NMEA 183 output interface

Product reference: 90-60-357

USER GUIDE

&

INSTALLATION GUIDE

nke – Sailing competition

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1. PRESENTATION

The ***NMEA output interface*** allows the conversion of the ***Topline*** data present on the NMEA data bus, so as to allow the interfacing between your Topline network and the equipment from a different manufacturer.

When the ***NMEA output interface*** is connected to the COM port of a PC with navigation software, the navigation information (heading and distance to Waypoint, cross-track error) may be resent from the same COM port on the Topline network via a Gyrographic, a TL25 or an NMEA input interface.

The **NMEA 0183** standard is a specification for communication between items of marine equipment and GPS equipment. It is defined, and controlled, by the *National Marine Electronics Association* (www.nmea.org) .

The 0183 standard uses a simple serial protocol to transmit a "phrase" to one or more listening units. An NMEA frame uses every ASCII character.

IMPORTANT

- Read this user guide entirely before starting the installation.
- Any electrical connection on the ***TOPLINE bus*** must carried out with the terminal box 90-60-417. Only use ***TOPLINE bus*** cable 20-61-001.

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2. INFORMATION CONVERTED BY THE NMEA OUTPUT INTERFACE

Depending on the sensors connected to the ***TOPLINE*** bus, the following information is converted into NMEA format by the interface:

- Surface speed, daily log, total log
- Compass heading, UT time, UT date, depth
- Water temperature, air temperature
- Atmospheric pressure
- Apparent wind speed and angle
- True wind speed and angle
- True wind direction
- Heading and distance to waypoint
- Cross-track error, bottom speed and heading
- Latitude and longitude
- Mast angle
- Man over board

3. FRAMES TRANSMITTED BY THE NMEA OUTPUT INTERFACE

The frames transmitted by the NMEA interface depend on the sensors connected to the Topline bus.

Surface speed and compass heading:

$IIVHW,x .x,T,x.x,M,x.x,N,x.x,K*hh
```
        I   I   I   I   I   I   I  I__I_Surface speed in kph
        I   I   I   I   I__I_Surface speed in knots
        I   I   I__I_Magnetic compass heading
        I__I_True compass heading
```

Total log and daily log:

$IIVLW,x.x,N,x.x,N*hh
```
        I    I    I__I_Daily log in miles
        I__I_Total log in miles
```

Depth:

$IIDPT,x.x,x.x,,*hh
```
        I    I_Sensor offset, >0 = surface transducer distance, >0 = keel transducer distance.
        I_Bottom transducer distance
```

$IIDBT,x.x,f,x.x,M,,*hh
```
        I   I   I__I_Depth in metres
        I_ I_Depth in feet
```

Water temperature:

$IIMTW,x.x,C*hh
```
        I__I_Temperature in degrees C
```

Apparent wind angle and speed:

$IIVWR,x.x,a,x.x,N,x.x,M,x.x,K*hh
```
        I   I   I   I   I   I   I   I__I_Wind speed in kph
        I   I   I   I   I__I_Wind speed in m/s
        I   I   I__I_Wind speed in knots
        I__I_Apparent wind angle from 0°to  180°, L=port, R=starboard
```

True wind direction and speed:

$IIMWD,x.x,T,x.x,M,x.x,N,x.x,M*hh
```
        I   I   I   I   I   I   I   I__I_Wind speed in m/s
        I   I   I   I   I__I_ Wind speed in knots
        I   I   I__I_Wind direction from 0° to 359° magnetic
        I__I_Wind direction from 0° to 359°  true
```

$IIVWT,x.x,a,x.x,N,x.x,M,x.x,K*hh
```
        I   I   I   I   I   I   I__I_Wind speed in kph
        I   I   I   I   I__I_Wind speed in m/s
        I   I   I_ I_Wind speed in knots
        I__I_True wind angle from 0°to 180° , L=port, R=starboard
```

Air temperature:

$IIMTA,x.x,C*hh
```
        I__I_Temperature in degrees C
```

Heading magnetic:

$IIHDG,x.x,,,,*hh
```
        I_Heading magnetic
```

$IIHDM,x.x,M*hh
```
        I__I_Heading magnetic
```

Heading true:

$IIHDT,x.x,T*hh
```
        I__I_Heading true
```

Barometer:

$IIMMB,x.x,I,x.x,B*hh
```
        I   I   I__I_Atmospheric pressure in bars
        I_ I_Atmospheric pressure in inches of mercury
```

Mast angle:

$IIXDR,A,x.x,D,mastangle,*hh
```
        I_Measurement of the mast angle in degrees
```

UTC time and date:

$IIZDA,hhmmss.ss,xx,xx,xxxx,,*hh
```
        I           I    I    I_Year
        I           I    I_Month
        I           I_Day
        I_Time
```

Geographical position, latitude and longitude:

$IIGLL,llll.ll,a,yyyyy.yy,a,hhmmss.ss,A,A*hh
```
        I   I       I       I       I               I_Statut, A= valid data, V= non valid data
        I   I       I       I               I_UTC time
        I   I       I___ I_Longitude, E/W
        I__I_Latidude, N/S
```

Bottom heading and speed:

$IIVTG,x.x,T,x.x,M,x.x,N,x.x,K,A*hh
```
          I   I   I   I   I   I   I__I_Bottom speed in kph
          I   I   I   I   I__I_Bottom speed in knots
          I   I   I__I_Magnetic bottom heading
          I__ I_True bottom heading
```

Cross-track error:

$IIXTE,A,A,x.x,a,N,A*hh
```
                I_Cross-track error in miles, L= left, R= right
```

Heading and distance to waypoint:

$IIRMB,A,x.x,a,,,IIII.II,a,yyyyy.yy,a,x.x,x.x,x.x,A,a*hh
```
            I   I   I   I    I        I   I   I   I_Speed to WP in knots
            I   I   I   I    I        I   I   I_True heading to destination in degrees
            I   I   I   I    I        I   I_Distance to destination in miles
            I   I   I   I    I_ ___ I_Longitude of the WP to destination, E/W
            I   I   I__ I__ I_Latidude of the WP to destination, N/S
            I   I_Direction of cross-track error, L/R
            I_Distance of cross-track error in miles
```

Man over board:

$TRWPL,,,,,MOB,*hh
```
                I_Name of the WP
```

$PMLR,05,01,02,037,*hh (this phrase launches the "MOB" procedure on compatible MLR GPS).
```
          I   I   I    I_Checksum
          I   I   I_Data bytes (02= MOB key of the GPS)
          I   I_Number of data bytes (01 = only 1 data byte)
          I_Type of phrase (05 = simulating key pressing on the keyboard)
```

4. TECHNICAL SPECIFICATIONS

- Power supply: 10 to 16VDC.
- Power consumption: 20mA.
- Tightness: IP54.
- Topline bus connection cable: 3 metre length.
- NMEA connection cable fitted with SubD 9-pin connector: 3 metre length.
- Weight: 380g (cable included).
- Operating temperature: -10℃ to +50℃.
- Storage temperature: -20℃ to +60℃.
- Characteristics of the NMEA frames:

The NMEA frames transmitted by the **NMEA output interface** comply with the NMEA 0183 V2.30 standard.

The format of the frames is: 4800 bauds / 8 bits with bit 7 at 0 / 1 start bit and 1 stop bit. With checksum.

The frames are continuously transmitted, and every frame is transmitted during each cycle.

Upon startup, the **NMEA output interface** sends a proprietary frame that indicates the Firmware's version number and creation date.

5. DIAGNOSTIC FOR 1ST LEVEL TROUBLESHOOTING.

This chapter can help you rapidly resolve minor problems which do not require the intervention of a specialist. Before contacting technical support, please check the troubleshooting table below.

Problem	Possible causes and solutions
The listening apparatus does not display the data from the **NMEA output interface.**	The bus cable is not or is badly connected to the terminal box : check the plugging and the connection inside the terminal box. Check the state of the cables : they must not show any sign of wear or cut.
	The listening apparatus is not properly setup: NMEA 4800 bauds, 8 bits of data, 1 stop bit.
	Check that the NMEA frames transmitted by the **NMEA output interface** are compatible with the listening apparatus.
	You can check the frames using a PC with the **NMEA output interface** connected to a COM port and Windows HyperTerminal program (Start menu/All programs/Accessories/Communications/HyperTerminal). Port parameters: 4800 bits per second, 8 bits of data, no parity, 1 stop bit, no flow control.

If you do not manage to solve the problem, please contact your distributor.

6. INSTALLATION

6.1 List of accessories

- TOPLINE Terminal box : 90-60-121

6.2 Installation precautions

The housing of the **NMEA output interface** is waterproof against water spray. Install the housing in a location that is unlikely to get flooded.

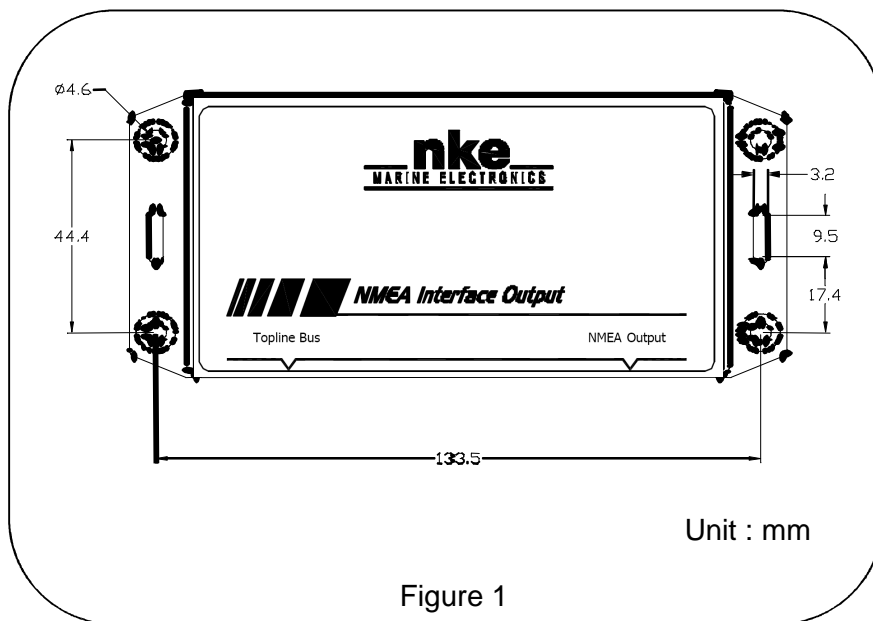## 6.3   Installation of the interface

-   Fix the housing using Ø4 screws

Figure 1

CAUTION:

-   Connecting the ***NMEA output interface*** must be carried out with the power switched off.

6.4 Connecting the NMEA output interface to a PC and a Gyrographic

- Make the bus cable run from the **NMEA output interface** to the **TOPLINE** terminal box of your installation.

- Connect the bus cable inside the terminal box as shown in Figure 2.

- Connect the SubD connector to the PC's COM port (RS232) (a USB/RS232 adapter may be used).

- Setup your navigation software so that it transmits the navigation information on the PC's RS232 port, then perform the initialization of the Gyrographic's NMEA input interface (refer to the Gyrographic's user guide).
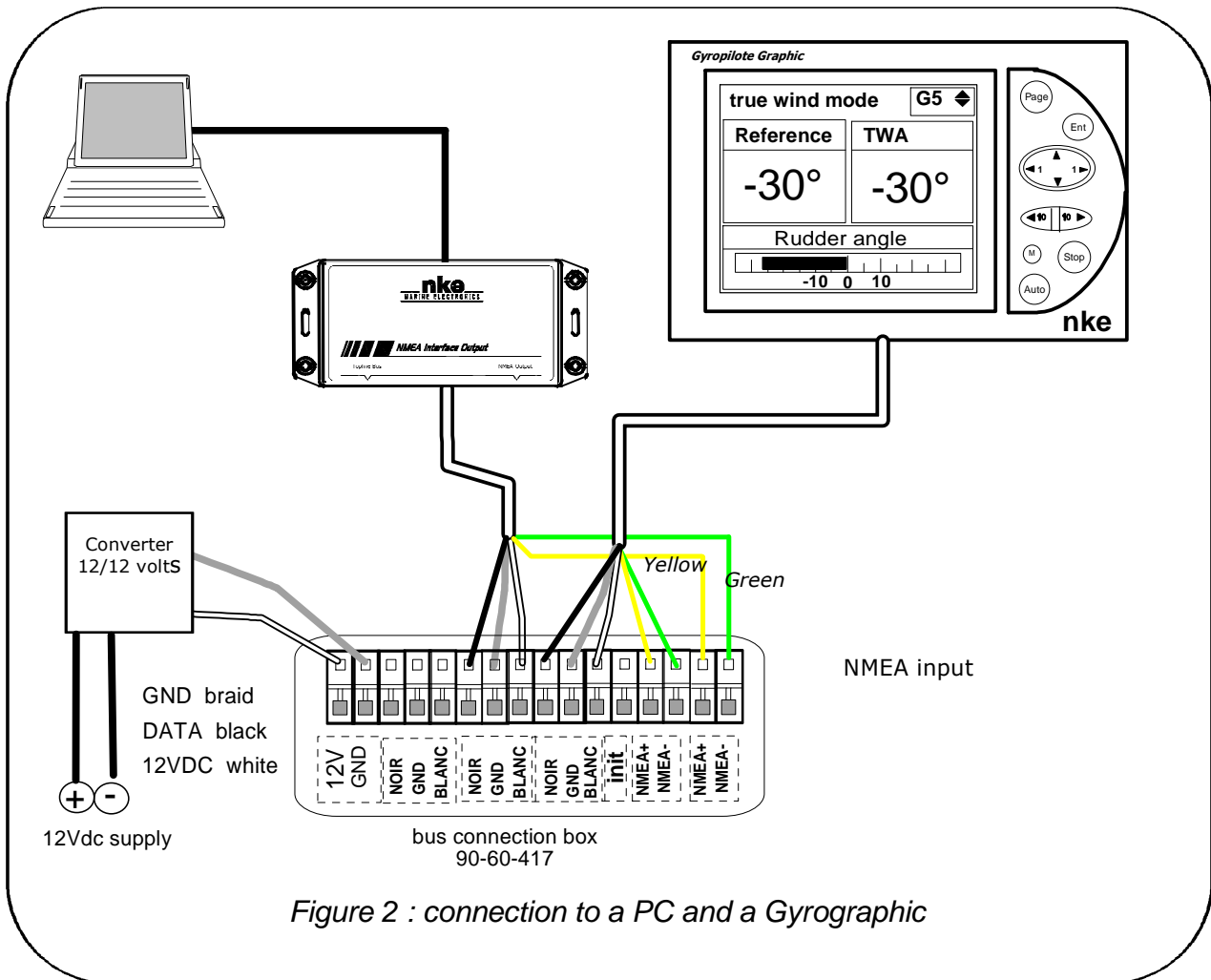

Figure 2 : connection to a PC and a Gyrographic

6.5 Connecting the NMEA output interface to a PC and a TL25

- Make the bus cable run from the *NMEA output interface* to the *TOPLINE* terminal box of your installation.

- Connect the bus cable inside the terminal box as shown in Figure 3.

- Connect the SubD connector to the PC's COM port (RS232) (a USB/RS232 adapter may be used).

- Setup your navigation software so that it transmits the navigation information on the PC's RS232 port, then perform the initialization of the TL25's NMEA input interface (refer to the TL25's user guide).
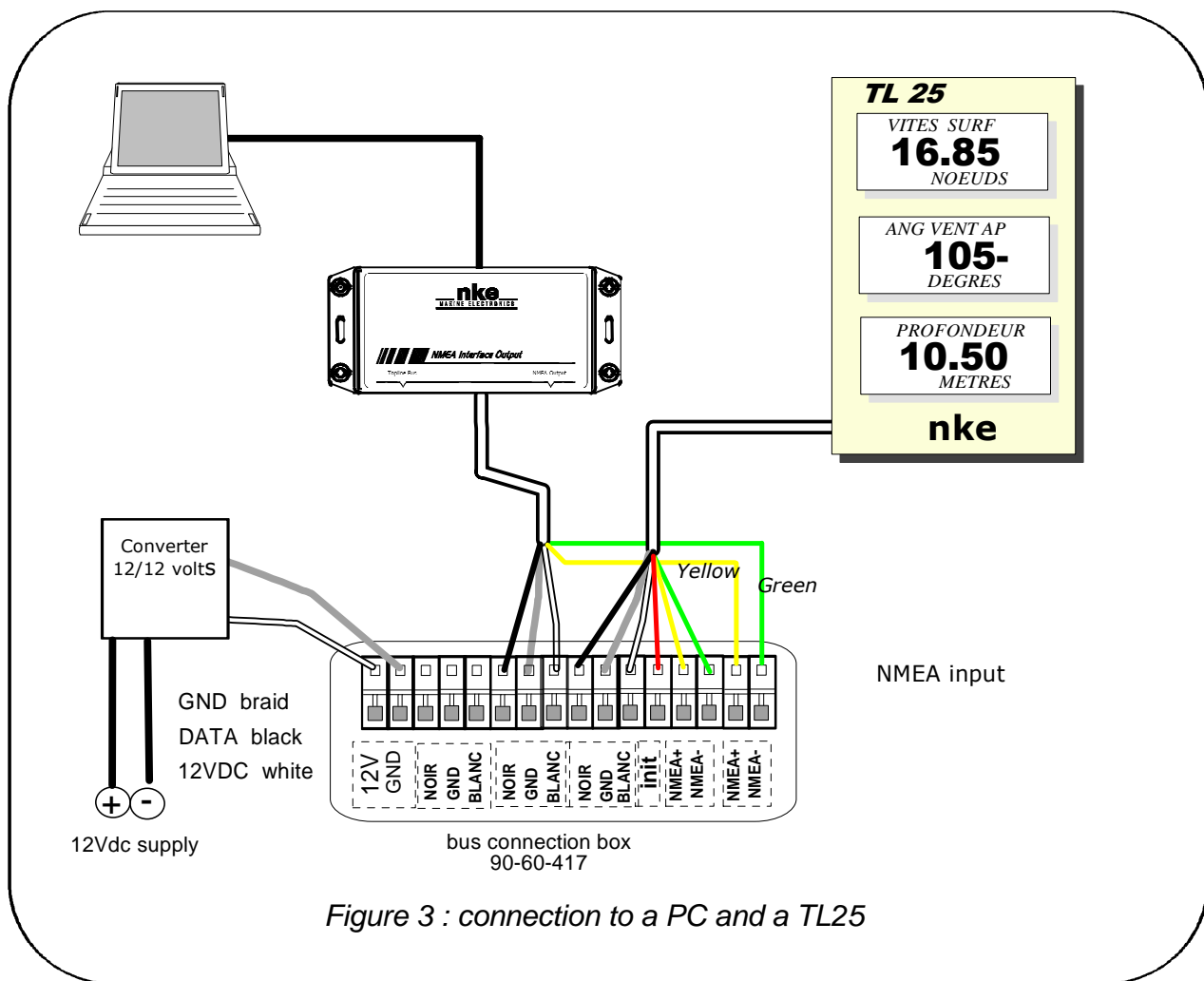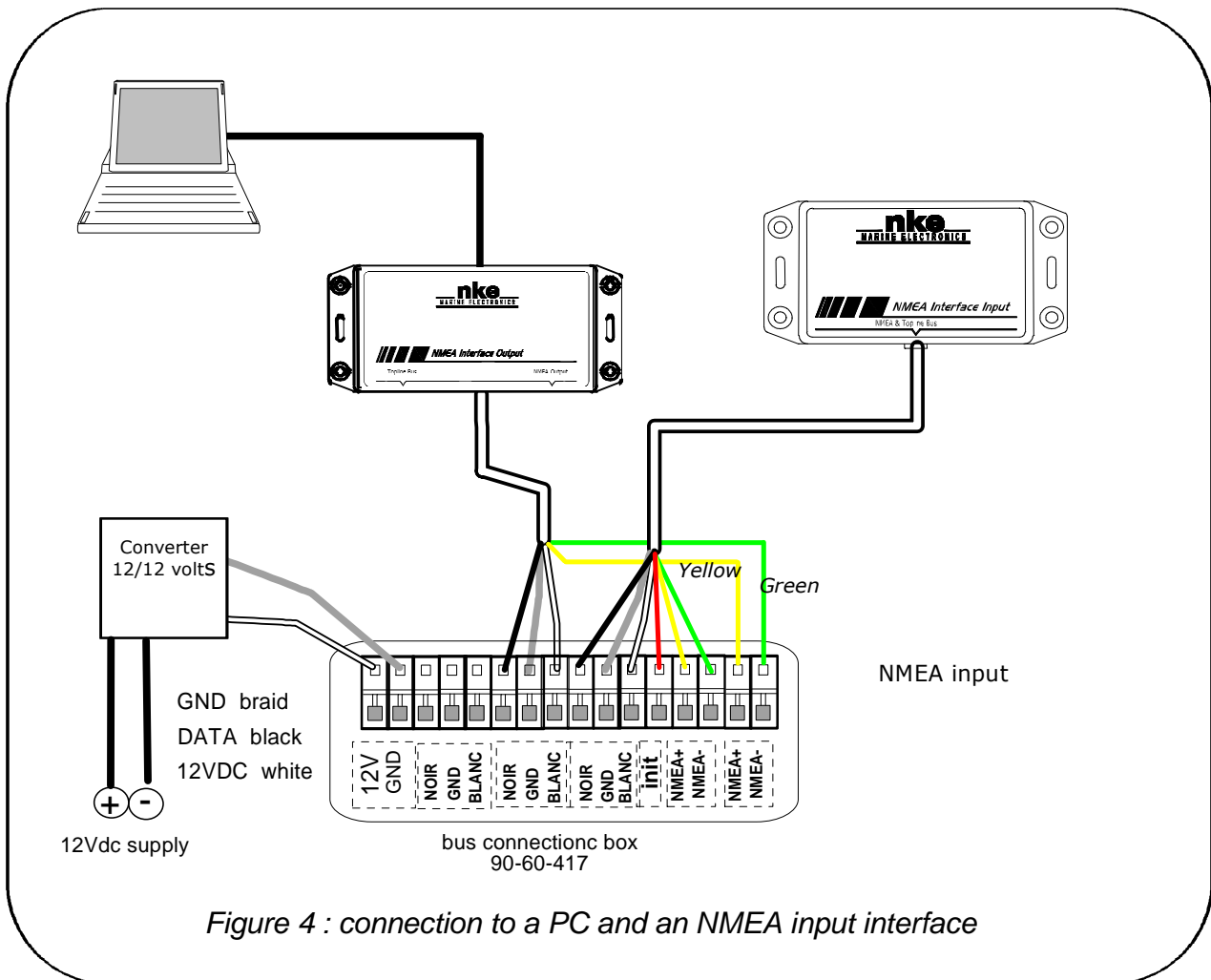
Figure 3 : connection to a PC and a TL25

6.6   Connecting the NMEA output interface to a PC and an NMEA input interface

- Make the bus cable run from the ***NMEA output interface*** to the ***TOPLINE*** terminal box of your installation.

- Connect the bus cable inside the terminal box as shown in Figure 4.

- Connect the SubD connector to the PC's COM port (RS232) (a USB/RS232 adapter may be used).

- Setup your navigation software so that it transmits the navigation information on the PC's RS232 port, then perform the initialization of the NMEA input interface (refer to the user guide for the NMEA input interface).

Figure 4 : connection to a PC and an NMEA input interface

6.7 Connecting the NMEA output interface to a listening apparatus

- Make the bus cable run from the *NMEA output interface* to the *TOPLINE* terminal box of your installation.

- Connect the bus cable inside the terminal box.

- Cut the SubD connector.

- Connect the blue wire to the "+NMEA" of the listening apparatus and the earthing braid to the "– NMEA". Isolate the other wires.
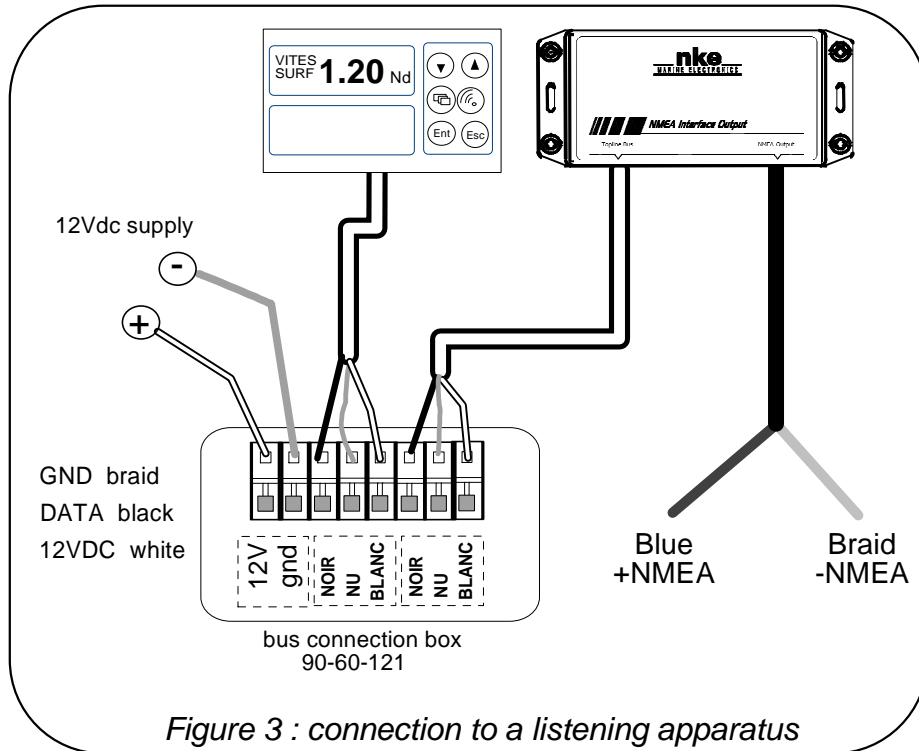

Figure 3 : connection to a listening apparatus

If you reduce the length of the bus cable, strip and galvanise the wires before connecting them inside the terminal box.

Identification of the cable wires

Bus cable 3 conductors	Wire identification	
White wire	+12V	*TOPLINE* bus
Black wire	*Topline* data	
Braid	GND	
NMEA cable 5 conductors	**Wire identification**	
Braid	RX & TX – NMEA	
Blue wire	RX +NMEA	
Red wire	NC	
White wire	TX +NMEA	
Yellow wire	NC	
Green wire	NC	