SmartSENSE

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 organization of such changes or improvements.

A Yellow triangle is shown for parts of the manual which should be read very carefully and are important when operating the E500/E700/E900.

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

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

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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, contacts your local LXNAV dealer or contact LXNAV directly.

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1.2 Packing Lists

- SmartSENSE unit
- Quick Reference Manual

2 Technical Data

2.1 General specifications

Parameter	Condition	Min	Typ	Max	Unit
Operating supply voltage [1]		7	12	32	V
Absolute maximum supply voltage [2]	Non-operating	-50		36	V
Current consumption [1]	WIFI Enabled		100		mA
Load equivalent number	WIFI Enabled		1		LEN
Supply protection			-50V		V
Operating temperature		-20		+65	°C
Storage temperature		-40		+85	°C
Recommended humidity		0		95	RH
Weight			100		g
Housing length			95		mm
Housing diameter			24		mm
Ingress Protection			IP66		IP

Note1: Supplied via M12 NMEA2000 connector
Note2: Non-operational, voltages outside of this range may permanently damage the device

2.2 NMEA2000 specifications

Parameter	description
Compatibility	NMEA2000 compatible
Bit rate	250kbps
Connection	A coded M12 connector

Note1: Supplied via M12 NMEA2000 connector

2.3 Sensors

2.3.1 Temperature and humidity sensor specifications

Parameter	Condition	Min	Max	Unit
Operating input range		0	100	%RH
Relative humidity accuracy		typ. ±2		%RH
Operating input range		-40	+125	°C
Temperature accuracy	Pullup enabled	typ. ±0.5		°C

2.3.2 Barometric sensor specifications

Parameter	Condition	Min	Max	Unit
Operating range		10	1200	hPa
Resolution		0.03		hPa
Accuracy (at 25°C, 750mbar)		±2		hPa
Temperature accuracy		±0.8		°C

2.4 Internal memory and power management

Internal memory storage:

The device is powered by the NMEA2000 network: The device will keep the last 512 measurements in its internal memory and will overwrite old measurements over time.
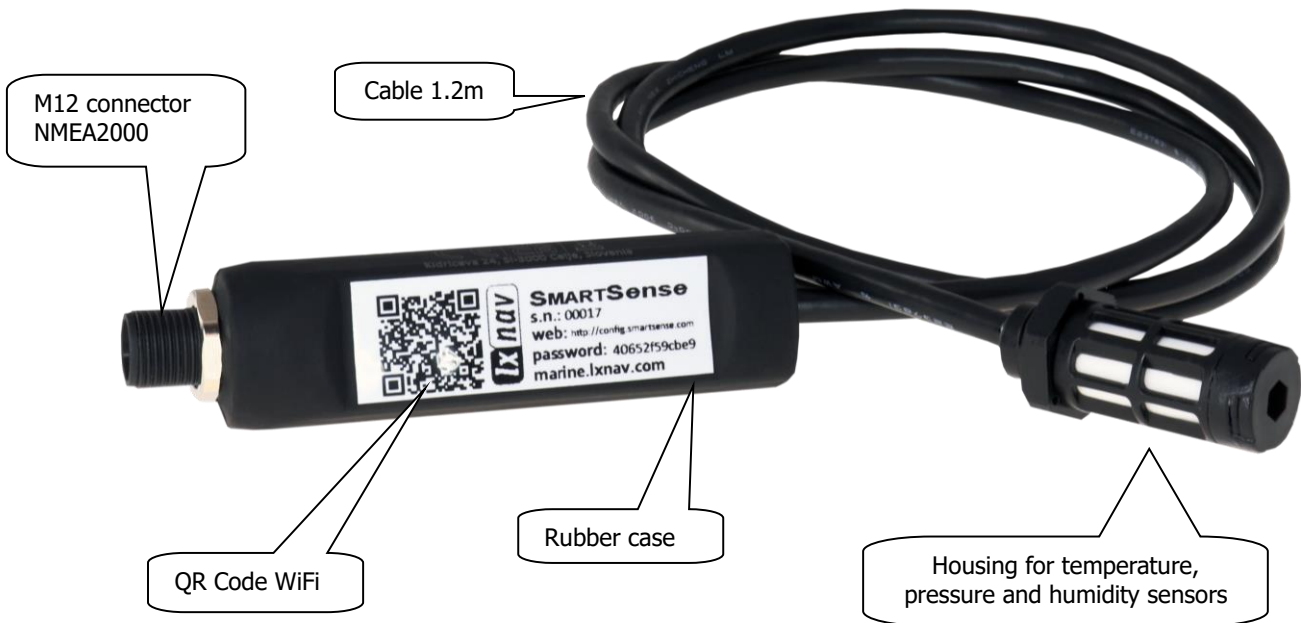
The device is powered off: The device discharge time varies according to user-defined tracking intervals.
e.g.: autonomy time with 1 hour measurement intervals = 72 hours.

Internal power management:

The energy storage is managed by supercapacitor which provides long autonomy and lifespan, fast charging, does not contain harmful chemicals or toxic metals and maintains a compact and lightweight size in its rubber casing.

3 Product specification

M12 connector NMEA2000

Cable 1.2m

QR Code WiFi

Rubber case

Housing for temperature, pressure and humidity sensors

2.3 NMEA2000 M12 connector pinout

NMEA2000 pinout
Male connector (pins)

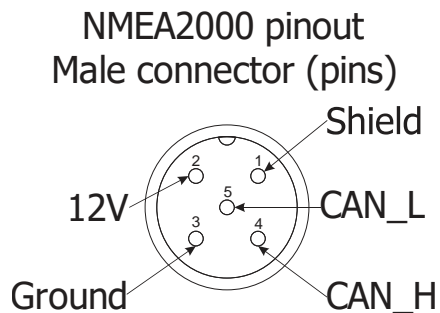Shield

12V

CAN_L

Ground

CAN_H

Figure 1: NMEA2000 M12 Male connector pinout (view from unit side)

4 Information and Installation

General:

The SmartSENSE is an All-in-One device which measures air temperature, barometric pressure, humidity and dew point. The SmartSENSE must be connected to the NMEA2000 network and will provide the measurements via smartphone or any compatible chartplotter.

The device requires no maintenance; calibration of the digital sensors has been performed by the manufacturer.

Connecting to the NMEA2000:

The SmartSENSE must be connected and powered up by the NMEA2000 network. Once performing, the device will start reporting the measurements and display them on any compatible chartplotter, smartphone, tablet or computer.

Mounting position:

When installing, choosing the right spot is important.
To ensure accurate readings make sure to choose an area well-ventilated away from wet surfaces.
Do not place the sensor in an area where it may be flooded.
Do not place the sensor in direct sunlight during peak hours, as this could affect its data. Heating sources causes errors when measuring humidity and temperature.
Avoid areas where the SmartSENSE sensors can be exposed to unintentional impact.
To prevent the sensor from being heated by the vessel itself, minimize the area of contact between the sensor housing and other surfaces.
To isolate the sensor housing from metal surfaces or surfaces that can be heated from within or other parts of the vessel use low thermal conductivity materials.

3   Connecting to the SmartSENSE

Configuration can be performed via QR code & Wi-Fi with any Smartphone or tablet. Measurements are readable by any compatible NMEA2000 chartplotter.

3.1   Connect to the device via Wi-Fi

The SmartSENSE has an integrated Wi-Fi hotspot which allows you to connect to it with any smartphone, tablet or computer.
Joining the device network can be done via scanning the QR code or by entering the password from the label of the SmartSENSE unit.

Configuration via QR code scan :

Use the camera on your smartphone or tablet and scan the QR code.
Join the SmartSENSE Wi-Fi network.
Once connected, a new popup webpage will open automatically. If not, quit the camera app on your smartphone and open your browser, the configuration webpage will automatically be displayed.

Manual configuration:

Search the device in the list of available Wi-Fi networks and fill the password from label on SmartSENSE unit.
Open a new page and access to the configuration page:
http://config.smartsense.com/home

Once connected to the network, you will have access to the home page.

4.1 Home page

The home page displays current weather data and configured sensor data.

- Outside air temperature
- Pressure
- Humidity
- Dew point

The monitoring air temperature, humidity and barometric pressure are shown into individual screen to get precise information about current status and history based on the configured tracking intervals.

The displayed time scale and clock get updated based on the system time coming from the GPS or the multifunctional display.
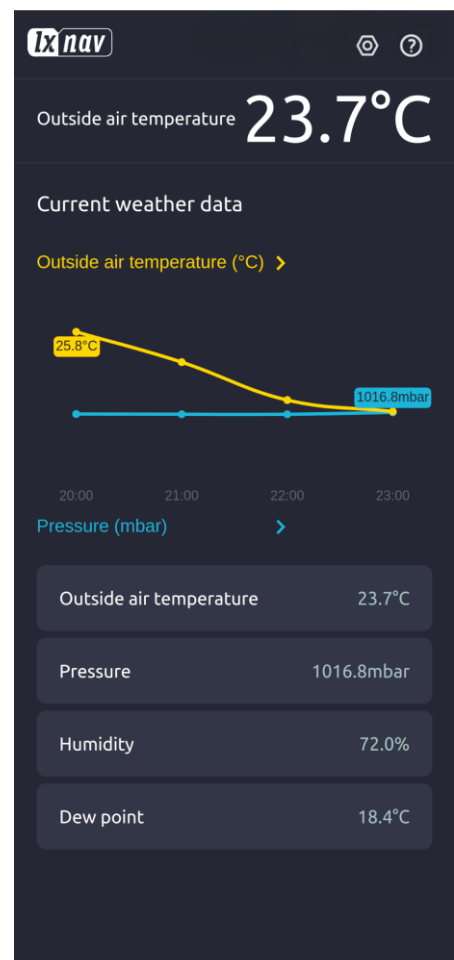
4.2 Settings

Tracking

Tracking interval configuration
- 5 minutes
- 15 minutes
- 30 minutes
- 1 hour
- 2 hours
- 4 hours

💡 The power storage will last according to the tracking intervals. Fast recharge is powered by the NMEA network.

Units

Temperature source configuration:
- Celsius (°C)
- Fahrenheit (°F)
- Kelvin (K)

Pressure
- Millibars (mbar)
- Hectopascals (hPa)
- Millimetres of mercury (mmHg)
- Inches of mercury (inHg)
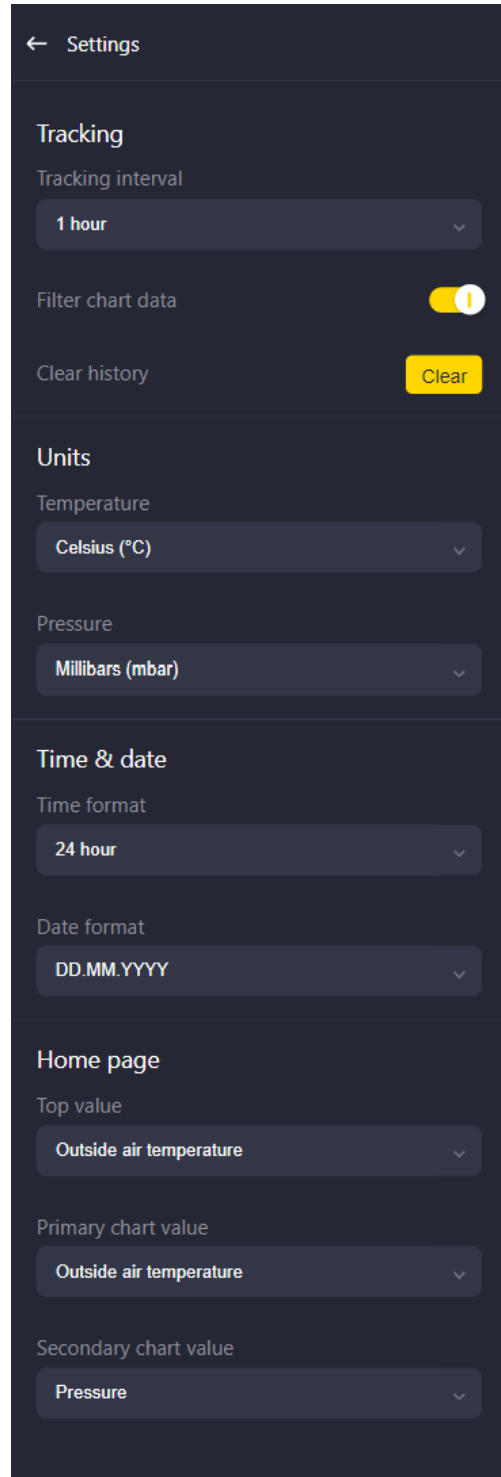
Time & date

Time format
- 24 hours
- 12 hours

Date format
- DD.MM.YYYY
- MM/DD/YYYY
- YYYY/MM/DD

Home page

Top value / Primary and Secondary chart value
- Outside air temperature
- Pressure
- Humidity
- Dew point

5 Info page

5.1 General information

The About page shows the general information about SmartSENSE device:
- Firmware version,
- Firmware build time
- Device time

5.2 Firmware update

Download the latest firmware from your smartphone directly from the LXNAV web site.
Follow the below instruction to proceed to the firmware update.

1. Select the file.
2. Select the downloaded firmware file (normally it is downloaded into downloads folder)
3. Press UPLOAD
4. When upload is COMPLETED, press UPDATE
5. Wait a minute and device will be updated with new firmware.
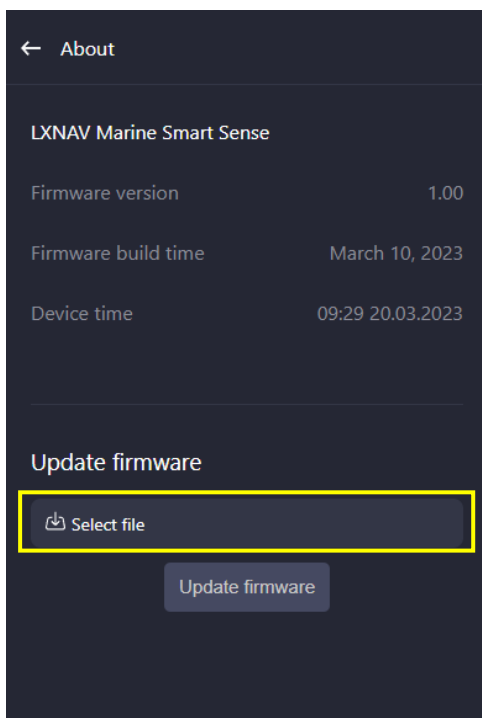
6 Supported data

NMEA 2000 compliant PGN
List NMEA 2000 PGN (Receive)

BAROMETER PGNS RX
129029 - GNSS Position Data

BAROMETER PGNS TX

130310 - Environmental Parameters 1
130311 - Environmental Parameters 2
130314 - Actual Pressure

HUMIDITY PGNS RX
129029 - GNSS Position Data

HUMIDITY PGNS TX
130310 - Environmental Parameters 1
130311 - Environmental Parameters 2
130312 - Temperature
130316 - Temperature, Extended Range
130313 - Humidity

7 Revision history

Date	Revision	Description
May 2023		Initial release of this manual
September 2023	1	Added Internal memory and power management specification