



# Box N2K

Product reference : 90-60-568



## USER GUIDE

&

## INSTALLATION SHEET

V1.0

20/04/2023

## Table of contents

<b>1. Presentation</b>	<b>3</b>
<b>2. Product description</b>	<b>3</b>
2.1. Technical characteristics	3
2.2. Connection ports	4
2.3. Indicators	5
2.4. Init button	5
<b>3. Installation</b>	<b>7</b>
3.1. Installation precautions	7
3.2. Connection	8
3.2.1. Topline bus	8
3.2.2. NMEA 0183	9
3.2.3. NMEA 2000	10
3.2.4. USB	11
3.3. Initialization	11
<b>4. Features</b>	<b>12</b>
4.1. NMEA 0183	12
4.1.1. Receipt/Transmission of data	12
4.1.2. Initialization of incoming and outgoing data	12
4.1.3. Topline / NMEA 0183 connection tables	13
4.1.4. Configuration with TopSailor	17
4.1.5. Watt&Sea frames	17
4.2. NMEA 2000	17
4.2.1. Receipt/Transmission of data	17
4.2.2. Initialization of incoming and outgoing data	17
4.2.3. Topline / NMEA 2000 connection tables	18
4.2.4. Configuration with TopSailor	21
4.3. USB	22
4.4. WIFI	23
4.4.1. Configuration from a display	24
4.4.2. Connecting to the WiFi network from a smartphone	25
4.4.3. nkeDisplay application	26
4.5. Priority of data origin	27
4.6. AIS	27
4.6.1. NMEA 0183	27
4.6.2. NMEA 2000	27
4.7. Data flow diagram	28

## 1. Presentation

The N2K Box is a communication gateway between several protocols: Topline, NMEA 0183 and NMEA 2000. It allows you to make the data from all your sensors usable on your Topline, NMEA 0183 and NMEA 2000 installations.

It also allows you to connect via USB to a PC with Toplink and TopSailor software to view your Topline bus, configure and update your NKE products.

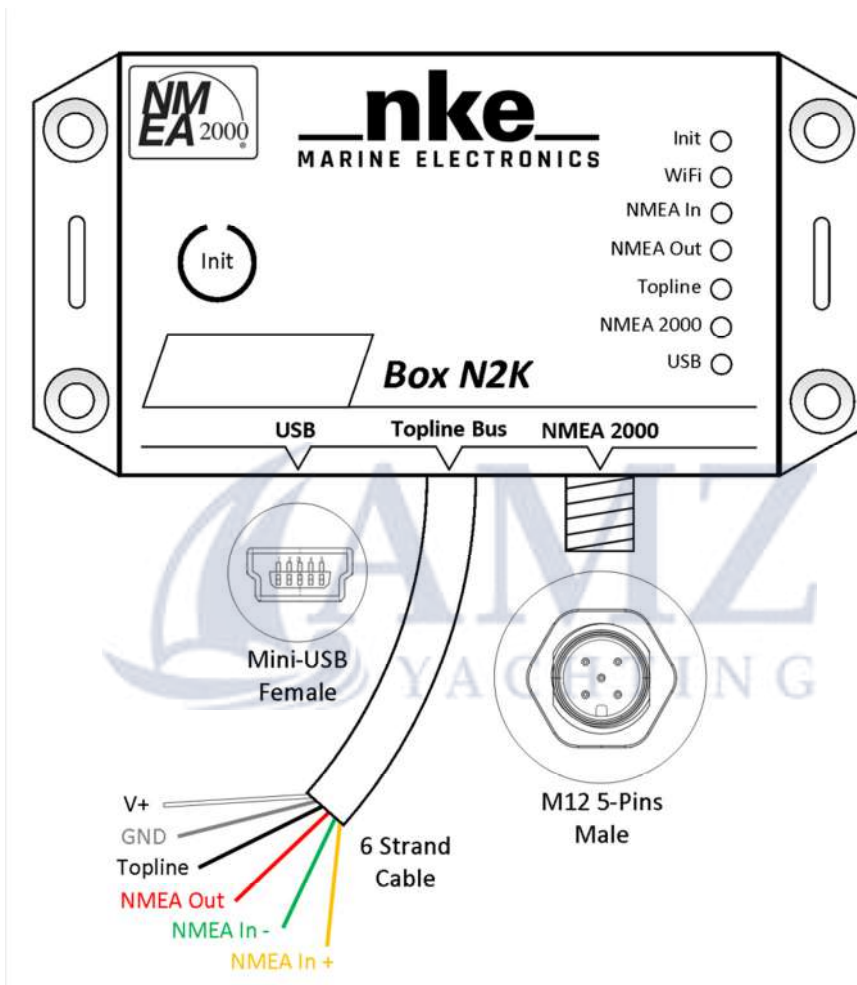
## 2. Product description

### 2.1. Technical specifications

















<b>Dimensions</b>	110mm x 56.4mm x 26mm (length   height   thickness)
<b>Weight</b>	200g with 3m cable (104g + 32g/m)
<b>Power supply</b>	DC (continuous)   8V - 32V
<b>Consumption</b>	50 mA @ 12 V
<b>NMEA 0183 wired input</b>	Electrically isolated input, supports input signals from 3V to 5V Automatically detected baud rate between 4800 and 38400 baud
<b>NMEA 0183 wired output</b>	Output at 3.3V Baud rate programmable to 4800, 9600, 19200, 38400, 57600 bauds
<b>USB connector</b>	Serial port - Mini-USB connector Fixed baud rate of 115200 baud
<b>Wifi link</b>	Wifi 802.11b+g SSID: nke-xxxxxx (6 character string) IP address: 192.168.56.1 Port : 50000 Protocol : TCP + UDP Range in free field ~ 35m
<b>NMEA 2000 connector</b>	Standard 5-pin male connector, 12V power supply Data rate at 250 kbps LEN = 1 (50 mA)
<b>Environment</b>	IP54 sealing (protected against dust and splashing water) Operating temperature : -10°C to +50°C Storage temperature: -20°C to +60°C
<b>Power cable</b>	Ø5.5 mm, 5 wires + ground wire, length 3 m

## 2.2. Connection ports

- Topline cable
  - Power supply (**White** wire and **braid**)
  - Topline (**Black** wire)
  - NMEA 0183 Input (**Green (-)** and **Yellow (+)** wires)
  - NMEA 0183 Output (**Red (+)** wire)
- Mini-USB port
- NMEA 2000: M12 / 5-pin male connector

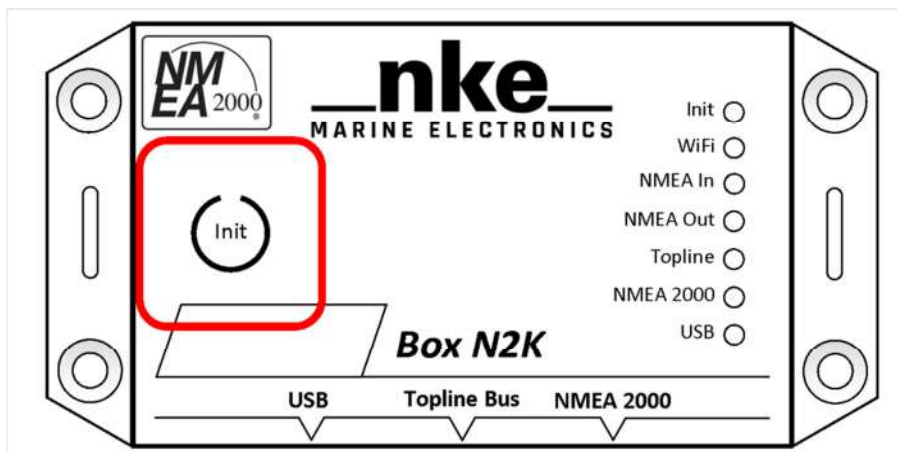


### 2.3. Indicators

<b>Init</b>		<b>Steady:</b> Init button pressed in progress
		<b>Flashing</b> (every second): Counter + beep
<b>WIFI</b>		<b>Flashing:</b> Sending data via WIFI
		<b>Flashing:</b> Receiving data via WIFI
<b>NMEA In</b>		<b>Flashing:</b> Receiving valid NMEA 0183 data on the wire link
		<b>Blinking:</b> Invalid NMEA 0183 data received on the wire link
<b>NMEA Out</b>		<b>Flashing:</b> NMEA 0183 data transmitted on the wire link
<b>TOPLINE</b>		<b>Flashing :</b> The Box has a valid Topline address
		<b>Flashing :</b> The Box has a Topline address of 0
		<b>Fixed:</b> Topline connection disconnected or Topline master absent
		<b>Flashing (every second):</b> Box has a Topline address of 0, and Topline connection disconnected or Topline master absent
<b>NMEA 2000</b>		<b>Flashing:</b> Transmitting or receiving NMEA 2000 data
		<b>Flashing:</b> Error detected on the NMEA 2000 bus
		<b>Flashing (every second) :</b> No NMEA 2000 network detected
<b>USB</b>		<b>Flashing:</b> Receiving valid NMEA 0183 data on the USB link
		<b>Blinking:</b> Invalid NMEA 0183 data received on the USB link

### 2.4. Init button

The Init button is a button on the front of the box. It is a contact sensor, not a push button; there is no sensory feedback when pressed.



When the Init button is pressed, the "Init" indicator lights up green and a beep is heard every second to facilitate counting.

Some of the functions of this button are only available during the first minute after the Box is switched on.

Duration maintained	Effects
1 s	<p><b>Display</b> of the number of devices connected in WIFI on the Box: the number of red lights on indicates the number of active connections.</p> <p>Up to 7 devices can be connected at the same time.</p>
3 s	<p>NMEA 0183 and NMEA 2000 <b>initialization</b></p> <p><b>Start</b> a 10-second listening session during which the Box scans the NMEA 0183 and NMEA 2000 inputs. Following this listening :</p> <ul style="list-style-type: none"> <li>- <b>Creation of the Topline channels</b> corresponding to the data received during listening. A series of beeps is emitted, corresponding to the number of channels created on the Topline bus.</li> <li>- <b>Sends NMEA 0183 and NMEA 2000 data</b> according to the data on the Topline bus.</li> <li>- Topline Slave <b>address socket</b></li> </ul> <p>If the Box is <b>switched off/on</b> during the 10 seconds of listening : Reset NMEA configuration and Topline address</p>
6 s	<p>NMEA 0183 and NMEA 2000 <b>initialization</b></p> <p>Same as a 3 second press, but <b>without deleting</b> existing <b>channels</b>: e.g. adds channels from the NMEA without deleting those of a momentarily absent instrument.</p>
8 s	<p><b>Reset</b> WIFI settings to default (Without WPA)</p>
9 s	<p><b>Reset</b> WIFI settings to default (With WPA)</p>
10 s	<p><b>Within the first minute of powering up</b></p> <p>NMEA 0183 and NMEA 2000 <b>initialization</b></p> <p>Same as a 3 second press, but the Box takes a <b>master Topline address</b>.</p>
24 s	<p><b>Launch of NMEA 2000 Network Scan</b></p>
27 s	<p>Switching the WIFI module <b>off / on</b></p>

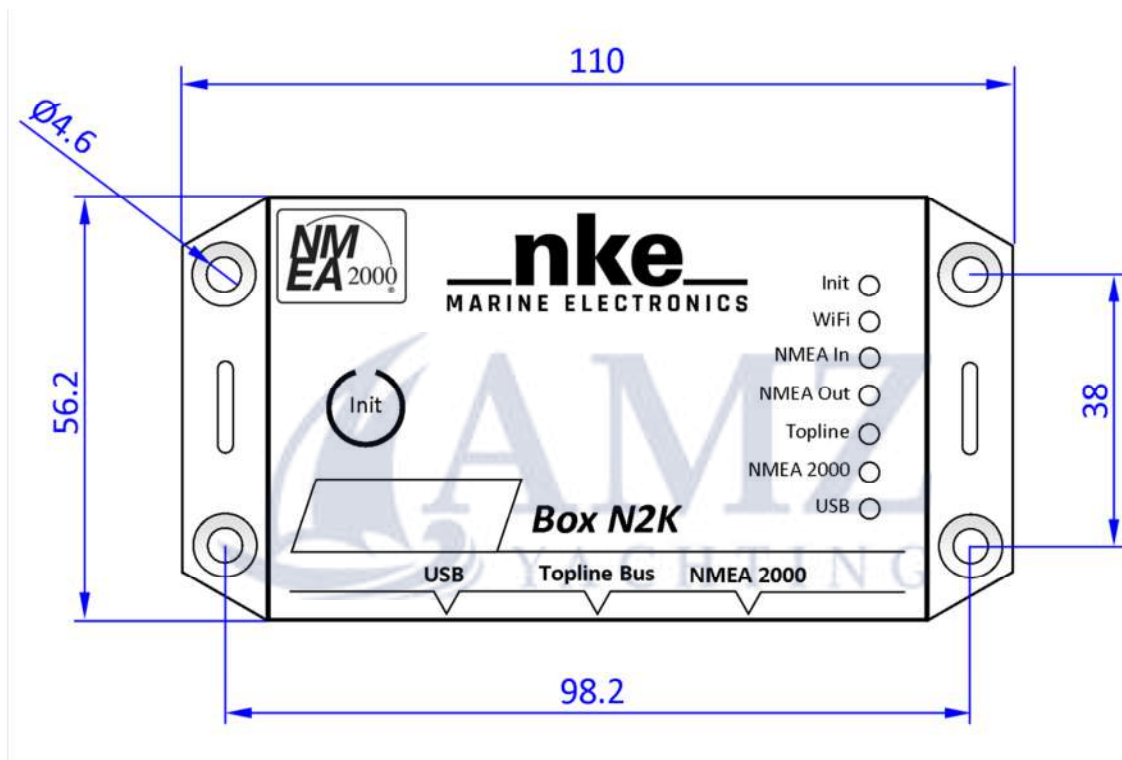
### 3. Installation

#### 3.1. Installation precautions

The housing of the Box N2K has an **IP54** protection rating (protected against dust and water ingress). It must not be immersed, even briefly, and is not resistant to strong weather conditions. It should therefore preferably be installed indoors, in a place where there is no risk of flooding.

Thanks to its holes, the housing can be fixed to a flat wall with 4mm diameter screws.

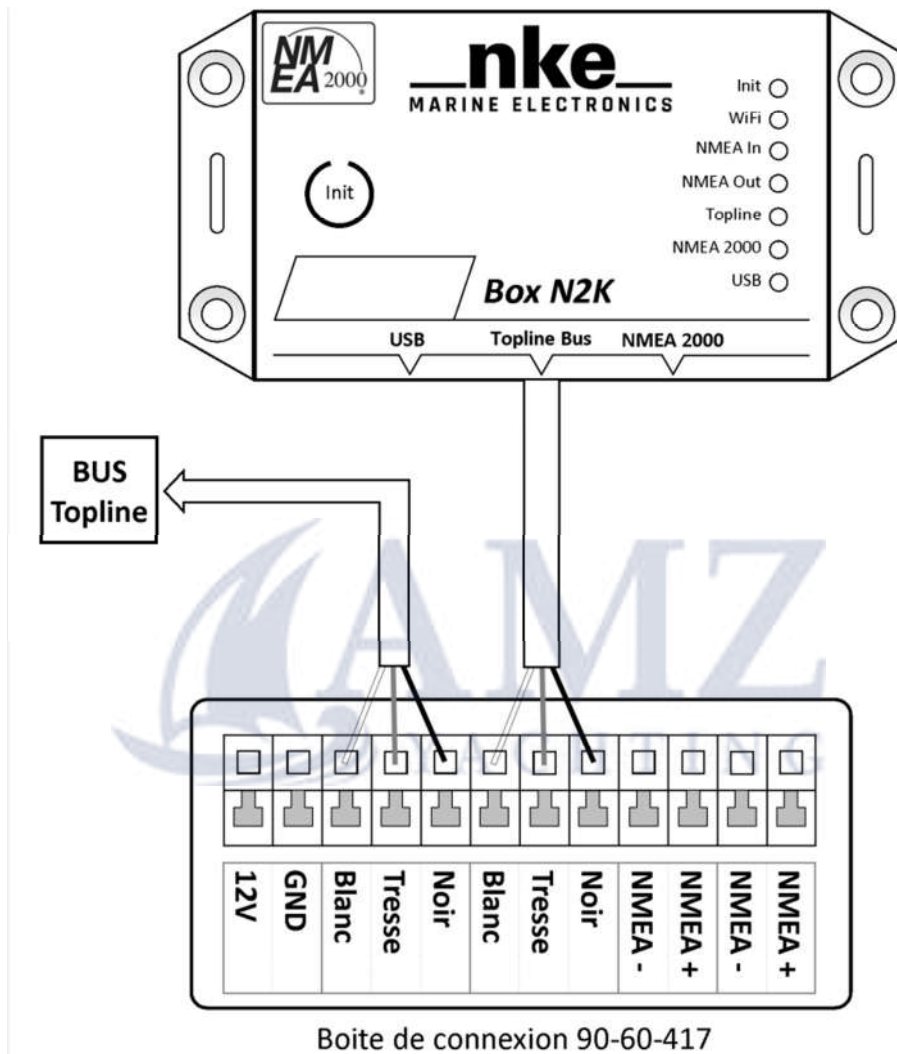
Don't forget to leave room for the cables, especially the NMEA 2000 connector.



## 3.2. Connection

### 3.2.1. Topline bus

To connect the Box N2K to the Topline bus, connect the White, Black and Braid wires in a junction box connected to the rest of your network.





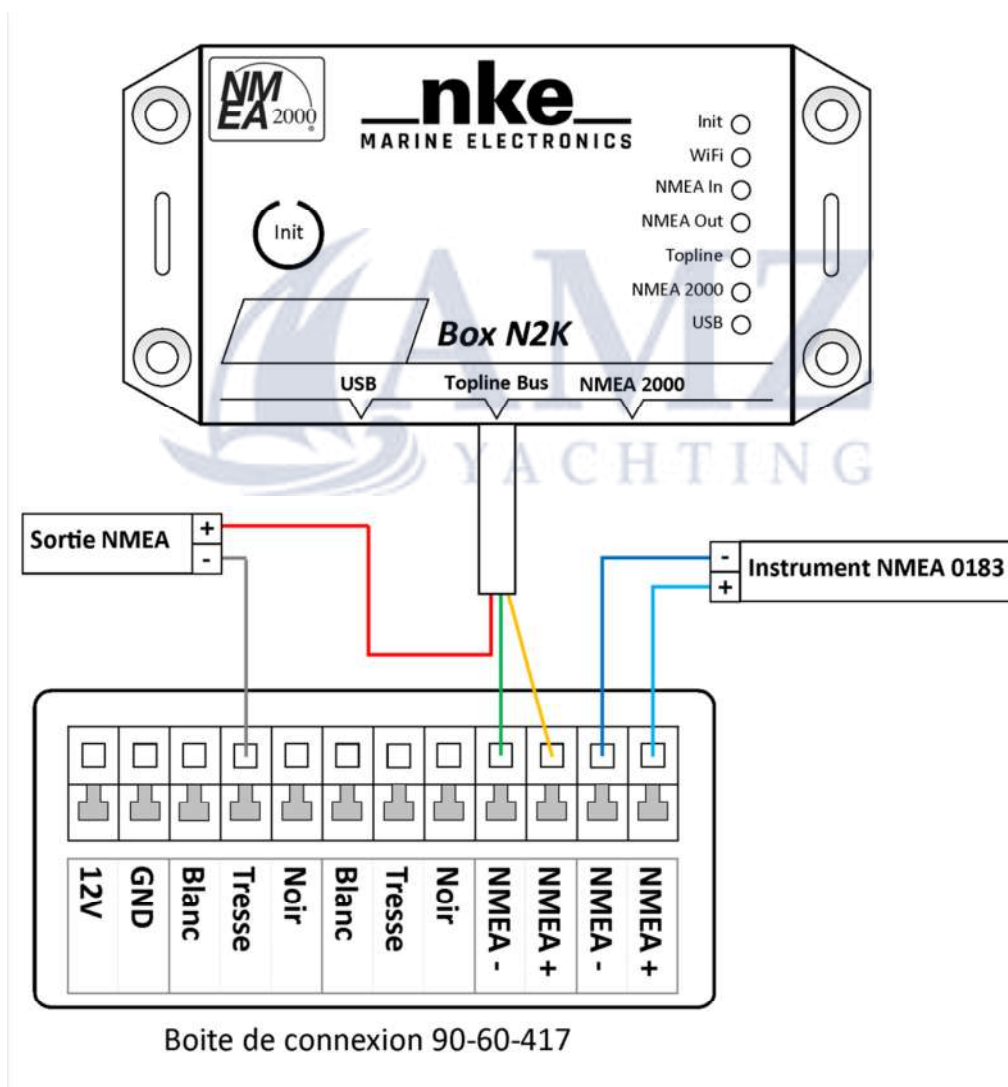
### 3.2.2. NMEA 0183

The Box N2K has a wired NMEA 0183 link.

The input and output are electrically connected to two different serial links; this allows them to operate at their own baud rate.

The wired NMEA input is electrically isolated: it has a separate ground and accepts several possible input voltages (from 3V to 5V). To connect the NMEA input of the Box, connect the Yellow (Rx +) and Green (-) wires to your NMEA 0183 instrument.

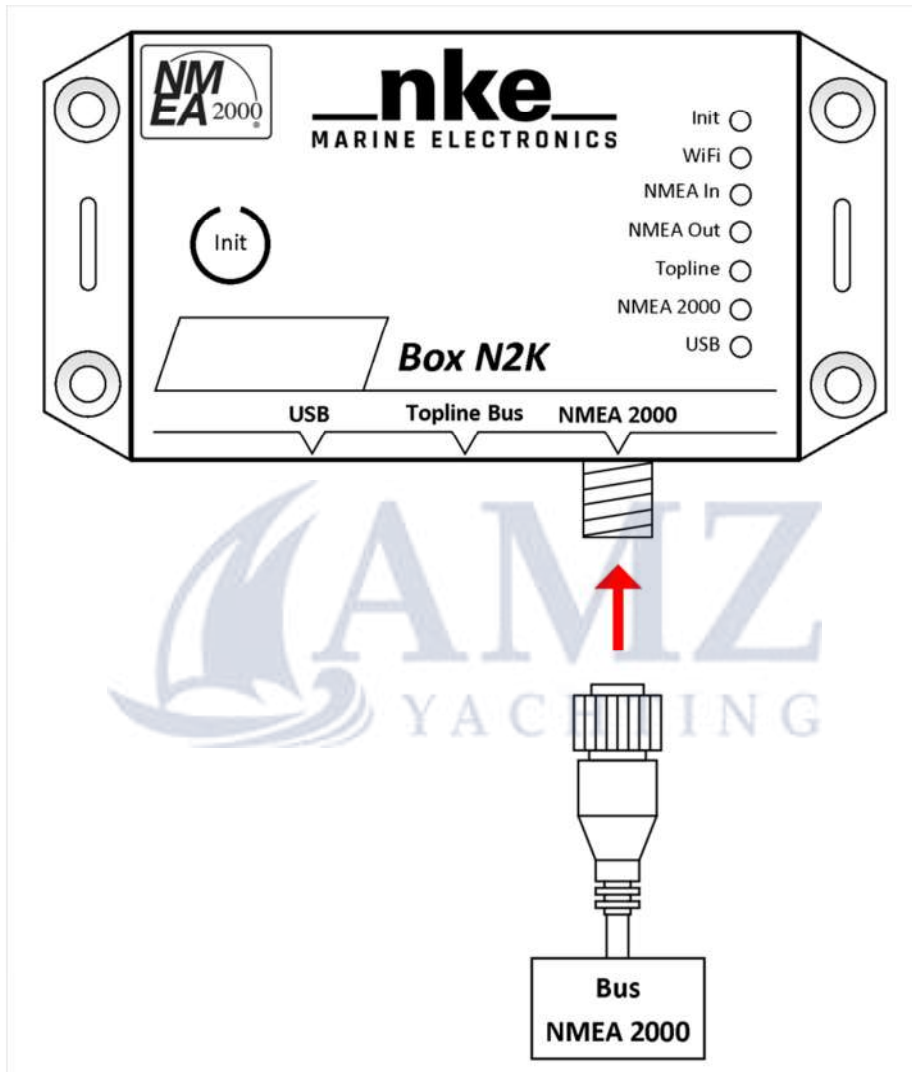
The wired NMEA output does not have a separate ground. The ground of the wired NMEA output is linked to the ground of the Topline bus. To connect the NMEA output of the Box, connect the red wire (Tx +) and the braid (-) to your NMEA 0183 instrument.



### 3.2.3. NMEA 2000

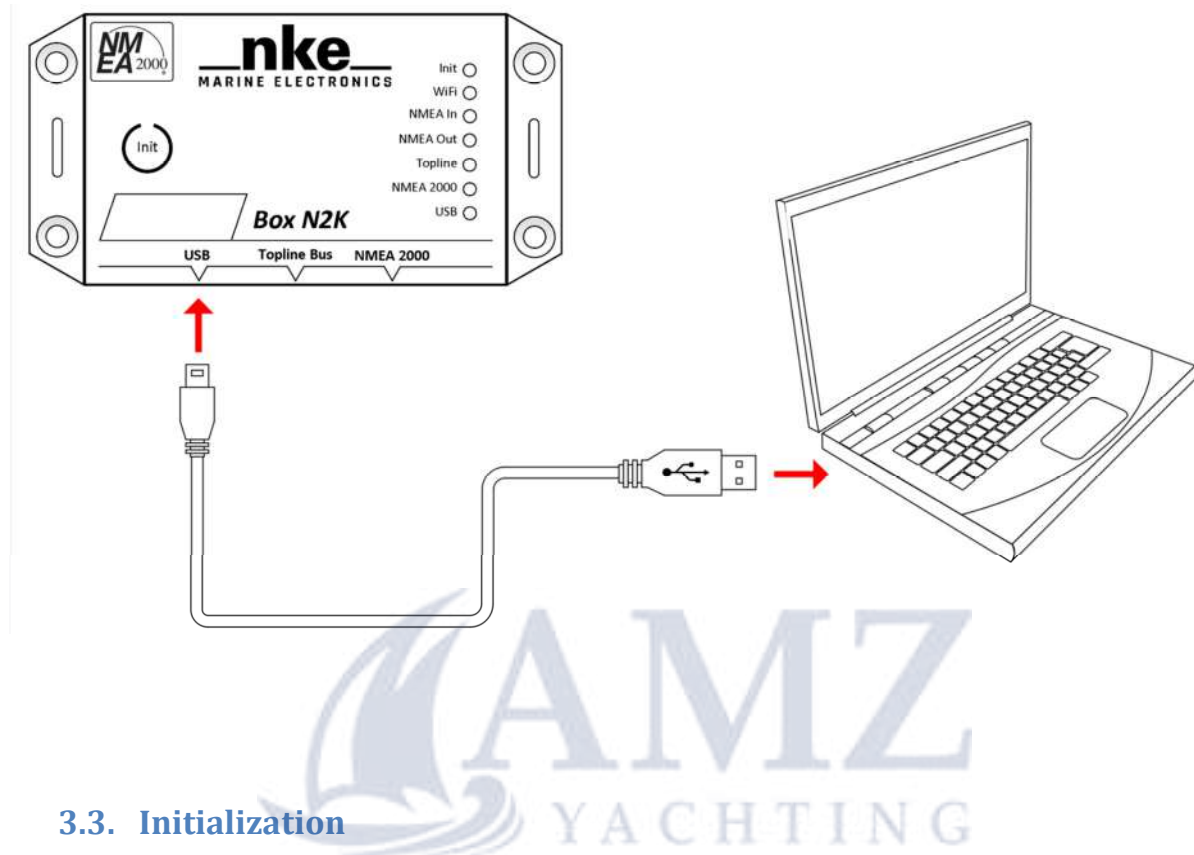
The Box N2K connects to a NMEA 2000 bus via its dedicated connector; this is a standard 5-pin male NMEA 2000 connector.

According to the NMEA 2000 standard, the cable from the N2K box to the backbone should not be longer than 6 metres.



### 3.2.4. USB

The USB connection of the Box N2K is via a Mini-USB port. We advise you to choose a USB / Mini-USB cable, in order to easily connect your box to a computer.



### 3.3. Initialization

When the Box N2K is connected for the first time to your Topline bus, it is by default at address 0. To initialise it, press the Init button for 3 seconds. The Box N2K will then take a free address on the Topline bus after 10 seconds.

## 4. Features

### 4.1. NMEA 0183

#### 4.1.1. Receipt/Transmission of data

There are three ways to send and receive NMEA 0183 data from the Box N2K:

- Wired input/output
- USB port
- WIFI connection

The Box N2K creates on Topline the channels corresponding to the data it receives from NMEA 0183, if these do not already exist.

On the other hand, the Box N2K sends the data it receives from the Topline bus to its NMEA 0183 outputs.

The NMEA input baud rate is set automatically: the Box N2K detects the transmission speed of the incoming data. The NMEA output baud rate must be set manually. The Box supports a range of the most commonly used reference baud rates.

***Baudrates supported by the N2K Box***

Baudrate	Input	Output
4800 baud	X	X
9600 baud	X	X
19200 baud	X	X
38400 baud	X	X
57600 baud		X

#### 4.1.2. Initialization of incoming and outgoing data

Follow the steps below to configure NMEA 0183 data flow through the N2K Box:

1. Connect your NMEA 0183 instruments to the NMEA inputs of the Box (Wired, WIFI, USB)
2. Power up the Topline bus and your NMEA 0183 instruments; make sure the data is being sent
3. Press the Init button on the N2K box for 3 seconds
  - If you want to keep the existing channels, press for 6 seconds
4. Wait 10 seconds while you listen.

After 10 seconds, the Box will create the Topline channels corresponding to the NMEA 0183 data received **if they do not already exist**; it will emit a long beep followed by a number of beeps equal to the number of Topline channels created.

It will also send the data on the Topline bus to its wired, WiFi and USB outputs in NMEA 0183. The initialization allows the Box to determine which NMEA 0183 sentences to send on its outputs.

The channels and phrases created in this way will be restored each time your system is switched on. This procedure also causes a slave address to be taken from the Topline bus.

By default, the Box will use its internal priority table (below) to define the origin of the data published on the Topline bus. It is however possible to configure the NMEA 0183 frame of origin of the data via the TopSailor software.

#### 4.1.3. Topline / NMEA 0183 connection tables

**Priority list of NMEA 0183 input frames for each Topline channel**

Channels created		NMEA frames used		
N°	Label	Priority 1	Priority 2	Priority 3
1	R_SPEEDO	VHW	--	--
2	CAP MAGNETICS	HDG	VHW	HDM
3	CAP TRUE	HDT	VHW	--
4	PROF	TPD	DBT	--
5	MINSEC	ZDA	RMC	--
6	LOCHT	VLW	--	--
7	LOCHJ	VLW	--	--
8	HELLO	ZDA	RMC	--
9	AIR_TEMP	MTA	XDR	--
10	WATER_TEMP	MTW	--	--
11	BARO	MMB	XDR	--
12	SPEEDO	VHW	--	--
13	ANEMO	MWV	VWR	--
14	ANG_VENT_APP	MWV	VWR	--
15	DIST_WPT	BWC	RMB	--
16	CAP_WPT (true)	BWC	RMB	--
17	RUN_START	APB	RMB	XTE
18	V_BACKGROUND	VTG	RMC	--
19	CAP_FUND (true)	VTG	RMC	--
20	TEN_ETAIS	XDR	--	--
21	C_WP_OD	APA	APB	--
22	B_PILOT	APA	APB	XTE
23	ANNMOIS	ZDA	RMC	--
24	R_COMPAS	HDG	VHW	HDM
25	R_ANG_VENT_APP	MWV	VWR	--
26	LAT_DEGMIN	GGA	GLL	RMC
27	LAT_MILMIN	GGA	GLL	RMC
28	LON_DEGMIN	GGA	GLL	RMC
29	LON_MILMIN	GGA	GLL	RMC
30	VOLTAGE_B1	PNKEP,11	--	--
31	CURRENT_B1	PNKEP,11	--	--

32	CAPACITY_B1	PNKEP,11	--	--
33	CAPA_PCENT_B1	PNKEP,11	--	--
34	VOLTAGE_B2	PNKEP,12	--	--
35	CURRENT_B2	PNKEP,12	--	--
36	CAPACITY_B2	PNKEP,12	--	--
37	CAPA_PCENT_B2	PNKEP,12	--	--
38	V_WP	WCV	--	--
39	VIT_CIBLE	KEP	--	--
40	CAP_OTHER_BOARD	KEP	--	--
41	ANGLE_OPT_VENT	KEP	--	--
42	REND_PRES	KEP	--	--
43	REND_POLAR	KEP	--	--
44	ANGLE_OPT_CMG	KEP	--	--
45	ANGLE_OPT_VMG	KEP	--	--
46	GAIN_ROUTE_CMG	KEP	--	--
47	GAIN_ROUTE_VMG	KEP	--	--
48	DIREC_COURANT	KEP	VDR	--
49	SPEED_RUNNING	KEP	VDR	--
50	PRESS_ATMOS	MMB	XDR	--
51	DYN1	PNKEA,,1	--	--
52	DYN2	PNKEA,,2	--	--
53	DYN3	PNKEA,,3	--	--
54	DYN4	PNKEA,,4	--	--
55	DYN5	PNKEA,,5	--	--
56	DYN6	PNKEA,,6	--	--
57	DYN7	PNKEA,,7	--	--
58	DYN8	PNKEA,,8	--	--
59	TENSION_B3	PNKEP,13	--	--
60	CURRENT_B3	PNKEP,13	--	--
61	CAPACITY_B3	PNKEP,13	--	--
62	CAPA_PCENT_B3	PNKEP,13	--	--
63	TENSION_B4	PNKEP,14	--	--
64	CURRENT_B4	PNKEP,14	--	--
65	CAPACITY_B4	PNKEP,14	--	--
66	CAPA_PCENT_B4	PNKEP,14	--	--
67	DECL_MAG	RMC	--	--
68	Waypoint name	RMB and BWC		

**List of NMEA 0183 frames sent out for each Topline channel**

Channels Topline	XDR	RSA	DBT	TPD	VLW	VHW	MWV	VWR	VWT	MWD	MTW	MMB	HDG	HDM	HDT	VTG	ZDA	GLL	XTE	RMB	RMC	PNKEP,01	PNKEP,02	PNKEP,03	PNKEP,04	PNKEP,05	CUR	WPL	PNKEP,11	PNKEP,12	PNKEP,13	PNKEP,14	ZCD	
ANG_INCI	X																																	
BARRE		X																																
DEPTH			X	X																														
LOCHJ					X																													
LOCHT					X																													
SPEEDO						X																												
COMPASS						X																												
CAP_TRUE					X																													
GIR_MP							X	X																										
ANG_VENT_AP P							X	X																										
ANEMO							X	X																										
ANG_VENT_TRU UE							X		X																									
VIT_VENT_TRU E							X		X	X																								
DIR_VENT_TRU E											X																							
AIR_TEMP	X																																	
WATER_TEMP											X																							
PRESS_ATMOS												X																						
BARO2												X																						
COMPASS													X	X																				
CAP_TRUE															X																			
CAP_FUND																X						X												
V_BACKGROU ND																X						X												
ANNMOIS																	X					X												
HELLO																	X	X				X												
MINSEC																	X	X				X												
LAT_DEGMIN																		X				X												
LAT_MILMIN																			X			X												
LON_DEGMIN																			X			X												
LON_MILMIN																				X		X												
RUN_START																				X	X													
D_WP																						X												
A_WP																						X												
DECL_MAG																						X												
R_GITE	X																																	
TANGAGE_MES	X																																	
TARGET_SPEED																							X											
CAP_OTHER_B OARD																								X										
ANGLE_OPT_V ENT																									X									
REND_PRES																									X									

Channels Topline	XDR	RSA	DBT	TPD	VLW	VHW	MWV	VWR	VWT	MWD	MTW	MMB	HDG	HDM	HDT	VTG	ZDA	GLL	XTE	RMB	RMC	PNKEP_01	PNKEP_02	PNKEP_03	PNKEP_04	PNKEP_05	CUR	WPL	PNKEP_11	PNKEP_12	PNKEP_13	PNKEP_14	ZCD				
REN_POLAR																								X													
ANGLE_OPT_C MG																										X											
GAIN_ROUTE_ CMG																										X											
ANGLE_OPT_V MG																										X											
GAIN_ROUTE_ VMG																										X											
DIREC_COURA NT																											X										
SPEED_RUNNI NG																											X										
C_COURANT																												X									
V_COURANT																												X									
A_HOMME_M ER																													X								
VOLTAGE_B1																																		X			
CURRENT_B1																																		X			
CAPACITY_B1																																		X			
CAPA_PCENT_ B1																																		X			
VOLTAGE_B2																																		X			
CURRENT_B2																																		X			
CAPACITY_B2																																		X			
CAPA_PCENT_ B2																																		X			
TENSION_B3																																			X		
CURRENT_B3																																			X		
CAPACITY_B3																																			X		
CAPA_PCENT_ B3																																			X		
TENSION_B4																																				X	
CURRENT_B4																																				X	
CAPACITY_B4																																				X	
CAPA_PCENT_ B4																																				X	
CHRONO																																				X	

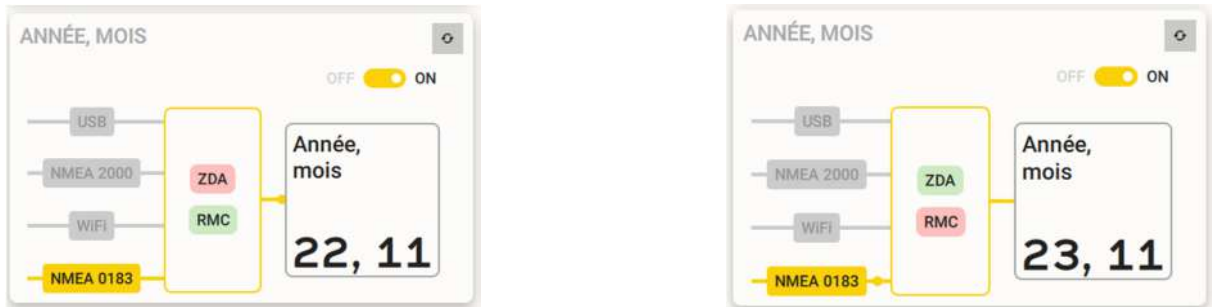


#### 4.1.4. Configuration with TopSailor

TopSailor allows you to configure the NMEA 0183 phrase you wish to use to feed a Topline channel.

On the Box page, each channel is represented by a box. When NMEA 0183 is selected, it is possible to choose from different sentences containing this data.

For example, for the Year / Month channel, it is possible to choose between the CMR and the ZDA.



#### 4.1.5. Watt&Sea frames

The Box N2K can interpret the frames provided by the Watt&Sea energy converter and display the data provided on NKE displays in dynamic channels.

To set up this link, connect the Watt&Sea output to the NMEA 0183 wire input #2, then perform an initialization.

## 4.2. NMEA 2000

#### 4.2.1. Receipt/Transmission of data

The Box N2K can be connected to a NMEA 2000 bus via its dedicated connector. It allows to create on Topline the channels corresponding to the data it receives from NMEA 2000, if they do not already exist.

On the other hand, the Box N2K sends the data it receives from the Topline bus on the NMEA 2000 bus.

It is possible to configure the source address, instance and information fields of the Box from the TopSailor software, or with a dedicated tool from the NMEA 2000 bus.

#### 4.2.2. Initialization of incoming and outgoing data

Follow the steps below to configure NMEA 2000 data flow through the N2K Box:

1. Connecting your Box to the NMEA 2000 bus
2. Power up the Topline bus and the NMEA 2000 bus; ensure that all instruments are sending data
3. Press the Init button on the N2K box for 3 seconds
  - If you want to keep the existing channels, press for 6 seconds

4. Wait 10 seconds while you listen.

After 10 seconds, the Box will create the Topline channels corresponding to the received NMEA 2000 data **if they do not already exist**; it will emit a long beep, followed by a number of beeps equal to the number of Topline channels created.

It will also send the data on the Topline bus to the NMEA 2000 bus. The initialization determines which PGNs can be fed by your Topline instruments, which the Box will send on the NMEA 2000 bus.

The channels and PGNs created in this way will be restored each time your system is switched on. This procedure also causes a slave address to be taken from the Topline bus.

By default, the Box will use its internal priority table to define the origin of the data published on the Topline bus. However, it is possible to configure the instrument and the PGN NMEA 2000 of origin of the data via the TopSailor software.

### 4.2.3. Topline / NMEA 2000 connection tables

*Data PGNs supported by the N2K Box*

PGN	PG
126992	System Time
127245	Rudder
127250	Vessel Heading
127251	Rate of Turn
127257	Attitude
127258	Magnetic Variation
127505	Fluid Level
127506	DC Detailed Status
127508	Battery Status
128000	Nautical Leeway Angle
128259	Speed Water Referenced
128267	Water Depth
128275	Distance Log
129025	Position Rapid Update
129026	COG SOG Rapid Update
129029	GNSS Position Data
129033	Date and Time UTC
129283	Cross Track Error
129284	Navigation Data
129291	Set Drift Rapid Update
130306	Wind Data
130310	Environmental parameters 1
130311	Environmental parameters 2
130312	Temperature
130314	Actual Pressure
130316	Temperature Extended
130322	Current Station Data

130323	Meteorological Station Data
130324	Moored Buoy Station Data
130577	Direction Data



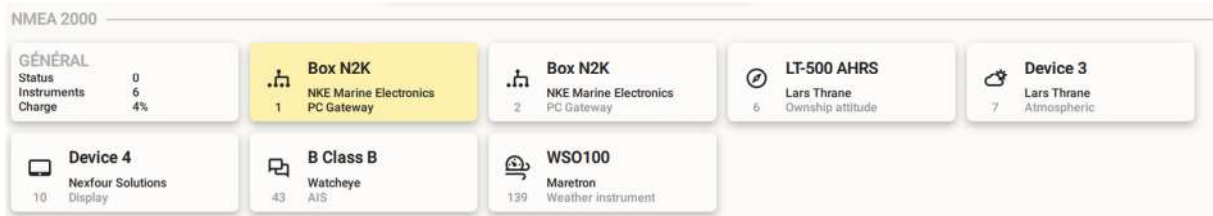
**List of PGNs used as input and output for each Topline channel.  
(Priority order from left to right)**

	PGN	
<b>Légende :</b> ▼ NMEA Input ▲ NMEA Output PGNs Obsolètes	<b>Groupe de donnée NMEA 2000</b>	
	Speed, Water referenced	128259
	Water Depth	128267
	Rate of Turn	127251
	Wind Data	130306
	Vessel Heading	127250
	System Time	126992
	Attitude	127257
	Rudder	127245
	Temperature, Extended Range	130316
	Battery Status	127508
	Navigation Data	129284
	Cross Track Error	129283
	COG & SOG, Rapid Update	129026
	Actual Pressure	130314
	Position, Rapid Update	129025
	DC Detailed Status	127506
Fluid Level	127505	
Set & Drift, Rapid Update	129291	
Nautical Leeway Angle	128000	
Direction Data	130577	
GNSS Position Data	129029	
Magnetic Variation	127258	
Time & Date	129033	
Distance Log	128275	
Temperature	130312	
Environmental Parameters 1	130310	
Environmental Parameters 2	130311	
Current Station Data	130322	
Meteorological station data	130323	
Moored buoy station data	130324	
<b>Canal TOPLINE</b>		
R_SPEEDO	▼▲	
PROF	▼▲	
R_VROT	▼▲	
R_ANG_VENT_APP	▼▲	
R_COMPAS	▼▲	
MINSEC	▼▲	
R_GITE	▼▲	
R_BARRE	▼▲	
LOCHJ		▼▲
LOCHT		▼▲
VIT_VENT_VRAI	▲	
ANG_VENT_VRAI	▲	
DERIVE		
GITE	▼▲	
HEUJOUR	▼▲	
TEMP_AIR		▼▲
TEMP_EAU		▼▲
BATTERIE		▼▲
SPEEDO	▼▲	
ANEMO		
ANG_VENT_APP	▼▲	
COMPAS	▼▲	
D_WP		
A_WP		
ECART_ROUTE		
V_FOND		
CAP_FOND		
V_WP		
ANNMOIS		
C_WP_OD		
GIRMP	▲	
BARO_2		
V_COURANT		
C_COURANT		
BARRE		
LAT_DEGMIN		
LAT_MILMIN		
LON_DEGMIN		
LON_MILMIN		
TENSION_B1		
COURANT_B1		
CAPA_PCENT_B1		
TENSION_B2		
COURANT_B2		
CAPA_PCENT_B2		
CAPA_PCENT_R1		
CAPA_PCENT_R2		
CAPA_PCENT_R3		
CAPA_PCENT_R4		
ANGLE_TRIM	▼▲	
DIREC_COURANT		
VITES_COURANT		
PRESS_ATMOS		
TENSION_B3		
COURANT_B3		
CAPA_PCENT_B3		
TENSION_B4		
COURANT_B4		
CAPA_PCENT_B4		
DERIVE_MES		
CAP_VRAI	▼▲	
DECL_MAG	▼▲	

#### 4.2.4. Configuration with TopSailor

TopSailor allows, thanks to the N2K box, to visualize your NMEA 2000 bus, and to configure the data transmitted to your Topline installation.

On the Box N2K page, there is a tab listing all the instruments detected on the NMEA 2000 bus.



The first box is a summary of the status of your NMEA 2000 bus:

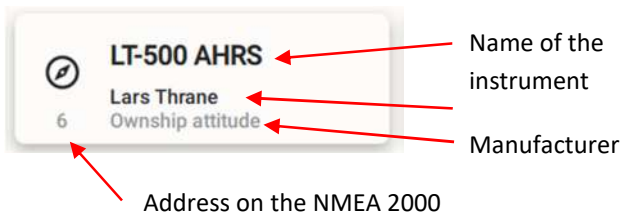


**Status:** bus status indicator. 0 = OK, different from 0 = problem detected  
**Instruments :** Total number of instruments detected on the bus  
**Load:** Percentage of bus bandwidth occupied

The second (coloured) box represents the currently selected N2K box:



The following boxes correspond to other instruments detected on the NMEA 2000 bus.



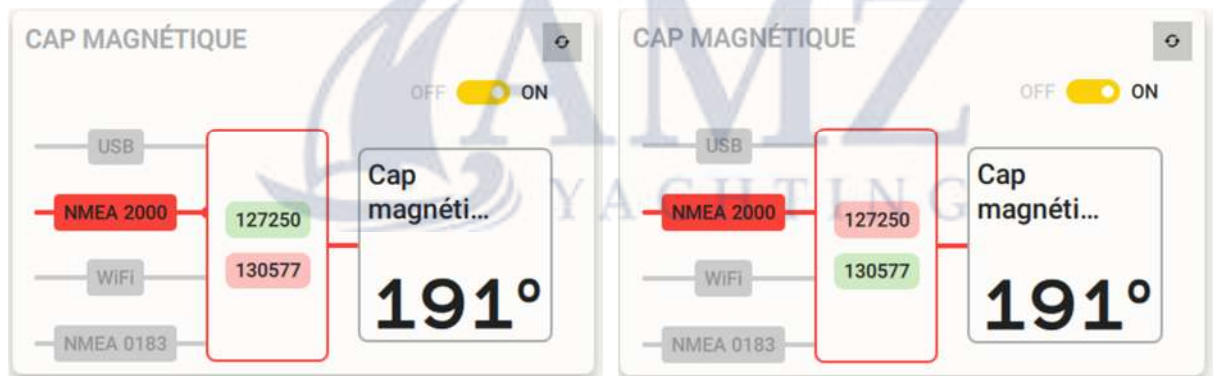
By clicking on an instrument, you have access to more detailed information about it. For the Box N2K, it is possible to modify some parameters: NMEA 2000 address, Instance, and description fields.



TopSailor also allows you to configure the instrument and the NMEA 2000 PGN you wish to use to feed a Topline channel.

On the Box page, each channel is represented by a box. When NMEA 2000 is selected, it is possible to choose among the different PGN containing this data.

For example, for the Magnetic Heading channel, it is possible to choose between PGN 127250 (Vessel



Heading) and 130577 (Direction Data)

### 4.3. USB

The Mini-USB port on the Box N2K is a serial port that allows you to connect it to a computer. It has two main functions:

- Send and receive NMEA 0183 stream

NMEA 0183 data can be exchanged via the USB port of the N2K Box. This allows some software such as Adrena to connect to the Box to retrieve navigation data from the Topline bus. The USB port operates at a baud rate of 115200 baud.

- Connecting to the Topline bus with NKE software

The NKE Toplink and TopSailor software can connect to the N2K Box on its USB port. This allows them to access the Topline bus directly, to visualise it and to set up the instruments connected to it.

#### 4.4. WIFI

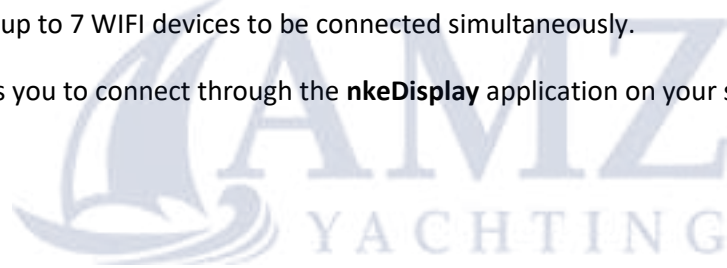
The Box N2K provides a wireless access point via its 802.11b+g interface with the following parameters:

- SSID: nke-xxxxxx
- WPA: 21xxxxxxxxxx (corresponding to the serial number of the N2K box which is indicated on the label stuck on the side of the box)<sup>1</sup>
- IP address: 192.168.56.1
- Port : 50000
- TCP + UDP protocols
- DHCP server active

This WIFI link can be used to send or receive NMEA 0183 frames to a wireless device, and publish this data on the Topline bus.

TCP mode is more reliable than UDP mode, but limits the connection to a single device. In UDP mode, the Box N2K allows up to 7 WIFI devices to be connected simultaneously.

The WiFi also allows you to connect through the **nkeDisplay** application on your smartphone.



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<sup>1</sup> By default, the WPA key is disabled because it causes a connection problem with PCs running Windows 10 and 11

#### 4.4.1. Configuration from a display

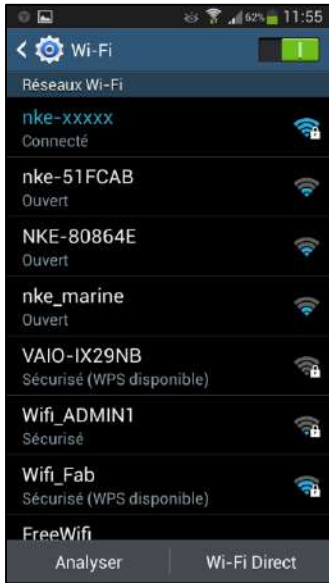
If your N2K box is connected to a Topline bus equipped with a display, you can change the SSID and the WIFI channel.

Configuration from a Multigraphic :





#### 4.4.2. Connecting to the WiFi network from a smartphone



Go to the WiFi settings of your smartphone, and select the WiFi network of your N2K Box. The name is written on the label on the side of the box.

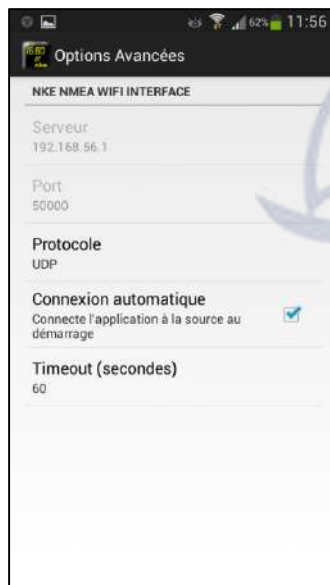
If WPA is enabled, enter the password (also shown on the label).

Then press "connect".



Once connected, launch the software you wish to use (here nkeDisplay).

In the parameters, enter the IP address of the box: "192.168.56.1", the port "50000", and the protocol (UDP or TCP)



**Caution:** If your device uses a firewall, check that port 50000 is free and open.

### 4.4.3. nkeDisplay application

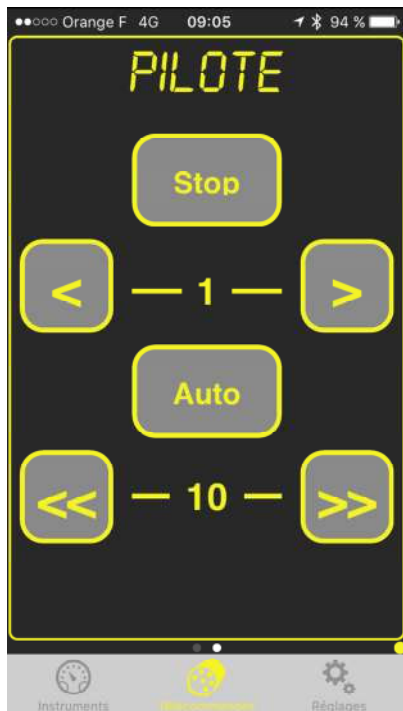
The nkeDisplay application is available for Smartphone and tablet on Android and iOS.

This application allows you to retrieve data from the Topline bus and display it on your smartphone or tablet. Two options are available separately: The multifunction remote control and the Pilot



remote control.





#### 4.5. Priority of data origin

If a Topline channel has the possibility of being fed by several different sources, a default priority will be applied during initialisation (from left to right):

**NMEA 0183 Wired > WiFi > NMEA 2000 > USB**

However, it is possible to choose the desired origin of the data after the initialization with the TopSailor software.

#### 4.6. AIS

The Box N2K processes the AIS frames it receives in NMEA 0183 format and redirects them.

##### 4.6.1. NMEA 0183

The Box N2K transmits the received NMEA 0183 AIS frames to all NMEA outputs: an AIS frame received on the wired input will be redistributed on the wired, WiFi and USB NMEA output. The N2K Box thus acts as a gateway to NMEA 0183 AIS data.

##### 4.6.2. NMEA 2000

The Box N2K also provides real-time translation of AIS data received in NMEA 0183 to the NMEA 2000 bus.

This translation will be automatic if the N2K Box receives a valid AIS frame on one of its NMEA 0183 inputs: wired, USB or WIFI, and does not require initialization. The Box supports the most common AIS frames.

**AIS frames supported by the N2K Box**

PGN	PG	Original NMEA 0183 frame
129038	Class A Position Report	IADLM Messages 1, 2 & 3
129039	Class B Position Report	AIVDM Message 18
129040	Class B Extended Position Report	AIVDM Message 19
129041	Aid to Navigation (AtoN) Report	AIVDM Message 21
129793	UTC and Date Report	AIVDM Message 4
129794	Class A Static and Voyage related Data	AIVDM Message 5
129809	Class B Static Data (Part A)	AIVDM Message 24
129810	Class B Static Data (Part B)	AIVDM Message 24

**4.7. Data flow diagram**

