

# User Manual

## WIB4S

concerning Software-Version 1.0.x

NAVTEX receiver for 518kHz in English language and for 490kHz in national language

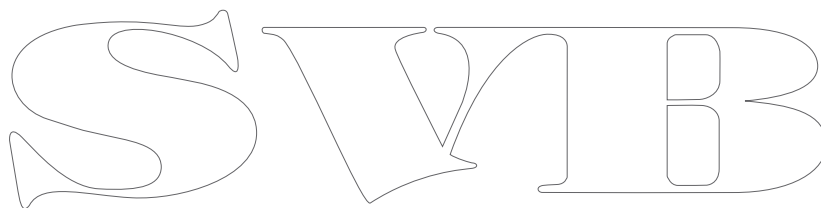
Sea weather receiver of the German weather service at 147,3kHz  
Barograph



This manual contains important information for correct using of this device.  
Please read the manual carefully before start up.



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#### **Note**

Software updates for this product are available in the Internet:  
<http://www.weatherinfo.com/english/Downloads.htm>

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## Scope of delivery

The following parts belong to the scope of delivery of the WIB2S:

- 1 x WIB4S,
- 1 x USB cable,
- 2 x fastening screws,
- 1 x retaining brackets,
- 1 x CD with WIB3/4 software,
- 1 x User Manual.

## Introduction

The WIB4S is a NAVTEX and sea weather receiver. The device receives NAVTEX messages on medium wave frequencies 518 kHz (international, English) and 490 kHz (national, national language) and sea weather messages in German language (147,3 kHz, 11039 kHz, 4467,3 kHz) or English language (4583 kHz, 7646 kHz, 10100,8 kHz).

Both NAVTEX frequencies and one weather frequency of Deutscher Wetterdienst are received simultaneously.

The NAVTEX and weather messages are displayed on 240 x 128 pixel LCD.

The WIB4S equipped with an inserted precision air pressure sensor, is able to record the air pressure during a period of up to seven days. On the device display only the air pressure of the last two days can be seen.

The device can be connected to the PC via an USB interface. The data of the WIB4S will be displayed by a comfortable Windows software. The software is working with the operating systems Windows XP, Vista and 7.

Software updates for the WIB4S are available in the Internet at:

<http://www.weatherinfo.com/english/Downloads.htm>

## Connections

The connections for power supply and antenna are led out at the back of the WIB4S. The following table shows the terminal assignment:

Terminal	Assignment
red	12V +
black	12V -
green/yellow	Ground
BNC	Antenna

The antenna terminal (BNC) can be connected with an active antenna (12V) or a passive antenna (e.g., isolated backstay with passiv-balun).

In the WIB4S menu you have to determine whether you use an active or passive antenna (see page 15).

The antenna input impedance is 50Ω.

With water contact the signal to noise ratio and therefore the reception of weak signals improves. The line *GND* is decoupled to the 12V(-) connection by an 100nF/50V capacitor in parallel with a 100kΩ resistor.

When connecting the supply voltage please pay attention to the correct polarity. Protect the supply lines of the WIB4S with time-lag 250mA fuse. The WIB4S is protected internally with a resettable fuse element.

The WIB4S can be integrated to the board connecting block. For receiving and saving messages in spite of the board network is switched off, the WIB4S must be connected directly to the battery. Additionally the supply lines must be protected by a fuse directly at

battery.

With the enclosed USB cable the connection of the WIB4S (outlet USB) with PC/Notebook will be done.

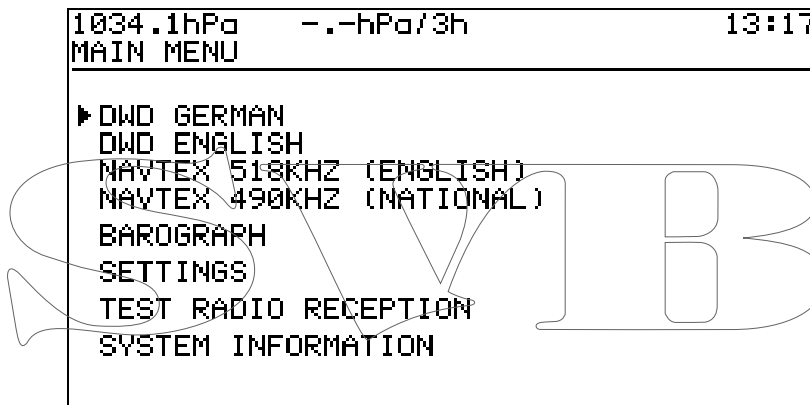
**The bulk of the USB jack as well as the connection 12V(-) are coupled with each other. Please note: you can get undesirable ground-loops between the USB connection and the PC. In such a case other electric devices can be parasitical connected with ground (or battery -). Devices needing much current could cause a damage in wiring or connected devices.**

## Handling

The WIB4S is handled by five keys. Press the power key (⏻) to switch the device on or off. In order to switch off, the power key must be pressed during approx. 3 seconds.

Use the four cursor keys (▲▼◀▶) to navigate within the menus. After switch on, the WIB4S displays the main menu (see figure below).

On the left beside the menu entries an arrow is located which can be moved by the keys ▲ and ▼.



With the key ▶ the menu item beside the arrow is selected. With the key ◀ the previous menu step can be reached until the main base. Practice a while with the handling of the cursor keys, until you are familiar.

On top of the display the actual air pressure, the air pressure tendency and the time of day are displayed. If the WIB4S is in timer operation the remaining term is also shown.

The menu language of the WIB4S can be changed (see section *Set Language*, page 17).

## Menu Overview

The menu of the WIB4S is constructed as follows:

### DWD GERMAN

WEATHER REPORT NORTH/BALTIC SEA  
REPORT GERMAN NORTH/BALTIC SEA COAST  
WEATHER REPORT MEDITERRANEAN SEA  
FORECAST NORTH SEA (5 DAYS)  
FORECAST BALTIC SEA (5 DAYS)  
FORECAST MEDITERRANEAN SEA (5 DAYS)  
FORECAST EASTERN ATLANTIC (5 DAYS)  
FORECAST NORWEG./BALTIC SEA (2 DAYS)  
FORECAST NORTH ATLANTIC (2 DAYS)  
FORECAST WEST. EUROPEAN SEA (2 DAYS)  
FORECAST WEST. MEDITER. SEA (2 DAYS)  
FORECAST EAST. MEDITER. SEA (2 DAYS)  
GALE AND STORM WARNINGS  
NAVIGATIONAL WARNINGS  
WARNINGS BALTIC SEA (ENGLISH)  
WARNINGS NORTH/BALTIC SEA (ENGLISH)  
STATION REPORTS NORTH/BALTIC SEA  
STATION REPORTS MEDITERRANEAN SEA  
ADVICE TRANSMISSION TROUBLE/NOTICES  
ADVICE ON THE USE OF WEATHER DATA

### DWD ENGLISH

WEATHER REPORT NORTH/BALTIC SEA  
REPORT GERMAN NORTH/BALTIC SEA COAST  
WEATHER REPORT MEDITERRANEAN SEA  
FORECAST NORTH SEA (5 DAYS)  
FORECAST BALTIC SEA (5 DAYS)  
FORECAST MEDITERRANEAN SEA (5 DAYS)  
FORECAST EASTERN ATLANTIC (5 DAYS)  
FORECAST NORWEG./BALTIC SEA (2 DAYS)  
FORECAST NORTH ATLANTIC (2 DAYS)  
FORECAST WEST. EUROPEAN SEA (2 DAYS)  
FORECAST WEST. MEDITER. SEA (2 DAYS)  
FORECAST EAST. MEDITER. SEA (2 DAYS)  
GALE AND STORM WARNINGS  
NAVIGATIONAL WARNINGS  
WARNINGS BALTIC SEA  
WARNINGS NORTH/BALTIC SEA  
ADVICE ON THE USE OF WEATHER DATA

NAVTEX 518KHZ (ENGLISH)  
ALL MESSAGES  
NAVIGATIONAL WARNINGS  
WEATHER WARNINGS  
ICE REPORTS  
SEARCH AND RESCUE INFORMATIONS  
WEATHER FORECASTS  
PILOT SERVICE MESSAGES  
ELEC. NAVAID MESSAGES  
REMAINING MESSAGES

NAVTEX 490KHZ (NATIONAL)  
ALL MESSAGES  
NAVIGATIONAL WARNINGS  
WEATHER WARNINGS  
ICE REPORTS  
SEARCH AND RESCUE INFORMATIONS  
WEATHER FORECASTS  
PILOT SERVICE MESSAGES  
ELEC. NAVAID MESSAGES  
REMAINING MESSAGES

BAROGRAPH

SETTINGS

SELECT DWD FREQUENCY  
NAVTEX 518KHZ STATION LIST  
NAVTEX 490KHZ STATION LIST  
CLOCK  
TIMER  
DISPLAY CONTRAST  
DISPLAY BACKLIGHT  
SCREENSAVER  
BAROMETER ALTITUDE  
CALIBRATE BAROMETER  
ACTIVE ANTENNA REMOTE POWER SUPPLY  
LANGUAGE

TEST RADIO RECEPTION

SYSTEM INFORMATION



## DWD Messages

The Deutscher Wetterdienst (DWD) transmits sea weather reports, weather forecasts and station messages on the frequencies 147,3kHz, 11039 kHz and 14467,3 kHz in German language and on the frequencies 4583 kHz, 7646 kHz und 10100,8 kHz in English language.

You can adjust the WIB4S to receive either weather messages in German or English language (see section *Select DWD Frequency*, page 11).

The WIB4S receives and stores this messages sorted by message type. To display the messages please select the menu item **DWD GERMAN** or **DWD ENGLISH** in the main menu.

In the DWD menu an overview of the different message types is shown:

```
1021.0hPa  -.-hPa/3h 10:51
DWD 147,3KHZ
▶ WEATHER REPORT NORTH/BALTIC SEA
  REPORT GERMAN NORTH/BALTIC SEA COAST
  WEATHER REPORT MEDITERRANEAN SEA
  FORECAST NORTH SEA (5 DAYS)
  FORECAST BALTIC SEA (5 DAYS)
  FORECAST MEDITERRANEAN SEA (5 DAYS)
  FORECAST EASTERN ATLANTIC (5 DAYS)
  FORECAST NORWEG./BALTIC SEA (2 DAYS)
  FORECAST NORTH ATLANTIC (2 DAYS)
  FORECAST WEST. EUROPEAN SEA (2 DAYS)
  FORECAST WEST. MEDITER. SEA (2 DAYS)
  FORECAST EAST. MEDITER. SEA (2 DAYS)
```

By selecting a message type from the menu the corresponding message appears. If a selected message is not available in then memory of the WIB4S you see the note: **NO MESSAGE AVAILABLE.**

```
ZCZC 250
FQEN51 EDZW 291400

SEEWETTERBERICHT DEUTSCHE NORD- UND
OSTSEEKUESTE
HERAUSGEGEBEN VOM SEEWETTERDIENST
HAMBURG
29.03.2011, 15 UTC:

WETTERLAGE:
TIEF 996 NORDWESTRUSSLAND,
ABSCHWÄECHEND, NORDOSTZIEHEND. HOCH
1018 UNGARN, SUEDOSTWANDERND. TIEF 1000
SUEDSCHWEDEN,
```

With the cursor keys ▲ and ▼ the shown message can be scrolled up and down. With the key ► you can switch to older messages in the memory of the device.



## NAVTEX Messages

The structure of a NAVTEX message is to be explained on the basis of following example:

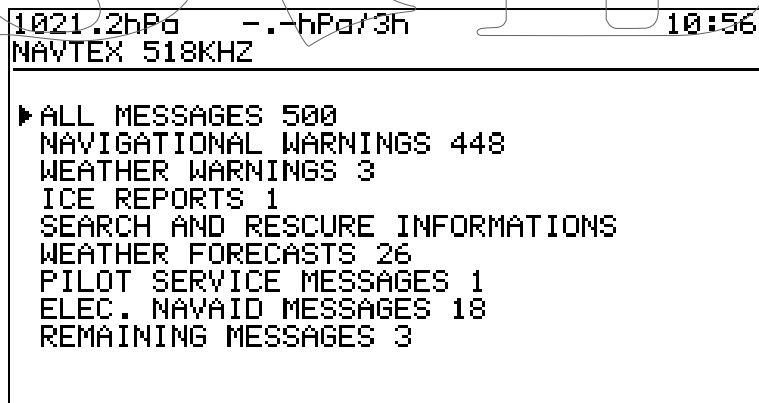
```
ZCZC PA09
NETHERLANDS COASTGUARD
NAVIGATIONAL WARNING NR. 9 172128 UTC AUG
PLATFORM L10-G 53-29.4N 004-11.7E
UNLIT
NNNN
```

Each NAVTEX-message begins with the letters **ZCZC**, followed by the message identification (**PA09**). The first letter of the message identification serves the master station for identification. In this example it is **NETHERLANDS COASTGUARD (P)**.

In the second letter the kind of message is coded, here navigational warning (navigation warnings). The last two numbers of the message identification (**09**) are a serial numbers. The number **00** has a privileged position. It is reserved for distress messages.

NAVTEX messages have a time stamp. It is shown at the end of the third line (**172128 UTC AUG**) and means: 17. August, 21:28 UTC. The time stamp refers to the date, the message was produced and not to the time of the radiant transmission. Afterwards the message content follows. The message ends with **NNNN**.

To display NAVTEX messages please follow the menu entries **NAVTEX 518KHZ (ENGLISH)** (internationale messages) or **NAVTEX 490KHZ (NATIONAL)** (national messages) in the main menu.



```
1021.2hPa --hPa/3h 10:56
NAVTEX 518KHZ
▶ ALL MESSAGES 500
  NAVIGATIONAL WARNINGS 448
  WEATHER WARNINGS 3
  ICE REPORTS 1
  SEARCH AND RESCUE INFORMATIONS
  WEATHER FORECASTS 26
  PILOT SERVICE MESSAGES 1
  ELEC. NAVAID MESSAGES 18
  REMAINING MESSAGES 3
```

An overview of the different message types is shown. The number behind the message types indicates the number of messages of the corresponding type stored in the WIB4S. Old messages are deleted automatically after two days uptime.

The following table gives an overview about the message types:

Code	Menu	Comment
A - Z	ALL MESSAGES	
A, L	NAVIGATIONAL WARNINGS	
B	WEATHER WARNINGS	(Meteorological warnings)
C	ICE REPORTS	
D	SEARCH AND RESCUE INFO	
E	WEATHER FORECASTS	
F	PILOT SERVICE MESSAGES	
G - K	ELEC. NAVAIID MESSAGES	Information about DECCA, LORAN, GPS
M - Z	REMAINING MESSAGES	

By selecting a message type from the menu, a list with all messages of corresponding type appears.

```

1021.1hPa  -.-hPa/3h  11:00
NAVTEX 518KHZ
▶ PA42 29.03.11 16:34 NEW
  PE34 29.03.11 16:30 NEW
  MA86 29.03.11 16:03 READ
  MA88 29.03.11 16:02 READ
  MA92 29.03.11 16:02 READ
  MA96 29.03.11 16:01 READ
  MG26 29.03.11 16:00 NEW
  KA78 29.03.11 15:46 ROLLBACK
  KA90 29.03.11 15:46 ROLLBACK
  KA91 29.03.11 15:45 ROLLBACK
  KA92 29.03.11 15:44 NEW
  KA03 29.03.11 15:43 NEW
  
```

The last received message is on top of the list. The date and time behind the message identification shows when the message was received. The message identifications are marked with either **NEW**, **ROLLBACK** or **READ** accordingly new, repeated or read messages.

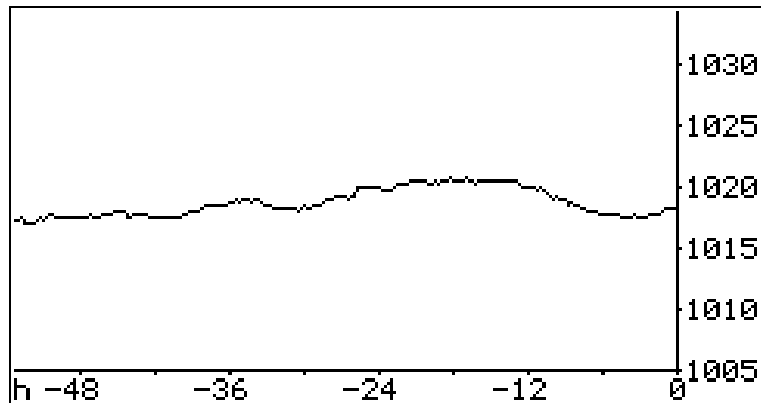
```

ZCZC PA42
NETHERLANDS COASTGUARD
NAVIGATIONAL WARNING NR. 42 211458 UTC
MAR
OFF TEXEL TSS APPROACHES TO THE
NORTHBOUND SHIPPING LANE
SALVAGE OPERATIONS IN PROGRESS 52-45.9N
004-12.7E
TWO BARGES WITH A WIDE ANCHORSPREAD
POSITIONED NEXT TO
THE WRECK. BECAUSE OF WIDE ANCHOR SPREAD
AND FOR SAFETY
REASONS SHIPPING IS URGENTLY REQUESTED
TO GIVE A BERTH OF
  
```

By selecting a message from the message list, the contents of the message appears on the display. With the cursor keys ▲ and ▼ the messages can be scrolled up and down. Characters, which were not received correctly, will be shown by the WIB4S as an underline ( \_ ).

## Barograph

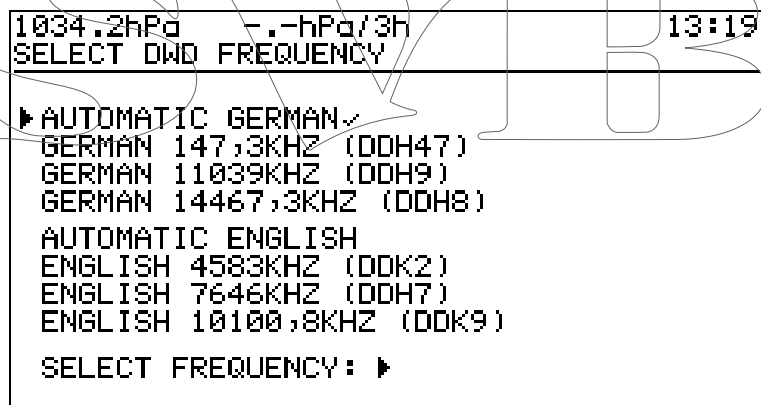
Please select the menu item **BAROGRAPH** in the main menu to display the barograph data.



The air pressure of the last 48 hours will be displayed. The actual air pressure is located on the right of the diagram.

## Select DWD frequency

To choose the DWD frequency, please choose the menu item **SELECT DWD FREQUENCY** in the main menu.



Use the keys ▲ and ▼ to select a DWD frequency and the key ▶ to activate it. The WIB4S is also able to select the best frequency automatically. Use therefore the menu items **AUTOMATIC GERMAN** or **AUTOMATIC ENGLISH** for German or English weather messages.

## Station List

To view the station list, please select in the main menu the menu entries **SETTINGS**→**STATION LIST 518KHZ** for international and **SETTINGS**→**STATION LIST 490KHZ** for national NAVTEX messages.

```
1021.1hPa  -.-hPa/3h  11:04
NAVTEX 518KHZ STATION LIST
▶A✓   G✓   M✓   S✓   Y✓
B✓   H✓   N✓   T✓   Z✓
C✓   I✓   O✓   U✓
D✓   J✓   P✓   V✓
E✓   K✓   Q✓   W✓
F✓   L✓   R✓   X✓

TOGGLE STATION: ▶
```

The station list is used to hide undesirable NAVTEX stations.

To hide a station, please select the corresponding station key with the keys ▲ and ▼. Then the station can be deactivated and activated with the key ▶.

Hidden stations will still be received, and appear again in the message list if they are reactivated. You find a list of the NAVTEX stations in Europe on page 20 (*Appendix NAVTEX Stations*).

Please note: Hiding of NAVTEX stations is not quite harmless. Thus, e.g., important messages are not displayed if you use the device in another sea area.

## Set Clock

To reach the *Set Clock* dialog please choose the menu entries **SETTINGS**→**CLOCK** in the main menu.

1021.2hPa	-.hPa/3h	11:07
SET CLOCK		
DD.MM.YYYY		
DATE:	12.04.2011 (TUE)	
TIME:	11:07	
CHANGE VALUE: ▲▼		
PROCEED:	▶	
BACK:	◀	

In the *Set Clock* dialog you can set time and date of the clock in the WIB4S. Please, select the field to be changed with the key ▶. The value of the field can be changed with the keys ▲ and ▼. The clock is adjusted by quitting the dialog with the key ◀.

## Set Timer

The Timer of the WIB4S allows to switch the WIB4S time-controlled on and off. To adjust the timer please choose the menu entries **SETTINGS**→**TIMER** in the main menu.

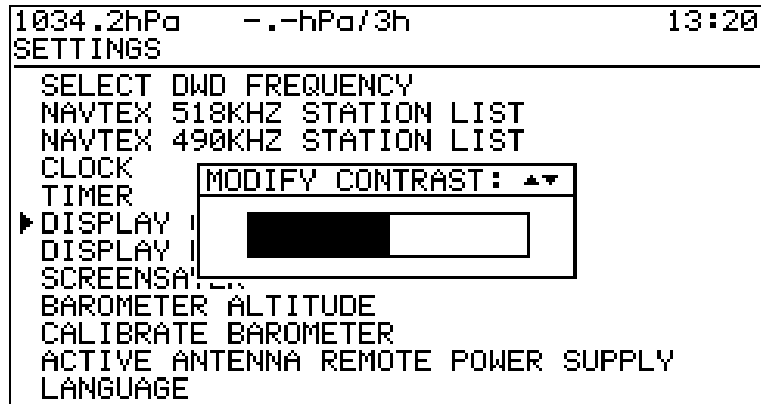
1021.2hPa	-.hPa/3h	11:09
SET TIMER		
TIMER:	ON	
DD.MM.YYYY		
DATE:	12.04.2011 (TUE)	
TIME:	11:14	
POWER DOWN WIB3S TOWARDS: 48h		
CHANGE VALUE: ▲▼		
PROCEED:	▶	
SET TIMER:	◀	

In the first field of the timer dialog you can switch the timer on and off. In the following fields the switch on time and the timer operating time can be adjusted. To activate the timer please quit the timer dialog and switch the WIB4S off. Then the device switches itself on at the adjusted time. In timer operation the remaining timer term is displayed in first display line left to the day time.

You can deactivate the timer, while switch if off in the timer dialog. The timer is switched off as well if you switch off the WIB4S in timer operation.

## Set Display Contrast

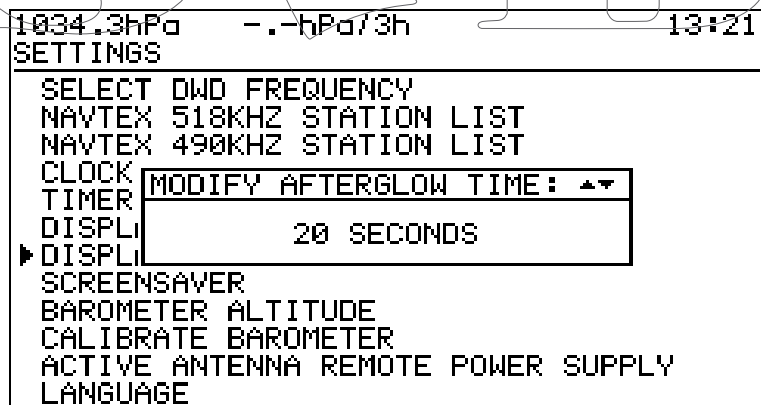
To reach the *Display Contrast* menu please choose the menu entries **SETTINGS**→ **DISPLAY CONTRAST** in the main menu.



the adjustment of the display contrast is possible with the keys ▲ and ▼. With the key ◀ you will return to the menu *Settings*.

## Set Display Backlight

By selecting the menu item **DISPLAY BACKLIGHT** in the menu **SETTINGS** the adjustment of the afterglow time of the display backlighting is possible with the keys ▲ and ▼.



The afterglow time determines, how long the backlighting remains enabled after the last keystroke. The adjustment range is between 0 and 60 seconds.

## Set Screensaver

By selecting the menu item **SCREENSAVER** in the menu **SETTINGS** the adjustment of the screensaver latency or switch off the screensaver is possible with the keys ▲ and ▼.

```
1034.1hPa  -.-hPa/3h  13:22
SETTINGS
-----
SELECT DWD FREQUENCY
NAVTEX 518KHZ STATION LIST
NAVTEX 490KHZ STATION LIST
CLOCK
TIMER          MODIFY LATENCY: ▲▼
DISPLAY C      2 MINUTES
DISPLAY E
▶ SCREENSAVER
BAROMETER ALTITUDE
CALIBRATE BAROMETER
ACTIVE ANTENNA REMOTE POWER SUPPLY
LANGUAGE
```

The adjustment range is between 2 and 10 minutes. The screensaver latency determines, how long it lasts, until the screen saver becomes active after the last keystroke. If the screensaver is active, the display is switched off. This raises the life time of the display and reduces the current consumption of the device.

## Set Barometer Altitude

By selecting the menu item **BAROMETER ALTITUDE** in the menu **SETTINGS** the adjustment of the barometer altitude (height of the device above sea level) in 5 meter steps is possible with the keys ▲ and ▼.

```
1034.1hPa  -.-hPa/3h  13:23
SETTINGS
-----
SELECT DWD FREQUENCY
NAVTEX 518KHZ STATION LIST
NAVTEX 490KHZ STATION LIST
CLOCK
TIMER          MODIFY ALTITUDE: ▲▼
DISPLAY I      50 METER
DISPLAY I
SCREENSAVER
▶ BAROMETER ALTITUDE
CALIBRATE BAROMETER
ACTIVE ANTENNA REMOTE POWER SUPPLY
LANGUAGE
```

With correctly justified barometer height the WIB4S displays the air pressure referred to sea level.

The adjustment range of the barometer altitude is between 0 and 1000 meter.

## Calibrate Barometer

The typical long term stability of the air pressure sensor of the WIB4S is -1 hPa/year. Every year the displayed air pressure sinks by approx. 1 hPa. You can correct this by calibrating the device. You need a reference air pressure referred on sea level. The barometer altitude must be adjusted correctly before calibration.

In order to calibrate the air pressure sensor please select the menu item **CALIBRATE BAROMETER** in the menu **SETTINGS**.

```
1034.1hPa  -.-hPa/3h  13:24
SETTINGS
-----
SELECT DWD FREQUENCY
NAVTEX 518KHZ STATION LIST
NAVTEX 490KHZ STATION LIST
CLOCK
TIMER
DISPLA CALIBRATE BAROMETER: ▲▼
DISPLA 0.0
SCREENSAVER
BAROMETER ALTITUDE
▶ CALIBRATE BAROMETER
ACTIVE ANTENNA REMOTE POWER SUPPLY
LANGUAGE
```

Now adjust the air pressure display (on top of the left) with the keys ▲ and ▼ until it conform to the reference air pressure.

## Antenna remote Power Supply

If the WIB4S is running with an active antenna (12V), the remote power supply must be switched on, so that the antenna is supplied with current. In order to switch the remote power supply on, select the menu item **ACTIVE ANTENNA REMOTE POWER SUPPLY** in the menu **SETTINGS**.

```
1034.2hPa  -.-hPa/3h  13:25
SETTINGS
-----
SELECT DWD FREQUENCY
NAVTEX 518KHZ STATION LIST
NAVTEX 490KHZ STATION LIST
CLOCK
TIMER
DISPLA MODIFY REMOTE POWER SUPPLY: ▲▼
DISPLA REMOTE POWER SUPPLY ON
SCREENSAVER
BAROMETER ALTITUDE
CALIBRATE BAROMETER
▶ ACTIVE ANTENNA REMOTE POWER SUPPLY
LANGUAGE
```

To switch on and off the remote power supply please use the keys ▲ and ▼. If you use a passive antenna the remote power supply must be switched off.





## System Information

To display the system information select the menu item **SYSTEM INFORMATION** in the main menu.

```
1021.3hPa  --hPa/3h  11:27
MAIN MENU

DWD 147.3KHZ (GERMAN)
NAVTEX 518KHZ (ENGLISH)
NAVTE
BARO
SETT
TEST
SYSTEM INFORMATION
  SYSTEM INFORMATION
    FIRMWARE VERSION: 1.0.2
    SERIAL NUMBER: WIB3S0211015
```

The system information shows the firmware version and the serial number of the device.

## Software

You can also use your PC to read the data of the WIB4S. The software appropriate is included in the scope of supply of the WIB4S. The software is working with the operating systems Windows XP, Vista and 7.

Software updates for the WIB4S will be spread via internet. Nevertheless, please look from time to time under <http://www.weatherinfobox.com>, to make sure, you have the latest version.



## Software installation

The software of the WIB4S is stored on the enclosed CD. The folder *Deutsch* contains the installation program for the German version and the folder *English* contains the appropriate installation program for the English version.

In order to install the software please start the required installation program (Setup.exe) with a double click. Afterwards you have to follow the instructions shown on the screen. After installation please attach the WIB4S via USB cable to the PC and start the WIB3 program.

Further instructions for using the software are available in the help of the application.

## Operating instructions

Please use the equipment only in the interior in dry environment. Do not expose the equipment in use to temperatures higher than 50°C and lower than 0°C.

## RTC Buffer Batterie

The WIB4S is equipped with an internal clock (RTC) which is buffered with a 3V lithium battery. If the clock does not work properly, the lithium battery must be changed. Wasted batteries must be disposed properly and do not belong in the domestic waste.

## Specifications

Receipt-frequencies	147,3kHz, 490kHz, 518kHz, 4583 kHz, 7646 kHz, 10100,8 kHz, 11039 kHz, and 14467,3 kHz.
LC-Display	240x128 Pixel, monochrom
PC-interface	USB Full Speed
Battery for internal clock	1 x CR2032
Resolution of air pressure sensor	0,1hPa
Absolute measurement error of the air pressure sensor	±1,5hPa
Typical long-term stability of the air pressure sensor	-1hPa/year
Air pressure measuring interval	60s
Maximum recording span air pressure	7 dys PC, 48 hours display
Supply voltage	12V
Current consumption	Approx. 70 mA without backlight
Antenna input	50Ω, BNC
Supply voltage active antenna	12V, max. 80mA
Operating temperature	0...50°C
Supported operating systems	Windows XP, Vista, 7
Memory for messages	each 256KB for NAVTEX 490/518kHz, 448KB for DWD, 63KB for barograph data
Dimensions (LxWxH)	Approx. 155mm x 97mm x 29mm
Weight	Approx. 300g

For inside use only.

## Warranty

If the WIB4S exhibits a defect due to production or material defects within 24 months starting from the purchase date, it is either repaired by us or exchanged free of charge against appropriate equipment. To wearing parts (e.g. housing, batteries, etc.) the warranty applies for six months starting from purchase date.

The warranty does not apply, if the defect is caused on inappropriate treatment or neglect of the manuals. A receipt of the warranty voucher with purchase date is required.

## Appendix NAVTEX Stations

A list of the NAVTEX stations for Navarea 1 (North Atlantic, North Sea and Baltic Sea), Navarea 2 (Atlantic East) and Navarea 3 (Mediterranean Sea) can be seen below. A liability for the correctness and completeness of the following entries cannot be taken over.

### NAVAREA 1 - North Atlantic, North Sea and Baltic Sea

518 kHz (international)

Code	Station	Latitude	Longitude	Time (UTC)
B	Bodø (NOR)	67° 16' N	14° 29' E	00:10, 04:10, 08:10, 12:10, 16:10, 20:10
E	Niton (GBR)	50° 35' N	01° 18' W	00:40, 04:40, 08:40, 12:40, 16:40, 20:40
G	Cullercoates (GBR)	55° 02' N	01° 26' W	01:00, 05:00, 09:00, 13:00, 17:00, 21:00
H	Bjuröklubb (SWE)	64° 28' N	21° 36' E	01:10, 05:10, 09:10, 13:10, 17:10, 21:10
I	Grimeton (SWE)	57° 06' N	12° 23' E	01:20, 05:20, 09:20, 13:20, 17:20, 21:20
J	Gislövshammar (SWE)	59° 29' N	14° 19' E	01:30, 05:30, 09:30, 13:30, 17:30, 21:30
K	Niton (GBR)	50° 35' N	01° 18' W	01:40, 05:40, 09:40, 13:40, 17:40, 21:40
L	Rogaland (NOR)	58° 39' N	05° 36' E	01:50, 05:50, 09:50, 13:50, 17:50, 21:50
M	Ostend (BEL)	51° 11' N	02° 48' E	02:00, 06:00, 10:00, 14:00, 18:00, 22:00
N	Ørlandet (NOR)	63° 40' N	09° 33' E	02:10, 06:10, 10:10, 14:10, 18:10, 22:10
O	Portpatrick (GBR)	54° 51' N	05° 07' W	02:20, 06:20, 10:20, 14:20, 18:20, 22:20
P	Netherlands Coastguard (HOL)	52° 57' N	04° 47' E	02:30, 06:30, 10:30, 14:30, 18:30, 22:30
Q	Malin Head (IRL)	55° 22' N	07° 21' W	02:40, 06:40, 10:40, 14:40, 18:40, 22:40
R	Reykjavik (ISL)	64° 05' N	21° 51' W	02:50, 06:50, 10:50, 14:50, 18:50, 22:50
S	Pinneberg (GER)	53° 38' N	09° 48' E	03:00, 07:00, 11:00, 15:00, 19:00, 23:00
T	Ostend (BEL)	51° 11' N	02° 48' E	03:10, 07:10, 11:10, 15:10, 19:10, 23:10
U	Tallin (EST)	59° 30' N	24° 30' E	03:20, 07:20, 11:20, 15:20, 19:20, 23:20
W	Valentia (IRL)	51° 56' N	10° 21' W	03:40, 07:40, 11:40, 15:40, 19:40, 23:40
X	Reykjavik (ISL)	64° 05' N	21° 51' W	03:50, 07:50, 11:50, 15:50, 19:50, 23:50

490 kHz (national)

Code	Station	Latitude	Longitude	Time (UTC)
C	Portpatrick (GBR)	54° 51' N	05° 07' W	08:20, 20:20
E	Corsen (FRA)	48° 28' N	05° 03' W	
L	Pinneberg (GER)	53° 38' N	09° 48' E	01:50, 05:50, 09:50, 13:50, 17:50, 21:50
T	Niton (GBR)	50° 35' N	01° 18' W	03:10, 07:10, 11:10, 15:10, 19:10, 23:10
R	Reykjavik (ISL)	64° 05' N	21° 51' W	03:18, 07:18, 11:18, 15:18, 19:18, 23:18
U	Cullercoates (GBR)	55° 02' N	01° 26' W	07:20, 19:20

## NAVAREA 2 - Atlantic East

518 kHz (international)

Code	Station	Latitude	Longitude	Time (UTC)
A	Corsen (FRA)	48° 28' N	05° 03' E	00:00, 04:00, 08:00, 12:00, 16:00, 20:00
D	Couna (ESP)	42° 54' N	09° 16' W	00:30, 04:30, 08:30, 12:30, 16:30, 20:30
F	Horta (AZR)	38° 32' N	28° 38' W	00:50, 04:50, 08:50, 12:50, 16:50, 20:50
G	Tarifa (ESP)	36° 01' N	05° 34' W	01:00, 05:00, 09:00, 13:00, 17:00, 21:00
I	Las Palmas (ESP)	28° 10' N	15° 25' W	01:20, 05:20, 09:20, 13:20, 17:20, 21:20
M	Casablanca (MRC)	33° 36' N	08° 38' W	02:00, 06:00, 10:00, 14:00, 18:00, 22:00
R	Monsanto (POR)	38° 44' N	09° 11' W	02:50, 06:50, 10:50, 14:50, 18:50, 22:50

490 kHz (national)

Code	Station	Latitude	Longitude	Time (UTC)
E	Corsen (FRA)	48° 28' N	05° 03' E	00:40, 04:40, 08:40, 12:40, 16:40, 20:40
G	Monsanto (POR)	38° 44' N	09° 11' W	01:00, 05:00, 09:00, 13:00, 17:00, 21:00
J	Horta (AZR)	38° 32' N	28° 38' W	01:30, 05:30, 09:30, 13:30, 17:30, 21:30

## NAVAREA 3 - Mediterranean Sea

518 kHz (international)

Code	Station	Latitude	Longitude	Time (UTC)
A	Novorossiysk (RUS)	40° 42' N	37° 44' E	03:00, 07:00, 11:00, 15:00, 19:00, 23:00
B	Mariupol (UKR)	47° 04' N	37° 33' E	01:00, 05:00, 09:00, 13:00, 17:00, 21:00
C	Odessa (UKR)	46° 29' N	30° 44' E	02:30, 06:30, 10:30, 14:30, 18:30, 22:30
D	Istanbul (TUR)	41° 04' N	28° 57' E	00:30, 04:30, 08:30, 12:30, 16:30, 20:30
E	Samsun (TUR)	41° 17' N	36° 20' E	00:40, 04:40, 08:40, 12:40, 16:40, 20:40
F	Antalya (TUR)	36° 53' N	30° 42' E	00:50, 04:50, 08:50, 12:50, 16:50, 20:50
H	Heraklion (GRC)	35° 20' N	25° 07' E	01:10, 05:10, 09:10, 13:10, 17:10, 21:10
I	Izmir (TUR)	38° 22' N	26° 25' E	01:20, 05:20, 09:20, 13:20, 17:20, 21:20
J	Varna (BUL)	43° 04' N	27° 46' E	01:30, 05:30, 09:30, 13:30, 17:30, 21:30
K	Corfu (GRC)	39° 37' N	19° 55' E	01:40, 05:40, 09:40, 13:40, 17:40, 21:40
L	Limnos (GRC)	39° 52' N	25° 04' E	01:50, 05:50, 09:50, 13:50, 17:50, 21:50
M	Cyprus (CYP)	35° 02' N	33° 17' E	02:00, 06:00, 10:00, 14:00, 18:00, 22:00
N	Alexandria (EGY)	31° 11' N	29° 52' E	02:10, 06:10, 10:10, 14:10, 18:10, 22:10
O	Malta (MLT)	35° 49' N	14° 32' E	02:20, 06:20, 10:20, 14:20, 18:20, 22:20
P	Haifa (ISR)	32° 49' N	35° 00' E	00:20, 04:20, 08:20, 12:20, 16:20, 20:20
Q	Split (HRV)	43° 30' N	16° 29' E	02:40, 06:40, 10:40, 14:40, 18:40, 22:40
R	Rome (ITA)	41° 37' N	12° 29' E	02:50, 06:50, 10:50, 14:50, 18:50, 22:50

Code	Station	Latitude	Longitude	Time (UTC)
T	Cagliari (ITA)	39° 13' N	09° 14' E	03:10, 07:10, 11:10, 15:10, 19:10, 23:10
U	Trieste (ITA)	45° 40' N	13° 45' E	03:20, 07:20, 11:20, 15:20, 19:20, 23:20
V	Augusta (ITA)	37° 14' N	15° 14' E	03:30, 07:30, 11:30, 15:30, 19:30, 23:30
W	La Garde (FRA)	43° 06' N	05° 59' E	03:40, 07:40, 11:40, 15:40, 19:40, 23:40
W	Astrakhan (RUS)	46° 18' N	47° 58' E	03:40, 07:40, 11:40, 15:40, 19:40, 23:40
X	Cabo de la Nao (ESP)	38° 43' N	00° 09' E	03:50, 07:50, 11:50, 15:50, 19:50, 23:50

490 kHz (national)

Code	Station	Latitude	Longitude	Time (UTC)
A	Samsun (TUR)	41° 19' N	36° 20' E	00:00, 04:00, 08:00, 12:00, 16:00, 20:00
B	Istanbul (TUR)	41° 04' N	28° 57' E	00:10, 04:10, 08:10, 12:10, 16:10, 20:10
C	Izmir (TUR)	38° 22' N	26° 36' E	00:20, 04:20, 08:20, 12:20, 16:20, 20:20
D	Antalya (TUR)	36° 53' N	30° 42' E	00:30, 04:30, 08:30, 12:30, 16:30, 20:30
L	Constanta (ROU)	44° 06' N	28° 37' E	01:50, 05:50, 09:50, 13:50, 17:50, 21:50
S	La Garde (FRA)	43° 06' N	05° 59' E	03:00, 07:00, 11:00, 15:00, 19:00, 23:00

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