User manual
MR902

Table of contents

Warning and safety instructions:

⚠️

- The battery in this product complies with the relevant IEC safety standards for batteries.

- Please read the safety instructions on the power supply before use.

- The power supply unit must meet the relevant IEC safety standards.

- The battery must not be replaced, and the product must be sent for repair.

- The product must not be disassembled. Risk of electric shock!

- Read the intended use before putting it into service.

- The product is not water-resistant unless noted in product specification.

Contraindications

In general, the product cannot be used if:

- The disabled client/patient is mentally ill.
- The disabled client/patient is critically ill.
- The client/patient is unable to use the transmitters.

Lifetime after mounting of the device

The battery, if applies, must be replaced when the battery replacement information appears on the display and according to the user manual.

Lifetime is evaluated in relation to the pressure button. This is made according to the supplier's specification.

Lifetime battery (products using battery, only)

KNOP calculates the life of the batteries. See specification in the user manual.

Intended use

In general, the different variants of the medical device (transmitters/receiver system from KNOP Elektronik) are made as assistive aid for impaired/disabled patients to be able to call for assistance.

The various variants of the medical equipment consist of a combination of products (transmitter and receiver) designed to call for help to impaired/disabled patients; The transmitter-receiver system can be activated in different ways:

- For example, patients who actively do this and are aware that they are calling for help, such as e.g., people with walking difficulties who need help going to the toilet.
- Or disabled patients who are not aware that they are inadvertently putting pressure on the sendere.g. during a seizure.

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- • Or patients with intellectual and cognitive deficits who are not aware that a receiver is receiving a signal from their transmitter when they leave a house or room.

The system is not designed for critically or mentally ill persons.

General product description

The products manufactured by KNOP elektronik consist of several variants of transmitters and receivers that can be combined with each other. In addition, these products are used in combination with positioning and repeater systems.

These products are medical devices intended to call for assistance and are used for disabled/mobile people, such as those with walking difficulties who need help going to the toilet. The transmitters are activated, for example, by a sound or by pressure (e.g. by pressure with a finger or a breath through the mouth). The recipient is supervised by health care personnel or lay people in private homes.

The system is not designed for critically or mentally ill people.

Part of product	Function in the product system
Transmitter	The transmitter can send the signal obtained from the patient to the receiver monitored by the healthcare personnel or lay person. The transmitter products can be activated by button, sound, blow or movements.
Receiver	The transmitters can be coded into all the receivers and to several receivers at the same time. Some receivers also have a summon button for calling assistance from their coworkers.
Repeatersystem	If it is needed to cover a more comprehensive and larger area a repeater system is used. The repeater system also gives an increased functionality as e.g. that an alarm automatically is received at first at the healthcare person closest to the client.
Positionsystem	If a sender is equipped with a position receiver it can be used in connection with a Position system. Not all product variants include position receivers. Typically, it is seen in connection with nursing homes and security for patients with dementia. The receivers can be portable or stationary.

Product description

MR902 is the primary unit of our Master Repeat System.

Together with RP902, the MR902 will extend the range and functionality of the system and devices. Up to 14 repeaters can be added to a system.

As a stand-alone unit, it adds new functionality to the devices.

Installation

MR902 only needs to be connected to a 230V socket. There are no cables between the units.

The product switches on automatically when it is connected to the mains.

Light emitting diode - LED

The LED is either green or red when switched on.

RED:	Error, not connected.
RED flashing:	Battery mode.
GREEN:	Connected, everything works fine.
GREEN flashing:	Confirmation.
NO light:	The device is switched off.

Backup

MR902 has an internal backup battery to keep the system running in the event of a power failure. The battery lasts for a few hours. If necessary, the battery can be recharged (full charge takes about 24 hours). The battery is not intended to be used as a replacement. Contact your retailer for battery service.

Commissioning

Before using MR902, the system must be configured for the current system.

Important: It is important that the clock is set on the MR902 as it is the system clock. Other products will be set after MR902 system clock. See main menu.

Note: The display language is in English only.

Setting up a system is quite simple.

- First determine the number of repeaters. In most cases, it is fine if you have no more than 25 meters between them. It depends on the building material, is it wood, concrete etc. You can check the connection level in the menu. (menu reports) We recommend above 3.0, otherwise you can just add an extra RP902.

- For example, if you have 5 repeaters, you have set the system size to 6, which is closest to the menu settings/system size.

- When you need to add repeaters to the system (menu repeaters / add new)

- Wait for about one minute per repeater. The system will automatically figure out how to make the connections between them. When all RP902 and MR902 units are ready, the green LED will light up. This is done every time the system is switched on. When the system is running normally, the system often checks the interconnection in the background.

- The basic system is now working. The installation of RP902 and MR902 is now complete.

- Receivers must now be added, this is done in the receiver menu when setting up the system or via KNOPtool when connecting to MR902. See the user manual for your receiver.

- KNOPtool can be used to configure the whole system as well as the receiver/transmitter. See the manual for installation of KNOPtool. This way you have a complete copy of the system setup.
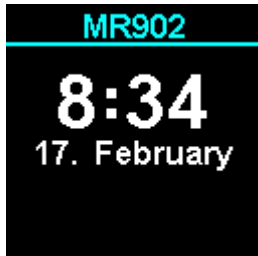
Start screen

The unit must be connected to a wall outlet before use.
The system clock normally appears on the display.
The system name "if coded" is shown at the top. By default, MR902.

 Set the clock !

Main menu

If you press ⬇ and ⬆ at the same time, either on the lock screen or on the home screen, it opens the main menu.

General information about the menu function:

Operation

Press ⬆ ⬇ to move the green arrow either up/down or right/left in the menu.

Press Esc to cancel the selection or exit the menu.

Press Ent to accept the current choice.

Note: After about 15 seconds of inactivity, the menu returns to the home screen.

Main menu - Repeaters

In this menu it is possible to add, modify, delete and check the status of the repeater.

Select *Repeaters* and press Ent to confirm. Press Esc to exit.

Add a new repeater, press "Add new".

This means that a new repeater is added to the system.
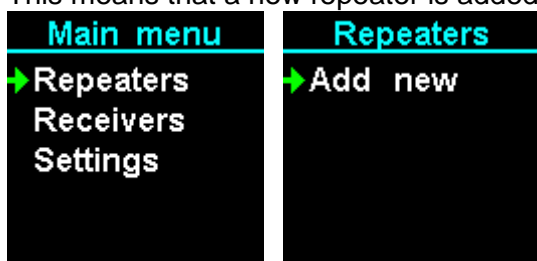
Select *"Add new"* and press Ent to confirm. Press Esc to exit.

Please wait, the MR902 will search for a new RP902 device.
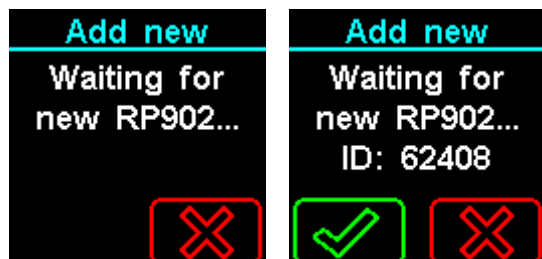
To add the RP902 device found, press Ent to confirm. Press Esc to exit.

The display has now been added to RP902 unit. The LED on RP902 will also glow green to show that it is connected.

In this case, the added RP902 is shown on the top line as repeater "1".
"1:5.0Y 9.9%", where 1=RP902 number, 5.0Y=antenna quality, 9.9%=rebroadcasts.

For a newly started system, the retransmissions will show a higher value due to the set transmissions at start-up, if needed you can select "Reset statistics in menu".

If you select a repeater by pressing Ent on the repeater you want to view, you will get a list with information about the repeater.
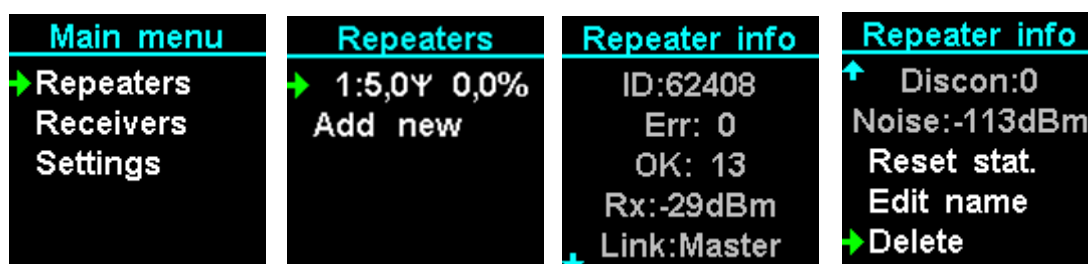
ID:	The ID or serial number of the selected repeater.
Err:	Transmission error.
OK:	Call handled.
RX:	Receive level. Higher numbers are better, e.g. -30 dBm is better than -40 dBm.
Link:	Connected for example to a Master or another RP902.
Discon:	Number of interruptions.
Noise:	Noise level. Lower numbers are better, e.g. -112 dBm better than -100 dBm.

Restored status.

This clears all status logs etc.

| Main menu	Repeaters	Repeater info
➤ Repeaters Receivers Settings	➤ 1:5,0Ψ 0,0% Add new	↑ Discon:0 Noise:-113dBm ➤ Reset stat. Edit name Delete

Select **"Reset status"** and press Ent to confirm.

Edit name

Edit the name of the repeater. The name is not used in the system, but it is for your information. The name can be the location of the repeater.

Main menu	Repeaters	Repeater info
➤ Repeaters Receivers Settings	➤ 1:5,0Ψ 0,0% Add new	↑ Discon:0 Noise:-113dBm Reset stat. ➤ Edit name Delete

Select **"Edit name"** and press Ent. Press Esc to exit.

Press Esc to return to the Repeater menu.

Edit name
Save? no◆pqrstuvw |Corridor OK: 0
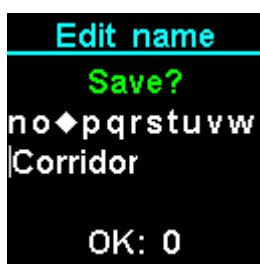
Press ⬇ ⬆ to change the letter.

Press Ent to select a letter.

Press Esc to choose to delete a letter.

Press Esc for about 3 seconds to close the menu.

To save the new name, select the symbol ◆ and press Ent .

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Delete

Remember to erase a repeater unit if it is not used or is replaced. An idle or replacement can slow down the system.
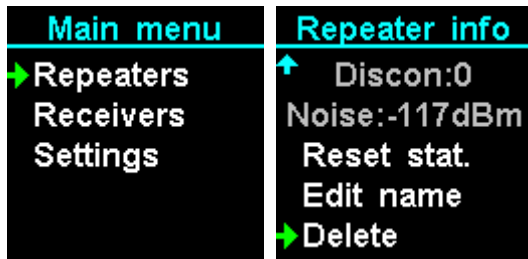
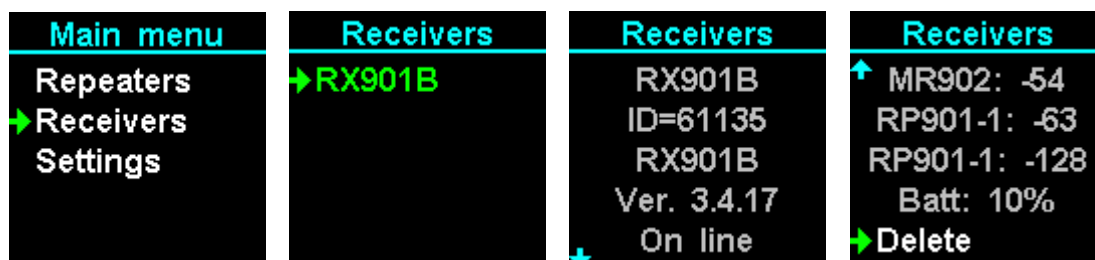Select delete and press Ent. And press Esc to leave.
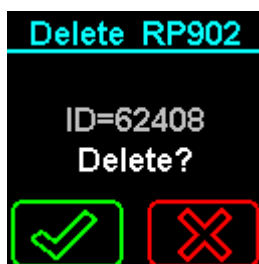
Pressing Ent confirms that it should be deleted. Press Esc to leave.

Main menu - Receiver

In this menu you can delete a receiver from the system and check its status.

Select the desired recipient and press <kbd>Ent</kbd> to confirm. Press <kbd>Esc</kbd> to exit

Product:	Product type e.g. RX901B
ID:	Product ID/serial number, e.g. 63123.
Name:	Product name e.g. RX901B
SW ver.:	Software version of the product, e.g. 3.4.17.
Online:	Status, online or offline.
MR902:	MR902 reception status in the product e.g. -33dBm.
RP901-1:	Reception status of RP902 In the product e.g. -53dBm.
Batt:	Battery level, either voltage or percentage, e.g. 20%.

Tip: If you name your recipients, it's easy to find them in a list like this, otherwise it's a list with the same name.

Delete

Remember to remove a receiver device if it is not in use or replace it if it is inactive or offline.

Select **"Delete"** and press <kbd>Ent</kbd>. Press <kbd>Esc</kbd> to leave.

Press <kbd>Ent</kbd> to confirm the deletion... Press <kbd>Esc</kbd> to exit.

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Main menu - Settings

This menu contains general information about system and clock settings, etc.

Select **"Settings"** and press `Ent` to confirm. Press `Esc` to exit.

ID:	ID is the normal serial number of an MR902.
SW ver.:	Software version (firmware) of an MR902.
Reply time:	The reply time can also be set.
System size:	Size of the system, maximum number of repeaters.

Set the clock

It is important that the clock in MR902 is set correctly. If you use timers in another product that is connected or used in the system, these timers will work according to this clock. The clock in other products is usually also synchronized with the system clock.

Select **"Set clock"** and press `Ent` to confirm. Press `Esc` to exit.

Press ⬇ ⬆ to change the setting.
Press `Ent` to accept and move on.
Press `Esc` to leave.

Set response time

This indicates the time between alarms on the receivers. When the system receives an alarm, MR902 estimates the location of the nearest receiver and then calls that unit. If the call is not answered or overheard within this time, the call goes to the next receiver. Normally, 15 seconds is a typical time to accept the call. You can change the time from 5 to 30 seconds.
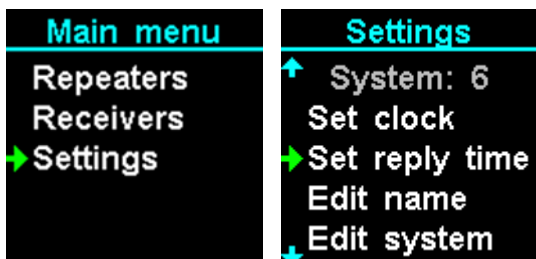
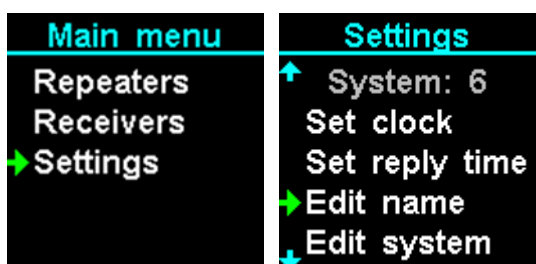Select **"Reply time"** and press `Ent` to confirm. Press `Esc` to leave.

Press `↓` `↑` to change the setting.
Press `Ent` to approve.
Press `Esc` to leave.

Edit name

Change the system name. The name is displayed on the main screen.

Select **"Edit name"** and press `Ent` . Press `Esc` to exit.
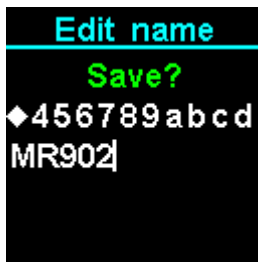
Press ⬇ ⬆ to change the letter.

Press **Ent** to select a letter.

Press **Esc** to choose to delete the last letter.

Press **Esc** to exit the menu. It takes 3 seconds.

To save the new name, select the ◆ symbol and press **Ent** .

Size of the system

Set the size of the system as close as the options allow, but the number should be greater than or equal to the number of repeaters. Response time will be faster the lower the value you choose.
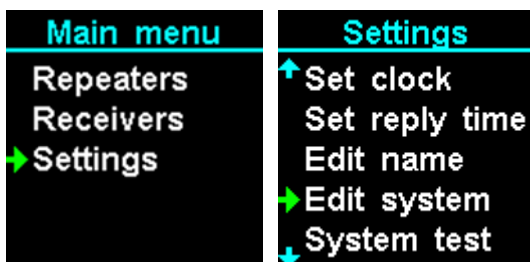
Select *"System size"* and press **Ent**. Press **Esc** to exit.
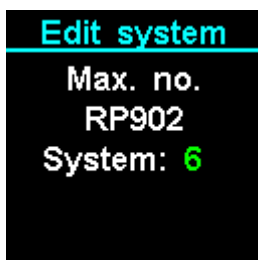
Press ⬇ ⬆ to resize the system.

Press **Ent** to accept the new choice.

Press **Esc** to leave.

Systemtest

System testing is a troubleshooting tool to update statistics as quickly as possible.
This function should normally be turned off. If you turn it on, it is important to turn it off again.

Select *Reset stat.* and press **Ent** to reset all statistics.

Select *RP test* and press **Ent** to activate or deactivate the repeater test.

Select *RX test* and press **Ent** to activate or deactivate the repeater test.

Press **Esc** to exit.

Reset all

CAUTION!! This will delete everything and be removed from all devices.

Select *"Reset all"* and press **Ent**. Press **Esc** to exit.

Select **Ent** to accept to **RESET ALL!**

Select **Esc** to leave.

Turn off

This shuts down MR902 and the system. All calls are no longer handled by the system.
IMPORTANT: Before selecting *"Power off"*, MR902 must be unplugged from the power outlet.
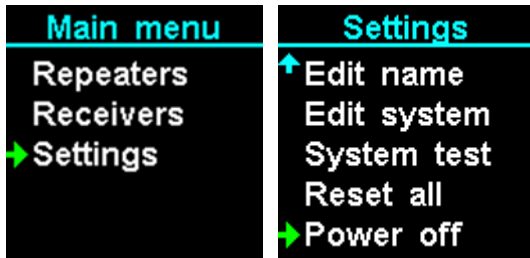
Select *"Power off"* and press Ent and press Esc to exit.

Select Ent to accept to DELETE EVERYTHING!
Select Esc to leave.

Maintenance

Updating software
It is possible to update the software of MR902. For a more detailed description please check the KNOP tool.

Cleaning

The product can be cleaned with a moist cloth or a dry cloth.

Spare parts and accessories

Spare parts and accessories can be ordered from Knop Elektronik A/S at www.knop.dk.

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Technical data

Frequency HF:	869.2125 MHz
Range:	Up to 1500 m between MR902/RP902 and RP in free sight. **[1]**
Range in building:	Recommended distance between repeater units <25m
Power supply:	230VAC
Connection plug:	2-pole EURO
Battery:	Lithium battery, LP853048 3.7V 1200mA
Battery time:	Approximately 4 hours
Charge:	Approximately 1 day
Surrounding environment:	Indoor use. ≤ 90% non-condensing
Ambient temperature:	0°C to +40°C
Cabinet type:	Color RAL9001 ABS
Cabinet dimensions:	Ø110mmx52mm
Desnity:	IP40
Weight:	135g

The right to make changes is reserved

[1] Measured outdoors with an unobstructed view between transmitter and receiver. In buildings, the range is reduced.

Explanation of symbols and approvals

CE	**This product complies with:** Directive 2017/745/EU MDR Directive 1907/2006/EU REACH Directive 2011/65/EU RoHS Directive 2012/19/EU WEEE ISO 14971:2019 Risk Management for Medical devices EN 301 498-1 V2.2.3 Electro Magnetic Compatibility EN 301 489-3 V3.1.1 Electro Magnetic Compatibility EN 50130-4:2011 + 2014 Immunity alarm systems EN 300 220-1 V3.1.1 Short Range Devices EN 300 220-2 V3.1.1 Short Range Devices EN 300 220-3 V2.1.1 Short Range Devices EN 60601-1-2:2014 + 2015 Electromagnetic compatibility (Medical) EN 62368-1:2020 Electrical safety EN 50581:2012 Hazardous substances
(symbol)	The product must not be used if the packaging is damaged.
MD	**Medical Device** Class 1, rule 1
(factory symbol)	**Manufacturer** KNOP Elektronik A/S, Fabriksvej 20, DK-7600 Struer, Denmark
(manual symbol)	Read the manual(s) before installation and commissioning at www.knop.dk.
((•))	Interference may occur in an environment with equipment marked with this symbol.
(umbrella symbol)	Must be protected against liquids.
(thermometer symbol)	0 °C to +40 °C, temperature limit for transport/storage and use.
(waste bin symbol)	The product must not be disposed of with normal household waste.
SRN	**Single Registration Number** DK-MF-000025631
UDI	**Unique Device Identifier** 05744002850335
REF	**Product reference** MR902 Master Repeater
SN	**Serial number** Placed on the product
IP	**Ingress Protection Code** IP40