

LX 7007 C

Users manual V 3.60

(Also valid for LX 7007 CB and LX 7007 Compact C/CB, LX 5000R)



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1 General

The unit consists of two units, one 80 mm unit (LX 7007 DU) and one 57 mm unit (USB D). The 80 mm unit is a master unit and contains a high-resolution colour display, 6 push buttons and four rotary switches. The 57 mm unit is a vario unit and does not have any controls on it's front panel. All necessary commands are sent from the master. Sensors to measure altitude and IAS are located in the vario unit. The Vario unit display consists of a mechanical needle, which is mainly used as vario indicator, and a colour graphic display, which is configurable in setup.

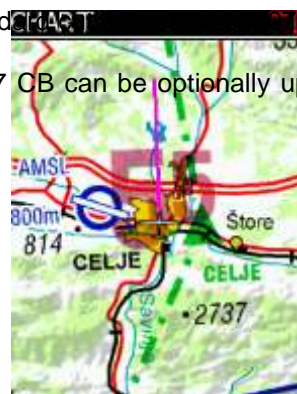


LX 7007 C



LX 7007 CB

The unit comes in two versions LX 7007 C can be fitted into 80 mm standard cut-out. LX 7007 CB has a bigger (3.5 inch) display which requires a larger cut-out. The functions of both units are identical. Both LX 7007 C and LX 7007 CB can be optionally upgraded with ICAO map page.



Vario functions include:

- Vario with audio, Netto, Relative (Super Netto) and Average

- Smart vario
- Speed command
- Final glide calculator
- TE compensation is selectable for either pneumatic TE tube, or electronic TE
- Altitude gain indicator
- Total averager of last thermal

Navigation functions include:

- Airport and airspace database for Europe or USA, an almost unlimited number of AS sections can be stored
- Turn points in .cup format, an almost unlimited number of files can be stored, up to three active files can be used at the same time
- A wide range of task options, either imported as a part of .cup files, user created in addition to one declared task
- Statistics, flight statistics and task statistics
- Display of nearest airports and out landing fields
- Support of AAT (assigned area task)
- Distance measuring equipment in TP and APT mode
- Multi pilot function (storing of 100 pilots names with their individual settings)

Flight recorder functions include:

- Integral pressure transducer based on 1013 mb level, for altitude recording
- Integral Engine Noise Level sensor
- Memory to store typically 100 flight hours (hardly depends on settings)
- Digital and mechanically security device to ensure high level of data security

Interfaces:

- **PDA interface** powers and sends data to a PDA. Programs supported: SeeYou Mobile, Winpilot Version 7 or higher, Navigator, LK 8000
- **User interface** powers and sends NMEA at various baud rates, connection to a transponder possible.
- **SD Card** interface for data transfer and firmware update
- **IGC interface** to connect and power Colibri or LX 20. The connector pin out corresponds to the IGC standard and may be used to power the LX 7007 and to communicate with PC also, by the use of a standard Colibri Power adaptor. Whilst training, this input can be used to connect to Condor flight simulator.

Options:

- Integral **Flarm**, collision avoidance system
- **Remote** control, for both seats
- **Two seater** configuration
- **Compass**
- Secondary **LCD colour vario** indicators
- **Voice Module**, to give voice warnings and information

1.1 Technical data

- Power input 10-16 V DC
- Consumption: 210 mA @ 12V (without audio and options), 260 mA with Flarm option
- 80mm (3") standard Aircraft cut-out for LX 7007 DU
- 57mm (2 1/4") standard Aircraft cut-out for USB D Length 120 mm (incl. connector)
- Three physically separated com ports:
 - PDA port with 5V power supply delivers NMEA and task data to PDA and allows data transfer
 - IGC com port with IGC standard connector, suitable to connect Colibri or LX 20 or PC
 - User port for GSM Modem connection

- Drives the following PDA programs: SeeYou Mobile, Navigator, LK 8000, and Winpilot...
- PDA data exchange with ConnectLX, ConnectMe, Navigator
- 16 Channel GPS receiver
- SD card interface
- External speaker
- System bus enables connection to a wide range of options
- Built in fuse to prevent damage in the event of a short on the 485 bus
- Data compatible with LX 20 and Colibri
- IGC approved flight recorder
- Weight: apr. 800g

1.2 Options

By use of a bus system a wide range of optional interfaces can be easily connected to the basic configuration, without any significant installation work. The LX 7007 system bus is extended simply by use of **485 splitting units**, which allow plug and play connection of additional devices. The following units can be connected to LX 7007 system bus:

- Second seat device
- Remote control, for both seats
- Flarm option (integral part, not bus connected)
- Secondary vario LCD vario indicators (unlimited number)
- Electrical compass device
- Voice module

1.2.1 Two seater configuration

A unit installed in the rear seat of the glider, is powered and receives all it's data from the main unit. The communication between both units is exclusively **via 485 system bus**. An automatic **TP and TSK update** will follow after each power on, the airspace update is done on pilot demand. See LX 7007 D manual for details.

1.2.2 Remote control

An extremely ergonomic lather coated handle which includes **8 push buttons** to operate LX 7007 and also two additionally buttons with open wires. This two buttons can be used for instance as PTT for radio and SC/Vario changeover command. Using a two seat configuration, two remote units can be installed to control the front and rear seats separately.

1.2.3 Flarm

Flarm electronics is completely compatible to original Flarm units and an integral part of LX 7007 C DU, if ordered as an option. All necessary connectors are available at the back of the unit (Flarm update port, Flarm External Indicator, Flarm antenna), which guaranties the same features as an original Flarm device. It is very important to point out that the whole system uses only one GPS receiver and therefore offers a low power solution. One Flarm External display is part of the delivery; extension to second seat is possible.

1.3 LX 7007 Compact C and LX 7007 Compact CB

Both units are derivatives of the LX 7007C & LX 7007 CB respectively. Configuration is the same as for LX 7007C, but there is no in built GPS. The following functions differ on the LX 7007 Compact C and LX 7007 Compact CB:

- no approved flight recorder (there is recorder but it cannot be used as an official IGC file)
- external GPS input plug and play compatible with Colibri, LX 20, Colibri II, Flarm)
- vario electronics built into main unit (not valid for CB)

Unit operation is almost the same as the LX 7007 C, so the same manual can be used. Functions that are different are marked.

2 System description

2.1 Rotary switches and keys (buttons)

The following controls are mounted on the front face of the LX7007 C

- Four rotary selector switches
- Six push buttons



2.1.1 ON/START button - Switching the Instrument ON and OFF

The **ON/START** button is multifunctional. If the instrument is not already powered up, a short press on the **ON/START** button will switch the instrument **ON**. The following initial pages will appear after power on.

Important!
 Message 'Seal Not Valid' is a warning that the IGC security device is out of order, no message means



A long press (about 2 seconds) during operation will change to next turn point in Task mode, but only if the glider is inside the TP sector. This is only valid if the changeover preset has been set to 'not automatic'. In TP a short press will start storing of present position to become a new turn point.

During edit a short press on Start will move cursor one step back. The unit is equipped with a facility of storing up to 100 pilot names. Pilot selection can be done by rotating the Up/Down knob. 'Enter' will select the pilot and the unit will change over to the GPS status page. There are some other functions connected with Start bottom, please see further chapters. After booting is finished take off airfield elevation and pilot selection are offered.

2.1.2 MODE selector (rotary switch) ⇔

The mode selector is used to change modes of operation. This switch has the **highest priority** in the system. Whenever it is operated, **a mode change will occur.**

2.1.3 AUDIO Volume selector

This knob is exclusively used to adjust audio volume.

2.1.4 UP/DOWN selector (rotary switch) ⇕

This rotary switch has a lower priority than the mode selector switch and is active all the time in the selected mode. It is mainly used for selecting sub menus during navigation and to scroll in the edit menu.

2.1.5 ZOOM Rotary switch

This is a multifunctional rotary switch. While its main function is to change the **zoom level in the graphic mode**, it can also be used as follows:

- If an error is made during editing, it is possible **to move the cursor** back by rotating this knob. This can only be done if 'editing' is active which is shown by the cursor blinking
- ZOOM can be used for numeric inputs (elevation, sectors....) to speed the process, using ZOOM instead of Up/Down will increase in steps by a **factor 5**
- Some special functions of Zoom knob will be described in next chapters.

2.1.6 ENTER button

The main function of this key is **confirmation**, and **to start edit procedures.**

2.1.7 ESC/OFF button

This is a multifunctional key, which has two main functions. If it is pressed and held for a few seconds, then the instrument will start turning OFF sequence. A count down will show time in seconds until the unit will switch off. A new press on any key during count down will interrupt switching off process.

If a short press is made, then the button has the following functions:

- The display will jump to the menu of the next higher level (in edit only)
- During alpha-numeric input with the cursor active (blinking), **ESC confirms the whole line** (It is not necessary to keep pressing ENTER)
- Some special functions can be activated using ESC as described in subsequent paragraphs

2.1.8 EVENT button

Activates so called event function of flight recorder.

Event is a multifunction button, a short press will activate **Flarm traffic information page** and a longer press (apr.2 seconds) will activate flight recorder **Event function.**

2.1.9 MC and BAL buttons

Pressing of MC button will activate the MacCready (MC) input screen. The value is changed with the UP/DOWN-selector. After second press Ballast can be input. This form of input should be used with the LX 7007 CB, as there is no Bal button.

Note!

If **Competition mode** has been activated in Setup Pilot (only 3 modes available) then a **long press** on MC button deactivates the function.

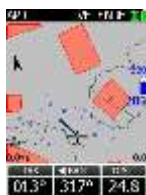
Ballast button is multifunctional, first press enables ballast input, the second press activates so called Bugs input, degradation of best glide ratio.

2.2 Operating modes

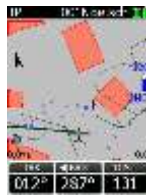
⇐ MODE ⇒



Near airport
GPS



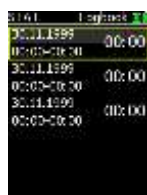
Airport



Turnpoint



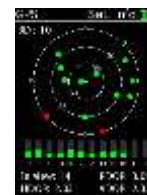
Task



Log book / statistics

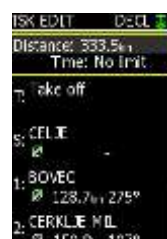


Setup



Pilot

Navigation menus (APT, TP and TSK) have sub menus, which can be selected using the **Up/Down** rotary switch.



Sub pages of task mode

GPS	GPS status , no inputs possible
NEAR	Near airport , select one airport or land able turn point, no further inputs are possible
APT	Navigation and selection of airports
TP	Navigation, selection and editing of turn points
TSK	Navigation, selection and editing of tasks
STAT	Flight statistics and logbook

SETUP has two levels. The first level enables direct input of individual parameters. By entering into **SYSTEM SETUP** global parameters can be adjusted.

Note!
After activation of **Competition Mode** only three modes are available, TSK, TP and Statistics. See capture 2.3.

2.3 SETUP

The SETUP is divided into two parts, **First level** (non system data) and the **Second level** (system data). Inputs done in the first level are connected with daily work, the settings done in the second level may change system characteristics and as such are significant.

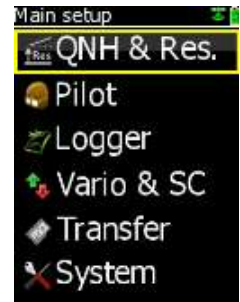
Note!

Some settings are so called **global** settings, not connected to pilot and second parts are so called **local** settings. Local settings belong to pilots. Local settings are accompanied with a man silhouette which to make understanding more easy.

2.3.1 Main Setup (First level)

All options are selected with the **UP/DOWN** (⇅) switch and can be entered at any time;

The **system settings are not affected**. The Menu has six items, starting with QNH Reserve and ending with System which allows entry into system setup.



Note!

TRANSFER offers no inputs, but enables data transfer LX 7007 C to SD Card, PDA, Colibri or PC.

Once the desired option has been selected, press **ENTER** to access the sub-menu.

2.3.1.1 QNH RES (QNH and Safety Altitude input)

Input Procedure:

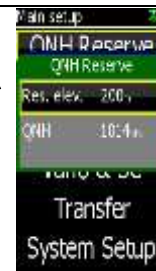
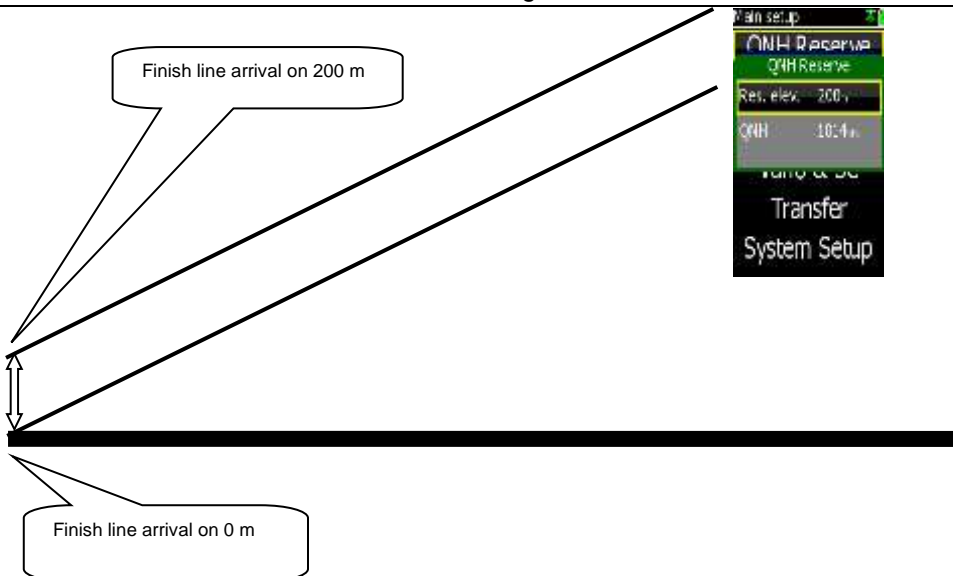
- Use the **UP/DOWN** selector to choose the item it is required to change (QNH, ALT.R.)
- Press **ENTER**
- Use **UP/DOWN** to select the value required and press **ENTER** to input it
- Once all changes are complete, press **ESC** top return to SETUP menu



ALT.R : This setting is used to input the altitude reserve or safety altitude. Setting 0 means that no altitude reserve is set for the final glide. After input the final glide is shifted and the arrival is calculated to the altitude set in the reserve menu.

Note!

Even after input of a reserve the final glide director will show you 0 glide deviation if the glider position is on the shifted glide.

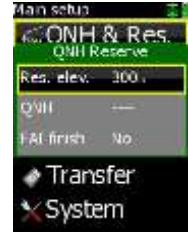


QNH: Initial status after power on is undefined (- - - -). If the pilot wants to adjust the altitude reading due to

Pressure changes during the flight, then an initial input of the actual QNH is required. Input is done with Up/Down and ZOOM. This procedure can only be made on the ground, after take off no initial input is possible. Following QNH input on the ground, then an update during the flight is possible.



FAI finish: if a badge flight is intended to be flown this menu could be used to adapt arrival altitude relating to IGC rules. After input **Yes** the final glide will be adequately shifted if the start was above 1000m. This is valid only in task mode.



2.3.1.2 PILOT



Input of pilot personal data is possible with this menu. New input is done simply following an update of existing data and store as a new pilot.

Important!
Setting **Competition mode** (Y) will reduce selection of navigation modes. Only Task, TP and Statistics will remain active. To recall standard configuration, use long press on MC.



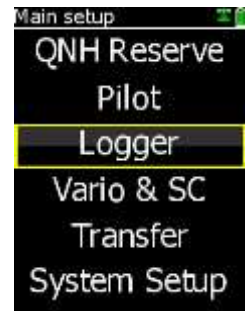
Competition mode is linked to the pilot, so if one pilot has activated this function then the function will not affect other pilots. For future a pilot list transfer file transfer via SD card is foreseen.

2.3.1.3 LOGGER (Input of flight recorder parameters)



The flight recorder is fully approved by the IGC (A sub-committee of the FAI) and will produce **secure flight records** that are acceptable for all kind of FAI badge flights and also world records.

After selecting **LOGGER** and pressing **ENTER**, the following flight recorder settings are accessible.



Class input means input of the glider class for instance Standard. For safety reason faster recording interval can be used close to the turn point. All necessary parameters are to be defined in near TP and near radius. IGC regulations require more frequent recording after a so called "Event function" has been activated (press the event button long). After event activation the recording interval will follow setting in "Event fix int". Number of additional fixes is defined in Num. of fix.

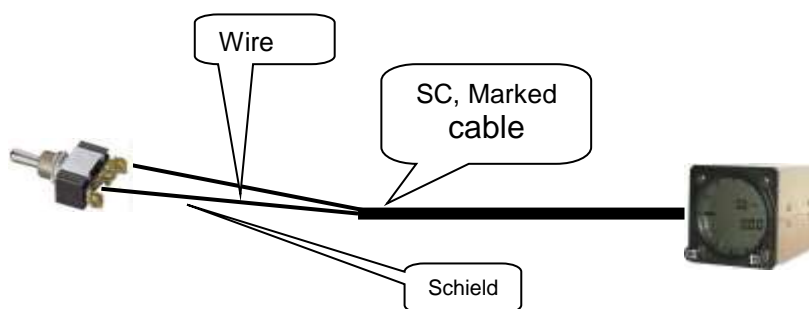
2.3.1.3.1 Vario & SC 

Vario & SC allows the setting of the variometer and speed command. All vario functions are exclusively executed in vario unit (AU, USB or USB D), but the commands are sent from this menu.

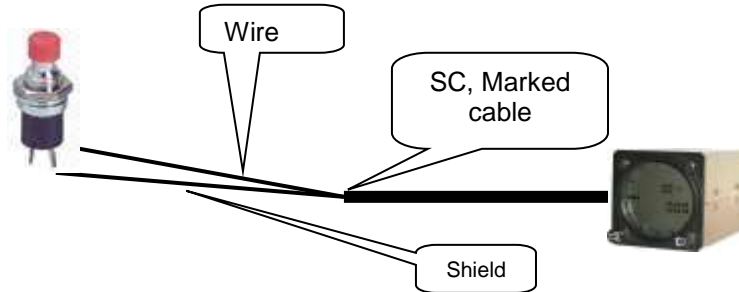


- **Var. filter:** This sets the time constant of the vario from 0.5sec up to 5 sec; the default setting is 2.0 seconds (higher figures results in a slower reaction of the vario needle)
- **Var. int:** This setting defines integration period for the averager in seconds; default is 20 seconds
- **Var.range:** This sets the full scale range of the vario
- **Smart var. :** S.v. means Smart Vario, giving four levels of additionally dynamic damping of the vario indication the function can enabled or disabled, see chapter 2.5 for details
- **ETA:** This setting selects the parameter, **VAR** (daily vario average) **or MC**, (actual) that is used to calculate the **Estimated Time of Arrival**. When flying a programmed task, the calculation takes account of the unflown portion of the task , around any TPs or APTs not yet reached
- **TAB:** This setting defines the width of the audio dead band in speed to fly mode
- **Auto SC:** This option defines the conditions by which the instrument is switched between vario and speed command
OFF: Switching is possible exclusively by an external switch, connected to the LX 7007 AU or USB unit
GPS: When the **GPS detects** that the glider is circling an automatic change over to vario mode will happen after approximately 10 seconds. Detection of straight flight will cause a change 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)
- **SC Switch:** if external switch is used for vario to SC change over, take note of the following:

The LX 7007 C has a connection for an external speed command switch, which is **wired to LX 7007** vario unit. Using an external switch it is possible to switch between SC and Vario manually. Setting the **SC Switch** to **ON** means that closing of the switch will cause SC mode, and setting **SC INPUT** to **OFF** means that closing of the switch will select Vario mode. There is a third option by setting SC INPUT to **Taster** and connecting a push button each press will toggle between SC and Vario (obligatory setting when using the LX Remote).



Wire	Shield	Open	Setting: ON	Staus: VAR
Wire	Shield	Closed	Setting: OFF	Staus: SC
Wire	Shield	Closed	Setting: ON	Staus: SC
Wire	Shield	Open	Setting: OFF	Staus: VAR



Note!
The external switch wired to LX 7007 AU/USB –D has an absolute priority and will override all other switching methods.

- WIND/COMPASS: N.C. means compass option not connected. When the optional compass module is installed, the instrument uses magnetic track to make an additional wind calculation. The calculation requires the glider to **fly straight for a specified period**, which is set in this option. The default is 15 seconds, but the longer the period, the more accurate is the calculated wind.

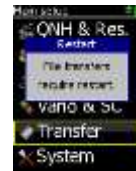
2.3.1.4 TRANSFER

Transfer makes it possible to input Turn point data, Airport data and Airspace data into LX 7007 C. The files should be copied to an SD card by PC. TP files format should be **.cup**, airspace **.cub** and airports in **.af** format. Flight info (pilot and declaration) should be in **.hdr** (LX navigation format). Item **FlarmNet** which is positioned below Airport icon can be used for input of Flarm IDs. This makes possible to recognize Flarm objects under their custom names. The file is available on <http://www.flarmnet.org>. Download LX Navigation variant.

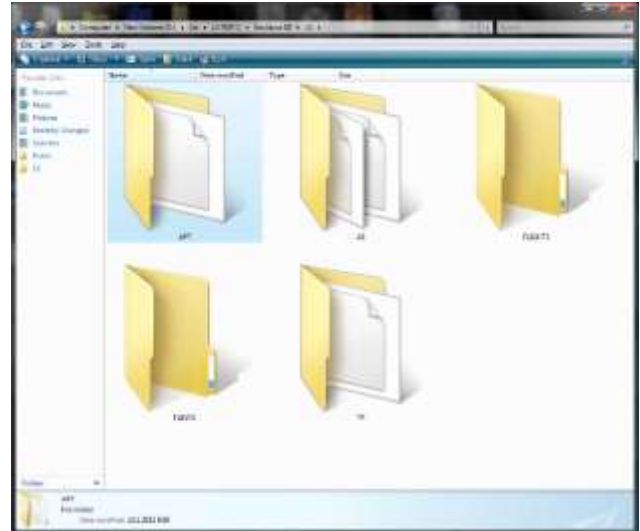
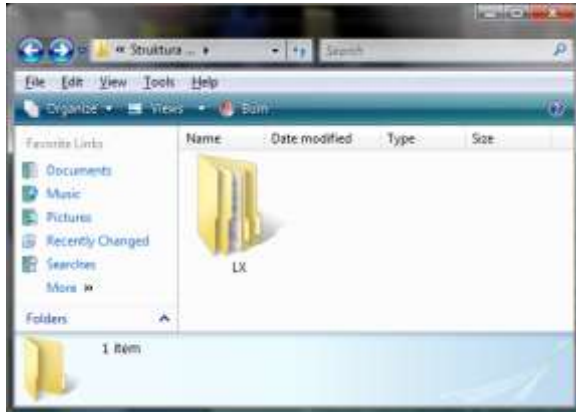


Note!
After copying into the memory of the unit, the airspace and the turn point files should be **activated** in System setup under **Airspace & Turn points** respectively. Airport file becomes immediately active after copy sequence is completed.
After transfer process, a controlled power off will follow.

Select item of interest, press enter (item will become yellow) and select file by \updownarrow . After enter the file will be copied to LX 7007 internal memory.



Structure of **LX folder** in which individual files should be copied by PC.

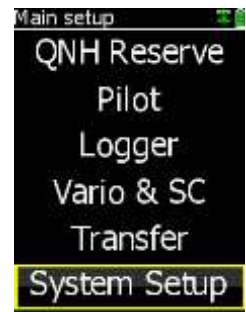


2.3.2 SYSTEM SETUP (Second level)

After entering the System Setup, a further 19 system settings are available.

2.3.2.1 Glider

All data connected to glider should be entered in this menu. There is space to store two glider polars for instance 15 m and 18 m version. Equipment means in fact luggage, this input will be also taken in account in the ballast calculation.

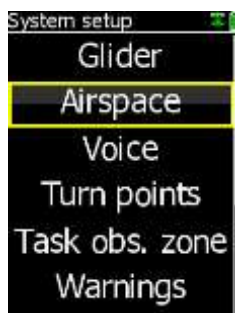


Note!
If two polars are entered, both of them will be offered when booting.



2.3.2.2 Airspace (Selection of airspace section and warning criteria)

The unit is capable of storing an almost unlimited number of airspace sections. Selection of suitable area should be done by pilot after use of this menu. Airspace file uploading to LX 7007 C is exclusively via SD card. **Active file** menu will show you all stored airspace sections. Select section of interest by Up/Down.



Input of Warning **Yes** will produce an audio warning close to the airspace. See also chapter Graphic/Appearance.

Note!
LX 7007 C is able to use only one airspace section at the same time, the section should be enabled in Airspace menu of System Setup, also during the flight.

Creation of custom airspace files

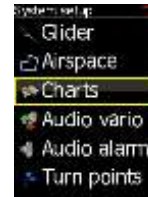
To prepare custom airspace, in **.CUB** format, use our special tool for airspace creation and edit, called LxAsbrowser, which is available for free on www.lxnavigation.si or on LXe CD.

2.3.2.3 Charts (maps)

LX 7007 C can be optionally upgraded with ICAO maps of nearly all European countries, see www.lxnavigation.com for details. The maps can be loaded from this menu.

The procedure is as follows:

- copy file with extension **.ras** on SD card root
- **insert SD** card and power on LX 7007 C
- select menu **System /Charts** (Maps)
- **Copy charts** (select file)
- after enter **Copy**, **Delete** and **Info** options will be offered
- copy option activation will start **map uploading** process
- Exit with **escape**, an automatic power down will follow.



Note!

Uploading process may take up to **20 minutes** and depends on map data volume. Ready is signaled by **green progress bar**.



Map page is now available as a stand alone navigation page near to the GPS page. The orientation is always north up, use zoom knob to arrange zoom. This page doesn't include any navigation data, it is poor map.

2.3.2.4 Charts licencing

You need to have the licence file which is generated especially for the instrument with its serial number. The procedure is:

- Go to **System menu / Charts**
- Press **Copy Charts** and select file: LX33(xxx).lic
- Press **Chart info** and you should see icon Lic. in green colour



2.3.2.5 AUDIO Vario (Adjustment of audio)

A wide variety of audio variants can be configured by user: Use **Test audio** function after every change to hear the difference.



- **VARIO mode:** select type of vario audio, use test function to perform
- **SC mode:** defines interrupted tone (piep, piep) presence in SC, regarding to needle position
- **SC: VOL H** audio volume will be increased or decreased during speed command period set (H) or (L)

- 0%: tone frequency at 0 m/s
- +100%: tone frequency at full + deflection
- -100%: tone frequency at full – deflection

2.3.2.6 Audio Alarm

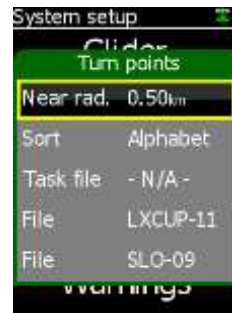
The unit produces an audio alarm on reaching certain confirmation points. This screen allows the parameters of the audio to be configured. Also Entering airspace will be accompanied with an audio warning. Setting in this menu makes it possible to customize the audio tone.




Note!
If a Voice Module option is used, the alarms will be **disabled** automatically to prevent double warnings.

2.3.2.7 Turn points

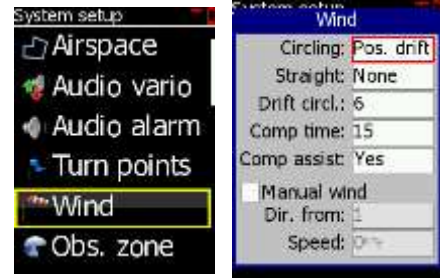
This section is about some settings relating to turn points and TP file management. The unit accepts **.CUP** file format. And the store capacity is almost unlimited. Input of TP files is exclusively via SD card.



- Near rad.:** defines radius around the turn point which will be taken as a confirmed turn point after flying of a so called simple task
A Simple task is flying without specifying a task around turn points and APTs. All TPs or APTs detected as inside (Near rad.) will be taken as part of a task. (Not active at the moment)
- Sort:** defining TP sort criteria, alphabet and distance are offered
- Task file:** the unit is capable of managing up to three turn point files at the same time, combining the points of all three files. If a turn point file activated as **Task file** includes also task data, those tasks will be available for navigation (maximal 20) and selectable from imported task store. The turn point files stored under File will not contribute task data.
- File:** only the turn points in the specified file will be available for navigation and user task creation
- QP name:** turn points names which are a result of saving the 'actual position can be designated under
- QP date:** if enabled all actual position names will be stored under date and time
- QP auto sel.:** if ON is set, the turn point will become active immediately after saving the 'actual position' is done, otherwise a normal select procedure will be required

2.3.2.8 Wind 

LX 7007 C offers different wind calculation methods which are selectable in this menu. After enter following menu will open. Circling menu offers two methods; Position drift and GS dif. **GS difference** method measures wind based on GS variation during climbing, caused by wind. Two turns are necessary to get a result. **Position drift** method measures wind on base of position drift which happens during climbing. The method needs more turns but is therefore more reliable. **Drift circl** input defines number of circles until new result. **None** means circling method disabled. **Straight** makes possible to select straight flight wind calculation methods.



Available methods are:

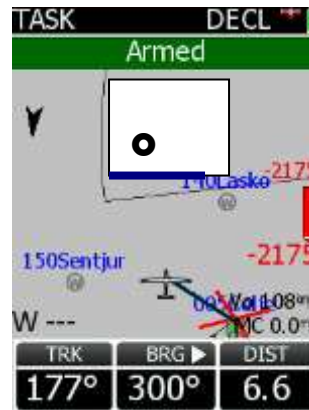
-**Component**; only tail wind or head wind will be indicated

-**Compass**; is available only if electronic compass device is connected to the system. Wind calculation is carried out after using of IAS and GS vectors. The process requests stable straight flight (speed and heading).

Comp time input defines how many seconds will take the calculation (higher values offers better results and vice versa). **Comp assist** can be enabled or disabled. After **Yes**, in the graphic page a small window will open which consists of a dot and a bar. The window opens automatically after the conditions to measure the wind are fulfilled (stable speed and heading). The pilot should keep the dot inside the borders as long as the bar is in progress. In case of not enough stable flight the process will be terminated. In that case the assistant will disappear and no wind update will follow.



Correct

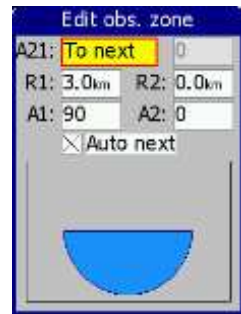
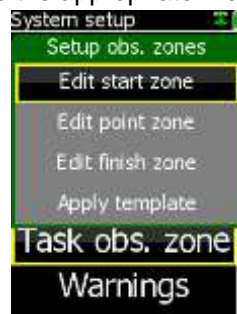
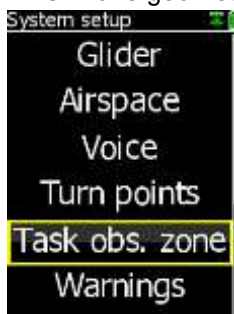


Push and steer left

Manual wind: makes possible to input wind parameters by hand in that case measured values will be disabled.

2.3.2.9 Task Observation Zone

This menu defines point sector geometry and **relates only to points in tasks**. To edit start, point or finish zone geometry access the appropriate menu.



To define geometry following parameters are to be respected.

A21 : means orientation

R1 : first radius

A1 : first angle*

R2 : seconds radius

A2 : second angle

Auto next : defines change over automatism**

Apply template will restore settings to default values, IGC 45 deg. sector or 500m cylinder.

Example of two different configurations

*input should be 1/2 of real angle, for instance 90 for 180 deg sector

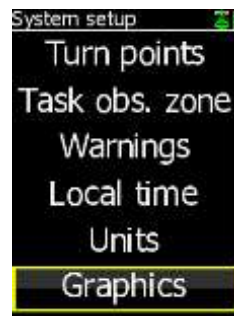
** After flying an AAT it is recommended that manual setting is used.

Note!

The above settings are so called global settings and will affect all tasks which are stored in memory.
Local sector adjustment is possible in task edit (zone) of Task navigation menu.

2.3.2.10 Graphics

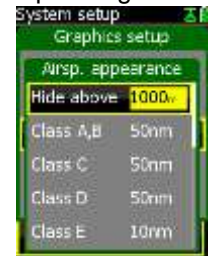
The graphic display of the LX 7007 C can show a lot of information and if it is all selected, the display can become very cluttered. This particularly applies to airspace information and the user should ensure that only relevant airspace is selected. There are four menus:



Orientation: North up, Track up and a combination of track up during climbing and north up during straight flight are offered

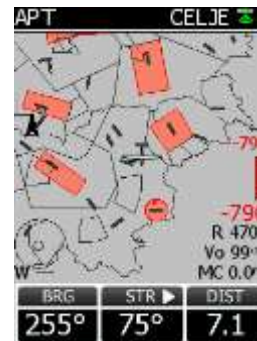
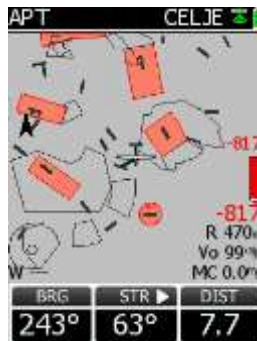
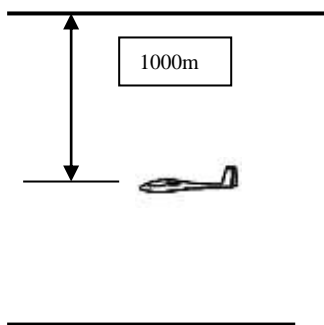
Tail: defines done track presentation in last x minutes

Airspace appearance: defines airspace appearance in graphic navigation pages.



Hide above

After input different than Never, the airspace sections positioned higher than the set margin will not be shown in the graphic navigation page. Using of this function will reduce display loading significant. It is important to point out that the figure is not a fixed altitude but is connected to glider actual altitude. Setting 1000m means that particular AS section which level is 1000m higher than glider actual altitude will not be shown.



Situation after using of "Hide above" function

Show as: Dot only

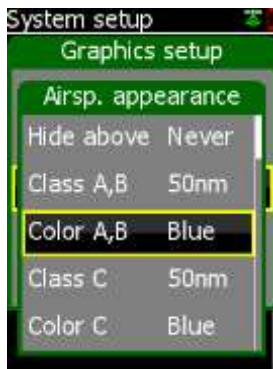
This setting makes possible to dismiss airspace warning rows

In that case only dots positioned on the airspace border will remain. In case that detailed airspace data are required, press long on enter and a list of all near airspace sections will open. Upper two places are reserved for the sections which caused warnings.



Allocation of colours

To every AS class and type a colour (black, yellow, red or grey) can be allocated after using of appearance Menu of Graphics. Fill command can be executed only on CTRs and Restricted areas.



Allocation of colours



Fill option



Example: NO Fill

Meaning of figures

Numbers connected to class and type defines zoom level (used in graphic navigation page) which makes particular airspaces visible on the display. Zoom higher than set will **not show** particular airspace sections.

Middle Box Steer/Track

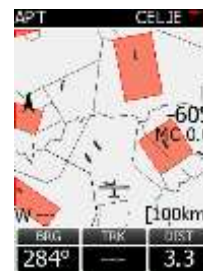
The middle nav box can be custom designed to show **track** or **steering** command.

Graph. Type

The graphic page can be selected as **Large** or **Default**. Large offers bigger characters but less information.



Default

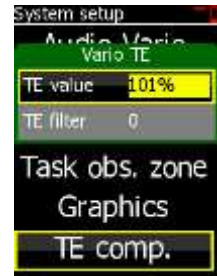


Large

2.3.2.11 TE comp.



LX 7007 C has the capability to offer variometer total energy compensation in two ways. Selection of compensation method is done after selection the % figure. 000% means total energy compensation when using a TE tube. When using this solution the unit does not process compensation this depends entirely on the TE tube and its installation. After an input of a percentage which is other than zero the special software routines will be activated and will provide an electronic compensation process. The default value is 100% but this can be varied following a test flight.



Note!
Electronic and pneumatic TE compensation requires different connection of tubes.

The TE compensation can be fine tuned during flight with the following procedure. It is essential that this is only done in smooth air; it is not possible to tune the TE accurately when it is thermic.

- Select 100 % and default TEF
- 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 maneuver. At 160 km/h (75 Knots) the vario will indicate about -2 m/s

(-4kts). During the speed reduction the vario should move towards zero and should never exceed zero (slightly positive indications are acceptable). If the vario shows a climb, then the compensation is too low, increase the TE%; and vice versa. Repeat this procedure and make further adjustments if necessary.

The **TEF** (TE filter) is the compensation delay. Larger numbers will increase the delay and vice versa. During the first test is recommended to use TEF 4.

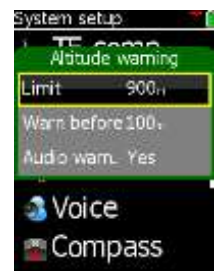
Electronic TE is only effective when the pitot and static sources are co-located and the pneumatic lines to the instrument are approximately the same length. The best sensor to use is the combined pitot/static Prandtl tube. If problems are experienced with the electronic TE compensation, then the most 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 (75 Knots) and reduce the speed. Observe the vario indicator. If the static source is good, then 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.

2.3.2.12 Altitude warning



In case of an altitude limitation the pilot is able to set the altitude which is a top limit. Three parameters are offered:

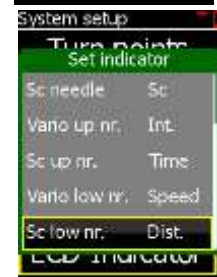
- Limit: means upper level which couldn't be crossed
- Warn before: altitude margin where the warning will start
- Audio warn: **yes** will execute also an audio sound (didl, didl)



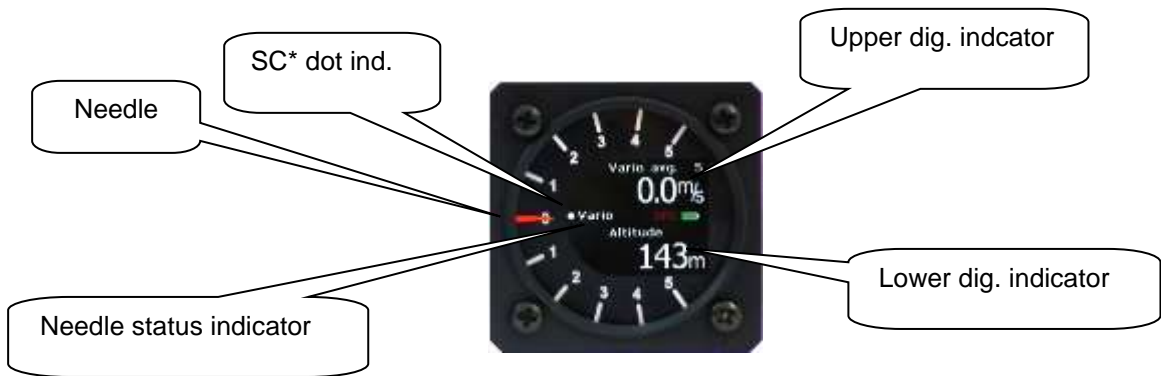
2.3.2.13 LCD Indicator



LCD indicator means vario indicator with it's mechanical needle and colour graphic display. The system is capable to drive also secondary indicators. Secondary indicators may be simple repeaters or may also indicate different data sets, it all depends on the indicator number setting. Vario unit is always addressed as Number 1, secondary indicators can be addressed from 1 up to four.



Note!
Every setting should be set twice once for vario mode and once for SC mode.



- A **radial moving dot** serves as a continuous speed to fly indicator, no setting is possible.

Some explanations of terms:

Vario needle : xxxxx, means needle function in vario mode, eg; vario, SC, Netto....

SC needle: xxxxxx, means needle function in SC mode

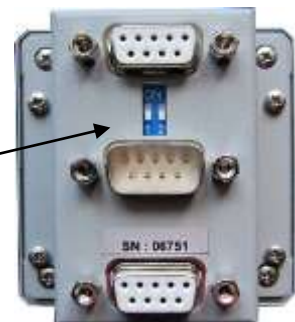
Vario up nr.: upper numerical display indication in vario mode

SC low nr.: lower numerical display in SC mode



Secondary indicators

Secondary indicators should be connected via 485 system bus. There are three 9P connectors at the back of the unit. All contacts are absolutely parallel, so it doesn't matter which one is occupied. The unit can be also used as 485 system bus splitter. To define Ind number use **DIP switches** which you find at the back of the unit.



Note!
Units having Adr1 will simply repeat what is displayed on the vario.
Higher addresses makes possible different sets.

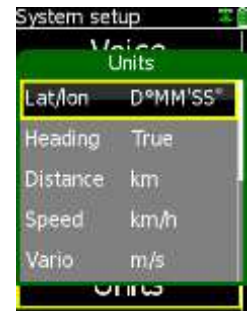
Number	Switch
IND 1	x x
IND 2	x
IND 3	x
IND 4	x x

After indicator functions have been defined, switch the unit off and then on again, this procedure will memorize the settings.

2.3.2.14 Units

All known units and combinations can be programmed in the LX 7007 C.

The various units that can be selected are outlined below:



LAT/ LON:	degrees and decimal minutes; or degrees, minutes and seconds
Distance:	kilometers (km); nautical miles (NM); or statute miles (mi)
Speed	kilometers per hour (km/h); knots (kts); or statute miles per hour (mph)
Vario:	meters per second (m/s); or knots (kts)
Heading:	degrees magnetic (°M) or degrees true (°T)
Wind:	kilometers per hour (km/h); knots (kts); miles per hour (mph); or meters per second (m/s)
Altitude:	meters (m); or feet (ft)
QNH:	millibars (mb); millimeters of mercury (mm); or inches of mercury (in)
Mass:	kilograms per sq meter (kg/m²); pounds per sq foot (lb/ft²); kg, or lbs.....
Temp:	deg Celsius or Fahrenheit

2.3.2.15 Voice

If Voice module is connected to LX 7007 C (connection via 485 bus) following settings will settle Voice module operation. Items Having attribute Yes will be active. The first part of settings is connected with LX 7007 C information and warnings and second part defines Flarm audio. Flarm part is relevant only if the unit is equipped with Flarm option.

Volume: adjustment of voice volume
 Mix: percentage of voice volume mixed with audio
 Version: voice account
 Elevation: set elevation
 Pilot: set pilot
 T. declared: task declared after decl. procedure



T. start: task is started after start line crossing
 Inside zone:
 Outside zone:
 Next: after change over to next TP
 Appr. FG: approaching to final glide
 Establ. FG: final glide established



Two minutes: two minutes before reaching finish line
 Airport: after selection
 Land.gear: message appears 15 minutes after take off
 Stall: stall warning if set
 Airspace: entering into airspace
 Low battery: low battery



Event mark: event marked after event f. is activated
 FI traffic: Flarm traffic info
 FI warnings: Flarm traffic warning
 FI obstacle: Flarm obstacle warning
 FI hor dist: horizontal distance to Flarm object
 FI ver pos: above or below



2.3.2.16 Flarm



Item Flarm is only active with units which are equipped with Flarm module. The upper four rows are information only, the last two rows enable inputs. Region input will adjust frequency relating to the area of operation. Privacy yes will reduce the data which is sent, so that gliders near to you will not receive complete data about you, but they will be warned for sure. When privacy is enabled your Flarm will show reduced data about all near gliders, even they don't use privacy mode. This is some kind of punishment, so if you don't send complete data you will be also not fully informed about other gliders.



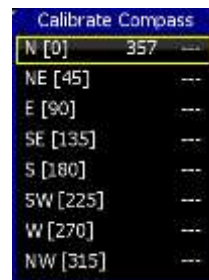
Important!
 Flarm version 5.09 and higher doesn't makes possible to input region, this is done automatically.

More about Flarm see in section 3

2.3.2.17 Compass

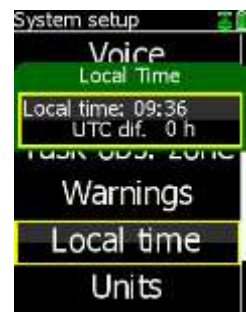
This menu is active only if LX compass device is connected. In fact the page serves as a compass calibration tool. After using of compass HDG indication becomes active in the second navigation page. After Enter calibration mask will open and the calibration process could start. The glider should be rotated into 8 directions and enter should be pressed after reaching stable indication. Use Save and Exit command to finish the process. After that the compass is calibrated. A final check after using of HDG indication in second navigation page is suggested. More details about compass compensation you find in compass manual.

Important!
 Compass device should be enabled in item Hardware. Otherwise it will not work.



2.3.2.18 Local time

Adjustment of UTC time to local time is possible.



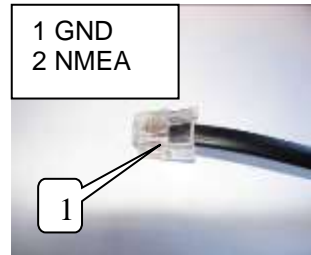
2.3.2.19 NMEA output

LX 7007 C is capable of sending NMEA data to third party units such as PDA and PNA. The data is available on the connector marked PDA. Six data strings are offered. GGA and RMC include basic position data. GPGLL and GPRMB are also required by some applications. LX Wp sentences also contain pressure and altitude information in addition to IAS data. PFLAx data must be enabled, if Flarm data is required on a PDA. LX7007 C sends data exclusively at 19200 bps. A suitable (1638) cable, which connects majority of PDA units is included in the pack.



2.3.2.20 User Port

User port is a stand alone RS 232 standard port which is capable to deliver NMEA sentences to third party units connected to LX 7007 C. The port can be used to supply GPS data for transponder. Most common used baud rates are available. **Restart** the unit after any change of baud rate.



2.3.2.21 GPS Input

(Valid only for LX 7007 **Compact C/CB**) Setting makes it possible to adjust LX 7007 baud rate to meet GPS source baud rate. Possible settings are: 4800, 9600, 19200, 38400 bps

4800 bps: LX 20, Colibri
19200 bps: LX Flarm, Colibri II

2.3.2.22 ENL (Engine noise level)

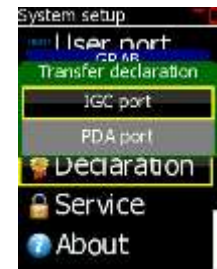
This page allows no input, the bar shows ENL figure and can be used only to check that the ENL is working properly.

2.3.2.23 Hardware

Any additional bus participant as Rear seat unit, Remote controls or compass **should be enabled** in this menu, otherwise will not operate.

2.3.2.24 Declaration (transfer to Colibri and PDA)

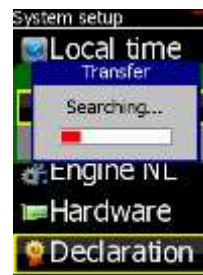
LX 7007 has two com ports, one is called IGC and another PDA. Using of this menu is possible to transfer declaration data towards units which are connected to those ports. IGC port has an IGC standard connector and Colibri or LX 20 can be connected that way. PDA port is designed to connect PDA units with LX 7007 C.



2.3.2.24.1 Declaration to Colibri (LX20)

Connect Colibri via original cable (twisted) to LX 7007 C. Run IGC port variant and the procedure will run fully automatic. Searching, transfer and finish status will follow.

Note!
By LX 20 the process should be started by pressing of READ key and after IGC port on LX 7007 C.



2.3.2.24.2 Task Declaration to and from PDA

LX 7007 C declared task data can be transferred to PDA (pilot and task data). Declaration can be also send opposite way; from PDA into LX 7007 C. In that case only task data are sent, pilot data will taken from currently active pilot of LX 7007 C. Suggested program is ConnectMe. Use PDA option on LX 7007 C.

2.3.2.25 About

This is a poor information menu which informs about the program version and date of its creation.

2.3.2.26 Service

Item service is generally for maintenance activities by authorized personnel. After press on enter a password is required. Some passwords can be also used by user.

Password	Function	Remark
99999	Deletes flight recorder	
49046	System reset	Will delete complete data base and set all settings to default, a FW update is mandatory after System reset, as the unit become inoperative.

2.3.2.27 Firmware update

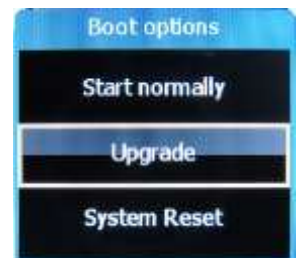
The update procedure is extremely easy and can be provided by user. The unit is prevented with password so it is absolutely necessary to have a password which is based on unit serial number and program version. The password is therefore valid only for particular unit.

LX 7007 C FW update procedure:

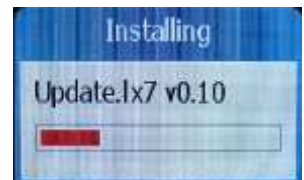
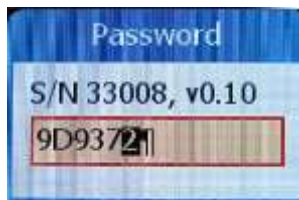
-check actual program version status and creation date in Setup About



- switch the unit off
- insert SD card which includes new file (update.LX7)
- press and hold EVENT key
- switch the unit ON (short press on ON button)
- release event after Update menu will open
- select Upgrade function and press Enter
- verifying process will start, this is not update
- input PW which you find above (you have to input all positions) if PW is shorter, than go on by Enter until update bar will start



System Reset will execute after input of PW **49046**. After System reset a FW update is mandatory, as the unit will not function after System reset. It is also necessary to reinstall the data base after using of Transfer function.



Final check:

Check program version during next booting, pay attention on date.



Important!
Use the same file also for the update of second seat units and also use the same procedure. Second seat will adapt automatically to run as second seat repeater without any settings. The same is also valid for LX 7007 Compact C and CB

2.4 Navigation Functions

The LX 7007 C has following navigation functions displayed on six main pages. The pages are selected in sequence by rotating the **MODE** (\leftrightarrow) selector:

- **GPS** - Status and Coordinates
- **NEAR AIRPORT**
- **APT**, - Airport
- **TP** - Turn points
- **TSK** - Tasks
- **STATISTICS** - These can be accessed both during flight and after flight using the **LOGBOOK** function

2.4.1 GPS Page

This page is purely for information; no configuration is possible. GPS satellites status display can be selected by rotating of Up/Down selector. Page with satellite status is available only for units **without** Flarm.



2.4.2 NEAR AIRPORT

This option displays the nearest airports, from the APT database and also from the TP list. Only turn points having an attribute **land able** are included. The airports are sorted by distance with the closest first. Simply place the cursor with the **UP/DOWN** selector on the desired airport and press **ENTER**. The LX 7007 C will change to APT or TP mode and all navigation features will be available. Additionally a dot is present on the right side of the display. Red coloured means cannot be reached based on MC 0, yellow marked are theoretically available and green marked are available (flying MC 1).



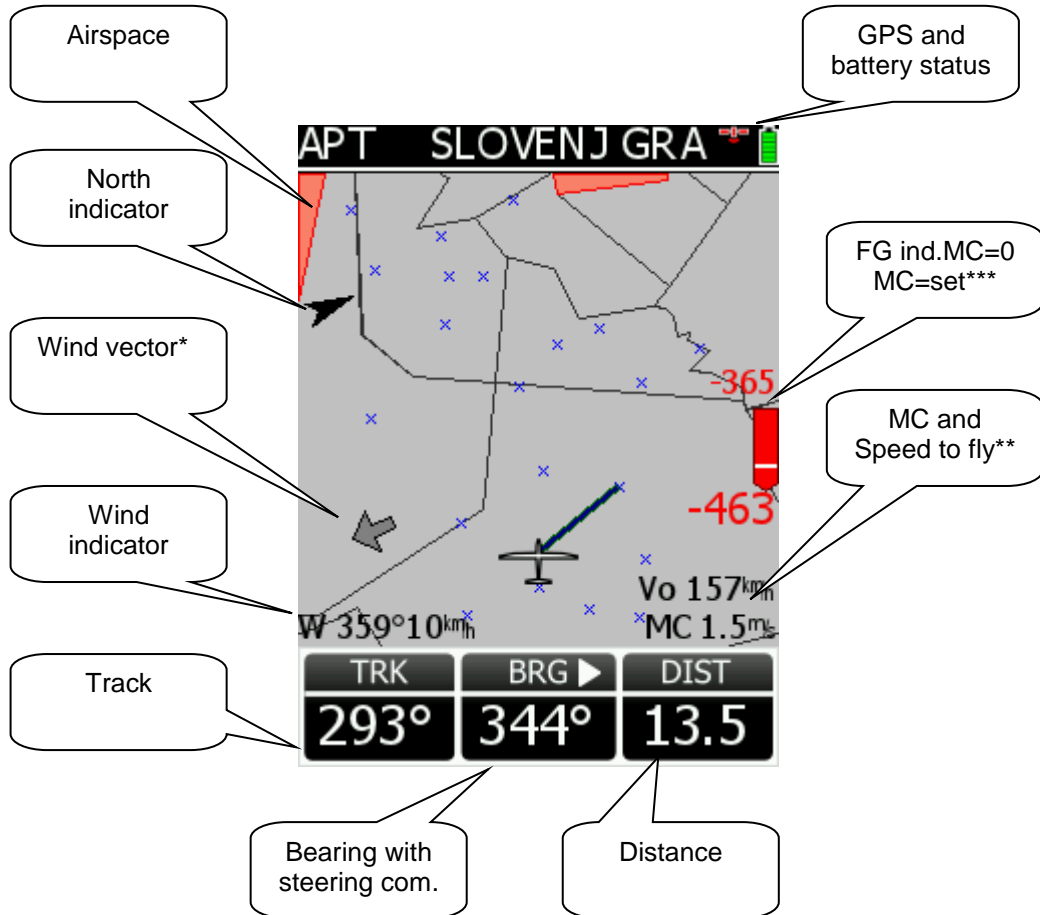
Important!

Terrain elevation data are not taken into account.

2.4.3 APT Airports, TP Turn Points

Both navigation modes (APT, TP) are selectable by rotating the **MODE** selector. The functions carried out are more or less similar and that's the reason of concentrated description. Basic page is graphic page where you will find initial navigation data and also graphic display which includes airspace data.

Note!
The graphic is oriented **track up**, so the glider symbol is stable and the map is moving.



* When climbing a thermal assistant will appear around wind vector.

** MC which is set by pilot and theoretic speed to fly figure relating to the MC value set.

***red figures indicates you will not arrive and blue figures indicate you will.

Note!
Central nav box can be also set as a steering command.

Note!
There are two variants of graphic page. See setup graphic.

The screenshot shows an alternative navigation display. At the top, it reads 'APT CEL.E'. The map is oriented track-up. A glider symbol is centered. Callouts identify: 'APT', 'CEL.E', '-605', 'MC 0.0', '[100km]', 'BRG 284°', 'TRK', and 'DIST 3.3'.

2.4.3.1 APT / TP Navigation sub pages

First subpage brings navigation data and also some gliding relevant data in numeric form. The information may vary dependant upon whether climbing or in straight flight. Averager is replaced with Netto during strait flight. Steering command is placed near track indicator.

Explanation of terms: 1st sub page

- BRG:** bearing towards selected point
- DIS:** distance to TP, APT
- TRK:** actual track
- NET:** netto during straight flight*
- AVG:** vario average in climbing
- FG:** deviation from final glide in m resp. feet

Wind indicator:**

Thermal assistant*:**

MC value: displayed in the left lower corner

Altitude gain**:** displayed in the central bottom part

Efficiency display***:** right bottom corner



* Netto and Average indication will alternate relating to climbing or straight flight

The **wind indicator consists of numeric indicator (direction and speed) and wind vector, which is oriented track up. Wait 1 or 2 indicates wind calculation is in progress.

*** **Thermal assistant** helps when climbing to find the centre of the thermal, see also capture Flying LX 7007 C.

**** **Altitude gain (AG)** collected during climbing in existent thermal will be displayed when climbing and **Total average (LTAvg)** reached in the last thermal will be displayed during straight flight. Change over is automatic and does not depend on SC switch.

***** **Efficiency display** shows **actual** efficiency calculated during last two minutes of straight flight. Calculation is carried out automatically without pilot influence. During climbing period a **C** character shows that status.

Figure under R is **required** efficiency based on distance and altitude and is present also during climbing. General rule to reach the point is that the number under A should be higher than under R. Lower values of A are also written in red. Not valid situation is characterized with - -.

Explanation of terms: 2nd sub page

- Time:** local time
- ETE:** estimate time elapsed
- GS:** ground speed
- ETA:** estimate time of arrival
- Frequency:** airport frequency*
- Runway:** runway direction*



AOT and Battrey voltage are displayed in the bottom row of the display

*Not available for non land able turn points.

Explanation of terms: 3rd sub page

This is an info page and can be used after a position report to ATC is required. There is no alternate data. QFE information is based on selected airport and not above take off place.



2.4.3.2 Airport Selection

Selection of an airport will start after pressing enter, navigation page doesn't matter. After use of an ICAO solution a direct selection will occur. Country selection makes it possible to select country of interest at first and then the airport. The airport selection method is based on input of first letters of the name. Use Up/Down and enter. Input of reduced number of letters will show all airports with the same first letters of their names. As long as the "Select from" has a red mark you should go on with the input of letters. Immediately you get a green selection key you can leave menu with **escape**. All airports having the same initial letters will be offered. Selection of the airport follows, after entry on desired position.



Note!
There is no edit function for airports. Any changes should be made after using of LXe PC program.

Note!
Use **Start or ZOOM** to correct an input error, to move one step back

2.4.3.3 Turn point Selection

Selection of a turn point uses the same principle as used by airport. The pilot is able to create some turn points (up to 50) by hand after input of turn point data. Such a turn points are called as **USER** points and are stored in a separate memory and selectable from user store.



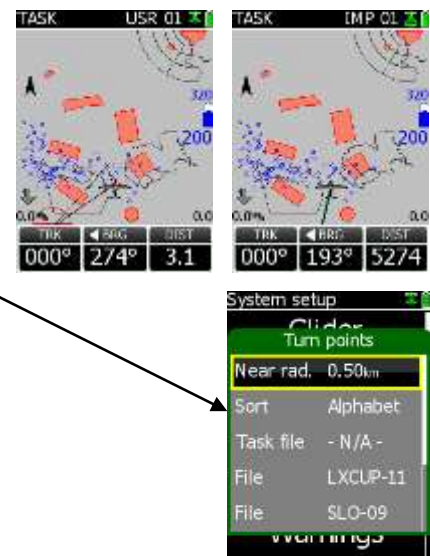
Note!
User turn points can be edited at any time by using of the edit function. There is a wide range of turn point types is offered as the last item.

2.4.4 Task

Task structure is similar to TP and APT. Basic page is also graphic page followed by three numeric pages which slightly differ to APT and TP. The most important difference is third page which makes it possible to edit and to create a new task. Task management is slightly different to LX 7007 pro igc, as there are three types of task available. Also there is a completely new approach to task start, which is offered as a new function.

2.4.4.1 Task management

Task is a complex procedure which guides the pilot from start point over turn points until finish line. There are several ways to get a task into LX 7007 C. The simplest way is to create new task by hand by use of turn points which are stored in the LX 7007 C memory and defined as active (Syst. Setup/Turn points). There are three stores for task data in LX 7007 C memory. First is called **User** (USR xx) and there are stored tasks created by hand (Maximum 70 tasks). Second store is built of tasks which are included in TP file which is activated as **Task File** in Turn point menu of **System Setup**. Such tasks are called **Imported** (IMP xx). Capacity of imported store is limited to 20 tasks, if the file consists of more tasks only first 20 will be useable. Imported task file original format should be **.cup**. The third store is **Declared task** store, in fact there can only be one task stored. The Declared Task data is also written into flight recorder header. Any task (IMP or



USR) can be declared after execution of **Declare** command. Declared Task can be also be edited at any time.

How to select IMP or USR task?

A slightly different task selection procedure has been developed for the LX 7007 C compared to the LX 7007 pro igc. After selection of Task mode by rotating the \updownarrow selector, the task edit menu will appear as the last sub page. When **task edit** has been reached, the **Zoom** selector will serve as a task selector knob. **Right** rotation will offer imported tasks and **left** rotation will offer user tasks (tasks created by pilot). After pressing **Escape** in task edit (doesn't matter if User, Imported or Declared) the unit will move straight to the navigation menu.



For instance if imported task under number 03 has been selected, the task ready for navigation will be also designated as IMP03 or USR03. It all depends on store from which the task has been selected.

How to edit task data?

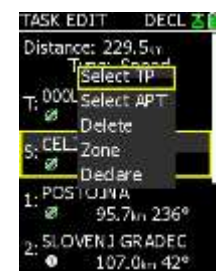
At any point the task (IMP, USR or Declared) can be edited. Simply put cursor to the point of interest press enter and edit menu will open. Use Select, Insert and Delete options. Insert will insert a new point one position higher than highlighted. That way you can edit IMP, USR and also DECL task data.



Note!
After input of start point the same name will be offered for finish, if this does not match requirements a new select should be carried out.

Task declaration

After **Declare** option in task edit on any User or Imported task has been used, the actual task data will be copied into DECL task.



Important!

Task data that is included in DECL task is automatically written into flight recorder, without any pilot assistance. The same will happen following any change of task data (made manually), which is done on the ground. Edit of Declared task editing is also possible during the flight, but all changes done will not be written into the flight recorder header, his will remain unchanged.

Declared Task update **during flight** is possible, but the action will **not change** declaration in Flight recorder, as IGC rules do not allow updates during flight. General rule; if you find **DECL** designator in the task right upper corner, you are sure that the task is regularly declared. Designations IMP or USR show a not declared task.

Understand declaration as an absolutely administrative process which will write declaration into the flight recorder. For instance you needn't start any task, you can fly after busing of APTs or TPs for navigation, but the declaration will be still valid.

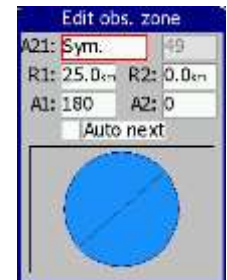
Assigned Area Task

If an AAT is intended to be flown, AAT time should be set. Use AAT option instead of Speed and input time after use of the Φ and ZOOM. **No limit** input describes a speed task and after time input the task will be recognized as an AAT.



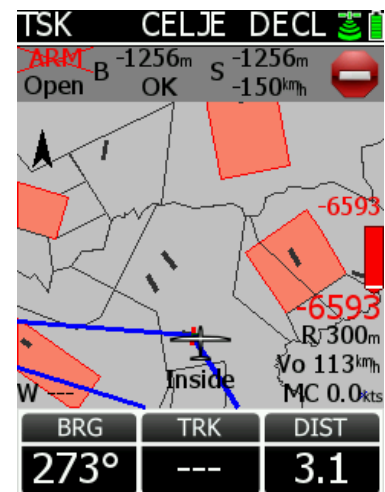
Zone

By use of the Zone function, required sector geometry can be adapted to any turn point of the task. The Input process is the same as described in 2.3.2.6 the only difference is that the sector adaptation is not global but local which means it is valid only for the turn point of interest.



Task Start

Task start has been optimized by loading the pilot during the start procedure keeping work load as low as possible. The unit is capable of recognizing when the Start line is crossed and to change over to first point automatically. All the pilot needs to do is to tell the unit that the next line crossing should be taken as a start. This can be done by pressing the **Start** button (short press), at any position and any time. The unit will change over to ARM status. Task graphic page has one additional upper row which is only active before start. The data of that row helps to the pilot to execute a good start within the actual rules. There are three sections in the row. Left section indicates ARM status and line opening time, B section gives the conditions before start and the right sections gives the start conditions. Input of all these parameters is possible in **Limitations** menu which will become available after moving to the main graphic page and enter.

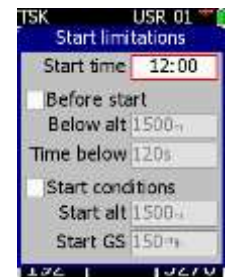


Explanation of terms:

- Start time: input of start line opening time
- Before start: input of altitude* and time limit before start
- Start conditions: input of start conditions*

*QNH based input should be done

More about task start see in capture Flying.



Note!

If any start parameter will be out of limits during start line crossing this will not prevent task start. All mentioned is for information purpose only. A **forced start** is possible at any time after a long press on start button. Position of the glider doesn't matter.

Task Restart

After a task is started a restart procedure can be executed at any time, **Task restart** option should be chosen. This option is available after pressing Enter in main graphic page. After restart an automatic change over to ARM status will follow.

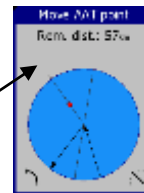


Move function

After a zone has been given the attribute **not Auto next** (Auto next not checked), the move function will become active. The pilot is now able to move the default turn point around the sector and thus modify the task distance. This function is useable after a so called AAT task has been announced. Move is executable with the ↕ and Zoom.



Note!
 During move operation you can observe remaining distance dynamic.



Restart Leg

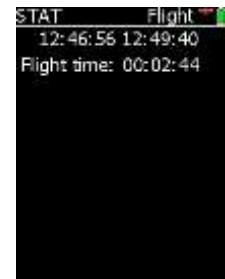
To reactivate last flown leg a function **Restart Leg** is offered. This command is available after pressing enter in the graphic page.

3.1.1 Statistics

Statistics is a stand alone mode of LX 7007 C and logically positioned near task mode. In general there are two levels of statistics, **flight statistics** and **task statistics**. Flight statistics is available during every flight and the task statistics can be called exclusively after a task has been started. When on the ground the statistics page is replaced with **log book**. Flights can be downloaded from this page.

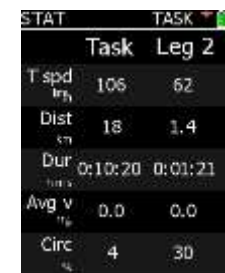
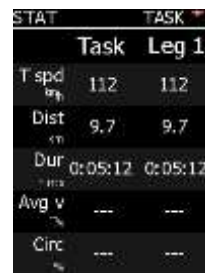
3.1.1.1 Flight statistics

Take off time, actual time and duration of actual flight are displayed.



3.1.1.2 Task statistics

This kind of statistics data is available exclusively after a task has been started and the ↕ switch rotated clockwise, the task statistics data become available. Left column describes task data and right column actual leg data.



Explanation of terms:

- Tspd Task speed
- Dist flown Distance
- Dur time spent on task/on leg
- Avg vario average on Task/on Leg
- Circ percentage of climbing for task and leg

3.1.1.3 Log Book

Log Book presence shows that the flight is finished and flight recorder data ready to be downloaded to SD card. After selection of flight of interest a short press on enter will execute downloading of flight data to SD card.



3.2 Variometer and altimeter

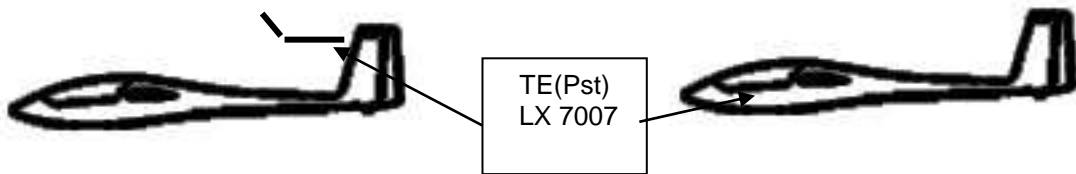
All signals from the pneumatic sensors (altitude, speed) are derived from high quality digital pressure sensors which mean that no flask is necessary. The vario signal is derived from the altitude signal. All signals are temperature and altitude compensated. The variometer can be configured to show:

- range 5,10 and 2.5 m/s 10,20 and 5 kts
- five time constants 1s to 5s, in addition there are 4 settings of electronic processing for the vario signal acquisition
- netto vario air mass lift and sink
- relative vario shows the lift or sink that would be achieved if the glider was circled at thermaling speed

There are two ways by which the vario units can be corrected for total energy; electronic TE compensation based on speed changes with time; and pneumatic compensation with a TE probe. When using pneumatic compensation by use of 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.

Note!

If electronic TE compensation is selected, then the TE(Pst) port should be connected to a good static pressure source. If pneumatic compensation is selected, then the TE(Pst) port should be connected to the TE probe.



Compensation with TE probe

Electronic compensation

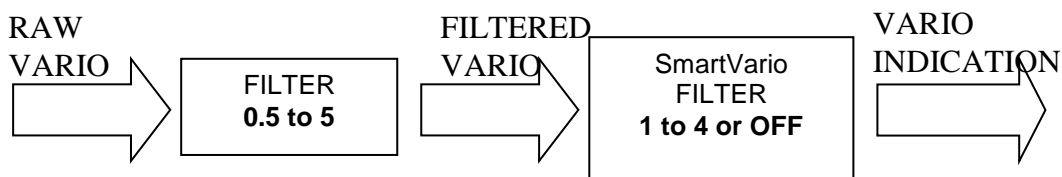
3.2.1 Smart Vario description

The LX system incorporates two configurable electronic filters in the circuitry. The first filter adjusts the time constant and is adjustable between 0.5 and 5 seconds. The 0.5 setting is the fastest while the 5 setting provides maximum damping.

The second filter, called the Smart Vario, is a dynamic filter and controls the rate at which the vario indication moves. When set to OFF, there is no restriction on the rate of movement of the vario indication other than the setting of the time constant filter. When set to 1, the vario indication will not move faster than 1 m/s (2 kts) per second, while when set to 4, the vario indication will not move faster than 4 m/s (8kts) per second. It should be noted that when set to 4, the vario indication will move four times faster than when set to 1.

Summary:

- The Smart Vario should not be used in isolation but in conjunction with the setting of the time constant filter. When the Smart Vario is activated, the time constant filter may need further adjustment to provide optimum indications.



3.2.2 Altimeter

The altimeter of LX 7007 C is temperature compensated from -20°C up to + 60°C. The altimeter is calibrated from 0 to 6000m (20,000ft), but indication goes up to 8000m (26,000ft).

Important!

After correct **field elevation input** the altimeter indication will always be MSL (Mean sea Level).

3.2.2.1 IGC barogram recalibration procedure

LX 7007 C has an **additional pressure sensor** for altitude recording. To comply with IGC procedures, this sensor has no external pneumatic Connection. To carry out the baro calibration procedure it is necessary to remove the instrument from the glider and place it in a vacuum chamber. The procedure is as follows:

- Switch the instrument **ON**, and wait some minutes (straight line on the barogram beginning)
- Set logtime to 1 second
- Place it in the chamber and carry out a short climb to about 100m (to start flight recorder)
- Bring the chamber pressure to exactly 1013.2 hPa
- Decrease the pressure by 1000m and hold for about 30 seconds
- Continue the procedure to 6000m
- Increase the pressure in 1000m steps back to 1013.2 hPa
- After reaching ground wait about 3 minutes and switch the instrument off
- Leave the instrument minimum 5 minutes off
- Download the last flight and print the barogram using the Lxe PC program
- Restore flight recorder settings

The barogram will be the last flight in the logbook.

3.2.3 Speed command

Speed command flying based on the MacCReady theory is a very useful tool to optimize cross country speed. There are many ways of visual indicators. 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. In order to reduce confusion between vario and speed command audio, some special features were developed:

- Continuous audio signal in + possible (other kinds of signals can be chosen, see setup)
- No audio at correct speed (dead band).

3.2.4 Final glide calculation

The final glide calculator calculates the **final glide altitude difference** to the selected point (APT, TP). In the task mode the final glide is always calculated from the current position, round all uncompleted turn points to the goal. A + indication will inform the pilot that the glider is above the final glide slope and vice versa. The final glide takes into account **Mc setting, wind, bugs and safety altitude**.

3.2.4.1 Final glide after using of FAI finish setting

Mentioned setting can be used after a badge flight is intended to be flown. FAI rulers request arrival above zero if start has been made above 1000m. The setting is valid until power off.

4 Flying with the LX 7007 C

To get the best out of the LX7007 C, it is important that some preparation is done prior to the flight – trying to configure the instrument or set up a task while flying the glider may spoil your whole day! Pre-flight preparation will ensure that the flight will be both successful and enjoyable.

4.1 Flight preparation on ground

Pressing the **ON/START** button will switch on the LX 7007 C. The instrument will go through the initialization phase and stop on the elevation selection. The **take off** airfield elevation should be entered. After successful input of elevation pilot selection will follow. The unit will offer elevation of the last nearest airport or land able point. Adjust if necessary.



Note!

It is recommended to switch the unit ON **some minutes before take off**, to give time to the GPS receiver to **acquire** enough satellites and that the flight recorder will build a **base line**. Longer time ON, will not reduce flight recorder capacity due **to circular logging** during stop status.

4.1.1 Single pilot option

If only one person fly's the glider, then only his name should be programmed into the instrument through **FLIGHT INFO**. The LX 7007 C will then show the name of the pilot during the initialization procedure and switch automatically to the **Set Elevation** page. Don't confirm SAVE TO PILOT LIST with Y.

4.1.2 Multipilot option



If more pilots are intending to fly the same glider their names Can be input after editing of an existing pilot name. After any change a very typical message **Create a new pilot** will appear on the screen. After **Yes** the new pilot will be stored. Some system settings are connected to the pilot name and are therefore private settings. To find out which settings are private refer chapter 2.3. Titles accompanied with a man silhouette shows private settings.

4.1.3 SET Elevation (take off elevation input)

We all know that air pressure changes all the time thus initialization is Very important, the instrument **requires** the **elevation** of the present position to be entered.

Important!

If the wrong take off elevation is input then this may seriously affect your final glide.



This setting is **strictly obligatory**. The instrument will offer elevation of the airport which was at the top of the NEAR AIRPORT list before switching off. If this is OK, the pilot can either simply confirm the offered elevation, or alter it. Altering could be done by ⬆ and Zoom. Zoom steps are 5 times bigger than using of ⬆.

Setting QNH

Actual QNH input is possible in **QNH/Reserve** menu of Main Setup. The input is not obligatory, but makes it possible to adjust altitude due to pressure changes which may occur during flight. Input of the actual QNH is only possible before take off. Use ⬆ or Zoom to input the QNH value.



4.1.4 Preparation of data base

Copy new turn point files from SD card if necessary, use **Transfer** function. To enable up to three turn point files use System Setup/Turn point menu. Activate a new airspace section if necessary use System setup/**Airspace**. For upload of a new airspace file use Transfer function at first and then activation. There is only one section of airport data stored in the unit, so a new airport data base should be entered directly from SD card.



1. prepare files (TP or Airspace) on **PC** and copy to SD card
2. use **Transfer** to copy from SD card into LX 7007 C
3. enable files of interest in System setup/**turn points** or **Airspace**

4.1.5 Preflight check

It is strongly recommended that all settings of following items will be checked:

- QNH/RES
- INIT
- Ballast if not defined with **set** in setup LOAD

4.1.6 Preparing a task

While it is advisable to prepare the task correctly before taking off and thus avoid mistakes made in haste, all the following actions, with the exception of a FAI Declaration, can also be done during flight.

a) Entering the task

- Transfer the task file (.CUP) after use of an SD card
- Activate a new file in System setup/Turn points if necessary
- Edit a similar one from IMP, USR, or edit DECL task
- Enter a new task manually (USR).

b) Check task

- **Right TP's**, sequence ,distances between points , bearings and total distance
- **Check visually** task geometry by use of graphic page
- **Check sector** geometry



4.1.6.1 AAT (assigned area task)

Assigned Area Task is in fact a speed task where the task distance is not strictly predefined. The pilot has limited influence on task geometry due to **bigger sectors** which are regularly set. The pilot decides how deep he will fly into individual sector to reach optimal task speed. Usually



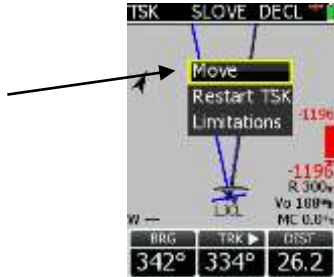
minimum time spend on task is set, to prevent flying to short tasks.

4.1.6.1.1 How to prepare an AAT?

The AAT has the same structure as whichever other task and all known methods to enter are the same as described. The only exceptions are bigger sectors having **specific geometry**. To prepare sectors use **ZONE menu** for each sector individually. If the expected task speed seems to be unrealistic, use **MOVE function** to adapt TSK distance and consequently the speed. MOVE function is available also on ground via edit. During flight, a short cut to move function can be used after Enter.

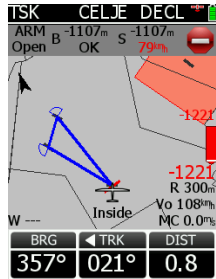
Note!

Following items are important building up an AAT:
 -input of AAT time
 -sector geometry creation



4.1.7 Task Start

Task start is a complex procedure, as this action includes tactical elements and also technical criteria which must be respected due to rules. LX 7007 C start support will help both before start and also during start. Particularly useful is the **Limitations** menu where all the most important parameters can be preset. In addition everything is visualized, so the pilot has all the important data on display. All start criteria are fulfilled when there are no red marked symbols in the upper row. See also 2.4.4



Important!

Any red marked parameter will not prohibit start. The start will be executed as normal, even by presence of warning. Warning is only for information.

Task restart is possible at any time. After restart, the task will change over into ARM status automatically. After a turn point was confirmed and there is a need to continue in the sector a **Leg restart** is offered.

4.2 Flying a task

The most important tip is to prepare the task which is intended to be flown before take off. Special care should be paid if an AAT is foreseen. First important maneuver is task start. It is recommended to set ARM status some minutes before start as a minimum. If an unexpected start happens then simply use the **Restart** function. After restart ARM function will be active immediately after restart has been executed.

4.2.1 Flying a speed task

Speed tasks have small sectors and therefore **Auto next** function will become active. Immediately after reaching of sector the navigation will change to next turn point and the sector will be removed. After a change over has occurred there is guaranteed minimum one fix inside. If the pilot wants to restart last leg this could be done by use of the **restart function**.

4.2.2 Flying an AAT

4.2.2.1 Start

Task start procedure is the same as for speed task. Refer 3.1.7.



4.2.2.2 Inside AAT sector

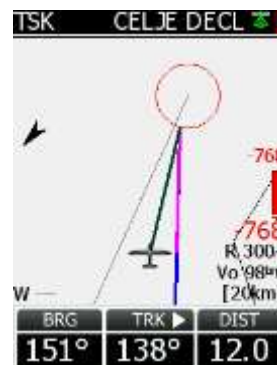
AAT sectors are in general big sectors which can have different geometries. LX 7007 will recognize AAT if the sector radius exceeds 10 km. In case of a smaller sector Auto Next **no** should be set by hand.

As the glider position enters into the sector a typical message **Inside** will appear. This is the signal for the pilot that he has reached the sector. The navigation is still oriented towards turn point; in the case of no previous "Move" function being used. After using of move the task **distance** is modified. Move can be used before reaching of the sector and also inside sector. After a change over to next point has happened (press on Start button) an automatic move happens and the task is modified so far that the position of change over point is taken as a new virtual turn point. All statistics data will change regarding to the new fact.

Note!
Use **long** press to switch to next turn point. There is **no automatic** change over.

4.2.3 Final glide

Final glide is always calculated from actual position until finish line. Modern finish procedures are not any more finish lines on the airport, but cylinders which are positioned some kilometers out of the airfield. By such a configuration LX 7007 calculates the distance to the closest point of the cylinder. This shorted distance is than taken in final glide account. Safety altitude (reserve) is also taken in account.



4.3 Flarm functions

Units equipped with Flarm module which is an integral part of the instrument offers plenty traffic information features.

Note!
Using the Flarm functions, which are available on LX 7007 C graphic display, doesn't suspend the use of Flarm external indicator.

There are two displays which show Flarm data on LX 7007. Flarm objects are shown in graphic page as glider symbols and also so called "Flarm radar", can be activated.

4.3.1 Traffic monitor in graphic page

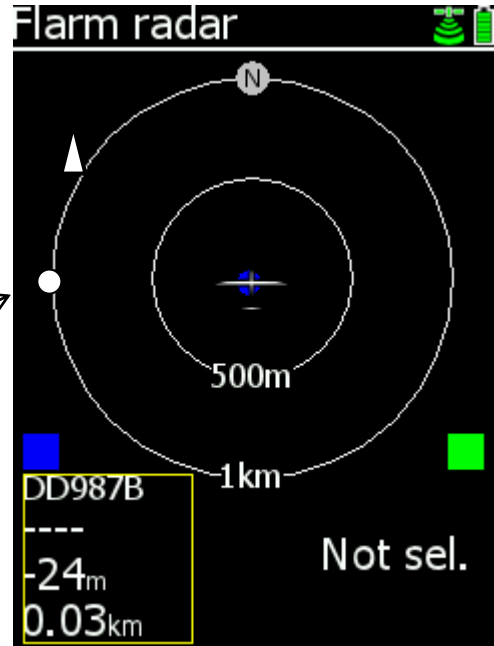
Every object which is visible by Flarm is positioned on the display as a glider symbol. The orientation corresponds to the real traffic situation. This page is an info only page which means no adjustments.



4.3.2 Flarm “Traffic Radar”

This function is exclusively achieved on pilot demand. A short press on Event button opens so called Flarm Radar page. The page consist of glider symbol which is centrally positioned, concentric circles with two possible info boxes. Use **escape** to leave menu. Any gliders in the vicinity are shown as arrow symbols and not as glider symbols. Their colour depends on collision risk status. **Red** marked symbols means risk of collision. This status is also synchronized with Flarm display alarm status.

Note!
 Sometimes the arrows change into **dots**. This means that some pilots are using the so called **Stealth** function and therefore send only limited data. Pilots using Stealth mode active, will see all incoming objects also as stealth objects. This is done to stimulate the pilots not use Stealth.



Commands:

- Zoom change range from 500 m to 10km
- select object which will be observed in more detail*
- Use ESC to leave Flarm radar

Info Boxes:

*LX 7007 Flarm radar has the capability to show detailed data of two close gliders. Mark Info box by use of \updownarrow , press Enter and rotate \updownarrow .

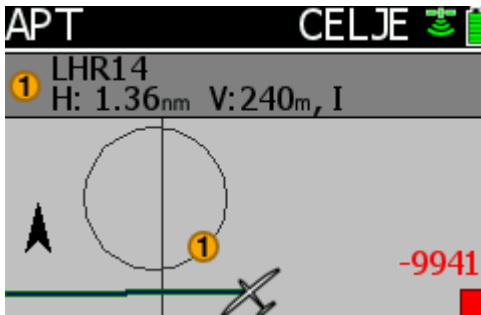
Data shown in info box:

- Flarm ID
- Vario
- relative altitude
- distance

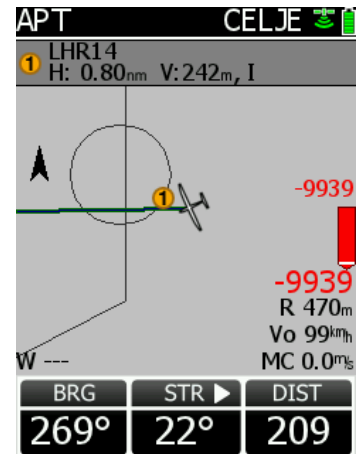
Note!
 The gliders whose data is presented in Info Boxes are coloured (blue and green).

4.3.3 Airspace monitoring during flight

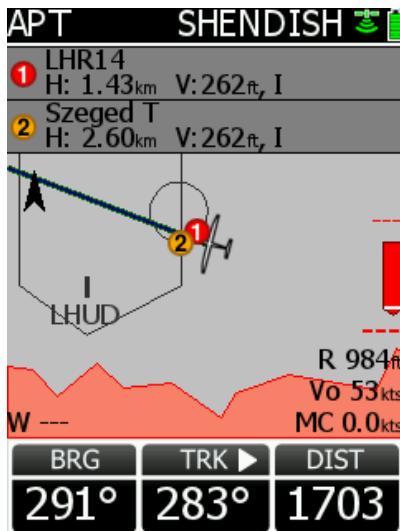
LX 7007 Computer permanently monitors all airspace sections in the vicinity. If the glider position becomes close enough, an **info row** in the upper part of the display become active. Both **vertical** and **horizontal** distances are respected by calculation. Low warning level is indicated as a yellow coloured dot with number. Red coloured dot means higher risk for airspace violation. Two warnings can be displayed at the same time and are therefore numbered as 1 and 2. Red coloured dots shows more critical situation.



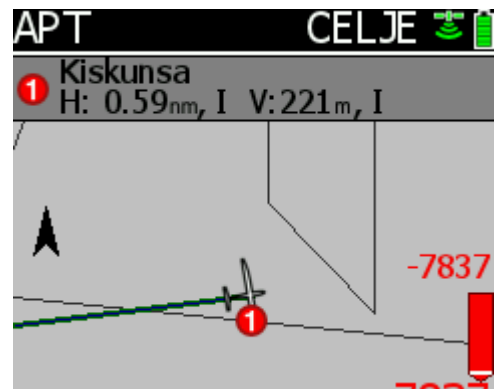
Situation: low level warning horizontal outside vertical inside



Note!
Position of the dot shows always the shortest distance to the airspace.



Combination of low level and high level warnings



High level warning inside situation (I)

Note!
Settings done in Setup/Graphics/Appearance don't influence airspace warnings.

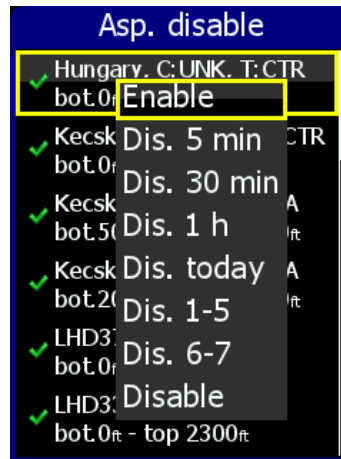
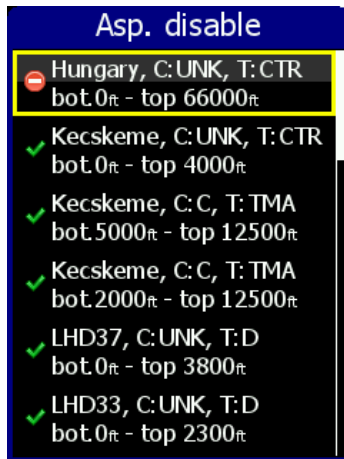
AS warning dots are present also in the second navigation page, to inform the pilot about possibility of airspace violation.

Note!
The airspace warning rows can be disabled in System setup Graphic/appearance. In that case only warning dots will remain.



4.3.3.1 Airspace Management

A **long press** on Enter (in graphic only) will open a list of all airspace sections which are close to the glider. The pilot is now able to select some restrictions or to disable particular airspace permanently. After any restriction the airspace will get a red attribute, but will remain on the list. Any disabled airspace can be enabled at any time.



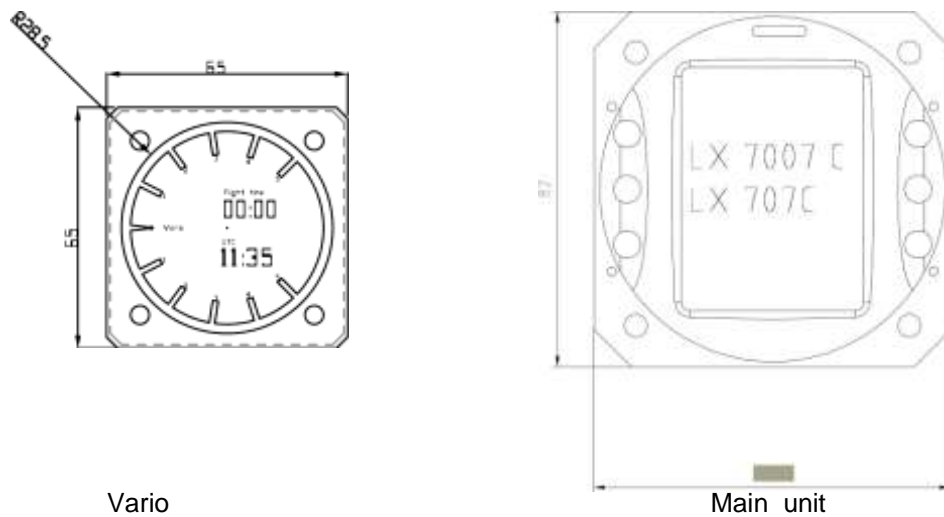
Note!
Disabled sections will not produce warnings.
1-5 means weekdays and 6-7 weekends.



Upper two sections are reserved for detailed airspace data of airspace sections which have caused warnings.

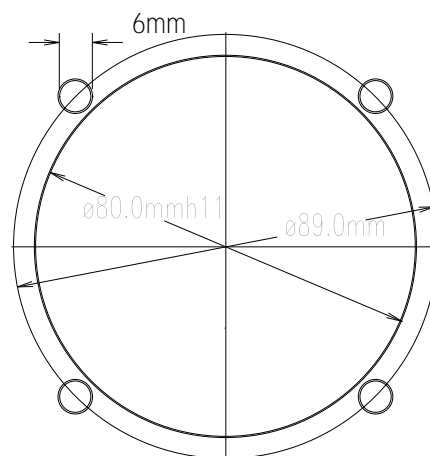
5 Installation

5.1 Mechanical layout



Vario

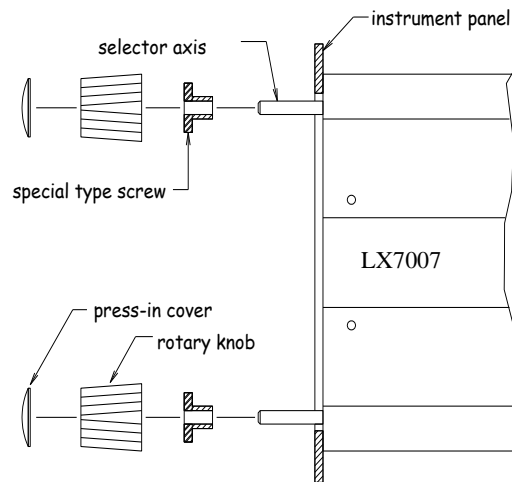
Main unit



Main unit installation template

5.2 Installation of main unit

Prepare the cut-out in the instrument panel According to the drilling template. Remove the press-in covers from the four main selectors on the LX 7007 PRO IGC. You can now see the mounting screws. While holding the knobs, slacken the screws with a screwdriver. Now the knobs can be removed (never use power to remove the knobs, you can **damage rotary** switches). By problems **hit on the slacken screw** a little bit. Remove the four special type screws. Position the LX 7007 PRO IGC in the cut-out in the instrument panel. Tighten the LX 7007 PRO IGC with the special screws (8 mm tool). Tighten the knobs and replace the covers LX 7007 vario don't need any changes having standard 57 mm cut-out.

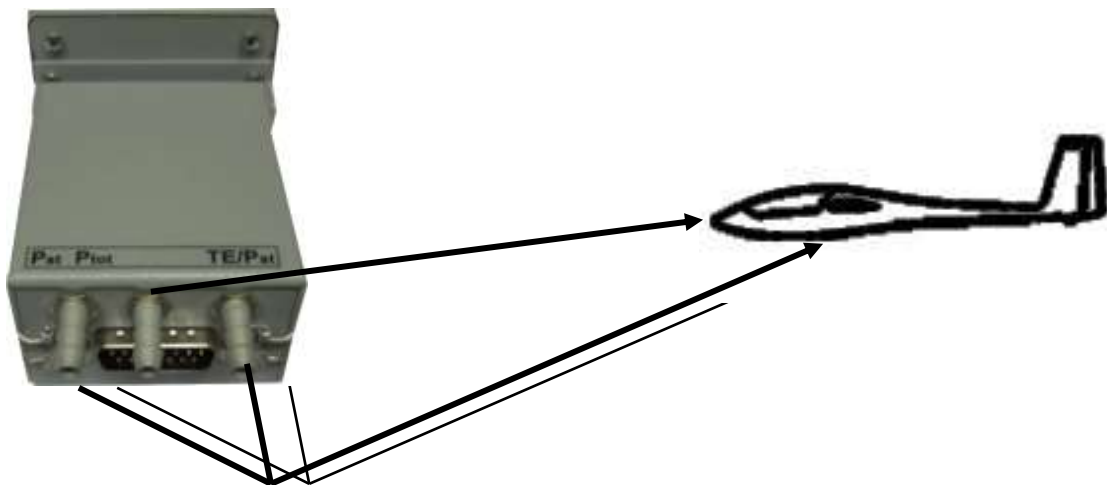


5.3 Pneumatic connections

Three pressure connectors are fitted to the back of the vario unit. **A label shows their functions.**

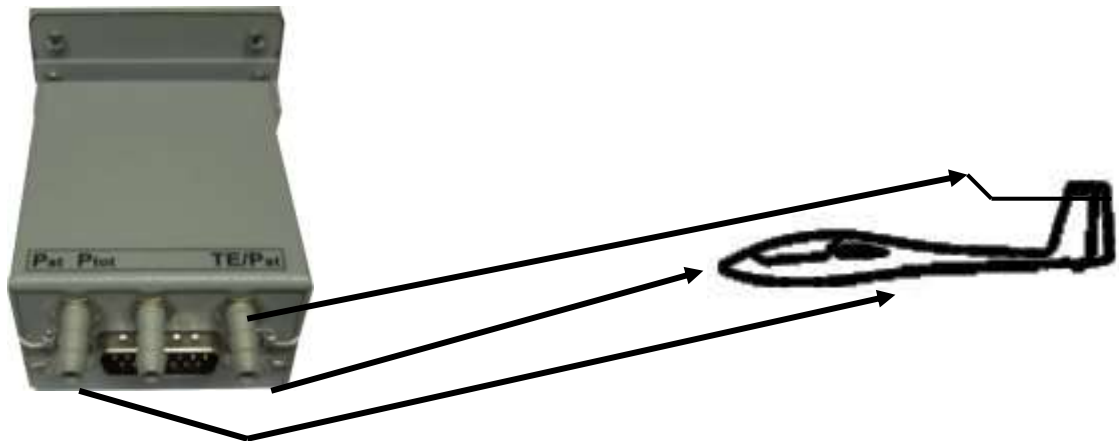
- Ptot = Pitot or Total pressure
- TE = TE probe
- Pst = Static

Electronic TE compensation schematics (Set TE 100%)



- TE/Pst Static
- Pst Static
- Ptot Pitot or Total pressure

TE tube installation schematics (Set TE 000%)



TE/Pst TE tube
 Pst Static
 Ptot Pitot or Total pressure

Note!

If the Ptot and Static are connected **the wrong way around**, there will be no integrator reading (average climb) during the flight.

5.4 Power connection

The LX 7007 DU (80 mm unit) is connected to 12 volt power via the 15 SUB D connector. Power up to 16 V isn't any problem. LX 7007 DU and LX Vario (57 mm) units are connected via the 485 bus and the connectors are marked as **485**. Don't connect bus participants under power. Please check, if both units are connected correctly, before **first power on**. The power wires (red and blue) should be connected to the **80mm unit**.



Note!

In case that vario unit will start immediately after master switch is ON, check wrong connection of 15 p connectors.

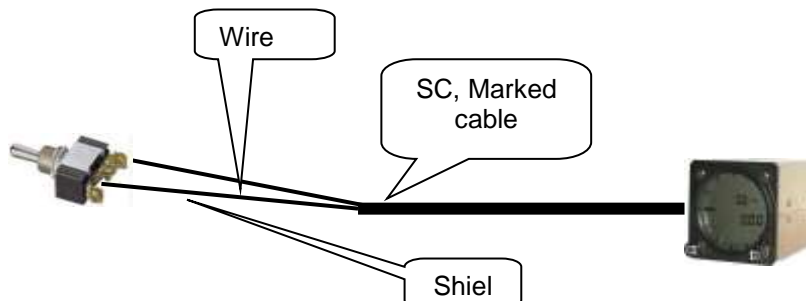
Note!

There is **no fuse in the instrument** so it is **VERY IMPORTANT** to use an external fuse (max. 3A). Power supply cables should use a minimum of 0.5mm² wires (20 avg). To prevent **damage to the LX 7007 80mm** unit after a short on 485 bus, a fuse of blade type (the same fuses that are used in modern cars and therefore available on petrol stations) is built onto the rear of the unit. After a short the 57 mm unit will no longer work, the reason is not a defect in the 57mm unit, but the blown fuse. Use **3 A** fast acting blade type fuse (violet).



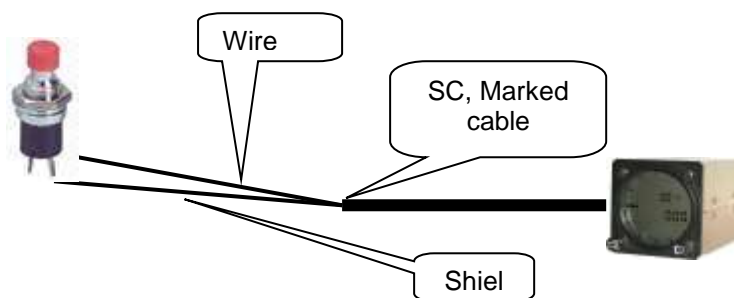
5.5 Vario/SC external switch installation

For this purpose an external switch usually installed on the top of the stick may be used. Flapped gliders use a solution which closes or opens a contact as the flaps are in circling position and vice versa. The configuration can be set in setup **INPUT**.



Wire	Shield	Open	Setting: ON	Staus: VAR
Wire	Shield	Closed	Setting: OFF	Staus: SC
Wire	Shield	Closed	Setting: ON	Staus: SC
Wire	Shield	Open	Setting: OFF	Staus: VAR

Setting **Taster**: will change over (SC/VAR) after each press on the push button. Set this after using of LX Remote.



5.6 Installation of PDA units

LX navigation offers a wide range of accessories which makes the installation of a PDA in conjunction with LX 7007 extremely easy and completely plug and play. LX 7007 has a separate com port specially designed to drive PDA, 5V power for PDA is included. Using of LX standard cables is possible to connect practically all iPAQ units to LX 7007. A cable is delivery included. There are two types of cables.

Cable 1636 for:
31xx, 36xx, 37xx

Cable 1638 for:
H22xx, H38xx, H39xx, H41xx, H43xx, H51xx, H54xx in H55xx, H4700

There are two swivel supports available.

iPAQ Handle for:

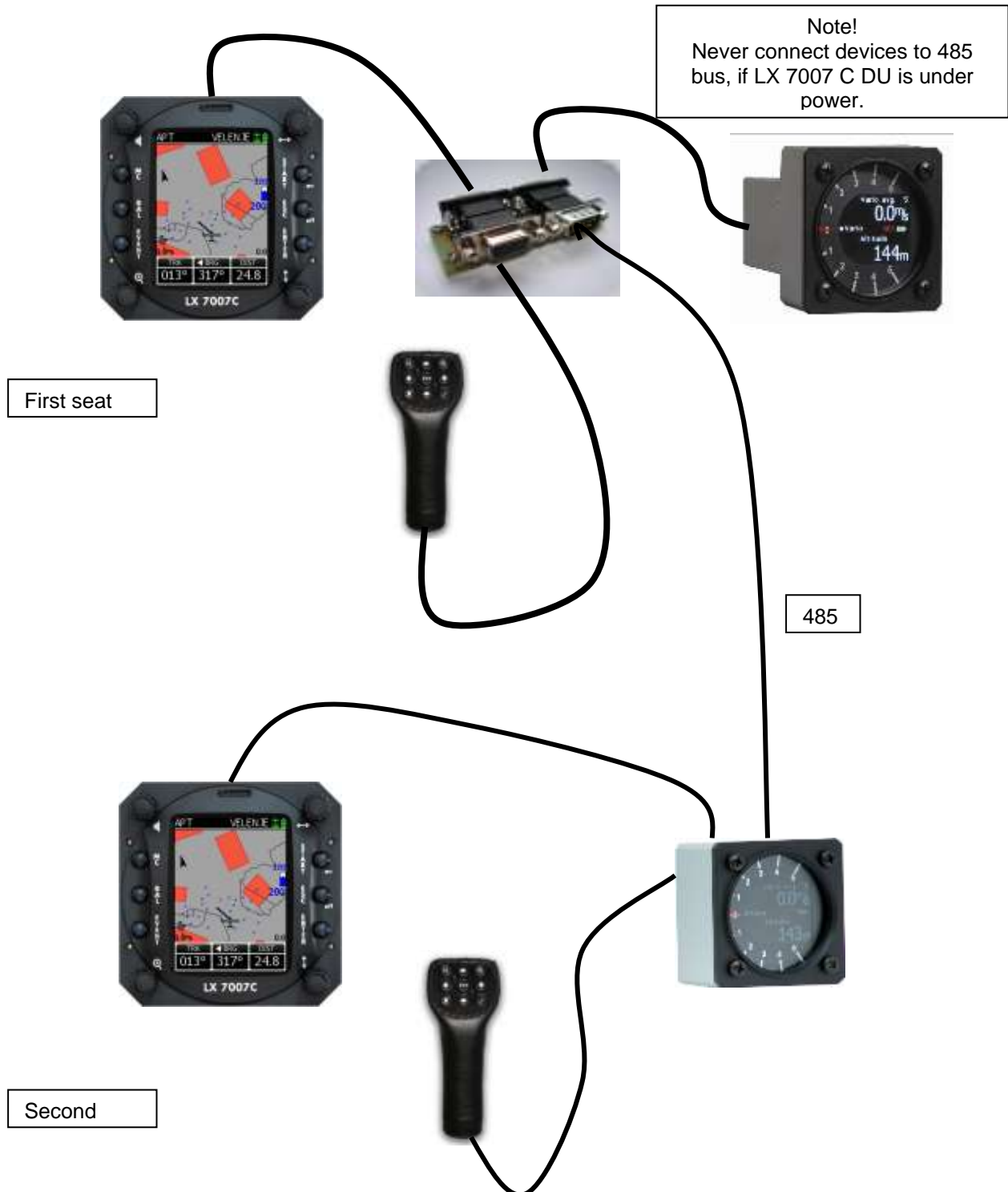
36xx, 37xx, 31xx, H38xx, H39xx, H51xx, H54xx, H55xx, H4700

iPAQ handle 22 for:

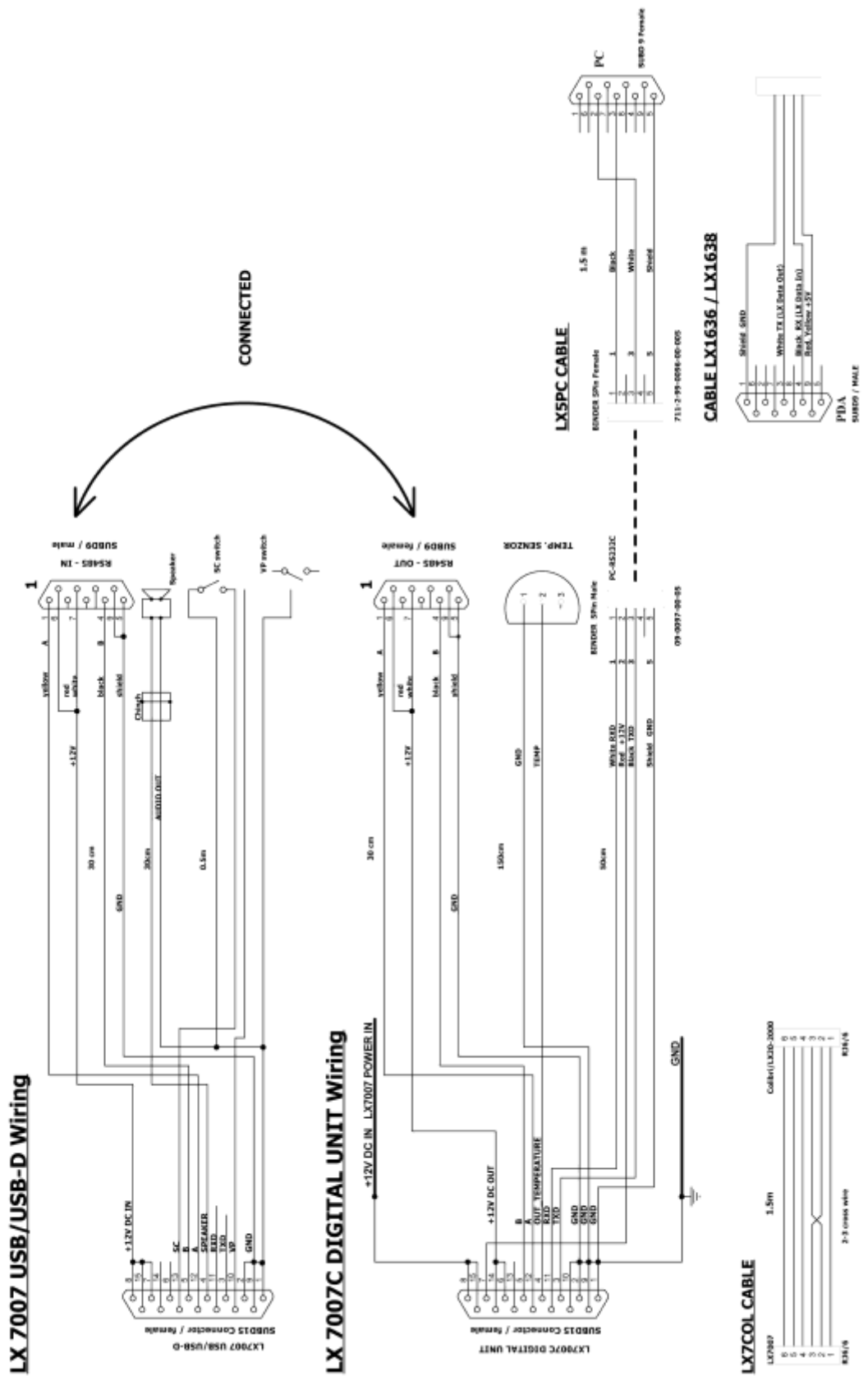
H22xx, H41xx, H43xx

5.7 Installation of options

All options (LX 7007 C D, Remote Control, Voice Module, Compass Module, secondary vario indicators) are pre prepared to be connected to 485 system bus by use of **485 Splitting units**. Installation of all options is plug-and-play and therefore requires only mechanical installation work. LX 7007 C DU also powers all bus connected devices. A fuse built on LX 7007 C DU back prevents damage to the DU after a short in wiring or in some 485 device will happen.



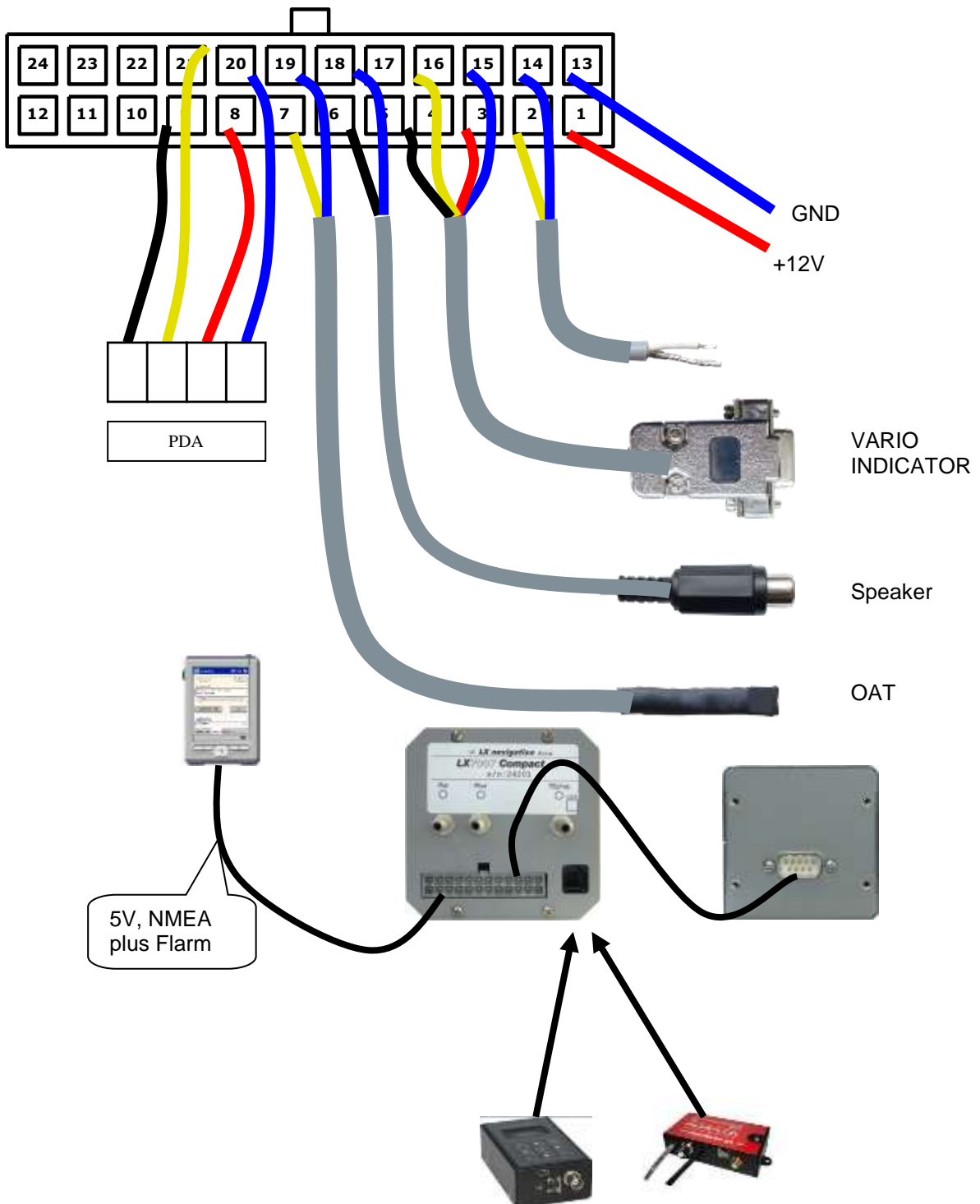
5.8 Wiring schematics (also valid for LX 7007 Compact CB)



5.8.1 Wiring LX 7007 Compact C

LX 7007 Compact wiring differs from wiring used in LX 7007 C, LX 7007 CB and LX 7007 Compact CB models.

Only one 24 p connector is positioned on the back side of the unit. Inputs and outputs are already wired and also clearly marked. PDA output delivers 5V to supply PDA unit and offers also Tx and Rx lines. A four terminal connector offers a so called open wire solution. Cables for PDA units and also LX Mini map are available as options.



5.8.1.1 GPS connection

Any GPS source which is capable to send NMEA data is capable to drive LX 7007 Compact C. GGA and RMC sentences are required as a minimum. LX 7007 Compact C can be adjusted to nearly any baud rate of GPS source. This can be done in System/Setup GPS Input. A 6P telephone type connector is provided for GPS reception purpose, the connector delivers also 12 V power to supply GPS. Connector pin out meets IGC specification.

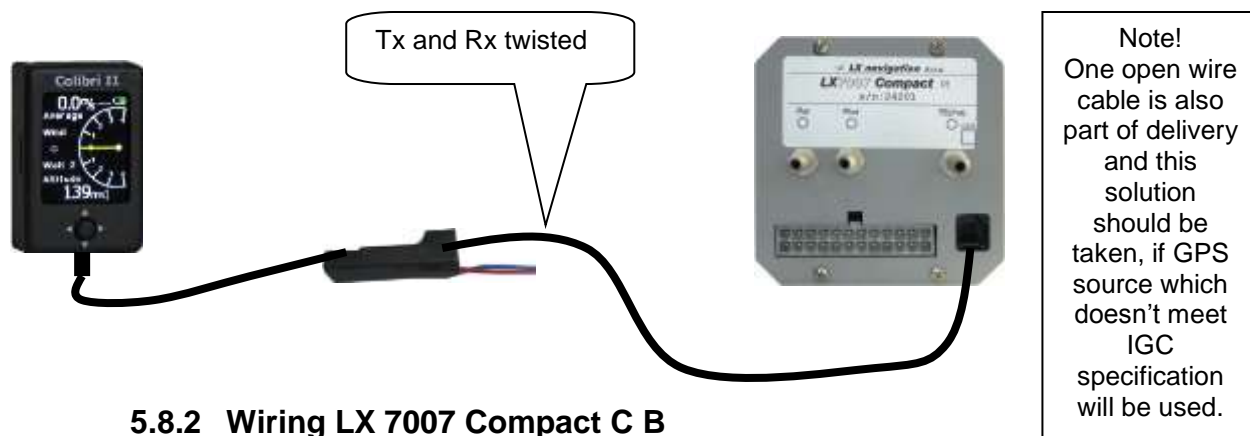
LX 20 2000, Colibri, LX Flarm* and any other unit which has IGC standard connector:

-plug and play via 6P/6P telephone type cable with two twisted wires (one cable is part of delivery) 12 V included

*original Flarm units should be connected via main connector (8P) and not via 6P connector

Colibri II

- Colibri II power and data adapter plus 6P/P cable with twisted wires (one cable is part of delivery)



5.8.2 Wiring LX 7007 Compact C B

The unit has standard LX 7007 C connector layout, the same is also wiring.

5.8.2.1 GPS connection

GPS connection is realized via 8P telephone type connector which positioned on the back of the unit. Connector specification meets IGC standard, so refer 4.8.8.1 for details.

6 LX 5000 R

6.1 General

The unit comes as a retrofit solution for LX 5000, version and HW configuration of LX 5000 doesn't matter. Such a unit uses **LX 7007 C technology** and offers a plug and play connection to exiting LX 5000 wiring that means no installation works at all. The only work is to remove old LX 5000 unit and to install a retrofit.

Use LX 7007 C manual to learn how to use LX 5000R.

6.2 System description

The LX 5000 R box consists of following modules:

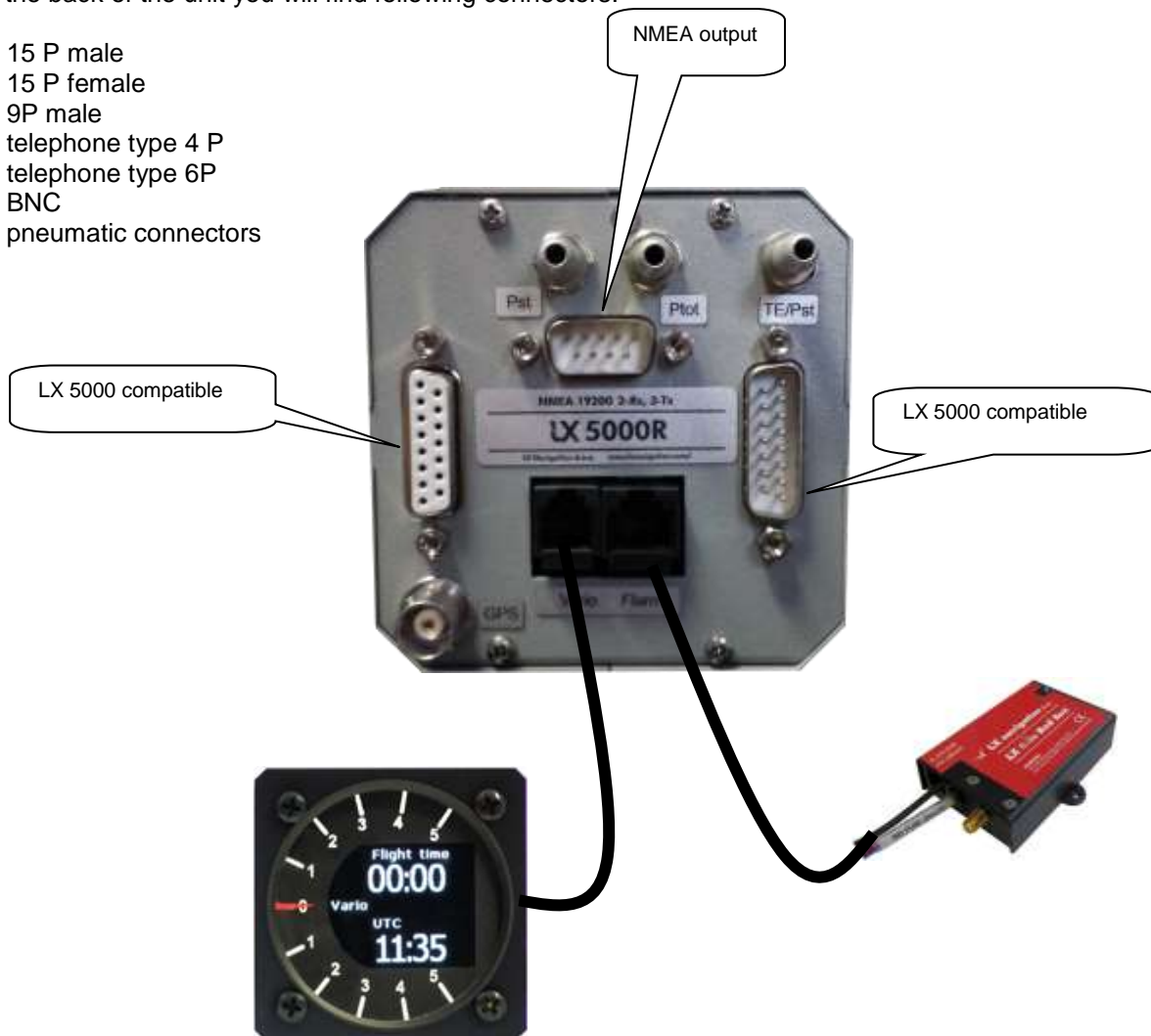
- colour display
- microcontroller unit
- vario unit (USBD 60)
- flight recorder
- ENL(engine noise level) Module
- IGC flight recorder
- GPS receiver

All necessary information about operation of LX 5000R you will find in first three sections of this manual.

6.3 Connectors on the back

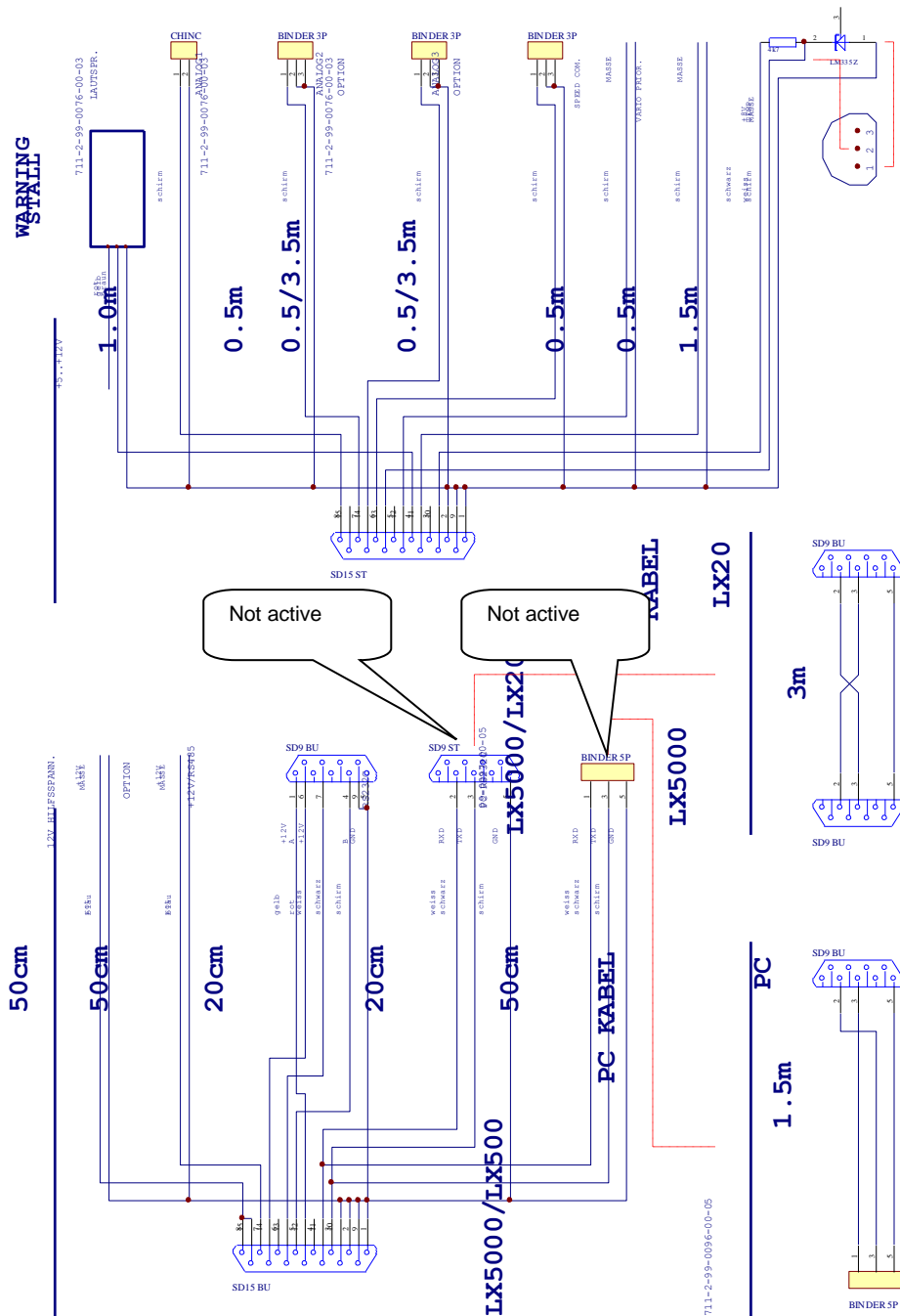
On the back of the unit you will find following connectors:

- 1x 15 P male
- 1x 15 P female
- 1x 9P male
- 1x telephone type 4 P
- 1x telephone type 6P
- 1x BNC
- 3x pneumatic connectors



9P male connector serves as a NMEA output. Its baud rate is fix 19200 bps. See section sections 2.3.2.19 and 25 for details. Pin out correspond to existing NMEA connector which you find on LX 5000 wiring. So, it is recommended to move your PDA cable to that plug. Existing 9P plug which is a part of LX 5000 wiring doesn't send NMEA any more. The plug doesn't include power for PDA. Pin 2 is Rx and pin3 is sending NMEA.

Existing PC connector (5P) usually positioned on the instrument panel isn't active any more.



6.3.1 Vario marked connector

In case that a new colour vario will be used, the unit should be connected to Vario marked plug. A special cable (9P-4P) is a part of delivery. Old vario units can remain as a part of the system.

6.3.2 Flarm marked connector

To visualize Flarm objects on LX 5000R is necessary to connect Flarm data source to 6P plug marked as Flarm.

Any Flarm can be used a data source, after a suitable cable will be used. For LX Navigation LX Red Box or Mini Box use simple 6P to 6P 1:1 cable.

6.4 Flight recorder

Flight recorder is a part of the system and corresponds 100% to LX 7007 C specification. That means all flights produced by LX 5000R will be represented as LX 7007 C flights. LX 7007 C as flight recorder type will be also written in the header of the flight record. See also section 2.3.1.3.

Registration: S5-KKE

Comp. sign: HC

Class:

FR type:LXNAVIGATION,LX7007FC

GPS engine:uBLOXf_TIM-LP,16,max9000m

Ser.Nr:PHD (33025)