



**NL-82002U u-blox NEO-M8U multi GNSS UDR USB receiver 1.50 m
operation manual (62756)**

1. Introduction

The NL-82002U is a USB GNSS receiver with an internal active antenna.

The GNSS receiving is realized using the u-blox NEO-M8U module. In this module, high-sensitivity sensors such as a 3D accelerometer and a 3D gyroscope are also integrated. These sensors enable the acquisition of dynamic three-dimensional motion data. These include speed, acceleration, direction and inclination. From this data, the NL-82002U acquires position data that complements the current GNSS position data. They allow reliable position determination even when the GNSS signal is interrupted in the case of four-wheeled vehicles.

In order to be able to fully utilize the UDR functionality, the receiver must be firmly and unchangeably connected to the chassis of the vehicle. At the first commissioning after reaching the 3D Satfix, an approximately 20 minute trip with a speed of more than 30 km/h has to be completed. The journey can be completed in normal road traffic with curves and acceleration periods. During this travel, the above-mentioned sensors values are calibrated fully automatic. During this time, the receiver supplies the normal GNSS position data. From the time of the successful sensor calibration, the UDR position data is added to the GNSS position data in the NMEA 4.1 protocol. The UDR data is determined and delivered with an updating rate of 20 Hz.

Due to the additional UDR position data, the receiver reliably delivers its position immediately after switching on even in the car park or garage.

If your vehicle is moved without its own force after calibration (towing, ferrying, etc.), the receiver automatically discards its calibration data. At the next trip meeting the above criteria it will be automatically recalibrated.

1.1. Contents*

- 1x Navilock NL-82002U
- 1x 8 cm CD ROM including operation manual

* Before using the device, please make sure that all the parts are included in the package. If any parts are missing or damaged, please contact your dealer immediately.

- **Important health and safety information**

When using this product, take the following precautions in order to avoid possible damages and legal consequences. Always follow all safety and operation manuals exactly and keep them for future reference. Observe all warnings in the operation manual and on the product. In order to avoid injuries, electrocution, fire and damages to the product, observe the following precautions:

- **Electric security**

This product is designed for operation with power supply via the USB port. Any other operation mode can be dangerous and may void the warranty claims for this product. This unit contains an internal back-up battery.

NOTE: RECYCLE OR DISPOSE OF USED BATTERIES OR RECHARGEABLE BATTERIES IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS AND THE INSTRUCTIONS INCLUDED WITH THE PRODUCT.



- **Precautions regarding direct sunlight**

Make sure the unit is not exposed to very high humidity and temperatures. Never leave the unit, the battery or the rechargeable battery for an extended period in a vehicle or plate, where the temperature can increase to over 60 °C (140 °F), for example on the dashboard of a car, the window sill or behind a pane of glass, which is directly exposed to the sun or very strong UV light. Otherwise the unit or the vehicle may be damaged, and the battery or the rechargeable battery may overheat.

- **Damages requiring repairs**

Disconnect the unit from the AC supply in the following cases; also disconnect the rechargeable battery and contact an authorized repair man or your dealer.

- Liquid or an object has entered the product.
- The product has fallen down or was damaged.
- There are visible signs of overheating.
- When operated normally, the product does not function flawlessly.

- **Avoid using the unit directly after strong temperature changes.**

If the unit is exposed to strong temperature and humidity fluctuations, condensation can form in the unit. In order to avoid damage to the unit, please wait until the condensation has dried off before using the unit.

NOTE: If you bring the unit from a cold to a warm environment, or vice versa, first let it get accustomed to the new temperature before turning it on.

2. Starting operation

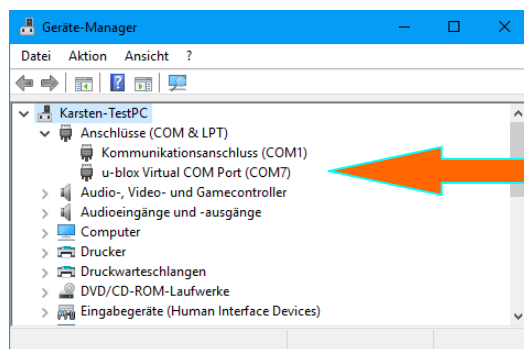
2.1. Assembly

The NL-82002U must be firmly and unchangeably connected to the chassis of the vehicle for reliable UDR operation. A temporary use in a vehicle will lead to a calibration described in the introduction.

2.2 Microsoft Windows

Plug the USB cable in a free USB port on your notebook etc. The NL-82002U will be recognized by your Windows operating system, which will attempt to install a driver. Abort this process, and load the driver from u-blox https://www.u-blox.com/sites/default/files/ubloxGnss_vcpDeviceDriver_windows_3264_v2.30.exe and install it.

Follow the installation instructions. After the installation is completed, restart your computer. Then the GNSS COM port will be available in the device manager under connections. Set this port in your navigation or route planning software. Do not use another program that accesses this port at the same time.



2.3. Calibration ride

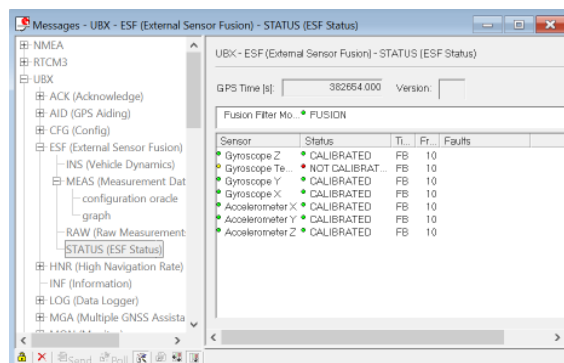
Check whether the receiver has a proper GNSS reception at the installation location. As a Fix Mode, 3D must be reached.

Drive with a car with good GNSS reception signals about 20 minutes. During the journey you must reach speeds over 30 km / h. The sensors calibrate automatically. You can see the success of the calibration on Fix Mode, which is then on 3D + DR. From now on, the advantages of the UDR GNSS position determination are available.

- Immediate position determination before departure. Also in a car park, in a garage or inside house sheds
- Position determination during the journey also in a tunnel, parking garage, in a garage, in the warehouse or in a hangar
- High navigation speed through a 20 Hz update rate of position determination

2.4 Check the sensor calibration

View \ Messages View



3. LED indicator

White lights: USB connection on

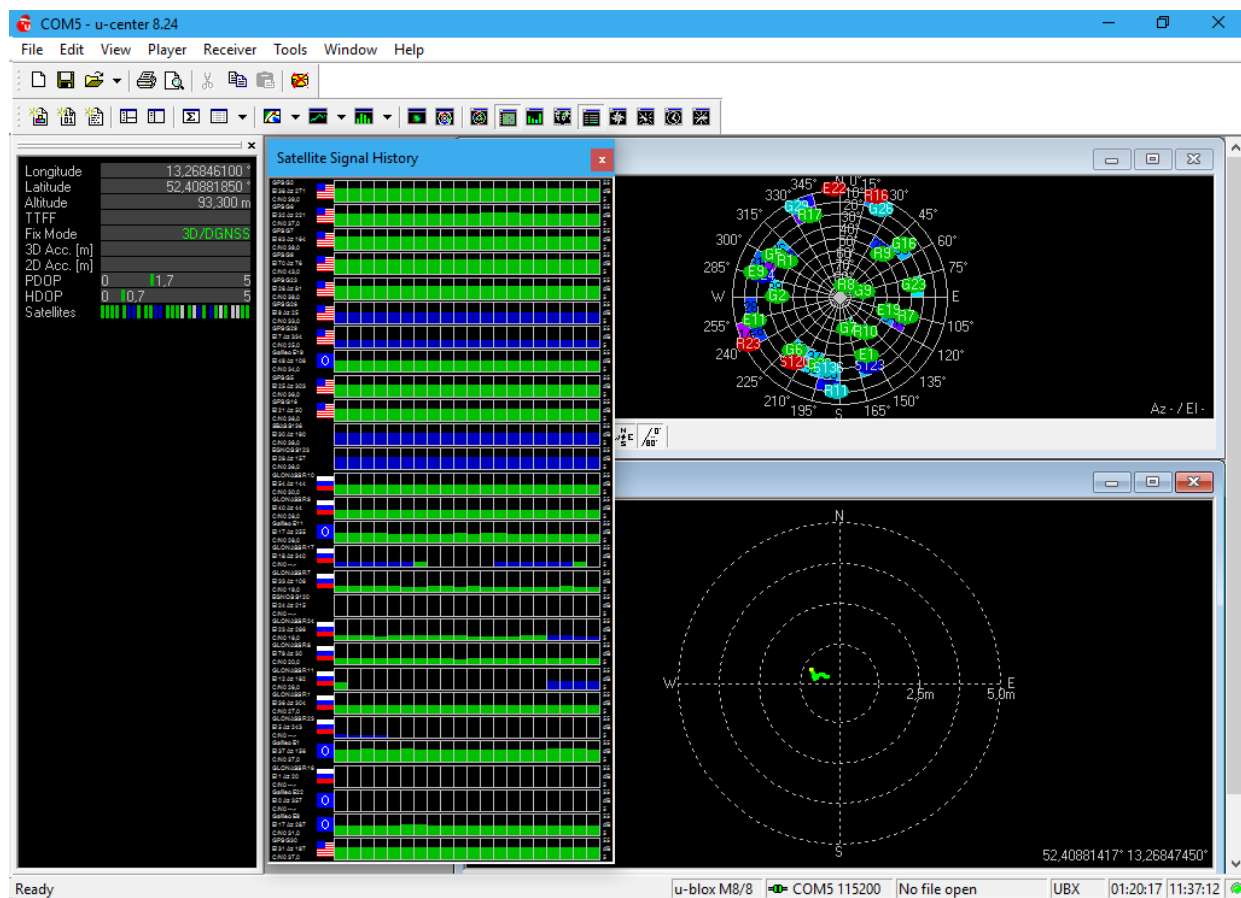
White flashes: GNSS satfix

4. Application environment

The NL-82002U can be used as a USB GNSS receiver under Windows 7/8.1/10.

5. Functional test and GNSS system selection with u-center 8.24 in Windows

- 5.1. Load the u-center software from: https://www.u-blox.com/sites/default/files/ublox-GNSS_u-center_windows_v8.24.zip. Install the software on your unit. Select the version suitable for your system. U-center is a pure test program and cannot be used for navigation or orientation. It must always be closed after the test. It blocks the COM port and does not allow any access of the navigation or routing software to the COM port. It also serves for updating the Assist GNSS data and other configuration switches as SBAS properties. If the NMEA protocol is displayed in u-center, but you cannot find a receiver in the application software, the connection problem is not with the receiver, but with the selected software setting. In this case, the software manufacturer support center may be able to help you.

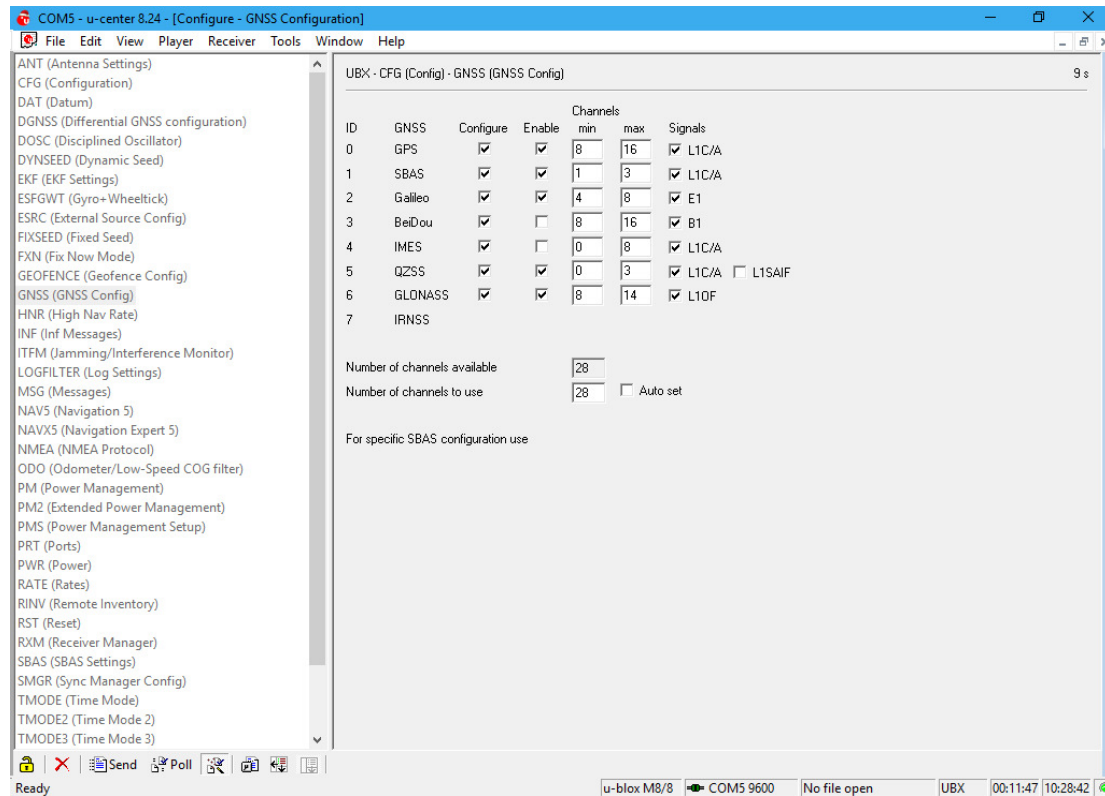


After starting the u-center software, check the functionality of your NL-82002U. As seen below, you can set up your u-center by yourself. Everything important can be connected and displayed immediately. The green bars at the bottom of the picture show the reception quality at your position. If no bars are displayed, please change your position. The NL-82002U cannot receive in a closed building. If the blue bars are displayed, the receiver is still acquiring the data and verifying the receipt data.

5.2. GNSS selection

To select which GNSS you want to use, proceed as follows.

View | Configuration View



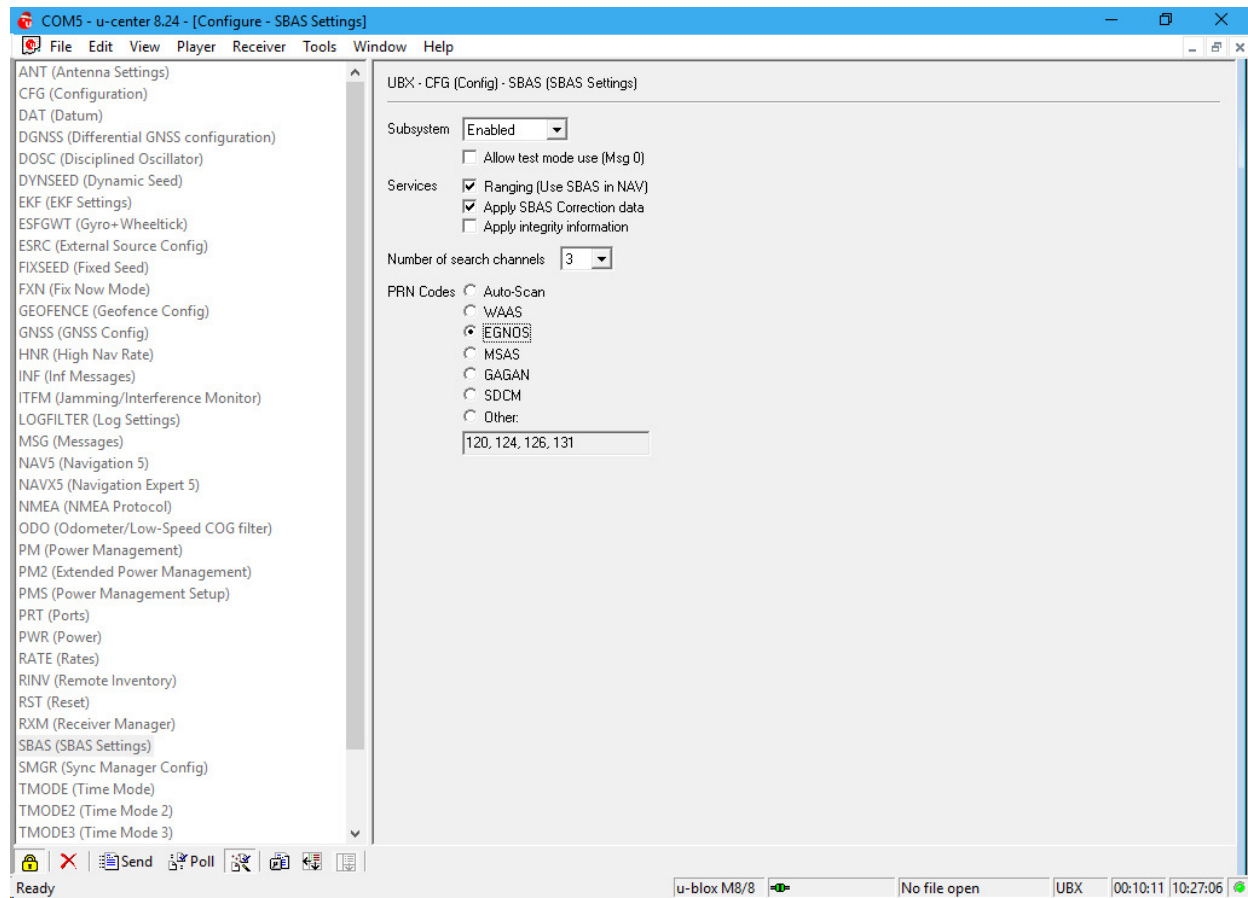
You can select your GNSS system or your combination of several systems on the right side. The following combinations available:

V	GNSS					SBAS						RTCM 2.3
	Galileo (EU)*	GPS (USA)	GLONASS (RUS)	BeiDou (CHN)	QZSS (J)	EGNOS (EU)	WAAS (USA)	MSAS (J)	GAGAN (IND)	SDCM (RUS)*	SNAS (CHN)	GPS
I		X	X		X	X	X	X	X	(X)		X
II		X		X	X	X	X	X	X	(X)		X
III			X	X								
IV		X	X			X	X	X	X	(X)		X
V		X		X		X	X	X	X	(X)		X
VI	X	X	X		X	X	X	X	X	(X)		X
VII	X	X		X	X	X	X	X	X	(X)		X
VIII	X		X			X	X	X	X	(X)		
IX	X			X		X	X	X	X	(X)		

* expected to be available in 2017, please visit our website for updates

** Expected to be available in 2017

6. EGNOS configuration with u-center 8.24



NL-82002U uses EGNOS as default. In the configuration menu you can check these options. For detailed information please use the documentation from u-blox https://www.u-blox.com/sites/default/files/u-center_UserGuide_%28UBX-13005250%29.pdf.

7. AssistNow configuration with u-center 8.24

The NL-82002U supports AssistNow.

AssistNow is a standard A-GNSS service, which increases the performance of the GNSS receiver by calculating a position almost immediately, even under difficult reception conditions. A-GNSS improves all GNSS capable applications, especially those that require a continuous state of readiness, for example applications for fleet management or GNSS capable hand-held devices, whose users would like to access local services immediately, independently of the reception conditions.

Without A-GNSS, a GNSS receiver must localize at least 4 satellites in direct line of vision, and then download their location data. This process takes 26 seconds under optimal reception conditions, but under less favorable conditions it may take much longer, e.g. in an urban environment or in a building, where the GNSS reception is weaker. AssistNow sends the data directly to the GNSS receiver, enabling a quick calculation of the position.

The offline service provides support data, which are valid up to 35 days. The user can profit for longer periods from the increased satellite acquisition performance, and they need an internet connection only occasionally, in order to update the support data.

Tools\AssistNow Offline\...(u-blox M8)

Please use the following server token in the configuration menu:

8cLxZxp_10Wya9h1eU_gBA

Multiple GNSS AssistNow Offline

Primary Server: offline-live1.services.u-blox.com

Secondary Server: offline-live2.services.u-blox.com

Get Token Default Servers

Server Token: 8cLxZxp_10Wya9h1eU_gBA

☐ Verify server certificate

☐ Request u-blox 5 - 7 format data

GNSS

☒ GPS

☒ GLO

Period (weeks): 5

Resolution (days): 1

Number of days: 1

Download

http://offline-live1.services.u-blox.com/GetOfflineData.ashx?token=8cLxZxp_10Wya9h1eU_gBA;gnss=gps,glo;period=5;resolution=1

Transfer Type

☒ Flash Update

Clear Flash

☐ Host Based

Reset Command: coldstart

Flow Control

☐ Simple

☐ None

☐ Smart

Transfer

Start

Legacy

Aiding

Server

Close

Data Status: None

GNSS	Date
------	------

Clear

Further information to the u-center can be found in the u-blox documentation under [https://www.u-blox.com/sites/default/files/u-center UserGuide %20UBX-13005250%29.pdf](https://www.u-blox.com/sites/default/files/u-center%20UserGuide%20UBX-13005250%29.pdf). If you have any questions, please contact u-blox directly.

8. Possible sources of error and their elimination

- 8.1 The white LED on USB plug A doesn't light up after the first connection to the USB port.
Make sure that the PC or notebook is turned on, and test the USB port, possibly with another USB device. If this other USB device works fine, please contact the support center.
- 8.2 You still don't get a satfix.
The NL-82002U needs up to 20 minutes for its first satfix on another continent. To get a satfix the line of sight to the sky must be unobstructed. Move the NL-82002U as far as possible from the wall. A wall reflects the signal strongly and contributes to the satfix time delay.
- 8.3 Your PC doesn't support the auto start function, and doesn't start the CD-ROM automatically.
Please check <http://msdn2.microsoft.com/en-us/library/Aa969329.aspx>.
- 8.4. The NL-82002U came in touch with jet water (water jet from a shower head or strong rain when it was mounted on a car roof). Do not connect the receiver with the notebook etc. under any circumstances, because it can otherwise be completely and irreparably destroyed. Return the receiver to our support center, mentioning "water damage". The support center will disassemble the receiver, dry it and check its functionality.
The Navilock repair center tries to be as obliging as possible, so please tell us the real reason for the defect. During the error analysis, we can generally detect if the cause for the defect was an external cause, water damage, fall, over-voltage or the wrong handling of the unit.

Before visiting your dealer, please contact the Navilock support center. They will try to help you quickly and without further ado, so that the circumstances of an exchange, which might in any case be unnecessary, are avoided.

In this case, please write down a detailed description of the error, add this information to your end device and the software used in this device, as well as the operation environment (operating system, service pack version, CPU type, storage size, hard disk drive and interface etc.), and send an e-mail to support@navilock.de.

A support member will look into your problem and work out a solution.

We hope your Navilock product brings you fun and enjoyment!

9. Specifications

Chip set manufacturer/type	u-blox NEO-M8U		
Channels:	72 channels		
Sensitivity	-160 dBm		
Frequency:	GPS:	L1, 1575.4200 MHz	
	BEIDOU COMPASS:	B1, 1561.0980 MHz	
	GALILEO:	E1, 1575.4200 MHz	
	GLONASS:	G1, 1602.5625 ~ 1615.5000 MHz	
Target precisions:			
Position horizontal:	GPS/SBAS/QZSS+GLONASS and TCXO 2.0 m CEP		
Time:	1 microsecond synchronized with GPS time		
Speed:	0.1m/s		
Date:	WGS-84		
Protocol:	NMEA-0183 V4.1 GGA, GSA, GSV, RMC, VTG		
Detection rates:			
Cold start	26 s average		
Hot start	1 s average		
Re-Acquisition:	1 s average		
Update rate:	20 Hz		
Dynamic prerequisites:			
Acceleration limit:	smaller than 4g		
Height limit:	50000 m		
Speed limit:	500 m/s		
Performance:			
Power supply:	5 V DC via USB		
Connection:	USB Type-A plug		
Cable length:	1.50 m		
Operating temperature:	-20 °C ~ 60 °C		
Dimensions (LxWxH):	ca. 65 x 45 x 22 mm		

10. Certificate

CE

11. Warranty period

Your GNSS receiver will be repaired free of charge within the legal warranty period, unless it was damaged due to external cases, humidity dropping or other damages due to improper usage. Your dealer is always ready to help you. Please send your unit for repairs directly to:

**Navilock Repair Center
Beeskowdamm 13/15
D-14167 Berlin-Zehlendorf**

Postage must always be paid by the client.

Please add a proof of purchase and a detailed error description. Time based error, meaning how often an error occurs, must be expressly mentioned.

For logistic reasons, we cannot accept returned packages without the postage being paid by the client.

12. Support

For additional support questions, please contact our support center:

support@navilock.de / www.navilock.com or by telephone: +49 30 84716503*.

You can also call the Service Hotline at the following hours: Mo – Fr.: 9:00 – 16:30.

* You will be charged a connection fee for a telephone call to Germany/Berlin, in accordance with the connection fee overview of your telephone service provider. Callers from Germany, who subscribed to a national telephone flat-rate service and can call nation-wide fixed-telephone numbers free of charge, can call us without incurring additional charges.

You can also find current product information on our homepage. www.navilock.com

13. Final provision

The information and data contained in this manual may be changed without prior notice. Errors and misprints reserved.

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15. Brands of third parties

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Conformity declaration

Please download the Declaration of Conformity from <http://www.navilock.de/support/> in the conformity area.



WEEE note

The WEEE (Waste Electrical and Electronic Equipment) directive, which came into force on 13 February 2003, lead to a comprehensive change in the disposal of used electric products. It is the main purpose of this directive to avoid electric waste products (WEEE), while simultaneously promoting the re-usage, recycling and other forms of reconditioning in order to reduce the amount of waste. The WEEE logo on the product and the package shows that the product should not be disposed of with regular garbage. You are responsible for disposing all used electric and electronic devices at the corresponding collection sites. The separate collection and meaningful re-usage of electronic waste helps to deal with natural resources more economically. In addition, re-using electronic waste contributes to the preservation of the environment and human health. Additional information regarding the disposal of electric and electronic devices, their re-usage and the collection sites can be found at your local authorities, disposal companies, specialist shops and the manufacturer of the product.

RoHS conformity

This product meets the requirements of directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003, concerning the limited usage of dangerous substances in electric and electronic devices (RoHS) and its amendments. This product complies with the directive 2011/65/EU from January 3rd 2013.

EU Import:

Tragant Handels- und Beteiligungs GmbH Beeskowdamm 13/15, 14167 Berlin, Germany

Status: 01/2017