, angle of bank and direction change to indicate circling.



The S10x has an internal GPS module.

### 5.7.4.5 Thermal Assistant Ping Method

If the Thermal assistant ping method is enabled the user will hear a PING during circling. When the PING is heard the pilot must expand the circle to centre the thermal. In the settings there are two methods available to trigger the PING: time before thermal maximum and angle before thermal maximum.

#### 5.7.4.5.1 Time Before Ping

Using this method, user will hear PING (different audible signal) the selected number of seconds before maximum of thermal.

#### 5.7.4.5.2 Angle Before Ping

Using this method, user will hear PING (different audible signal) the selected number of degrees before maximum of thermal.

## 5.7.5 Display





### **5.7.5.1 Automatic Brightness**

If the Automatic Brightness is checked, then the brightness will be automatically adjusted between the minimum and maximum parameters set. If the Automatic Brightness is unchecked, then the brightness is controlled by the brightness setting.

### **5.7.5.2 Minimum Brightness**

Use this slider to adjust the minimum brightness for the Automatic Brightness option.

### **5.7.5.3 Maximum Brightness**

Use this slider to adjust the maximum brightness for the Automatic Brightness option.

### **5.7.5.4 Get Brighter In**

The user can specify in which time period the brightness can reach the required brightness.

### **5.7.5.5 Get Darker In**

The user can specify in which time period the brightness can reach the required brightness.

### **5.7.5.6 Brightness**

With the Automatic Brightness unchecked you can set the brightness manually with this slider.

### **5.7.5.7 Night Mode Darkness**

Set the percentage of the brightness to be used after a press on the NIGHT mode button.

## 5.7.6 Graphics

The Graphics option has a sub menu for Map, Airspace, Waypoints, Glider and Track, Tasks, Flarm, Theme setup and Modes.



### 5.7.6.1 Map

Option to set Track Up or North Up.

### 5.7.6.2 Airspace



Airspaces are not enabled on S8/S80 Club version. To purchase this option please refer to chapter 3.2.3

In this dialogue you can define the airspace map presentation. Check the **Show airspace** item to enable airspace displays in navigational modes. If this item is unchecked no airspace will be displayed.

Use **Show only airspace below** to eliminate airspace which is going to be too high for the day. For example, if the forecasted cloud base is to be 1500 m, set this value to 1600 m and your screen will be much more readable.

In the airspace type list, you can specify how each airspace type is displayed. You should define each type of airspace zone separately. First choose an airspace type from the list. You can modify the **Transparency** of the selected type. The **Zoom** value defines to which zoom

level this type is going to be visible. The **Colour** and **Width** items specify how the selected airspace zone will be drawn.

All settings listed above can be changed for airspace classes A, B, C, D, E, F and for the following types of airspace:

- Control zone
- Restricted zone
- Prohibited zone
- Danger zone
- Glider sector
- Airway sector
- Transponder Mandatory Zone (TMZ)
- Military zone
- Other zone

### 5.7.6.3 Waypoints



In this dialogue you can define whether waypoints are displayed or not, how many characters are displayed and the size and colour of the label.

#### Show waypoint

Check the dialogue box to enable waypoint labels for the Waypoint and Task Modes.

#### Label Length

You can choose to display all the characters in the waypoint name or a maximum of 8, 7, 6, 5, 4, 3, 2, 1 or none.

#### Label Font size

You can choose between 24, 18 or 16 points.

#### Label Font Colour

You can choose a font colour from the pallet of 12 colours.

### 5.7.6.4 Glider and Track



In this dialogue you can choose to show a line to the target and your track line together with the colour from the pallet of 15 colours.

#### Show line to target

Check the dialogue box to display a line to the target.

#### Line to target

You can choose the colour of the target line from the pallet of 15 colours.

#### Show track line

Check the dialogue box to enable a line to the target.

#### Track line

You can choose the colour of the track line from the pallet of 15 colours.

### 5.7.6.5 Task



With this dialogue you can change the colour of the task line and turn point zone and modify the zone transparency and Zone line width.

### Task colour

You can choose the colour of the task line from the pallet of 15 colours.

### Zone colour

You can choose the colour of the task line from the pallet of 15 colours.

### Zone transparency

With this dialogue you can choose the level of the zone transparency from 0 to 100%.

### Zone width

This dialogue defines the line width of the zone with a choice of 10-line widths.

## 5.7.6.6 Flarm



In this menu you can choose to show Flarm traffic on the map, select target on map only, change glider colours and adjust the Flarm object timeout and graphical settings.

### 5.7.6.6.1 Traffic on Map

Check the dialogue box to display Flarm objects on the screen.

### 5.7.6.6.2 Select Target on Map Only

There will be only the selected target on the map.

### 5.7.6.6.3 Colours

Colours can be set for the following:

- Glider Above Colour
- Glider Below Colour
- Glider Near Colour
- Selected target Colour

**5.7.6.6.4 Label Text**

On the map it is possible to show additional, related text next to the Flarm object. This option can be set to None, Competition sign, Climb rate and Relative vertical.

**5.7.6.6.5 Active Timeout**

Adjusts the time a glider symbol remains on the map after it has last been seen by the Flarm.

**5.7.6.6.6 Inactive Timeout**

Adjusts the time for inactive gliders on the Flarm target list. Inactive gliders are gliders where the Flarm signal has been lost for a period longer than the Active timeout. The targets become inactive and remain only in the Flarm target list for this time.

**5.7.6.6.7 Draw Line to Selected Target**

Check this option to enable or disable a line drawn to a selected Flarm target.

**5.7.6.6.8 Draw History**

Select if a trail is to be drawn behind Flarm targets to show where the targets have been.

**5.7.6.6.9 Plane Icon size**

To adjust the pixel size of Flarm targets.

**5.7.6.7 Theme Setup**

With this dialogue you can change the background colour of the vario gauge and the inner information circle, the user message transparency and navbox transparency.

**5.7.6.7.1 Colour style – Gauge: Inner**

With this dialogue you can change the background colour for the vario gauge (Outer ring) and the background of the information circle within the gauge. You have the choice of the following:

Gauge	Inner
White	Black (default)
White	White
Black	White
Black	Black

**5.7.6.7.2 User msg. Transp.**

With this dialogue you can change the transparency of the user messages when they are displayed overlaid on each screen from 0 to 100%. Default is 50%.

### 5.7.6.7.3 Navbox transparency

With this dialogue you can change the transparency of the navboxes which are overlaid on each screen from 0 to 100%. Default is 44%.

### 5.7.6.7.4 Wind Symbol Size

Here you change the size of the wind symbol from Small to Large.

### 5.7.6.8 Modes

Task, Thermal and Flarm modes can be disabled via this menu. Also, the AHRS page can be disabled here.



For competitions the artificial horizon can be disabled in this menu. When the artificial horizon page is active a BFION event is written to the recorded flight for verification purposes.

## 5.7.7 Sounds

The sounds option has a sub menu for Equalizer, Vario and Flarm.



### 5.7.7.1 Equalizer Option

With the lower rotary knob, you can adjust the volume for each frequency. The settings are stored when you exit the screen (via the middle button).



## 5.7.7.2 Vario Sounds



In this menu the user can change all the parameters for vario sounds.



The volume for Vario, Flarm and Speech can also be adjusted directly via the upper rotary knob whilst in the Flarm, Waypoint and Task Modes.

### 5.7.7.2.1 Vario Volume

The user can set the default vario volume.

#### Sound shape

In this menu, you can choose between following shapes: Sinus, Triangular and Harmonic.

#### Vario audio mode:

- **Linear positive:** the sound is interrupted with silence every few milliseconds when the needle is positive; on negative side sound is linear (not interrupted).
- **Linear negative:** inverse function to **Linear positive**.
- **Linear:** the sound is linear and non-interrupted in full scale range.
- **Digital positive:** similar to **Linear positive**, except the frequency is not changing linearly but with larger steps.
- **Digital negative:** inverse function to **Digital positive**.
- **Linear positive only:** the sound is present only at positive values, for negative values there is silence.
- **Digital positive only:** similar function to **Linear positive only**, except the sound is similar to the digital tone.
- **Digital:** similar function to **Linear**, except the sound is similar to the digital tone. The frequency is not changing linearly, but by steps. Sounds like playing a flute.

#### 5.7.7.2.1.1 SC Audio mode

SC audio mode has five modes:

- **SC positive:** the sound is interrupted with silence every few milliseconds when the needle is positive; on negative side sound is linear (not interrupted).
- **SC negative:** inverse function to SC positive.
- **SC:** the sound is linear and non-interrupted in full scale range.



- **SC Mixed:** for positive relative values the sound represents relative; for negative relative values the sound represents SC (for that setting it is recommended to set SC needle to relative).
- **Netto speed:** the variometer will produce the same sound as defined in Vario audio, except it will follow netto vertical speed.

### Dead band

Defines the width of the audio dead band in speed to fly mode. Default value is  $\pm 1$  m/s.

#### 5.7.7.2.1.2 Audio frequencies

- **Freq at 0%** defines the tone frequency at 0 m/s.
- **Freq at +100%** defines the tone frequency at full + deflection.
- **Freq at -100%** defines the tone frequency at full – deflection.

#### 5.7.7.2.1.3 Equalization pre-sets

We have three options: default LXNAV speaker, flat setting or user defined.



The volume for Vario, Flarm and Speech can also be adjusted directly via the upper rotary knob whilst in the Flarm, Waypoint and Task Modes.

### 5.7.7.3 Flarm Sounds



#### 5.7.7.3.1 Flarm Volume

Adjust the default Flarm volume with the slider.

#### 5.7.7.3.2 Flarm Low Alarm

For distant Flarm targets the S8x/S10x give a short or long message, just a beep or be turned off (19-25 seconds before possible collision).

#### 5.7.7.3.3 Flarm Important Alarm

For close Flarm targets the S8X can give a short or long message, just a beep or be turned off (14-18 seconds before possible collision).

#### 5.7.7.3.4 Flarm Urgent Alarm:

For very close Flarm targets the S8x/S10x give a short or long message, just a beep or be turned off (6-8 seconds before possible collision).



The volume for Vario, Flarm and Speech can also be adjusted directly via the upper rotary knob whilst in the Flarm, Waypoint and Task Modes.

For the alarm sound the user has the possibility to select between beep, short message and long message sounds.

Short message sounds: "Traffic two o'clock"

Long message sounds like: "Traffic two o'clock, two kilometres, two hundred meters above".

## 5.7.8 Warnings

### 5.7.8.1 Enable Flarm Warnings

Warnings can be enabled or disabled in this section.

The warning dismiss time can be set from 0 to 120 seconds.

### 5.7.8.2 Flarm Warnings

**Display urgent alarms:** Third level approximately **8 seconds** before predicted collision.

**Display important alarms:** Second level approximately **13 seconds** before predicted collision.

**Display low alarms:** First level approximately **18 seconds** before predicted collision.

**Dismiss while circling:** This dismisses Flarm alarms for Flarm targets in the same thermal. Flarm warnings for urgent alerts override this.

**Altitude Alarm:** It can be set in meters or feet. The S8x/S10x will display a warning before reaching the selected altitude.



**Warn me before:** Is related to Altitude alarm; it can be set from 10 to 500 seconds. The predicted time to reach alarm altitude is calculated from the average vario.

**Dismiss time:** If a Flarm warning is dismissed, there will be no Flarm warnings for the number of seconds set in that menu.

### 5.7.8.3 Visual Messages/Warnings



The S8x/S10x will provide the following visual messages/warnings:

- Digital signature failed (it will appear immediately after initial setup)
- Freezing temperature (it is related to the OAT measurement)
- Task started
- Inside zone
- Next zone
- Outside zone
- Airbrakes not locked
- Check landing gear
- Low external battery
- Running on internal battery (if flight recorder is running) 
- Shutting down (if flight recorder is not running and there is no external power) 
- Freezing temperature (if the outside temperature is 1 degrees)
- Altitude warning

### 5.7.8.4 Voice Warnings

The S8x/S10x will trigger the following voice warnings:

1. Gear warnings  
CHECK GEAR: this warning is triggered 5 minutes after take-off if the landing gear is not wired to any of the inputs of the S8x/S10x.  
CHECK LANDING GEAR: during the flight, gear up\*, airbrakes opened\*.
2. Airbrakes warnings  
CHECK AIRBRAKES: if you are on the ground, speed 0, gear down\*, airbrakes opened\*. This warning is repeated every 30 seconds.  
WARNING AIRBRAKES, WARNING AIRBRAKES...: during the acceleration, gear down\*, airbrakes opened\*.  
CHECK AIRBRAKES: speed, airbrakes opened\*.
3. Low battery (if the battery is low – see battery chemistry setting).
4. Stall speed (warning is related to the stall speed set in the menu).
5. Flarm voice message long: Traffic at: position, distance, vertical distance.
6. Flarm voice message short: Traffic at: position.

\*airbrakes or landing gear should be wired to digital inputs!

### 5.7.9 Obs. Zones

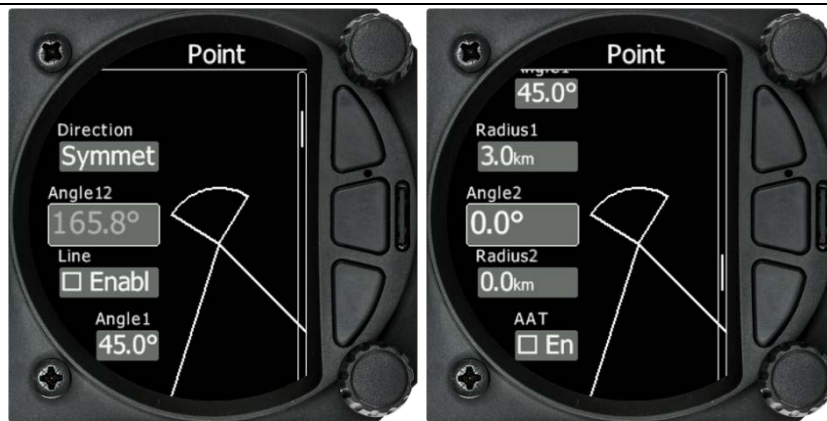
The default Observation Zones can be configured in this section for all tasks.



The Start, Waypoint and Finish zone can be configured separately although the setup is very similar.



The Start and Finish zone do not have the option of the AAT check box or Auto next.



- **Direction:** Options include Start, Previous, Next, Symmetrical or Fixed angle.
- **Angle 12:** is greyed out unless fixed angle is specified in Direction.
- **Line Check Box;** typically used for Start and Finish. If line is checked then Angle 1, Angle 2 and Radius 2 are greyed out.
- **Angle 1:** Sets the angle of the Turn Point Zone.
- **Radius 1:** Sets the radius of the Turn Point Zone.
- **Angle 2:** Sets angle 2 for complex Turn Points and Assigned Area Tasks.
- **Radius 2:** Sets the radius for complex Turn Points and Assigned Area Tasks.
- **AAT Check Box:** when checked the S8x/S10x considers the area created within the zone as an Assigned area.
- **Auto Next:** Typically used in racing tasks, this will change the navigation of the S8x/S10x to the next turn point when a single fix is made within the Turn Point Zone.

### 5.7.10 Units

Use this menu to specify units, UTC time offset and type of ballast input.



- **Units system:** Metric, English, US.
- **Distance:** Units available; statute miles, nautical miles, kilometres.
- **Altitude:** Units available feet, meters.
- **Temperature:** Units available; degrees centigrade or degrees Fahrenheit.
- **Pressure:** Units available; inches of mercury (inHg), mm of mercury (mmHg), mbar.
- **Speed:** Units available; fpm, m/s, mph, kts, km/h.
- **XC Speed:** Units available; fpm, m/s, mph, kts, km/h.
- **Vertical Speed:** Units available; fpm, m/s, mph, kts, km/h.

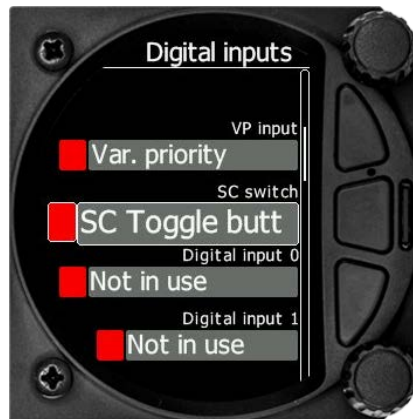
- **Wind:** Units available; fpm, m/s, mph, kts, km/h.
- **Weight:** lbs or kg
- **Load:** lb/ft2 or kg/m2
- **Longitude/Latitude:** DD.ddddd, DDMM.mmmmm', DDMM'SS.ss", DD.dddd, DDMM.mmm', DDMM'SS"
- **UTC Offset:** in half or whole hours plus or minus Zulu.
- **Ballast:** weight (insert ballast in kg), load (ballast kg/m2), overload (factor of overload).

### 5.7.11 Hardware

The hardware setup has a sub menu for Digital inputs, Indicator, Communications, Battery, Remote Stick, Flaps, Bridge and Compass module.



#### 5.7.11.1 Digital inputs



Digital inputs are not enabled on S8/S80 Club version. To purchase this option please refer to chapter 3.2.3

#### VP Input (Vario Priority)

When this input is activated by grounding the appropriate wire, the unit will change over to Vario immediately. This input wire is set open (not grounded) as a factory default on delivery. This switch has priority over all SC switching methods. This means it will override all other signals for SC and switch unit to vario mode. This input is not wired in standard wiring - it must be wired by the customer.

### 5.7.11.1.1 SC Switch

The LXNAV S8x/S10x has an input for an external **speed command switch**. Using the external switch, it is possible to manually switch between SC and Vario. Setting the **SC switch** to **ON** means that closing the switch will cause the instrument to enter SC mode. Setting the SC switch to **OFF** means that closing the switch will select Vario mode. There is a third option by setting SC INPUT to **TASTER** and connecting a push button to the input; each key press will toggle between SC and Vario (mandatory setting for LX Remote, which provides a push button for SC).

### 5.7.11.1.2 Digital Inputs 1,2,3,4

The LXNAV S8x/S10x has 4 external digital inputs which can be set to indicate the state of the landing gear, airbrakes and water open or closed. The wiring is described in Section 8.6.2.

### 5.7.11.1.3 Example of Warnings Triggered by the Input:

1. Gear warnings  
CHECK GEAR: this warning is triggered 5 minutes after take-off if the landing gear is not wired to any of the inputs on the S8x/S10x.  
CHECK LANDING GEAR: during the flight, gear up, airbrakes opened.
2. Airbrakes warnings  
CHECK AIRBRAKES: if you are on the ground, speed 0, gear down, airbrakes opened. This warning is repeated every 30 seconds.  
WARNING AIRBRAKES, WARNING AIRBRAKES...: during the acceleration, gear down\*, airbrakes opened.  
CHECK AIRBRAKES: speed, airbrakes opened.



Input pins are available on the rear DB15 connector, but they are not wired.



Input is active when it is shortened to ground.



## 5.7.11.2 Indicator Setup



**Vario Needle:** Can be set to Vario, SC, Netto or Relative.

**SC needle:** Can be set to Vario, SC, Netto or Relative.

**Yellow Bar:** Can be set to G-meter, Min/Max vario or no bar.

**Red Diamond:** Can be set to No diamond, Average, Netto, Average Netto or G-meter.

**MacCready:** The blue triangle can be enabled or disabled.

**Thermal:** The green T can be enabled or disabled.

**STF or Speed to Fly:** The push - pull bar can be enabled or disabled.

### 5.7.11.3 Communication Setup

This is used to configure the two ports on the back of the S8x/S10x for connecting to a GPS/Flarm source and to a PDA. Each port can be configured separately.



#### 5.7.11.3.1 Direct link: PDA-GPS link

If your PDA device does not support automatic switch to DIRECT LINK between GPS and PDA port, there is a manual **DIRECT LINK** menu. The user can select between PDA-GPS or BT-GPS.

When **automatic baud rate** is enabled, the LXNAV S8x/S10x will automatically search on all speeds to receive valid data on the GPS(FLARM) port. When the S8x/S10x receives a valid NMEA sentence it will lock on that baud rate and stop searching.



**PDA-GPS link** is normally automatic but some PDA's software requires manual settings.

#### 5.7.11.3.2 BT-GPS Link

Allows a PNA device connected via Bluetooth to directly communication with a device which is connected to the GPS/Flarm port (Flarm/Nano).

#### 5.7.11.3.3 PDA Baud rate

Set the baud rate of the PDA port.

The baud rate on the PDA port must be set to same as it is on the PDA device otherwise S8x/S10x and PDA will not hear each other.



The baud rate on PDA must not be lower than the setting on GPS port.


#### 5.7.11.3.4 GPS (S10x-Flarm port) Baud Rate

Set the baud rate of the GPS/Flarm port.



To obtain best performance from the LXNAV S8x/S10x it is recommended that both baud rates are set as high as possible.

### 5.7.11.3.5 Bluetooth

ON/OFF for the internal Bluetooth module. If the BT module is turned off the power consumption will be lower, and the operating time of the internal battery will increase. 

**NMEA output** on PDA port and on BT can be enabled or disabled. If you are not using a PDA port this setting should be disabled to obtain better performance.



The Bluetooth password is 1234

### 5.7.11.3.6 Beeps Controlled by PDA


If a PDA is connected to the S8x/10x, the PDA can send a beep command to the S8x. If this feature is enabled the S8x/10x will beep on request from the PDA.

### 5.7.11.3.7 External Target

If this item is checked unit will accept target information received by PDA, BT or GPS port. User will get information to the screen, that new target is received. User can accept or ignore the target.

### 5.7.11.4 Battery Setup

S10x units have 2 options listed:

- External battery
- Internal battery 



#### 5.7.11.4.1 External Battery chemistry

The user must select the battery from the battery list to obtain the proper voltage measurement.

Batteries used in gliders today are not just the old-style **lead acid battery** but also **Lithium Ion (LiIon)** and **Lithium Iron Phosphate (LiFePo)** are available.

Each battery type has a different power delivery curve and it is now possible to configure the Low and High Battery warnings.



Select battery from list gives you a drop-down list with the suggested battery settings for Full Voltage, Low Battery Voltage and Empty Voltage as pre-sets. Selecting one of these will set the values in the following boxes.



Alternatively, you can manually change the Full Voltage, Low Battery Voltage and Empty Voltage if your battery type is not listed. Those settings will influence the battery level icon and low battery warning.

#### 5.7.11.4.2 Internal Battery

S10x units have also a built-in internal battery where you can check the health and settings of this battery.



#### 5.7.11.4.2.1 Health of the Battery

This shows the health of the internal battery and its charge level.



#### 5.7.11.4.2.2 Settings of the Internal Battery



The following values can be set:

- Preserve battery = charger will not be activated until the battery drains below 75%.
- Charge to full = if it is not checked, the battery will be charged up to 90%.
- Charger mode = manual manipulation of charging.



The internal battery will not supply power to any peripheral devices, such as compass module, remote stick, Flarm, PDA...

#### 5.7.11.5 Remote Stick (NEW)

The remote stick is also connected to the CAN bus which is the main wiring of the S8x/S10x. The device must be registered in case of a two-seat device as it is possible to have two remote sticks; one registered to the main device and the other one to the second seat device.

Registering the remote stick can be done in the following way:

press any button on the remote stick – the S8x/S10X will detect the presence of the remote stick on the CAN BUS.

Go to Setup->Hardware->Remote stick.

**To confirm the remote stick, you must press the OK button on the remote stick.**

The process is similar for the second remote for the S8xD repeater unit. Be sure that at the time of registering repeater unit, front unit is not in Register mode, otherwise both units will listen to the same remote stick.



While remote stick is on different type of communication than Sxxx, user must specify for what purpose remote stick will be used when ordering one. In case of Sxxx instruments, there will be included adapter named Remote CAN. On one side is connected to CAN bus over DB9 connector and on the other side to appropriate wires of remote stick. Follow colour marks on spring contacts.



The Can bus is always under power, consequently the remote stick is also under power. After the flight disconnect the batteries or turn off the master switch to prevent discharging the batteries.



The remote stick is only recognized if the system is under external 12V power. It will not work if the S10/S100 is running on the internal battery only.

#### 5.7.11.6 Compass Module

**TO BE DONE** – the compass module is not supported yet.

#### 5.7.11.7 CAN Bridge

CAN Bridge is an external device which is sold separately and is used to output NMEA data or to connect a radio or transponder to the system.



See installation manual for details on the wiring of CAN Bridge.

Once CAN bridge is plugged in to the CAN BUS, Bridge Sxxxxxx will appear in the Hardware menu.



First, you must define functionality. The dialogue will change based on what you selected and will display related items.

### 5.7.11.7.1 NMEA output



NMEA output is used to transmit NMEA sentences. You can select desired NMEA sentences and define baud rate at which they will be transmitted.

### 5.7.11.7.2 Radio bridge

Radio bridge is used to operate a radio through the main display unit. First the type of connected radio must be selected. For the list of supported devices please refer to CAN Bridge installation manual found on [www.lxnav.com](http://www.lxnav.com).



Due to Becker AR6201 not supporting RS-232 connections it is not supported yet

Selecting **Config radio** will open the radio setup menu. In this menu you can select **Show target warnings**. This will trigger warnings generated from the device (example: radio is too hot). Here you can also setup **active** and **standby frequency**, **volume**, **squelch volume** and **VOX volume**.

### 5.7.11.7.3 XPDR Bridge

XPDR bridge can operate the transponder with the main unit. You can set ICAO Identity in XPDR Setup menu which is opened by clicking **Config XPDR**. It can also show target warnings from the transponder. For the list of supported devices please refer to CAN Bridge installation manual found on [www.lxnav.com](http://www.lxnav.com)



### 5.7.11.8 Flaps

When a flap sensor is installed, use this menu to set flaps position. Use the page selector to select the desired flap position. Press SET to set the position. Repeat this procedure for all flap positions.



When all flap positions are set, a green dot will be displayed with current flap position. If flap labels are not set yet, press **EDIT** to name label. Flap labels must be entered with increasing speed range. It is recommended that flaps labels are set together with speed range in Polar and Glider setup. It is also possible to toggle between cruise and climb mode using the flap sensor.



### 5.7.11.9 AHRS

Once AHRS is activated as described in chapter 8.5.5, this menu is used to calibrate AHRS for installation error.

Place your glider in levelled position and select **Level**. You can also modify **Pitch offset**.





While inflight pitch offset can be adjusted via the lower rotary knob.

In this menu AHRS can also be **Locked by Password**.



**AHRS locked** option serves for a judge at the competition. Judge can lock or unlock an AHRS with his own password. If he can't unlock it with his password, it means that pilot has changed the password and used the AHRS.

### 5.7.12 Profiles

In this menu, the pilot can save his own settings in a profile. Different profiles are useful if more than one pilot is flying the same glider, or, if the glider has a different wing configuration (15m, 18m).

With the lower rotary knob, a pilot can scroll between different profiles, the profiles are stored within the internal storage of the S vario. Please note, the profiles are not stored on the SD card.

When you select the profile, by pressing the lower rotary button, a sub menu will appear with the following options:

- **Edit** (edit name of the profile)
- **Active** (make that profile active)
- **Lock** (lock that profile. All later changes on the S vario will not be stored to profile, useful to protect a profile from changes in a club or syndicate environment)
- **New** (create new profile. You have the option to copy an existing selected profile or create a new factory default profile)
- **Save to SD** (copy the profile from the internal storage to the SD card)
- **Cancel** (do nothing and exit from that menu)
- **Delete** (delete selected profile) At power on, the profile selection menu will appear. A user can select between all the available profiles stored on the S vario.

## 5.7.13 Files

The Files menu allows you to upload or select Waypoint, Airspace and Flarm Net files.



### 5.7.13.1 Waypoints File

Selecting the Waypoints option opens a list of .cup files available on the SD card. Selecting a file loads this file into the internal memory.



Please note that only one Waypoint file can be loaded at any one time.



The file size of a waypoint file is limited to 1MB. The supported format is **CUP** as generated with the **SeeYou** program. Some versions of CUP may not be compatible if they are not created according to **CUP** standard, which is a proprietary format from the Naviter company.



The number of CUP files that can be viewed/selected is 20.

### 5.7.13.2 Airspace File

Selecting the Airspace option opens a list of .cub and .lxa (files from ASAPT database) files available on the SD card. Selecting a file loads this file into internal memory.



Selecting a file loads this file for use.



Please note that only one Airspace file can be loaded at once.



The LXNAV ASAPT database file format is also supported and can be loaded into the system.

### 5.7.13.3 Flarmnet file

Selecting the Flarmnet option opens a list of .fln files available on the SD card or in the internal memory. Selecting a file loads it.



Please note that only one Flarmnet file can be loaded at any one time.

## 5.7.14 Polar and Glider

### 5.7.14.1 Polar

The Polar and Glider section allows you to load and edit a set of parameters for your glider's polar. You can select from a pre-defined list of nearly every common glider or make your own polar.



**Select Glider from List:** presents you with an alphabetical list of all the common gliders and associated polar data. All glider data will be copied from the chosen polar. Verify that the best glide ratio and minimum sink rate displayed. To see whether the polar data matches your glider's performance review the MacCready Setting Menu where you can verify the values.



You can modify the polar by changing coefficients **a**, **b** and **c**. A polar is defined as a quadratic equation with the parameters a, b, and c.

Use the SeeYou program (Tools->Polar) to calculate coefficients a, b and c for a given glider's polar. The program requires three sink points entered at selected speeds (e.g.: 100 km/h, 130 km/h, and 150 km/h). The program will calculate the values of a, b and c, which should be noted and entered into the LXNAV S8x/S10x.

- **Class:** Options for Touring, Ultralight, World, Twin-seater, Club, 18-meter, 15-meter, Open, Standard and Unknown are available.
- **A, b, c:** Options can be adjusted or entered for a non-listed glider.
- **Reference load** (wing loading) value represents the value at which the polar was measured.
- **Reference weight** corresponds to the weight value at which the polar was measured.
- **Maximum take-off weight** is the maximum take-off weight allowed for the glider. It is not used in the calculation; it is just a reminder to the pilot of the maximum take-off weight. **Empty weight** is weight of the glider without the pilot and ballast.
- **Pilot weight** is the weight of the pilot with parachute and baggage.
- **Co Pilot Weight** is the weight of the co-pilot with parachute and baggage.



$$\text{overload} = \frac{\text{Empty.glider.weight} + \text{Pilot.weight} + \text{Water.ballast}}{\text{Minimum.glider.weight}}$$

In case of a two-seater configuration both users have possibilities to change parameters. The last change performed is synchronized into both instruments.

### 5.7.14.2 Speeds

The user can set the following speeds:

- Stall speed (VS0)
- Stall speed (VS1)
- Approach speed (Vapp)
- Best climb (Vec)
- Max flaps (Vfe)
- Manoeuvre speed (Va)
- Max speed (Vne)

These speeds will be used as warnings such as:

- Stall speed

### 5.7.14.3 Flaps

For setting up flaps please refer to Section **Napaka! Vira sklicevanja ni bilo mogoče najti.** for more details

### 5.7.15 Logbook

The logbook page lists all the flights sorted by date.



If GPS data is present the logbook will show the date and time of departure. Manual navigation (without GPS) will show duration and will be marked with “—” marks.



The user can download a flight by a short press on the lower rotary button.

## 5.7.16 Admin mode

In this menu a pilot can lock the unit and protect the settings with a password. If admin mode is selected and a password applied, the settings on the unit will be locked and are not able to be changed. This function is very useful in a club glider, where not all the pilots are experienced enough to setup the unit. In this case, the CFI will lock the unit with a password. The unit can be unlocked anytime with the same password. If a password is forgotten, the unit can be reset to the factory defaults, where the admin password is also erased.

## 5.7.17 Password

There are several system passwords which run specific procedures as listed below:




### 5.7.17.1 List of Password Functions

DELETE WHOLE LOGBOOK	99999
RESET TO FACTORY DEFAULT	00666
AHRS LICENSE ACTIVATION / DEACTIVATION	30000
AUTO ZERO	01043
REPORT TO SD CARD	00111
UPDATE FIRMWARE	89891
FORMAT INTERNAL MEMORY (all data will be lost)	32233

## 5.7.18 About

In the about page, information about the display platform and the sensor box can be viewed.

The user can view the following details:

- IGC serial number 
- Indicator version A and B,
- Sensor box version A and B.





## 6 Variometer and Altimeter

All signals from the pneumatic sensors (altitude, speed) are derived from high quality pressure sensors, which mean that no flask is necessary. The vario signal is derived from the altitude signal. All signals are temperature and altitude compensated. The colour display shows the vario information as well as many other parameters.

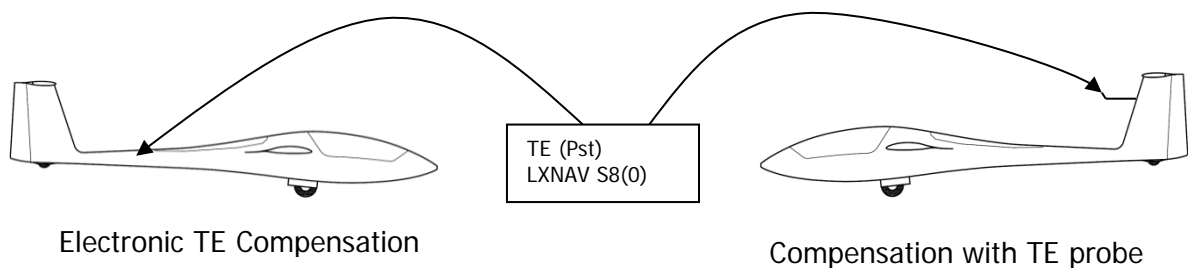
The display is user configurable. The Variometer can be configured to show:

- **Range** 5, 10 and 2.5 m/s or 10, 20 and 5 kts.
- **Time constants** 0.1 s to 5 s, in addition there are 4 settings for electronic processing for the vario signal.
- **Netto** shows the air mass lift and sink.
- **Relative** shows the lift or sink that would be achieved if the glider was circling at thermaling speed.

There are two ways by which the vario indications can be corrected for total energy. Electronic TE compensation is based on speed changes with time and pneumatic compensation with a TE probe. The quality of the TE compensation depends entirely on the location, size and dimension of the TE tube. The installation must be leak-proof.



If an electronic TE compensation is selected the TE (P<sub>st</sub>) port should be connected to a good static pressure source. If pneumatic compensation is selected the TE (P<sub>st</sub>) port should be connected to the TE probe.



### 6.1 Altimeter

The altimeter of the LXNAV S8x/S10X is temperature compensated from -20°C up to + 60°C. The altimeter is calibrated up to 20000 m.

### 6.2 Speed Command

Speed command flying based on the MacCready theory is a very useful tool to optimize cross-country speed. When the instrument changes to speed command mode the audio will change and become a director informing the pilot whether he is flying too fast or too slow. To reduce confusion between vario and speed command audio some special features are incorporated:

- Continuous audio signal and other kinds of signals can be chosen. For details see setup.
- No audio at correct speed (dead band).

## 7 Flying with the LXNAV S8x/S10x

To get the best out of the LXNAV S8x/S10x it is important that some preparation is made prior to take-off. Trying to configure the instrument or set a task while flying is very hazardous especially in a competition. Pre-flight preparation will help ensure that the flight will be both safe and enjoyable.

### 7.1 On the Ground

#### 7.1.1 Power on Procedure

Press any of the rotary or push buttons to start the LXNAV S8x/S10x. The LXNAV S8x/S10x welcome screen will appear. The first screen shows the version of the boot loader, firmware, hardware and serial number. The boot procedure normally takes a few seconds. When completed the Set Elevation dialogue is displayed.

#### 7.1.2 Set Elevation and QNH

This setting is crucial for final glide calculation: therefore, please pay careful attention to it.



The instrument will offer elevation over standard pressure level QNE. Use the knob to fine-tune the elevation.

The **QNH** should be changed only when airfield elevation and QNH pressure are given. This might happen in some competitions.

In all other cases the elevation should always match QNH pressure.



The Set Elevation dialogues are not shown if the LXNAV S8x/S10x is switched off and on during flight.



QNH can be also corrected during flight under Setup-QNH and RES menu.

### 7.1.3 Pre-flight Check

After elevation setup the LXNAV S8x/S10x will switch to the Info screen for normal operation mode.

Use the middle (Menu) button to scroll to Flarm, Waypoint or Task Screen to verify that the MacCready, Ballast, and Bugs settings are set to the expected values for the current flight.

In any of these screens press the lower rotary button to raise the dialogue box to check or set MacCready, Ballast and Bugs values.



Rotate the bottom knob to modify any setting. Next check the safety altitude (height above destination, arrival altitude) setting.

Refer to Section 5.7.1.2 to find how to define the safety altitude.

---

## 7.2 Airborne

### 7.2.1 Final Glide Calculation

Final glide is a function calculated from the target distance, target elevation, altitude, wind component, MC setting and Bug setting. The S8x/S10x will have sufficient information to calculate this automatically if a GPS source is attached and the target to navigate to is set in Waypoint or Task screen. To display the Arrival Altitude (above Safety Altitude) make sure you have configured at least one of the navboxes on the primary or secondary screens to Arrival Altitude.

## 8 Installation

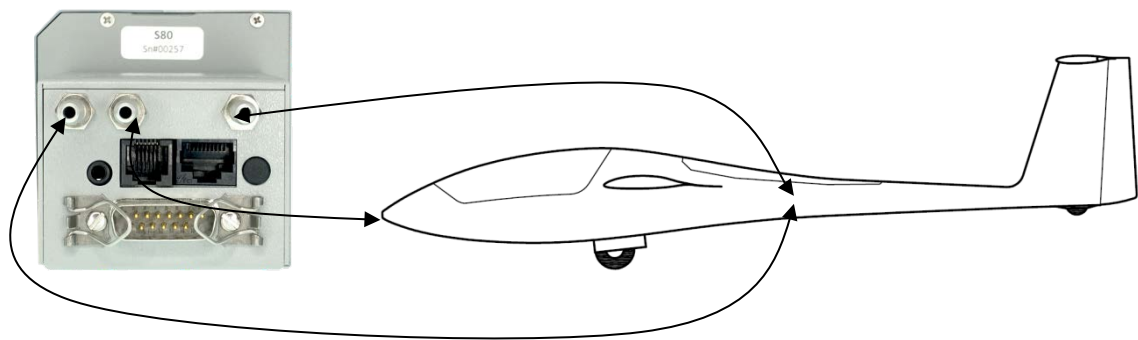
The LXNAV S8x/10x requires a standard 57 or 80 mm cut-out.

Three pressure connectors are fitted to the back of the S8x/S10x. A label shows their functions:

- $P_{\text{static}}$  means static pressure connector.
- $P_{\text{total}}$  means pitot or total pressure connector.
- TE means total energy TE pressure connector.

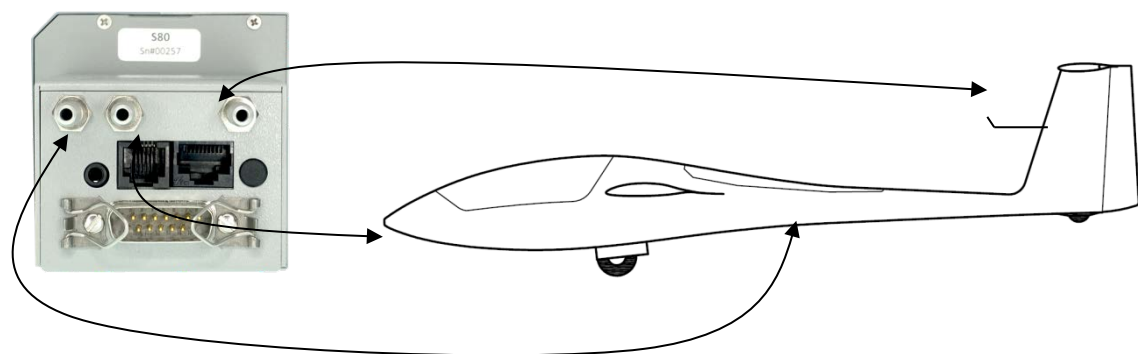
If the unit is to be configured for electronic TE compensation the connections are as follows:

- $P_{\text{static}}$  Static
- $P_{\text{total}}$  Pitot or Total pressure
- TE/ $P_{\text{static}}$  Static



If the unit is to be configured for pneumatic TE compensation using a TE tube, then the connections are:

- TE/ $P_{\text{static}}$  TE tube
- $P_{\text{static}}$  Static
- $P_{\text{total}}$  Pitot or Total pressure



If the  $P_{\text{total}}$  and Static are connected the wrong way around there will be no integrator (average climb) and speed to fly indication during the flight.

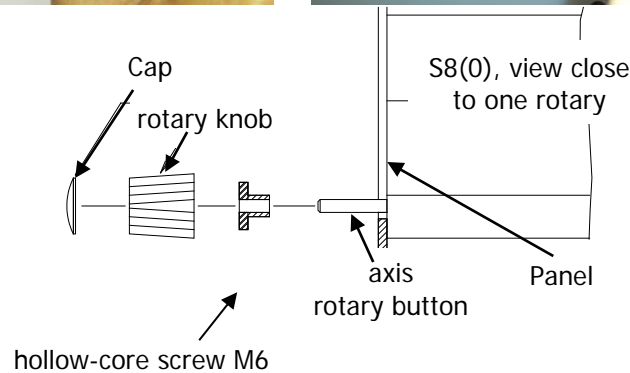
The LXNAV S8x/S10x is connected to 12 Volt power supply via the 15-pin SUB-D connector. Optionally the LXNAV S8xD can be connected via the CAN bus and the connectors are labelled with "**CAN**" at each end.



Instrument has no internal fuse. **3A external fuse is required!** Power supply cables should use a minimum of 0.5 mm<sup>2</sup> wires.

## 8.1 Installing the LXNAV S8x/S10x

The LXNAV S8x/S10x vario should be mounted in a standard 80 mm hole.



Remove the two rotary knob caps with a knife or flat screw driver, then hold each knob and unscrew it. Remove the remaining two screws and the two M6 threaded nuts. Install the S8x/S10x into the panel and screw back all screws, nuts and knobs. Ensure that between the knobs and the panel there is sufficient space so that the button can be pushed.



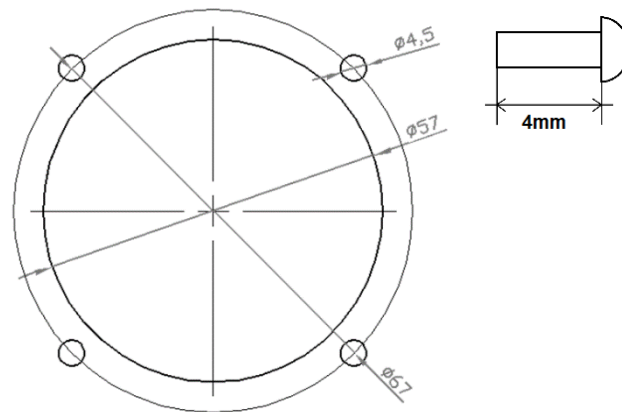
Ensure that the LXNAV S8x/S10x is located far enough from the compass.

## 8.2 Connecting the LXNAV S8x/S10x

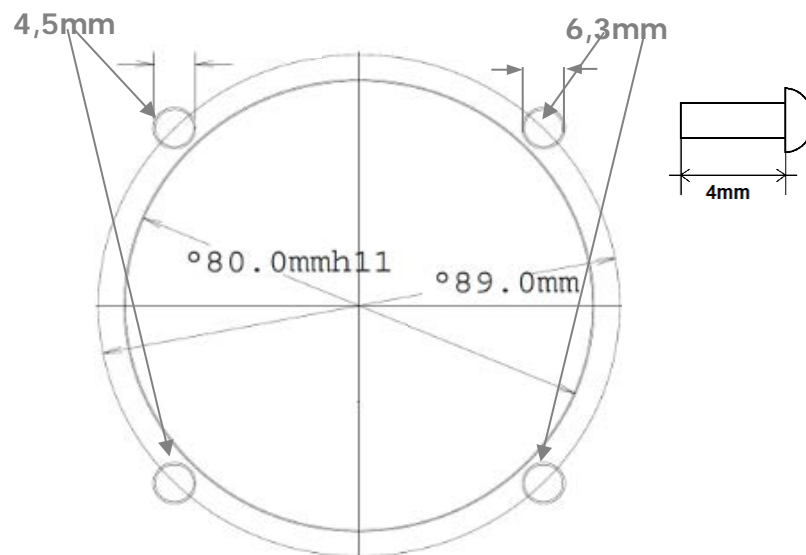
The LXNAV S8x/S10x is connected to the 12V DC power supply. The red wire goes to + positive and blue wire goes to – ground. If you don't use the S8xD (second seat unit) the Can connector should be left terminated with a CAN terminator. The SC cable is used for the external switch intended for switching between climb and cruise mode.

## 8.3 Cut-outs

### 8.3.1 Cut-out for S8 and S10



### 8.3.2 Cut-out for S80 and S100



Length of the screw is limited to max 4mm!

## 8.4 Available Cables for GPS/Flarm and PDA Ports

### GPS / Flarm port (on S10x)

Device	Cable Code
Nano power	CC-NP-LX <i>(RX/TX are crossed)</i>
Generic RS232 with female DB9	V7-GPS-232
Flight recorders, FLARMS with standard 6p IGC connector RJ12 type, Red Box, Colibri, Colibri2, VL	V7-GPS-IGC
Power Flarm (RJ45), K6 mux	V7-GPS-PF
Power Flarm Core	V7-GPS-PFCORE

### PDA Port

Device	Cable Code
LOUDIE	CC-NP-LOUDIE1
Generic RS232 with female DB9	CC-NP-232
IPAQ 310/314	CC-NP-IPAQ310
IPAQ 38/39xx/47xx	CC-NP-38
MiniMap	CC-NP-LX
Butterfly Connect	CC-NP-BFC

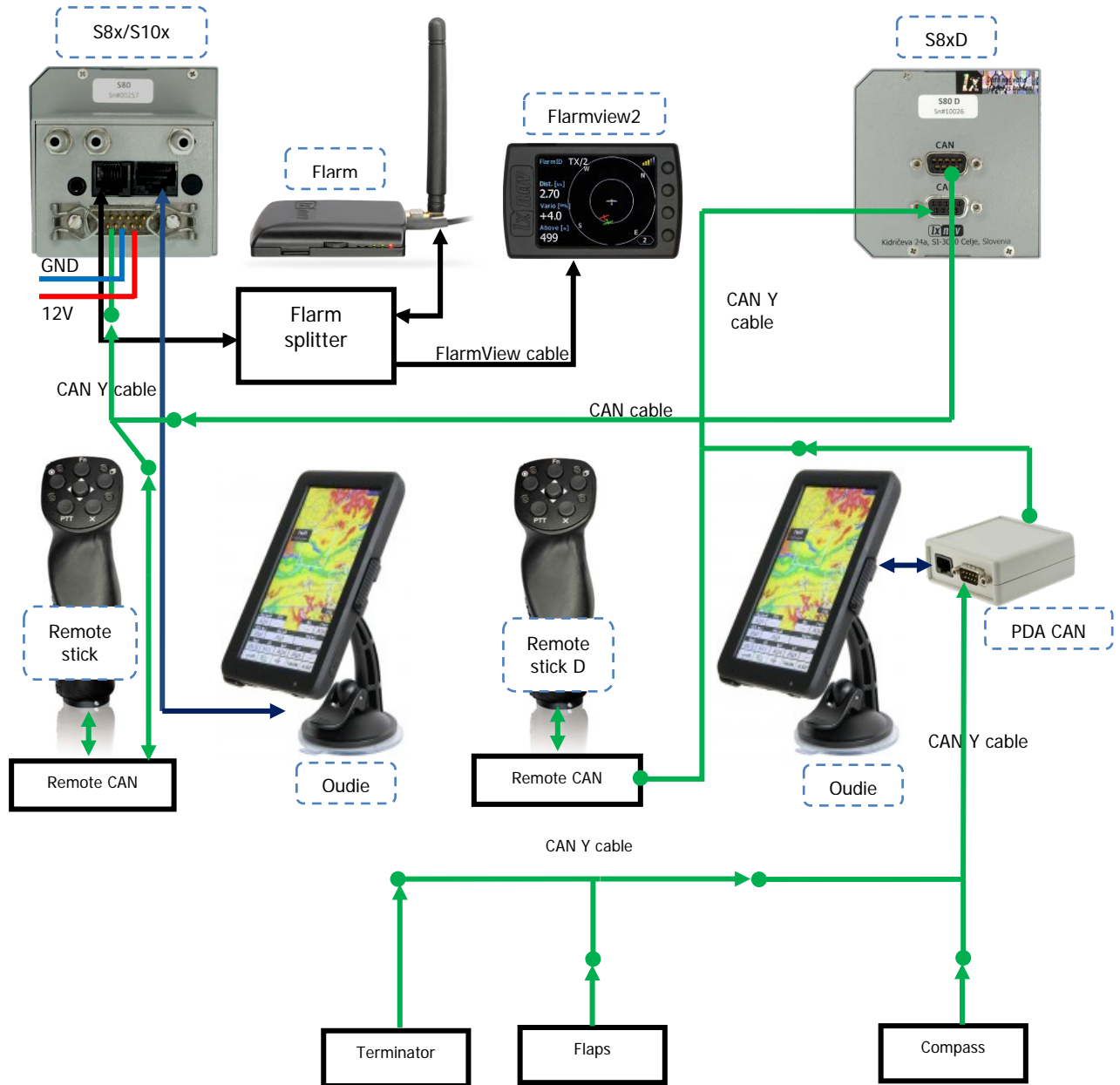


The PDA and GPS are not designed in accordance with IGC standard. It can be used only with a dedicated cable. Do not plug an unknown cable to it as it may damage the LXNAV S8x/S10x unit.



## 8.5 Installation of Options

The LXNAV S8x can be connected to a 2<sup>nd</sup> seat repeater unit LXNAV S8xD, remote stick, magnetic compass and AHRS options.



### 8.5.1 S8xD Option (Repeater)

In two-seat gliders it is possible to install the LXNAV S8xD rear seat device. The S8xD looks almost identical to the S8x; in fact, it runs the same software as the first seat device. The basic idea of the two-seat configuration is that both devices work independently from each other with the possibility of automatically exchanging various items of data (volume, Mc, polar...).

---

### 8.5.1.1 Data Exchange


All data is exchanged between the front and rear units. The LXNAV S8x/S10x also exchanges data with GPS and PDA. Change of MC, Bal, Bugs, Volume, polar settings... on a PDA will also influence the LXNAV S8x/S10x. The same will happen also in the opposite direction.

### 8.5.2 Magnetic Compass (Compass – CAN)

UNDER DEVELOPMENT



When simply connected to CAN bus the main unit will recognize it. This option is not released yet but is planned for a future software release.

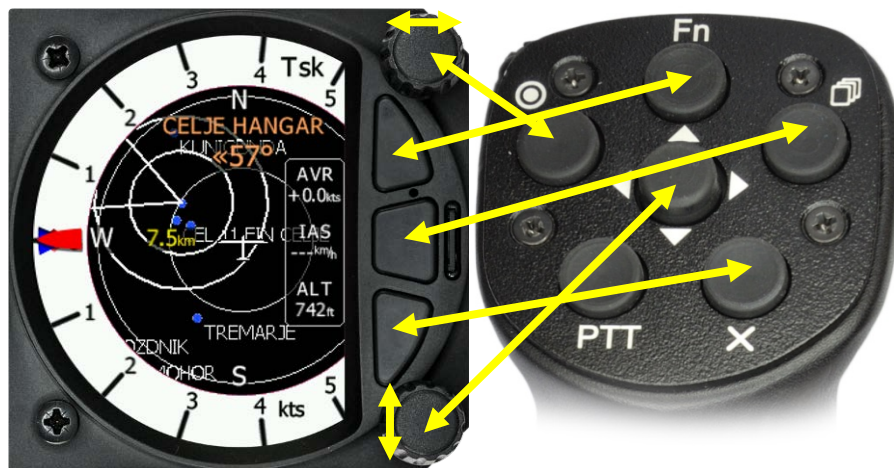
 The Can bus is always under power; hence the compass module is also under power. After flight, disconnect batteries or turn off master switch to prevent discharging batteries.

### 8.5.3 Flap sensor (Flap – CAN)



Flap sensor must be connected to CAN bus, through CAN bus (Y) splitter. Remaining port on Y CAN splitter must be terminated with CAN terminator.

### 8.5.4 Remote Stick (Remote-CAN)



The remote stick is also connected to the CAN bus. On the S8x/S10x a special menu is provided to register the remote stick. The device must be registered in case of two-seat device; it is possible to have two remote sticks, one registered on the front and another on the rear device.

Registering a remote stick can be done on following way. Press any button on the remote stick – in this way the S8x/S10x will detect the presence of the remote stick on the CAN BUS, after that go under setup-hardware-remote and register remote stick.



**To confirm a remote stick, you must press the OK button on the remote stick.**

The same is done with a second remote for S8xD repeater unit. Ensure that when registering the repeater unit that the front unit is not in Register mode, otherwise both units will listen to the same remote stick.



The Can bus is always under power, consequently the remote stick is also under power. After flight, please disconnect batteries or turn off master switch to prevent discharging batteries.

### 8.5.5 AHRS Option

To activate AHRS an activation code must be purchased.

The AHRS option can be activated by the following procedure:

- Enter password 30000
- Enter the 13-digit license key and confirm.

If the code is correct you will see an AHRS on the AHRS page.



Activating AHRS on main unit will also activate it on all the repeaters (second seat devices).

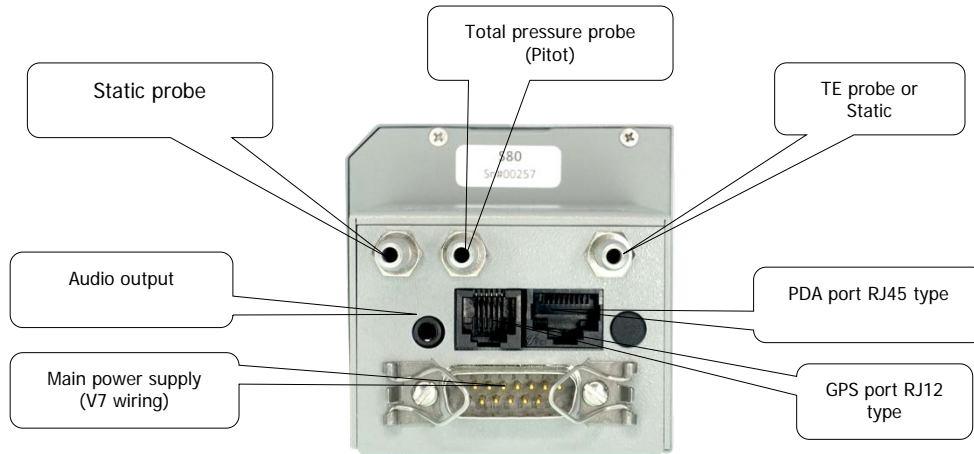


If you want to deactivate AHRS use same password (30000) again.

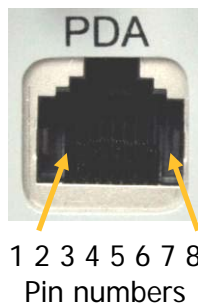


## 8.6 Ports and Wiring

### 8.6.1 LXNAV S8x Ports



#### 8.6.1.1 PDA Port (RJ45)



Pin Number	Description
1,2	Ground
3	(output) Transmit from LXNAV S8XRS232 (e.g. Computer, IPAQ38/39xx)
4	(input) Receive to LXNAV S8XRS232 (e.g. Computer, IPAQ38/39xx)
5	(output) Transmit from LXNAV S8XLV-TTL (3.3V) (e.g. Oudie, HP302, HP31x)
6	(input) Receive to LXNAV S8XLV-TTL (3.3V) (e.g. Oudie, HP302, HP31x)
7,8	5V OUTPUT (maximum 1A)



The RJ45 plug is NOT designed in accordance with the IGC standard. It can be used only with dedicated cable. Do not plug an unknown cable to it as it may damage the LXNAV S8Xunit.

### 8.6.1.2 GPS Port (RJ12)



Pin Number	Description
1	(output) 12V DC, to supply GPS (Maximum 2A)
2,3	N.C.
4	(input) Receive to LXNAV S8XRS232 (e.g. NANO power 232)
5	(output) Transmit from LXNAV S8XRS232 (e.g. NANO power 232)
6	Ground

### 8.6.1.3 Main Port

The main port is used to connect the S8X to the main wiring loom.

### 8.6.1.4 Audio Port

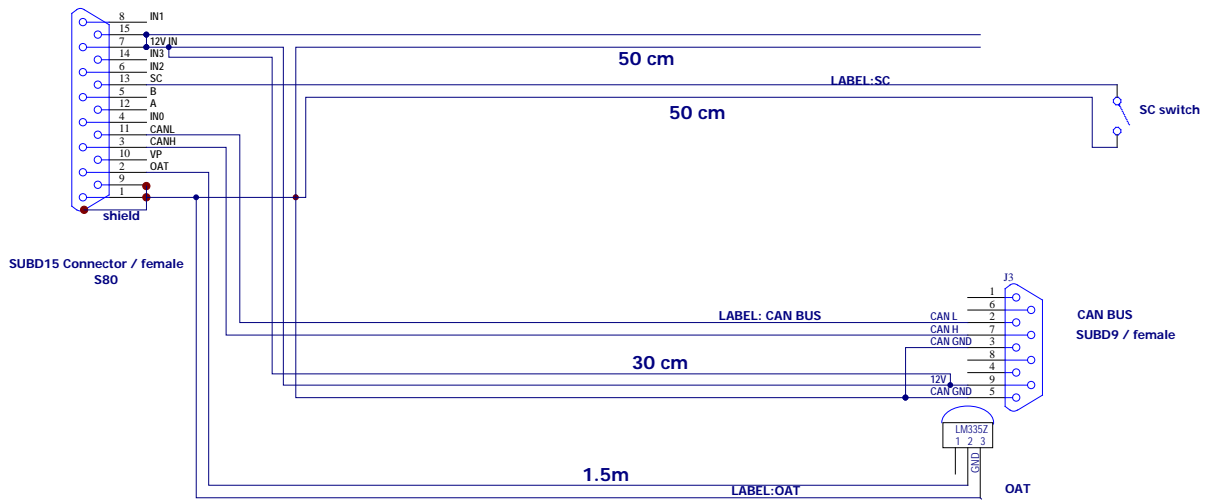
The supplied speaker is connected with a standard 3mm phono jack.



This port is designed to be connected with an 8-ohm speaker supplied with the S8x. Please consult with your dealer if you want to make a different connection.

## 8.6.2 Wirings

### 8.6.2.1 LXNAV S8X Wiring

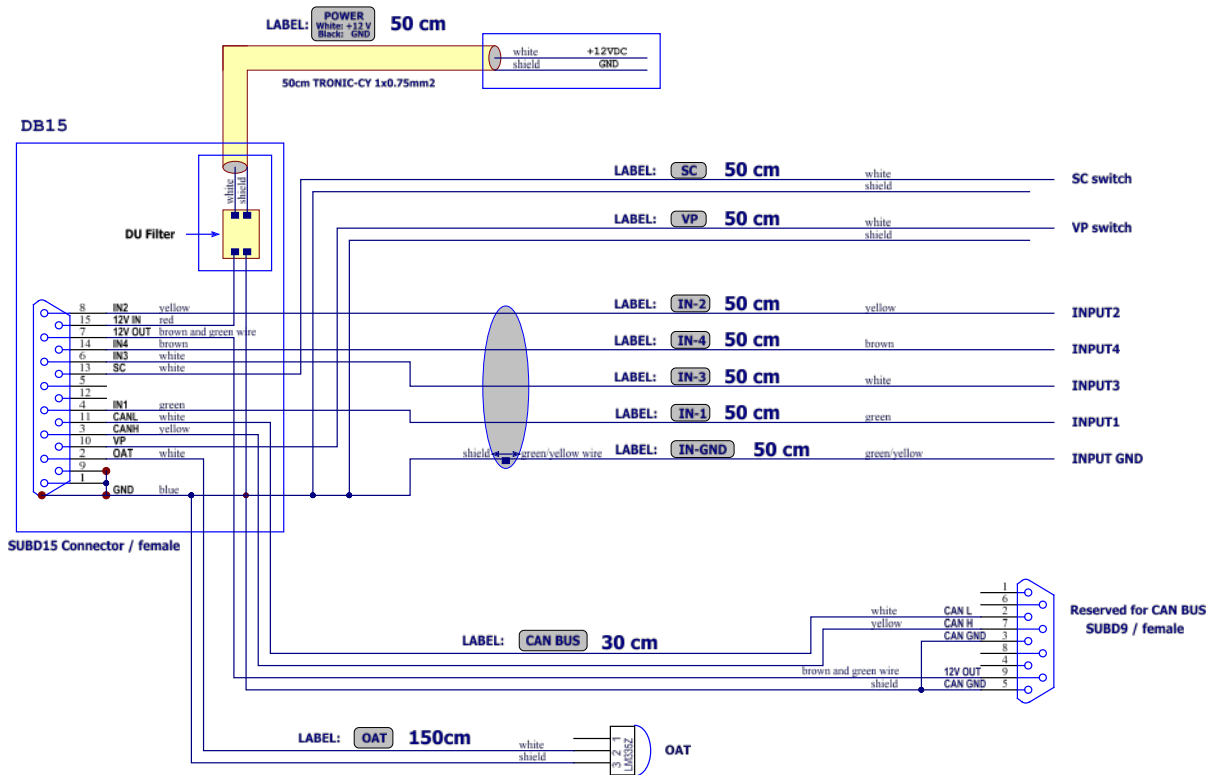


Newer versions of wirings can have the power supply cable shielded with black and white colour. White is +12V DC (positive pole) and black is GND (negative pole)



If a CAN BUS cable is not connected to an LXNAV S8xD, the CAN connector must be terminated with a CAN TERMINATOR!

### 8.6.2.2 LXNAV S10x Wiring



### 8.6.2.3 LXNAV S8xD Wiring

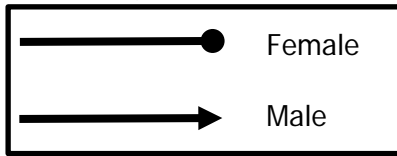


The rear seat device is powered from the first seat device.

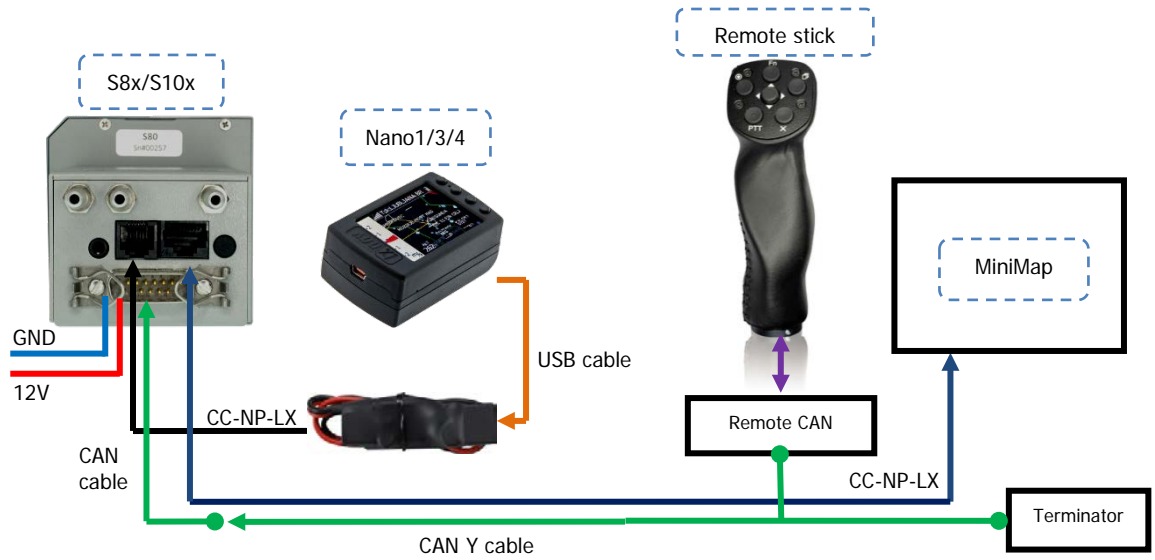


## 8.7 S8x/S10x Configurations

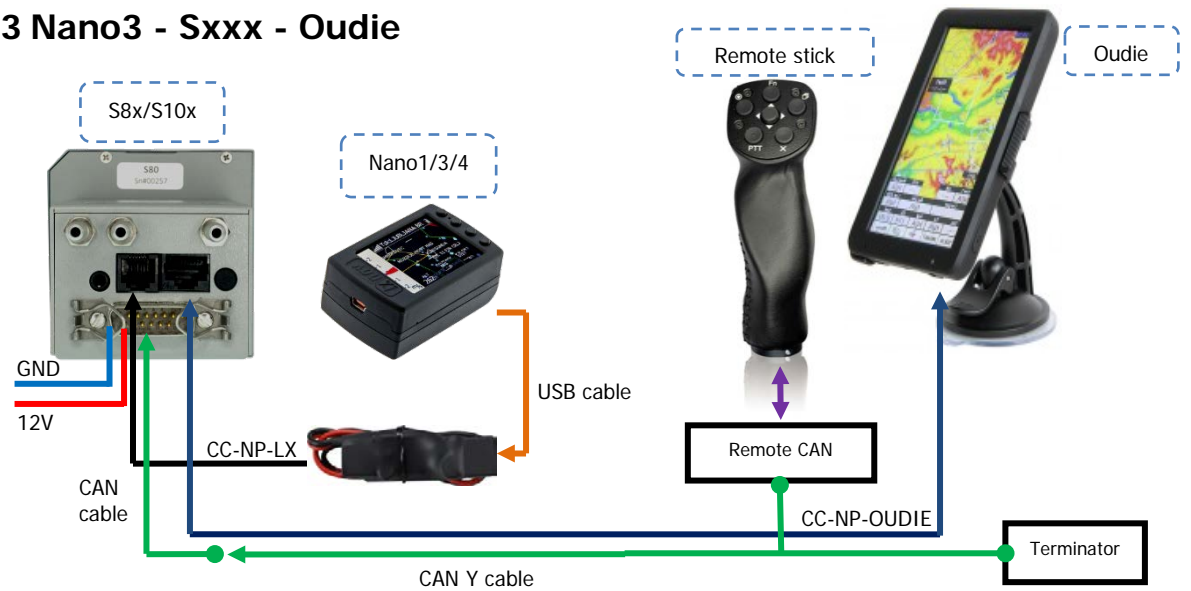
### 8.7.1 Symbols



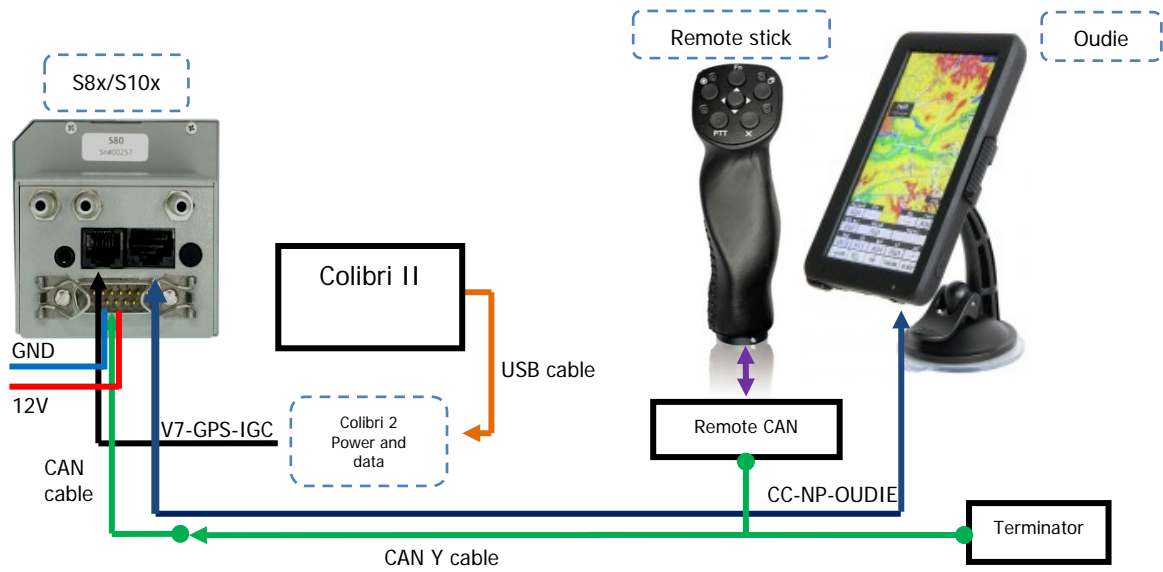
### 8.7.2 Nano/Nano3 – Sxxx - MiniMap



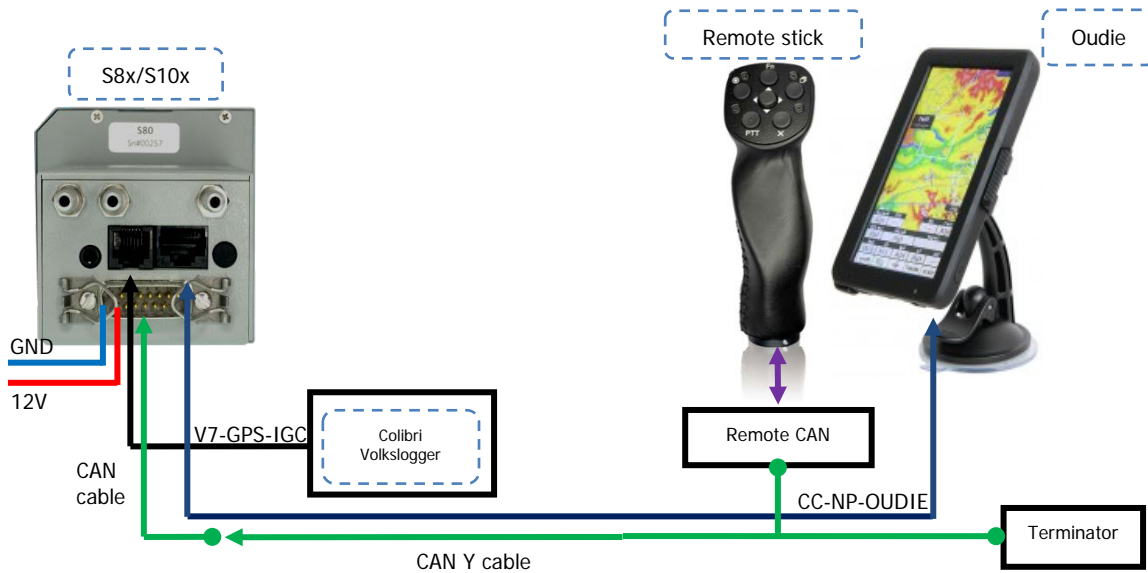
### 8.7.3 Nano3 - Sxxx - Oudie



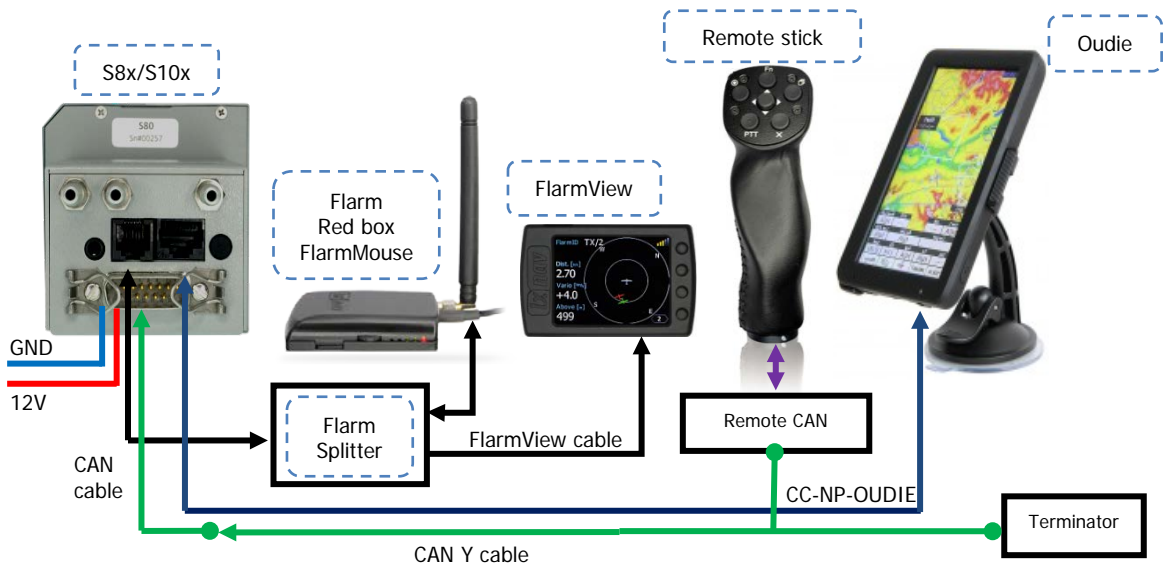
### 8.7.4 Colibri II – Sxxx - Oudie



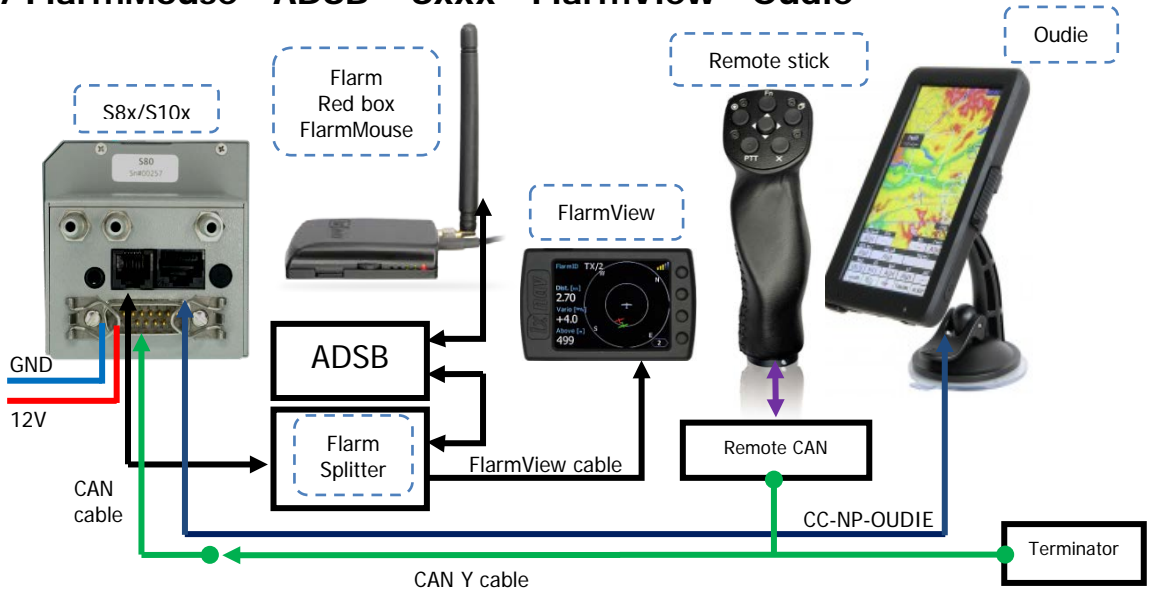
### 8.7.5 Colibri/Volkslogger - Sxxx - Oudie



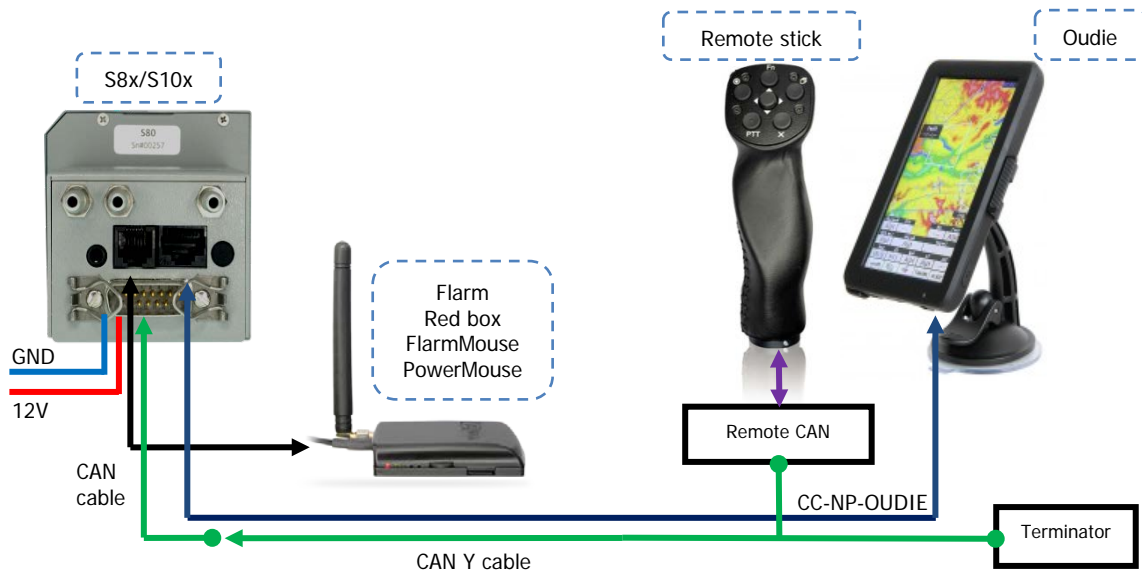
### 8.7.6 Flarm – Sxxx - FlarmViewX - Oudie



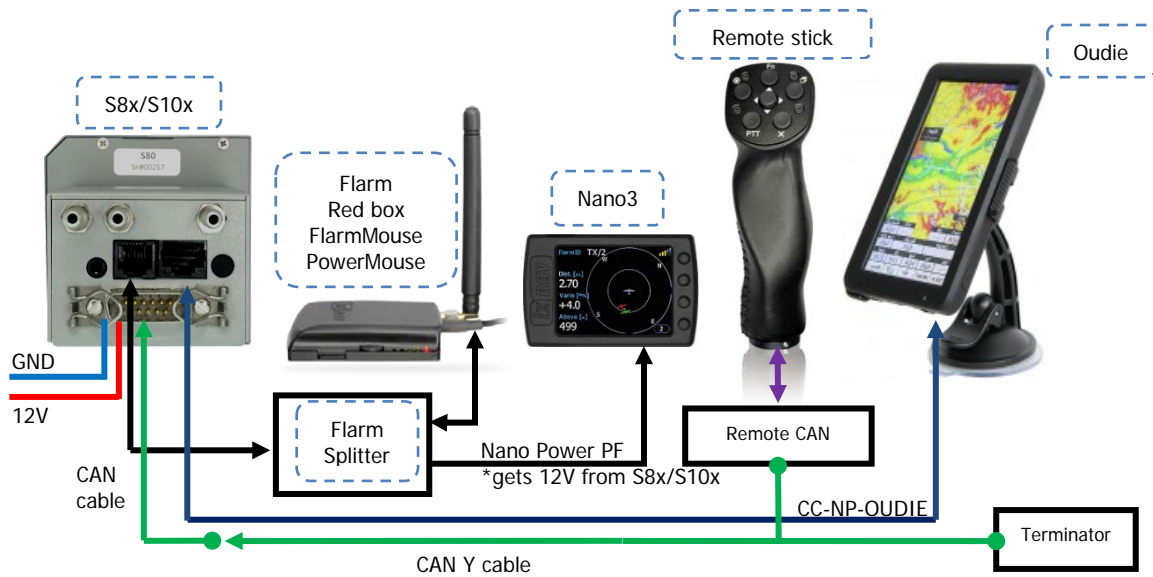
### 8.7.7 FlarmMouse - ADSB – Sxxx - FlarmView - Oudie



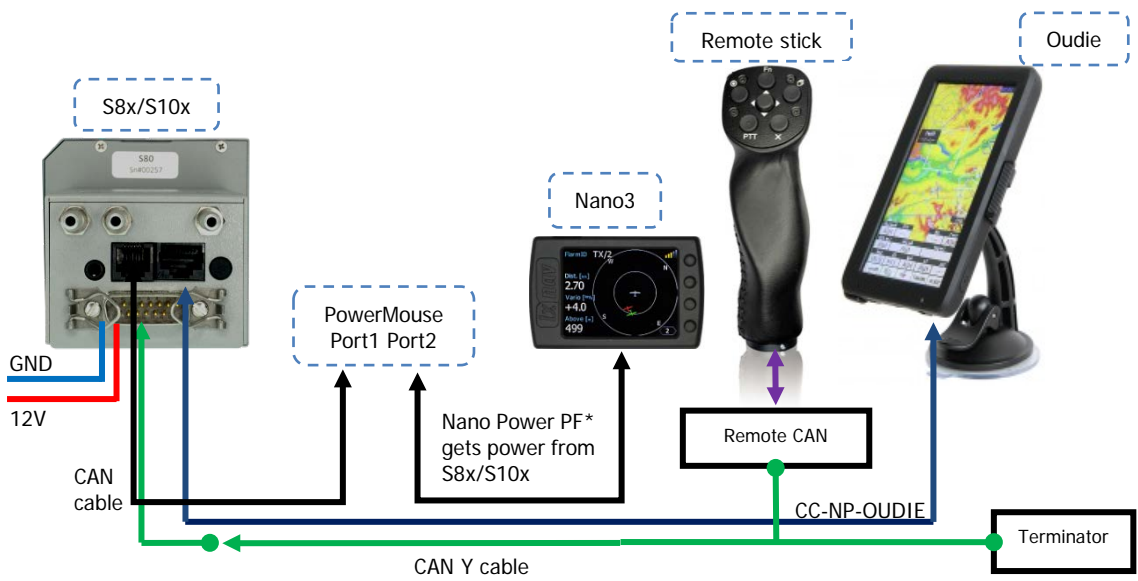
### 8.7.8 FlarmMouse – Sxxx - Oudie



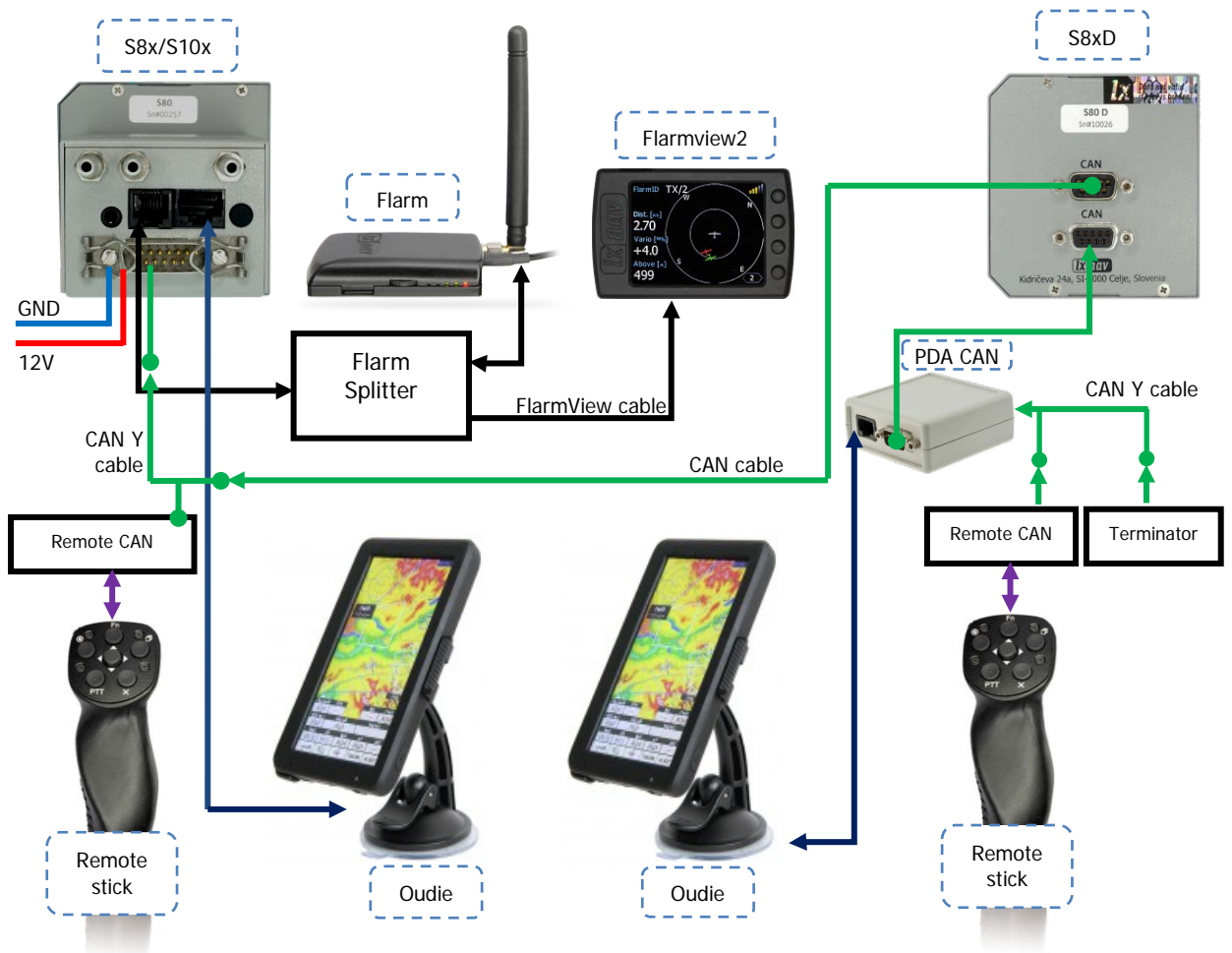
### 8.7.9 FlarmMouse - Nano3 - Sxxx - Oudie



### 8.7.10 PowerMouse + (Nano3) - Sxxx - Oudie



### 8.7.11 S8x/S10x– S8xD



## 8.8 Data Transfer

### 8.8.1 S8x/S10x

			Data Transfer/Action	Remark
S8x/S10x	↔	Oudie / Oudie BT	MC/Ballast/Bugs; ALT; TSK declaration; Pilot declaration	
S8x/S10x	→	Flarm	Task declaration	
S8x/S10x	→	Nano / Nano3	TSK declaration	
S8x/S10x, also BT	↔	XC soar	MC/Ballast/Bugs; ALT; TSK declaration; Pilot declaration	

### 8.8.2 Other Data Transfers

			Data Transfer/Action	Remark
Flarm	→	XC soar / Oudie	Flight transfer	Via direct link
XC Soar/Oudie	→	Flarm	Task declaration	Via direct link
Nano/Nano3	→	XC soar / Oudie	Task declaration, flight download?	Via direct link

## 9 Firmware Update

Firmware updates for the main display indicator and vario unit can be easily carried out using the micro SD Card. Please visit our webpage [www.lxnav.com](http://www.lxnav.com) and download the firmware update.

You can also subscribe to a newsletter to automatically receive news about the system.

### 9.1 Updating LXNAV S10x and S8x Firmware Using a Micro SD Card

Copy the firmware **ZFW** file type to the SD card. The S10x will ask you to update. After confirmation the firmware update will be performed automatically.

### 9.2 Updating LXNAV S8x Firmware Using a Micro SD Card (up to fw. 5.43)

Unzip the file from the website and put all three files to the SD card:

- App\_NINC\_X.YY.lxfw
- V80C.fw
- V80c\_init.bin

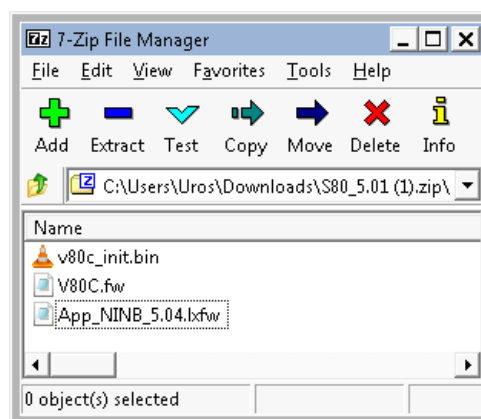
If some of these files are missing or are corrupt, the firmware update will not be successful. Transfer the firmware update files to the micro SD card and insert it into the S8x. The unit will ask you UPDATE? Confirm and reboot the S8x unit. The update will be performed automatically.

### 9.3 Updating LXNAV S8x Firmware Using a Micro SD Card (OLD Method)

The firmware consists of two parts, vario and display.

The firmware can be downloaded from the download-firmware section on [www.lxnav.com](http://www.lxnav.com). It is a compressed ZIP file which must be firstly uncompressed. Inside are three files:

- App\_NINB\_X.YY.lxfw (this is firmware for vario part),
- V80C.fw (first part of firmware for display part),
- V80c\_init.bin (second part of firmware for display part).



If some of these files are missing or are corrupt, the firmware update will not be successful. Transfer the firmware update files to the micro SD card and insert it into the S8x. Reboot the S8x and the update of the display part will be performed automatically.

- Go to the Setup screen and select the password option.
- Enter the password 89891 - this will bring you to the firmware update menu.
- Choose the correct firmware for the vario part and press update.



### 9.4 Incomplete update message (OLD version)

Update file contains 3 files:

- V8xc.fw
- V8xc\_init.bin
- App\_NINC\_XX.lxw

If V8xc\_init.bin is missing, the following message will appear "Incomplete update ..."



**All updates after version 5.45 contains all 3 files zipped in one file**





## 10 FAQ

1. How can I save the IGC file?  
Go to the logbook page, select the flight of interest, short press on the lower rotary button and download the flight to the micro SD card.
2. Is it possible to interface with an iPad/iPhone/other iOS devices?  
That is not possible.
3. I don't see how you charge the actual unit whilst it is bolted into the plane?  
Via the main power cable which is supplied with the device.
4. Do I have to put the fuse between the master switch and battery?  
Yes, use a 3A fuse.
5. Can pin 3 of the (now free) PDA port be configured to provide ADSb data at 4800 baud and a NMEA filter (GPRMC only) to a transponder?  
No, the PDA port is our standard and will never be changed. For a transponder we can provide a NMEA bridge.
6. Does the Bluetooth connection with the Oudie have all functions of the PDA port?  
Yes.
7. Can the original old flat FLARM box be connected to the Flarm port?  
Yes
8. Does the delivery include an external GPS aerial on S10x?  
Yes, but only on the S10x.

## 11 Revision History

October 2014	Initial release version 4.9
November 2014	Updated chapters 8.5.2,8.5.3
December 2014	Updated chapters 5.3.2, 5.5.1.2, 7.2.1
January 2015	Updated chapter 5.7.11.3
January 2015	Typos, release 4.97a
January 2015	New cables for PDA and GPS port ch.8.4
March 2015	New sections for thermal assistant and logbook
May 2015	Typos, release 501e
June 2015	Release 501f, updated ch.8.5.3, updated ch.5.7.13.1
June 2015	New chapter Quick access menus 5.1
March 2016	Complete review of the manual, added S10x
June 2016	Units chapter, Warnings, Added OAT to Info page, Update procedure for S8x, Voice warnings completely described
August 2016	Review of English language content (Thanks to Howard Mills)
August 2016	Added Flap navboxes
August 2017	Updated chapter 5.7.11.5, Updated connection schemes 8.7
September 2017	New Chapters 5.7.12, 5.1.14, Updated Ch. 5.5.2
October 2017	New chapter 5.7.16
December 2017	Updated chapter 8.5
January 2018	Minor change in chapters 5.2, 8.7.10
March 2018	New chapter S8/S80 Club 3.2.3, CAN Bridge 5.7.11.7, AHRS 5.7.11.9 and Flaps 5.7.11.8 Updated chapters: 5.7.2, 5.7.3, 5.7.12, 8.5.5