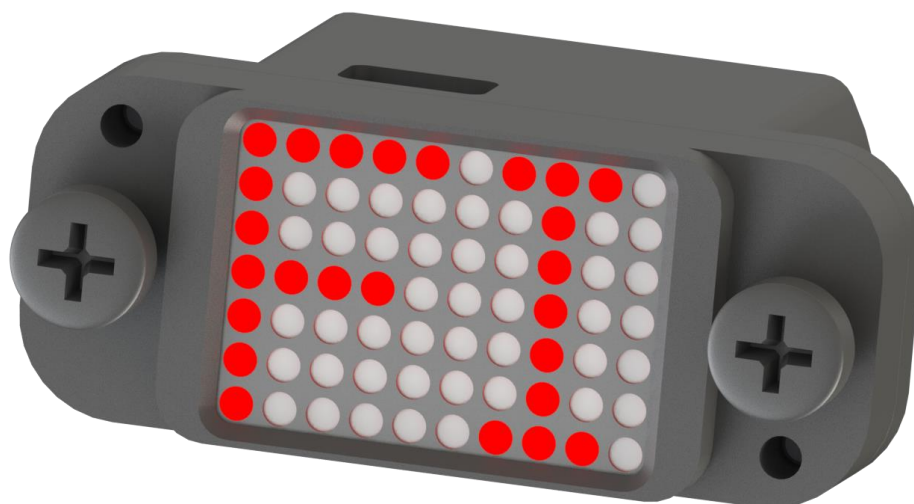


FLAP indicator

Installation manual

Version 1.00



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1 Important Notices

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



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



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



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

1.1 Limited Warranty

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

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

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

2 Installations

2.1 Packing Lists

- Flap Indicator unit

2.2 Basics

LXNAV FLAP indicator is small display unit with red 10x7 LED matrix display for indicating preconfigured flap positions. It can be used as a part of main instrument or as standalone unit connected only to LXNAV FLAP sensor. Indicator has no buttons or any other user interactives. All settings and firmware upgrades on device are made over main instrument or PC via mini USB cable.

At startup indicator will roll its name over the display as FLIND, when follows the "app" or "rec" and at the end, version of firmware for example "v1.00". "app" (application) means that Flap indicator is in operation mode and waiting either for settings from main unit, PC or data from FLAP sensor to show its position. If indicator is in "rec" mode (recovery), then it will not show any data. Reason could be in errors while upgrading firmware such as cable disconnection, low voltage, etc.

In case FLAP indicator is going to be used in standalone operation, it has to be purchased with:

- FLAP sensor
- RS485 splitter
- Power cable with termination

2.3 Electrical specifications

2.3.1 Absolute maximum ratings with respect to GND

| Parameter | Symbol | Rating | Units |
|--------------------------|------------------|--------|-------|
| Power Supply | V _{max} | 40.0 | V |
| Power Consumption at 12V | I _{max} | 200 | mA |

2.3.2 Recommended electrical and mechanical characteristics

| Parameter | Symbol | Min | Typ | Max | Units |
|-----------------------------|-----------------|-----|------|------|-------|
| Power Supply | V _{in} | 8.0 | 12.0 | 28.0 | V |
| Operation temperature range | T _{wr} | -20 | - | +60 | °C |
| Storage temperature | T _{st} | -40 | - | +80 | °C |

2.4 Installation

Flap indicator has specific, non-standard enclosure that fixes to airplane panel with two M4 screws on 41 mm distance between them. Mount it horizontally with mini USB connector on top.

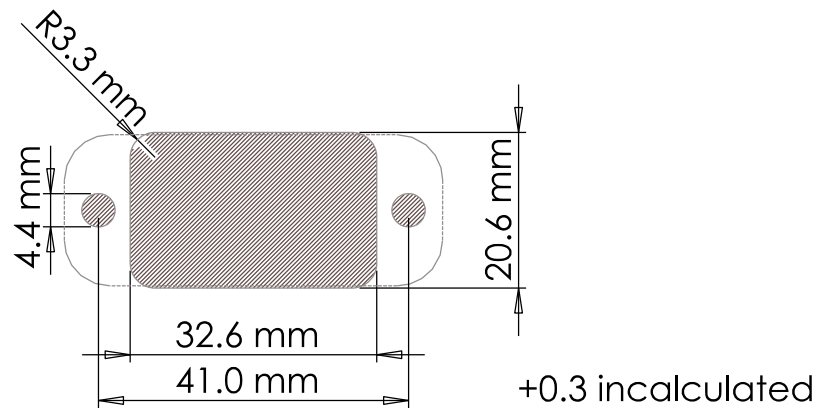


Figure 1: Recommended panel cutout (hatched area)

2.5 Wirings

LXNAV Flap indicator is connected to the RS485 bus through a RS485 splitter and SUB D9 connector. Splitter is not part of the package. If you don't have spare port on it, you must order another 485 splitter. Along Flap indicator should be mounted also FLAP sensor from which indicator receives data.

2.5.1 Slave mode wiring

In slave mode, connecting FLAP indicator to RS485 bus is the same as for any other LXNAV instrument. Connect it to any free port on RS485 splitter.

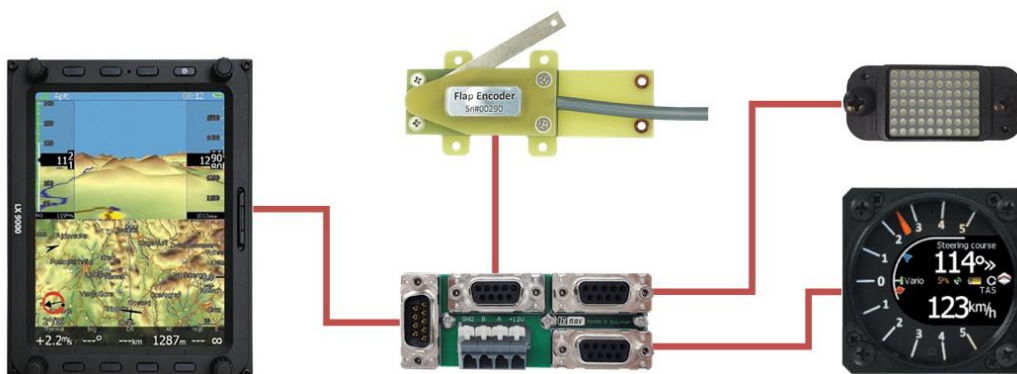


Figure 2: Example of slave wiring

2.5.2 Standalone mode wiring

When FLAP indicator is used in standalone mode, connect it to RS485 splitter along FLAP sensor. Two devices are powered from third connector on which is power cable and built in termination resistor.

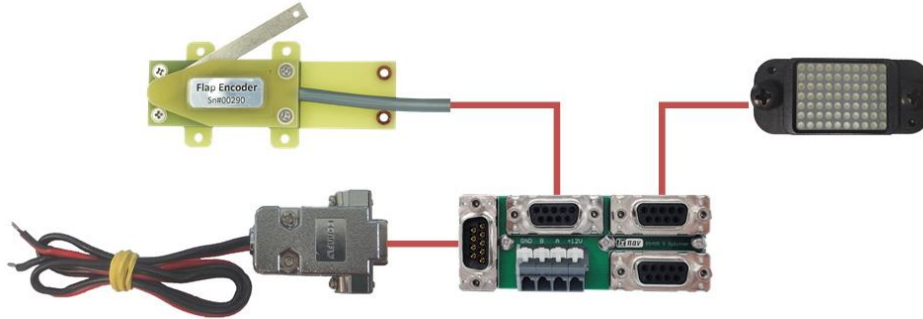


Figure 3: Wiring of FLAP indicator in standalone mode

2.6 Setting flap positions

Putting FLAP indicator working mode is selected automatically. When it receives flap settings from main unit, such as LX9000, it goes into slave mode. This means, indicator is just listening on the RS485 bus. Second option is, when there is no main unit. In that case it goes in standalone mode and is constantly asking FLAP sensor for current position. Standalone mode is selected right after user sends settings to FLAP indicator over USB. Setting flap positions is described in following chapters.

2.6.1 LX80xx, LX90xx

On main unit under "Setup" menu go to "Hardware" and "Flaps". Put flaps to the upper position, move cursor on instrument to first box and click "SET" button. This will save current angle from FLAPS sensor to first box. Write name for this state and repeat same action for remaining positions. When finished, click "CLOSE" button and data will be sent to FLAP indicator.

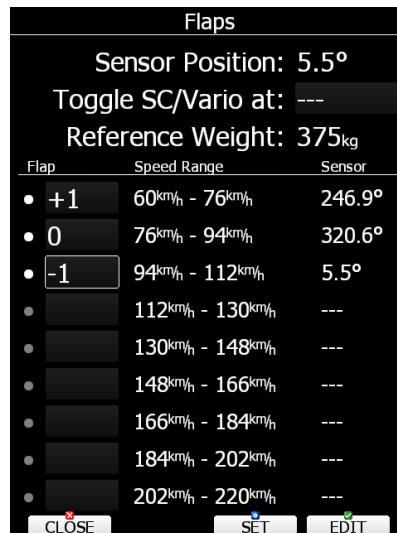


Figure 4: Example of saved flap positions on LX9000 main unit

If positions are already saved, after first startup with FLAP indicator, wait for a minute and instrument is going to update indicator automatically. When it receives data, it will save them to internal memory and show them next time right after system startup.

2.6.2 PC via mini USB

This option is available only for standalone mode of FLAP indicator. Settings made over Flap configurator tool will not be sent to main unit, instead they will be rewritten by LX80/90xx.

Connect mini USB connector to FLAP indicator **after** power up. On your computer you should see new serial communication port. Under "Settings", in Flap configurator, select it and then press "Connect" button just next to "Settings".

Now you are able to see current flap angle. Put flaps in upper position, write its name in "Pos1 name" text box and press "Set" button to determine angle. Repeat same process for remaining flap positions. When done, click "Save" button and "Disconnect". Now you are ready to use FLAP indicator with FLAP sensor.

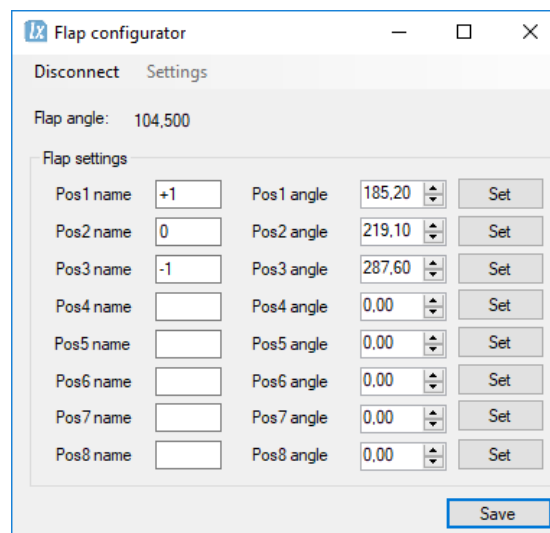


Figure 5: Flap configurator with FLAP indicator settings

2.7 Updating firmware of Flap Indicator

Latest firmware for LXNAV instruments can be found on:

<http://www.lxnav.com/download/firmware>

Update is possible with one of the following two examples:

2.7.1 LX80xx, LX90xx

Firmware updates can be done via main unit such as LX 80/90xx.

- 1.) Start main unit with connected FLAP indicator.
- 2.) Go to: Setup->Password and type in "89891"
- 3.) If there is only one update file, it will automatically update indicator. Otherwise it should be selected manually. Update filename name is "App_FIND_x.yy.lxfw", where x.yy is firmware version.
- 4.) When update is done, FLAP indicator will restart with new firmware and previously saved settings.

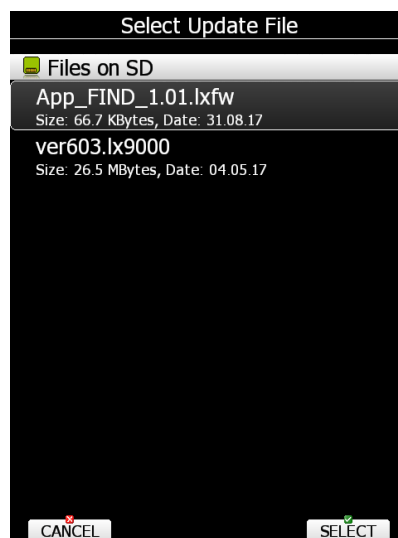


Figure 6: Select update file for FLAP indicator

2.7.2 PC via mini USB

Second option for firmware updating is via PC and is the only way when FLAP indicator is used without main unit.

- 1.) Download FlashLoader485App (PC update tool) from LXNAV website under section for S7 instruments: www.lxnav.com/download/firmware
- 2.) Connect mini USB connector to FLAP indicator and on the other side to your PC.
- 3.) Power up indicator over SUB D9 connector.
In this case, when USB is connected before powering up instrument, it goes in recovery mode, which can be seen from welcome text "FLIND rec vx.yy" on screen. From this moment on, firmware can be updated.

- 4.) Choose correct serial port. Baudrate has no function – leave as is.
- 5.) Chose firmware file App_FIND_x.yy.lxfw, where x.yy is the version.
- 6.) Press Flash button and update will start.

After successful update indicator will restart and go back in recovery mode thus USB has to be disconnected and indicator repowered. If update procedure is interrupted of any case, FLAP indicator will cycle in recovery mode and is has to be updated again following process described above.

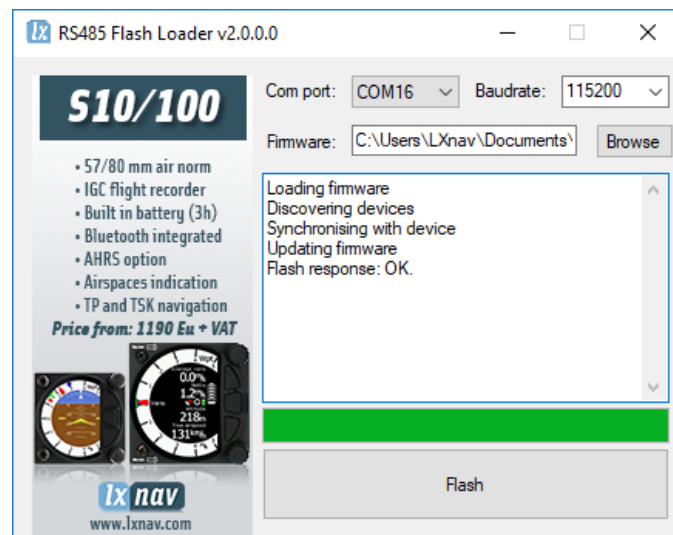
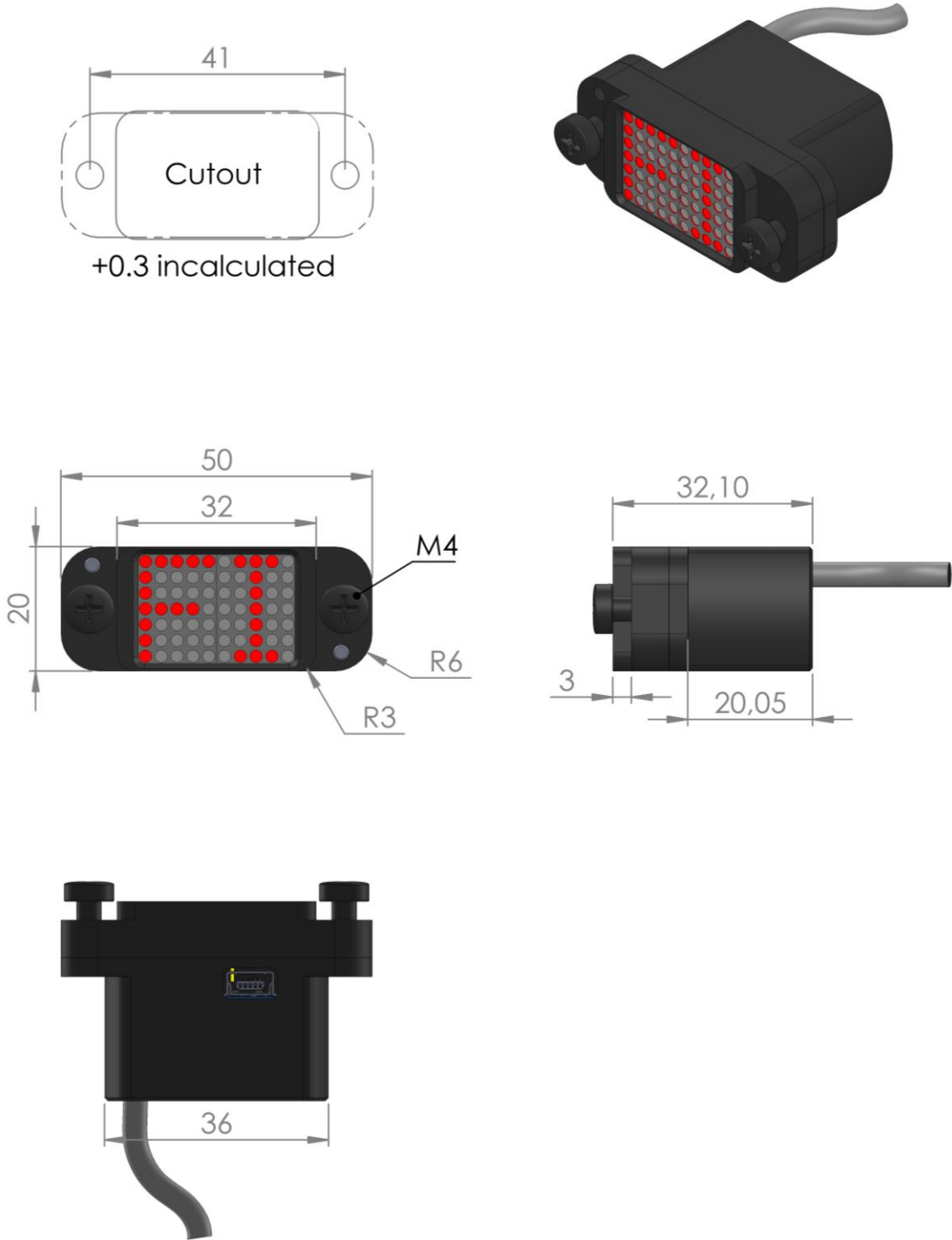


Figure 7: Flash Loader update tool after successful firmware update

2.8 Dimmensions



Drawing is not to scale

Figure 8: FLAP indicator outer dimmensions

3 Revision History

| | |
|----------------|-----------------|
| September 2017 | Initial release |
|----------------|-----------------|