Wind display type WSDI-2
DATA SHEET

Displays

- Relative or true wind speed and direction
- Wind speed in: m/s, knots or Beaufort

Read-out

- Black base, white lines and figures
  4-digit 7-segment red display

Approval

- Major class approvals, see homepage for certificates

Housing

- Front 172 x 172, panel cutout according to size Q144

Robust design

- Shock: 100 g 11 ms

Watertight

- According to IP66 from front

Illumination

- Direct pointer illumination
- Trans-illumination of the scale by white LEDs

Dimmer

- Front or remote control of the light intensity

Interface

- RS485 (NMEA 0183) wind sensor input
- Direct WSS sensor connection

User interface

- Two push-buttons on the front allows the user to select wind speed units, control the light intensity and change settings

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Document no.: 4921250062C

Displayed data
The DEIF wind indicator type WSDI-2 presents relative (apparent) or true wind data relative to ship on the high precision read-outs.

NOTE: True wind requires the NCI-1 option box.

Technology
The WSDI-2 uses a centre-placed microprocessor-controlled x-coil system for indication of the wind direction, combined with a 4-digit 7-segment display for indication of the wind speed. Compared to the traditional digital method, the clear advantage of this indicator principle, using an analogue pointer, is a more pedagogic presentation of the wind direction. This has been accomplished by means of the unique performance of the x-coil technology, well-known and proven in the DEIF XL instruments.

Housing
The WSDI-2 is designed for front mounting, using a standard cutout for size 144 combined with a front measure of 172 x 172 to give a clear read-out. The instrument is front mounted by means of four screws, one in each corner of the instrument. The screws are then covered by the front frame.

Interface
The WSDI-2 connects to any sensor with an RS422/485 communication port with NMEA 0183 protocol. DEIF wind sensor type WSS can be directly connected to the WSDI-2.

Illumination
The WSDI-2 has direct yellow pointer illumination. The scale base is black, and the figures and lines are white and illuminated from behind by white LEDs.

Supply
The WSDI-2 is supplied from nominal 12…24V DC.

Pointer
The WSDI-2 is equipped with a pointer made by light guide material and shaped as a needle pointer. Compared to traditional read-out based on LEDs arranged in a circle, the illumination method of the pointer makes the read-out extremely easy, even at longer distances and also in bright sunlight.

Pointer deflection
The pointer is able to move 360 degrees (endlessly).

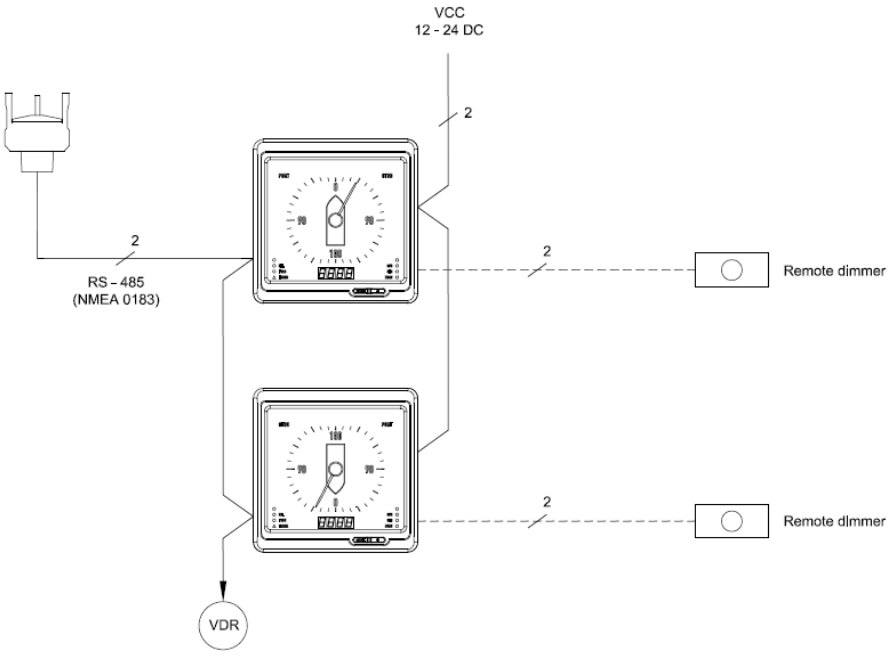
Display
The WSDI-2 is equipped with a red 4-digit 7-segment display. The intensity can be controlled in steps to match the actual situation, and in addition, a “bright sunlight step” can be selected to provide easy read-out in bright sunlight.

Error function
The WSDI-2 is equipped with a triangular LED located in the lower left corner of the display. This LED will flash if the unit is out of order.

Operation and setup
The WSDI-2 is equipped with two push-buttons located on the front. These push-buttons are used to set up the read-out on the display – m/s, knots, Beaufort. In addition, the push-buttons can be used to control the illumination intensity.

Available sensors, accessory and options
- WSS or WSS-L static wind sensor
- IP66 rear cover
- NCI-1 NMEA 0183 to CAN interface box

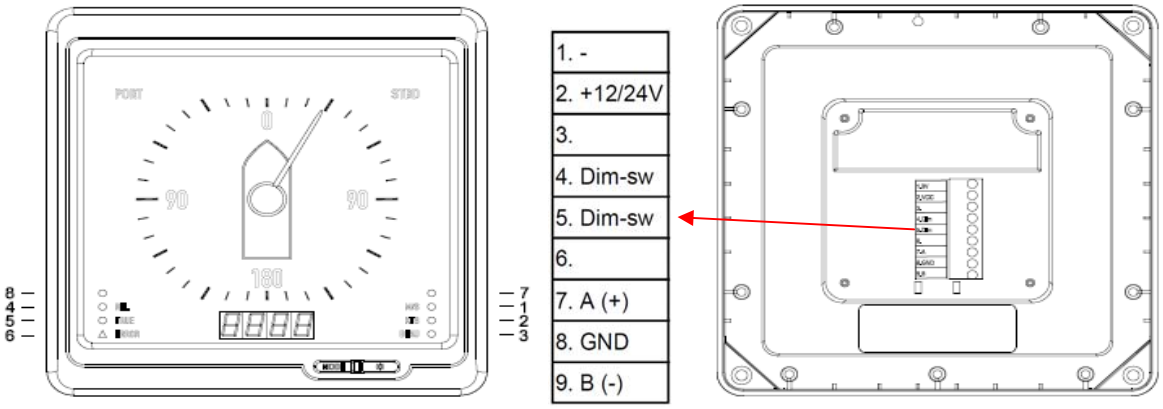
Single line application diagram



User interface - push-buttons on front side

Type	Function	Remark
1. Status LED	M/S	Indicates selection of wind speed read-out in m/s
2. Status LED	KTS	Indicates selection of wind speed read-out in knots
3. Status LED	BEAU	Indicates selection of wind speed read-out in Beaufort
4. Status LED	REL	Indicates selection of wind values relative to ship
5. Status LED	TRUE	Indicates selection of true wind values
6. Error LED	ERROR	Indicates internal error (orange flash)
7. Status LED	Service tool	See error functions section in User's Manual/Installation Note
8. Status LED	Service tool	
7-segment display	Wind speed/ information (4-digit)	Guides the user in the menu system and provides information about dimmer levels, setup, etc.
Analogue scale and pointer	Wind direction	360 degrees pointer rotation on a black back illuminated scale
1. Push-button	MODE	Selects operation and setup modes
2. Push-button	Dimmer	Selects dimmer level and provides enter function

@: All status LEDs and 7-segment displays are red.



Terminals and function - connector located on rear side

Terminal no.	Signal	Marking	Remark		
1	0 V	1.-	Aux. supply, 9.0…31.2V DC, <5 W	In addition, connect WSS[1] and NCI-1 black wire	
2	12/24 V	2. +12/24 V		In addition, connect WSS[1] and NCI-1 red wire	
3	CAN-H	3.	Do not connect	OR	CAN-H on the NCI-1
4	Dimmer (CAN-C)	4.Dim-sw	Connect to a potential free contact. Open 2.5 V, closed 0.1 mA		Do not connect to NCI-1
5	Dimmer or CAN-L	5.Dim-sw			CAN-L on the NCI-1
6	Not used	6.	Do not connect		
7	RS485 (Data+)	7.A (+)	Connect to orange wire on WSS		
8	RS485-GND	8. Data GND	Normally not connected, can be connected to screen on WSS to suppress EMC		
9	RS485 (Data-)	9.B (-)	Connect to brown wire on WSS		

[1] If the wind sensor is type WSS, the supply must be able to provide 12 V/24V DC/2A. If the sensor is type WSS-L, the supply must be able to provide 12 V/24V DC/0.6A. See the WSS documentation for more details.

User menu

Two push-buttons, “MODE” and “☼”, control the user interface.

The following can be set/selected using the setup and the select key:

Daily menu:

- Wind speed type (M/S, KNOTS, BEAUFORT)
- Dimmer level (0-9)

Advanced menu:

- Wind type (relative or true)
- Damping (1, 5, 10 or 30 seconds)
- Beep (on, off)
- Light group (0-6, none)

Installation menu:

- Input type (NMEA 0183, NMEA 0183+remote dimmer, CAN, Demo)
- Light mode (L1, L2)
- Offset correction (±180 degrees)
- Service tool
- Source reset

For further information about the menu structure, please see the User’s Manual/Installation Note.

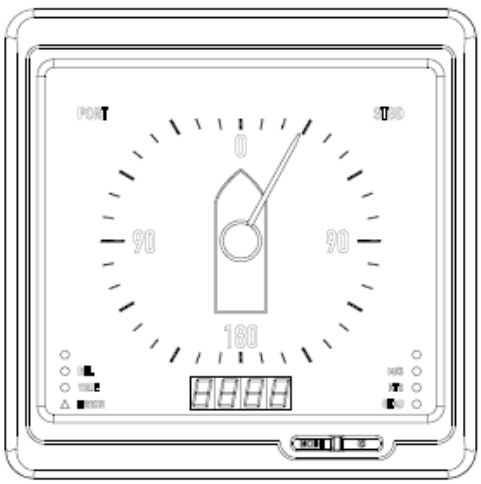
Versions

WSDI-2 FWD, for mounting on forward bridge
Ship’s bow and scale value zero are located at 12 o’clock.

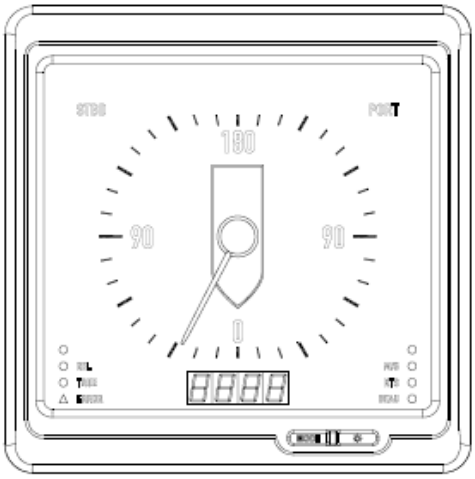
WSDI-2 AFT, for mounting on aft bridge
Ship’s bow and scale value zero are located at 6 o’clock.

Scale designs

There are two types: FWD (forward) and AFT. Please notice the inverted pointer on the AFT version. Both types are shown with identical input signal.



FWD



AFT

Technical specifications

Indicators are designed according to the standards below			**Standards**
Sensor input	RS485		
Accuracy	Analogue instrument (wind direction) class 0.5 (-10…15…30…55°C) Digital instrument ±1 digit		IEC/EN 60051
Response time	Analogue instrument 90° per sec./no overshoot		
Instrument size	Panel cutout	Front	DIN 43700 for panel cut-out only
	136 x 136 mm	172 x 172 mm	
Aux. supply	12/24 V (9.0…31.2V DC), <5 W		
Remote dimmer	Potential free contact. Open 2.5 V, closed 0.1 mA		
Galvanic separation	500 V between groups (RS485, PSU, remote dimmer/CAN)		
Scale	Black base, white figures and lines		
Pointer	Transparent polycarbonate with white print and yellow illumination (588 nm)		
Window	Antiglare 2 mm Acrylic (UV-resistant)		
Housing	ASA-PC blend		UL94 V0
Connections	Screw terminals: 2.5 mm^2 (multi-stranded), 4 mm^2 (single-stranded)		
Mounting angle	The indicator can be mounted at any angle between 0...150° horizontal without this affecting the calibration		DIN 16257
Compass safety distance	<0.2 m		IEC/EN 60945
Communication	RS485 interface and NMEA 0183 MWV sentence		NMEA 0183 ver. 2.x-3.0
	Proprietary CAN for use with NCI-1 NMEA to CAN interface box		
Out of range	Flashing orange LED		
Protection	From front IP66, from rear IP20/IP66 when using IP66 rear cover option		IEC/EN 60529
Climate	Class H S E, short-term condensing allowed		IEC/EN 60068-2-30 Max. 97% RH
	Max. 95% RH: Max. 30 days per year Max. 85% RH: Remaining days Max. 75% RH: Average per year		
Temperature	Nominal: -10…55°C Operating: -25…70°C Storage: -40…80°C		IEC/EN 60068-2-1 Cold IEC/EN 60068-2-1 Dry heat
	Influence: Max. ±1.5% within -15...55°C		
Panel influence	The accuracy is affected neither by the material nor by the thickness of the panel		IEC/EN 60051
Panel thickness	No limit		
Mechanical shock test	18 x 50 g half sine (11 ms)		IEC/EN 60068-2-27
Vibration test	3…13.2 Hz: 2 mm (peak-peak) 13.2…100 Hz: 0.7 g		IEC/EN 60945 DNV Class A
Safety	300 V – Cat. III. Pollution deg. 2		IEC/EN 61010-1
EMC	CE-marked for industrial environment		IEC/EN 60945
Weight	0.55 kg		
Dimensions, cardboard box	220 x 200 x 100 mm		

NMEA 0183 used in DEIF wind sensor type WSS

MWV, wind speed and direction response:

Sentence format: $WIMWV,296,R,9.7,N,A*20<cr><lf>

where

$	=	Start of the message
WI	=	Talker identifier (WI = weather instrument)
MWV	=	Wind speed and direction response identifier
296	=	Wind direction value (degrees)
R	=	Wind direction unit (R = relative)
9.7	=	Wind speed value (knots)
N	=	Wind speed unit (knots)
A	=	Data status: A = valid, V = invalid
*	=	Check sum delimiter
20	=	Two-character check sum for the response
<cr><lf>	=	Response terminator

Update rate: Every second.

Labels

Product label:

DEIF WSDI-2 wind display		**CE logo**	**Logo**
Bar code + item number	**Made in Denmark**		**DEIF logo**

Warranty label:
Placed over the centre mounting screw on the rear side (below the product label).

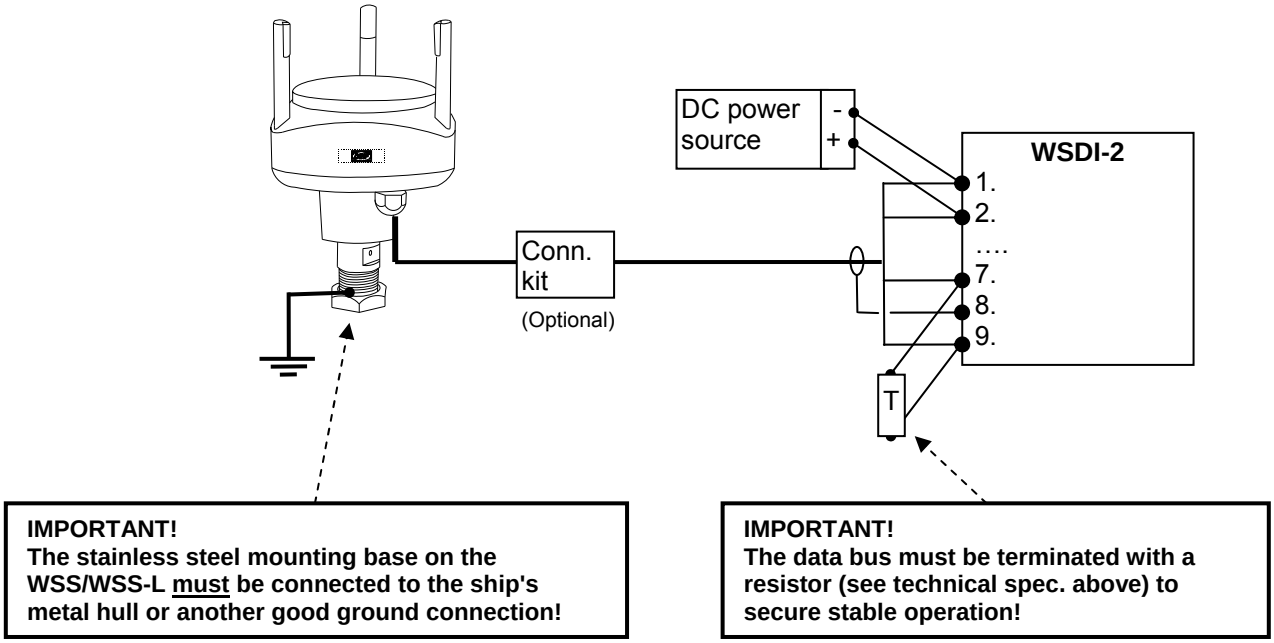
System connection with DEIF WSS sensor

RS485 (I/O) operation:
The bus should be terminated with 120 Ohm for pure RS485 operation.

Combined RS485 (I/O) and NMEA 0183 (I) operation:
A combination of up to ten RS485 (I/O) and one NMEA 0183 listeners can be connected to the WSS data interface at the same time.

The data line must be terminated with a 200 to 250 Ohm resistor to obtain ≥ +/- 2.1 V output necessary for a standard NMEA 0183 input circuit to work (a 200 Ohm resistor is included in the WSDI-2 package). The NMEA 0183 input load must be ≤ 2 mA @ +/- 2 V.

NOTE: The NCI-1 option box or a NMEA-buffer is recommended if connection of more than one standard NMEA input is needed.

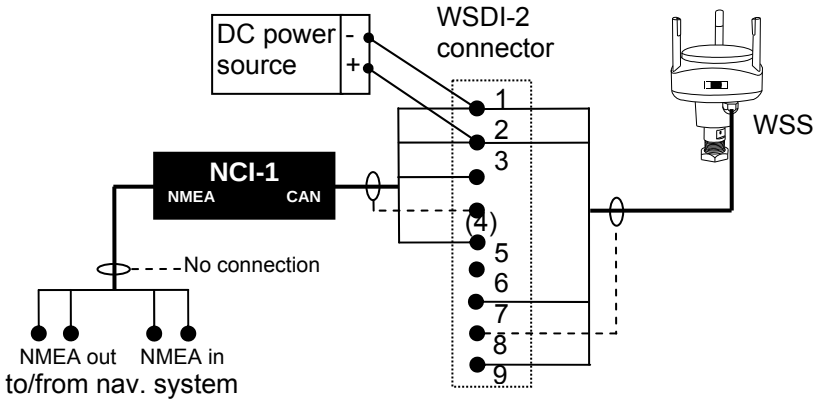


NCI-1 NMEA 0183 to CAN interface box (option)

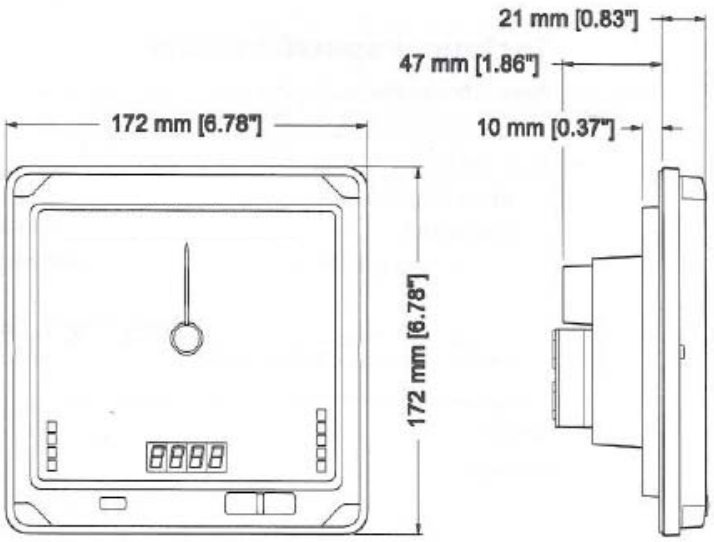
The NCI-1 is used to connect the WSDI-2 to the ship's navigation system in order to:

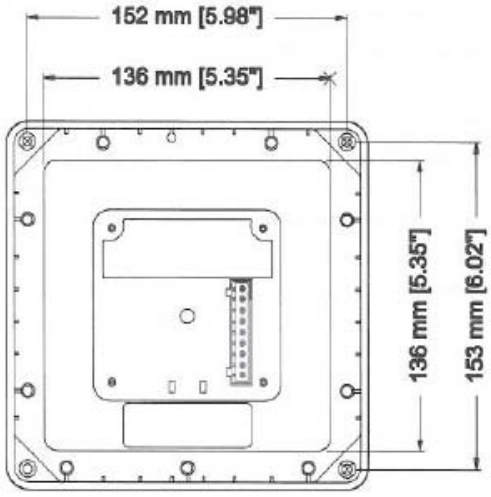
- receive speed data for true wind calculations
- provide buffered wind data on the NMEA 0183 output for up to eight NMEA inputs (listeners)
- provide MWV and VWR wind data sentences

Option: NCI-1 NMEA 0183 to CAN interface box		**Standards**
Connections	1.5 m NMEA 0183 cable with 4 wires and shield	
	1.5 m CAN cable with 2 CAN wires, 2 aux. supply wires and shield	
Input	NMEA 0183 opto-insulated (1.5 kV)	NMEA 0183 ver.2.x-3 IEC 61162-1:2000
	Differential input voltage min. 1.8 V	
	Max. input voltage: Continuous +/-15 V Less than 1 second: +/-35 V	
	Receiving sentence: VHW (water speed) or RMC, VTG (COG)	
Output	NMEA 0183/RS422 insulated (1.5 kV) from aux. supply and CAN	
	Output current max. 20 mA	
	Output voltage min. 2.1 V @ 100 Ohm load	
	Drives up to 8 NMEA 0183 inputs	
	Transmitting sentences: MWV and VWR	
Aux. supply	Nominal voltage 12…24V DC (8…35V DC)	
	Consumption max. 0.8 W @ full load on data channel	
CANbus	Built-in network terminator (120 Ohm)	
	Proprietary protocol	
Environment	Same as for the WSDI-2 display unit	
Size	Length 179 mm, width 46 mm, height 28.5 mm	

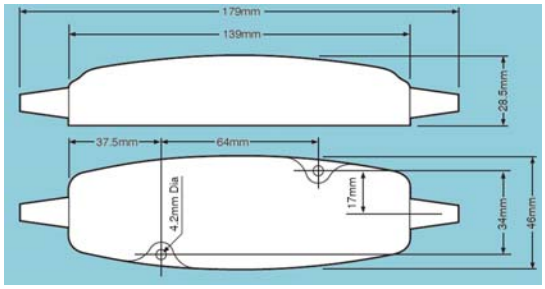


Unit dimensions in mm (inches)





NCI-1 dimensions



Order specifications

Example: WSDI-2 FWD or WSDI-2 AFT (only two versions exist)

FWD

AFT

Due to our continuous development we reserve the right to supply equipment which may vary from the described.

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