

OMS-Repeater CRANE

Manual



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1 Revision history

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Revision	Datum	Beschreibung	Autor
V1.0	16.05.2019	Initial Release	ML2/ SN2
V1.1	25.11.2019	Update App	ML2/ SN2
V1.2	26.05.2020	Update style sheet	SN2
V1.3	08.12.2020	Adjustments to the new software version	JG/EH2

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2 General information

These operating instructions are part of the WEPTech wireless M-Bus / OMS repeater CRANE and contain texts and images for the correct use of the product. In this section, we give you an overview of general information about the product and the operating instructions.

2.1 Scope of delivery

- One (1) wireless M-Bus/ OMS repeater CRANE

2.2 Signal words and warning symbols used

Symbols used:



DANGER/ WARNING/ CAUTION



Note



Information

2.3 Safety instructions



WARNING! The repeater is operated with 230V AC voltage. Installation and connection may only be carried out by qualified personnel. All live parts must be switched off before installation.



It is required that a suitable, all-pole disconnection device must be available as part of the building's electrical system. Before opening the housing, ensure that all poles are disconnected from the line voltage.



WARNING! In order to prevent danger to the operating personnel and damage to the device, the work described must be performed by qualified personnel.



CAUTION: Failure to observe the safety instructions can result in fire, electric shock and other injuries or damage to the device or other property (The housing is made of plastic with sensitive electronic components and batteries inside).



Note: Limitation of liability: The manufacturer assumes no liability for non-compliance with the operating instructions, improper use, modification or damage to the device.

2.4 Directives, laws and standards

The use of radio frequencies is limited by national regulations. This repeater was developed in accordance with the requirements of RED (Radio Equipment Directive) 2014/53 / EU.

2.5 Validity

These operating instructions apply exclusively to the product CRANE OMS repeater with the order number A001-0061-001.

2.6 Storage of documents

This manual and all other applicable documents should always be kept in a place where those, working with the device, have access to it.

3 Description of the device

3.1 Product information

The present device serves as a repeater for any wM-Bus device according to EN 13757-4. With the help of the repeater, it is possible to increase the range of wM-Bus devices.

The forwarding of the telegrams from devices (e.g. meters) takes place permanently, which means no caching takes place. The received telegram is written in a ring buffer and the time delay, according to the OMS specifications, takes place randomly in the range of 5 - 25 seconds. During this time, further telegrams can be received. The telegrams from the same meter are discarded during this time. The telegrams stored in the ring buffer are sent one after the other with the random delay.

Telegrams with regard to the status of the repeater are sent within a settable time interval of 0 - 15 minutes. According to the OMS specification, only one hop is allowed between wM-Bus devices and a gateway. The repeater supports the modes S, T and C and can receive in one mode and forward in another mode.

The legally prescribed duty cycle in the 868 MHz frequency range is checked by the repeater and independently maintained. The duty cycle is determined by the number of wM-Bus devices and the transmission frequency per time period (15 min/ 60min configurable). If it is exhausted, further telegrams received during this period are rejected and not saved.

A typical forwarding procedure is described below as an example:

A sender (e.g. water meter) sends out a telegram and does not reach a gateway directly. The repeater receives this telegram and stores it temporarily in a buffer memory, which is designed as a ring buffer. Then it randomly begins to determine the transmission delay in the range of 5-25 seconds (see OMS specification: <https://oms-group.org/en/open-metering-system/oms-specification>)

During these processes, the receptivity of the repeater remains intact. Telegrams from the same transmitter are discarded during this time; Telegrams from other transmitters are added to the buffer memory. After the determined transmission delay, the repeater goes into transmission mode and forwards the corresponding telegram in the buffer memory.

During this process, a receiving operation is not possible; possible incoming telegrams are ignored. Afterwards it turns back into receive mode, stores incoming telegrams in the buffer memory and changes into transmit mode after the determined transmission delay. It now sends the next telegram in the buffer memory before it returns to receive mode. This procedure continues until the Duty-Cycle for the corresponding time period is exhausted. All of the received telegrams during this time are discarded and not saved. The repeater will resume its full functionality within the following time period.

The device is configured via NFC interface. For this purpose, WEPTech provides an Android application. The app can be obtained here or is available on request:

<https://play.google.com/store/apps/details?id=de.weptech.nfcconfigurator>





3.2 Features

Features
Usage within the temperature range: -20°C to +55°C
Usage within the humidity range: 0% - 70%
Easy mounted to the wall
Internal Antenna
Weight: <150g
Ideal for Smart Metering
Firmware Update via NFC
Configuration via NFC
Can be used in S-, T- und C- Mode

Table 1 Features

4 Initial commissioning

4.1 Device structure

The repeater consists of an upper and a lower part. The PCB is located in the upper shell of the housing. The lower part of the housing with the terminal block for power supply is used for mounting on a wall or ceiling. The assembly takes place without any additional tools by simply putting the top on the lower shell.

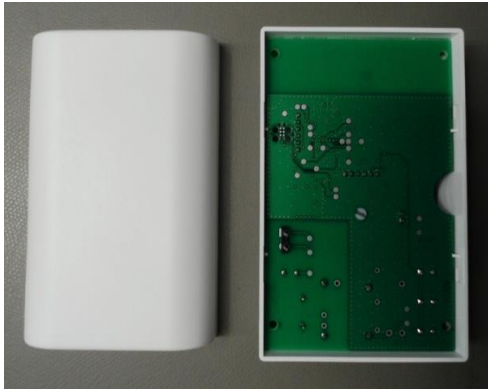


Figure 1 Upper shell



Figure 2 Lower shell/ terminal



Figure 3 Upper- and lower shell

4.2 Installation

The housing of the OMS repeater is primarily intended for mounting on an installation box (cavity wall socket, flush-mounted box, appliance box, or similar). This type of installation does not require separate mounting material. The lower shell is screwed onto the installation box and the electrical lines are placed on the screw terminal. Please note that only the outer conductor (L) and the neutral conductor (N) are applied. The protective conductor (PE) is not necessary for operation and can remain in the installation box.

The order in which external (L) and neutral (N) are connected must be observed. The outer conductor (L) must be placed on the lower terminal of the terminal block and the neutral conductor (N) on the upper terminal of the terminal block. After the installation process of the lower shell is finished successfully, the upper shell can be placed. The installation process is now completed and the repeater can be put into operation. Alternatively, the installation can be performed with additional mounting hardware (not included) and without an installation box. The lower shell of the housing offers appropriate mounting options.



Figure 4 Installation box



Figure 5 Installation box

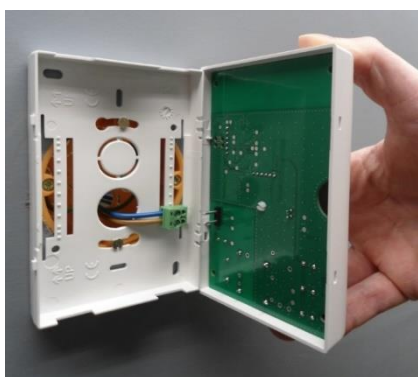


Figure 6 Placing the upper shell



Figure 7 Installed repeater

4.3 Commissioning

After a successful installation process, the OMS repeater can be put into operation by switching on the power supply. There is no possibility to switch the repeater on or off directly on the device (toggle switch, rocker switch, pushbutton, jumper, etc.). If the repeater is to be switched off or briefly disconnected from the power supply for a reset, the switching unit (circuit breaker, rocker switch, or similar) of the cable feed must be used.

After initial start-up, the repeater is in its standard configuration. With the help of the app, it must then be configured for the respective application scenarios.

Default settings:

- Receive and transmit modes: C
- Frame format: A
- Time span for calculating the duty cycle: 60 min
- Send interval: 6 minutes
- Security profile: 0 (no encryption)
- Address Management:
 - o RSL (Radio Scan List): empty
 - o Whitelist: all wild card

5 Configuration


To configure the device via NFC, please download the Android application “NFC Configurator” from the Play Store and install it:

<https://play.google.com/store/apps/details?id=de.weptech.nfcconfigurator&hl=de>




5.1 General use of NFC

Please note the following when configuring via NFC:

1. The NFC touchpoints must be placed one above the other. To do this, you must find out where the NFC touchpoint of your Android device is located. The NFC touchpoint of the SWAN 2 gateway is identified by the NFC logo on the front cover. 
2. If the devices are connected successfully, you will be informed via a haptic signal from your Android device (vibration).
3. After the successful connection, separate the two touchpoints from each other. The Android device **must not** be placed on the gateway during the configuration process. You will be asked to reconnect the NFC touchpoints if necessary.
4. All changes made in the app must be confirmed using the **WRITE/ EXECUTE** button and transferred to the device. A new NFC connection may be required for this.
5. Depending on the configuration, the loading process may take longer. A loading progress bar indicates this. Please maintain the connection of the NFC interfaces until complete.

5.2 Connect to the device

1. Open the „NFC Configurator App“ and place the NFC touchpoint of your Android device directly over the NFC touchpoint of the repeater. The NFC touchpoint of the CRANE repeater is identified by the NFC logo on the front cover. 

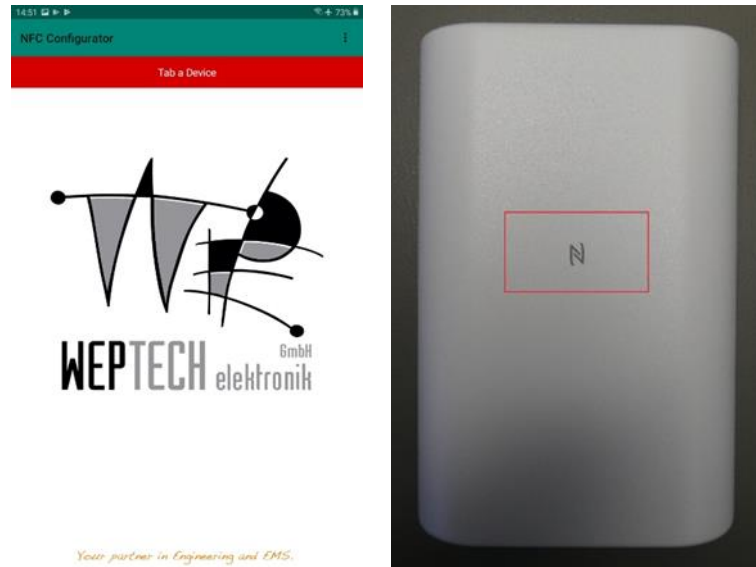


Figure 8 Connect to the device

2. If the connection is successful, you will be asked to enter the password (Standard password: "1234"). This password can and should be changed later (see section 6.5.3). After you have entered the correct number, you will be taken to the main menu of the device.

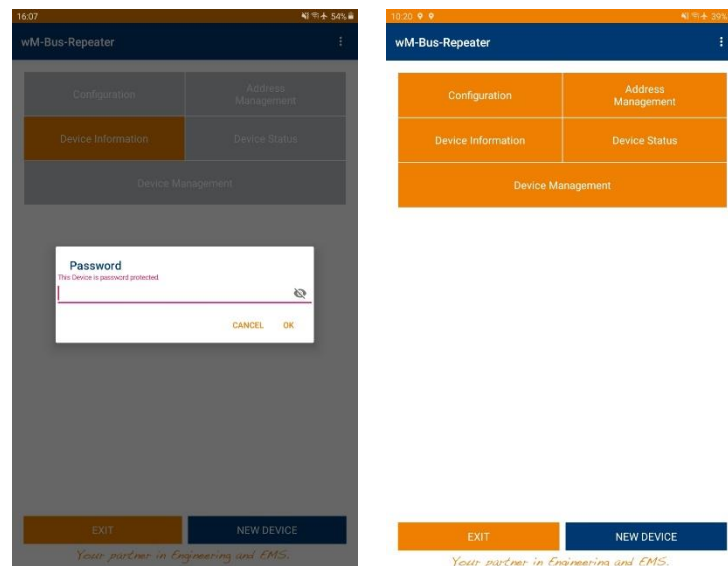


Figure 9 Password entry & main menu

6 Description of the functions

The menu structure is both intuitive and clearly laid out. The description of the individual main menu items and the submenu items can be found in the following sections.

6.1 Configuration

This menu item consists of the following setting options:

- Device
- WM-Bus
- Settings

You can navigate through the menu items either by selecting the respective menu item in the selection bar or by swiping left or right. A blue bar underneath the menu item indicates the current selection.

If the respective settings have been made for the menu items, this can be exited with either „Cancel“ or „Write“. With the "Cancel" option, the settings made are discarded; with the "Write" option, the settings made are transferred to the respective device. The "Write" button is only active when a change has been made in one or more menu items and input is a correct value.

6.1.1 Device

This tab can be used to read information from the repeater (Fig. 16). In addition to the ID, manufacturer and version of the device, the device type (see OMS specification: <https://oms-group.org/download4all/oms-spezifikation>) can also be determined. Settings cannot be made within this tab.



DEVICE	WM-BUS	SETTINGS
ID	00000000	
Manufacturer	WEP	
Version	06	
Device Type	32	

CANCEL WRITE

Figure 10 Configuration: Device

6.1.2 wM-Bus

This tab is used to set the reception- (RX)/ transmission mode (TX) and the frame format. There are several setting options for both operating modes.



Figure 11 Configuration: wM-Bus



Figure 12 RX mode

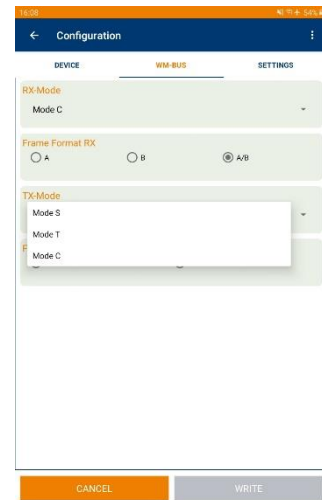


Figure 13 TX mode

6.1.2.1 Settings

This tab is used to select the transmission interval and the security profile of the status messages of the repeater and to set the duty cycle duration. The status telegram of the repeater contains the on-time, the number of RSL entries and the RX mode currently in use. The transmission interval can be selected from 0-15 minutes. The selection options for the security profile include Profiles A and B (with encryption) and Profile 0 (without encryption). Further information on the profiles can be found in the OMS specification (<https://oms-group.org/open-metering-system/oms-spezifikation>). The calculation duration of the duty cycle can be set to 15 or 60 minutes.



Figure 14 Settings

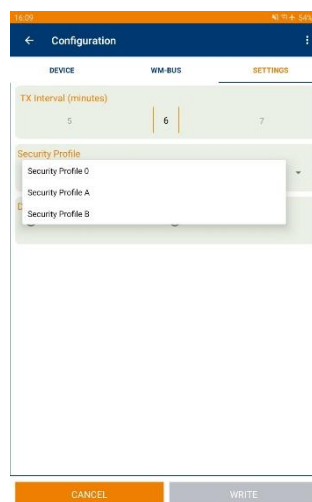


Figure 15 Security Profile

6.2 Address Management

A combined list consisting of RSL (Radio Scan List) and whitelist is displayed in this menu item. Sorting according to various criteria is possible. With an additional menu, accessible via the three points at the top right, new whitelist entries can be created by direct input, this view can be read in again (**Attention:** changes that have not been transferred yet, are lost) or the whitelist can be deleted.

The RSL consists of the wM-Bus address and the signal strength of the last packet received. The whitelist can be created from these displayed addresses by selecting or deselecting them. In addition, it is also possible to add it directly to the menu item "Add wM-Bus-Device". A total of up to 20 entries can be made. If the whitelist was successfully transferred through a write process, from this point onwards only devices that meet the criteria will be forwarded.

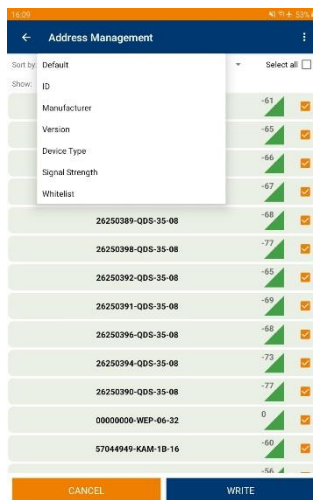


Figure 16 Sorting



Figure 17 Menu

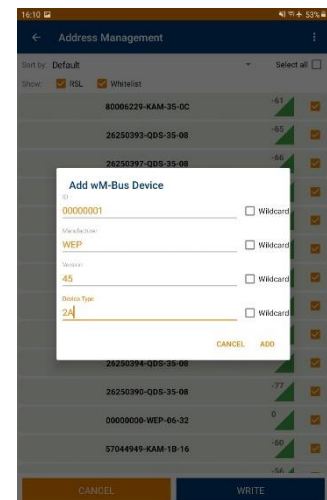


Figure 18 Add device

6.3 Device information

This menu item shows information about the current device, such as the article number, ID and the firmware version. This menu is also accessible without typing in the password.

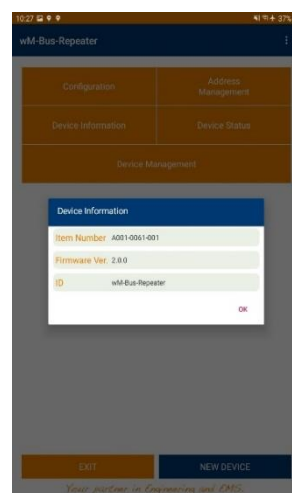


Figure 19 Device information

6.4 Device Status

This menu item shows information about the current status telegram of the device; Current reception mode, number of device and operating times received since the last power up in minutes.

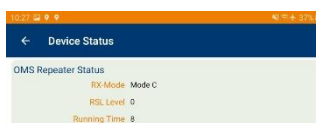


Figure 20 Device status

6.5 Device Management

The firmware update and a factory reset can be carried out in the Device Management menu. The device password can also be changed here. The individual options are described below:



Figure 21 Device Management

6.5.1 Firmware Update

This menu item allows the user to update the firmware of the current device. There are two options to update the firmware.

6.5.1.1 Check Update Online (internet connection required)

After pressing "Check Update Online" a review is carried out. The app checks for the latest firmware update available on the WEPTECH server. This process can take a few seconds. Information about the old and the new version of the firmware is then displayed. If the versions differ, an update should definitely be carried out. The update can either be carried out immediately or according to a specific date. With the "Activate Later" option, a calendar also opens where the date and time can be selected. The picked date will then be shown.

In this menu you can also choose to select a local update file.

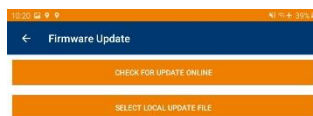


Figure 22 Firmware Update



Figure 23 Activate now



Figure 24 Activate later

6.5.1.2 Select Local Update File (no internet connection required)

You can also choose to select a local update file from your mobile device to update the firmware. A local update file is only released and sent to you by the WEPTECH elektronik GmbH.

6.5.2 Factory Reset

The menu item "Clear RSL" can be used to set whether the RSL is to be deleted or not. The RSL is a list of devices that the repeater has received since it was last deleted.

The menu item "Clear Whitelist" can be used to set whether or not the whitelist is deleted. By deleting the whitelist, the repeater forwards each received telegram according to the functional description. The menu item "Reset Configuration" resets the repeater completely to the delivery status.

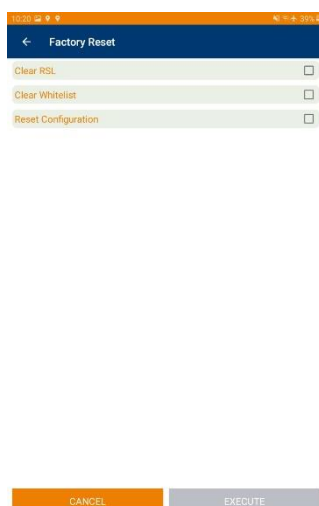


Figure 25 Factory reset

6.5.3 Change Device Password

This menu item allows the user to change the password. Either the initial password (1234) or a password previously assigned by the user can be changed after the repeater has been installed for the first time.

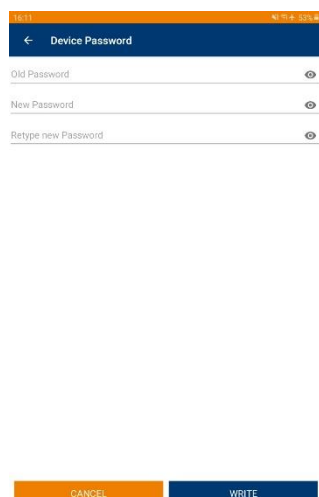


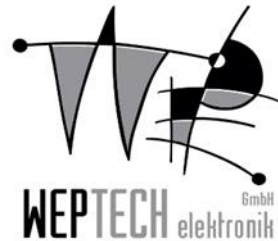
Figure 26 Change device password

6.6 New Device

This menu item enables a connection to a new device to be established without closing and reopening the app.



Figure 27 Main menu



Your partner in Engineering and EMS.

Figure 28 Read new device

7 Declaration of Conformity



Declaration of Conformity



We, the manufacturer

WEPTeCH elektronik GmbH
Ostring 10
76829 Landau
Germany

declare under the sole responsibility that the product:

Item Number: A001-0061-001
Description: Wireless M-Bus / OMS Repeater CRANE

with the included components:

Description	Item Number
-	-

is in conformity with the provisions of the following EU directive; and are designed and manufactured with application of the harmonized standards.

Applied directives and harmonized standards

Type	Document	Issued / Version
RED Directive	2014/53/EU	
Health & Safety (Art. 3(1)(a)):	IEC 62368-1	2014 (2.Edition) and Cor. 1: 2015
	EN 62368-1	2014/AC: 2015/A11: 2017
EMC (Art. 3(1)(b)):	ETSI EN 301 489-1	V2.2.3
	ETSI EN 301 489-3	V2.1.1
Spectrum (Art. 3(2)):	ETSI EN 300 220-1	V3.1.1
	ETSI EN 300 220-2	V3.1.1

The mentioned product is compliant to the RoHS Directive (2011/65/EU)

Landau, 2020-11-03


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 Manufacturer / Authorized representative
 i.V. Ulrich Schmitt

President: Oswald Maurer
Commercial Register Landau HRB 2583

Applicable Documents:
Change-Control-Management_ A001-0061-001

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8 Disposal

All old electric and electronical appliances have to be exposed of separate from the domestic waste over locations provided for this by the state. In accordance with EU Directive 2012/19 // EC on old electrical and electronic devices and their implementation in national law, old electrical devices must be collected separately and recycled in an environmentally friendly manner.

9 Copyright protection

Transmitting, as well as copying, of this document and utilization of its contents are not permitted, if not explicitly allowed. Violation obligates compensation. We reserve all rights in this document and in the subject matter and illustrations contained therein.

10 Warranty information

Great care was taken in preparing this manual. No guarantee is given for the correctness of the contents of this manual since errors, in spite of all efforts, can never be completely avoided.

11 Disclaimer

The author reserves the right to not be responsible for the topicality, correctness, completeness, or quality of the information provided. Liability claims regarding damage caused by the use of any information provided, including any kind of information which is incomplete or incorrect, will therefore be rejected. Parts of the pages or the complete publication including all offers and information may be extended, changed or partly or completely deleted by the author without separate announcement.

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12 Operating limitations

WEPTech elektronik products are not authorized for use in life support appliances, devices, or other systems where malfunction can reasonably be expected to result in significant personal injury to the user, or as a critical component in any life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness. WEPTech elektronik GmbH customers using or selling these products for use in such applications, do so at their own risk and agree to fully indemnify WEPTech elektronik GmbH for any damages resulting from any improper use or sale. Use of WEPTech elektronik GmbH products commits the user to the terms and conditions set out herein.

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Note:

The information, instructions and descriptions in this manual refer to the actual operating and service conditions herein.

For technical questions, safety notes or technical failure, please contact WEPTech elektronik GmbH.

We reserve the right to technical modifications.