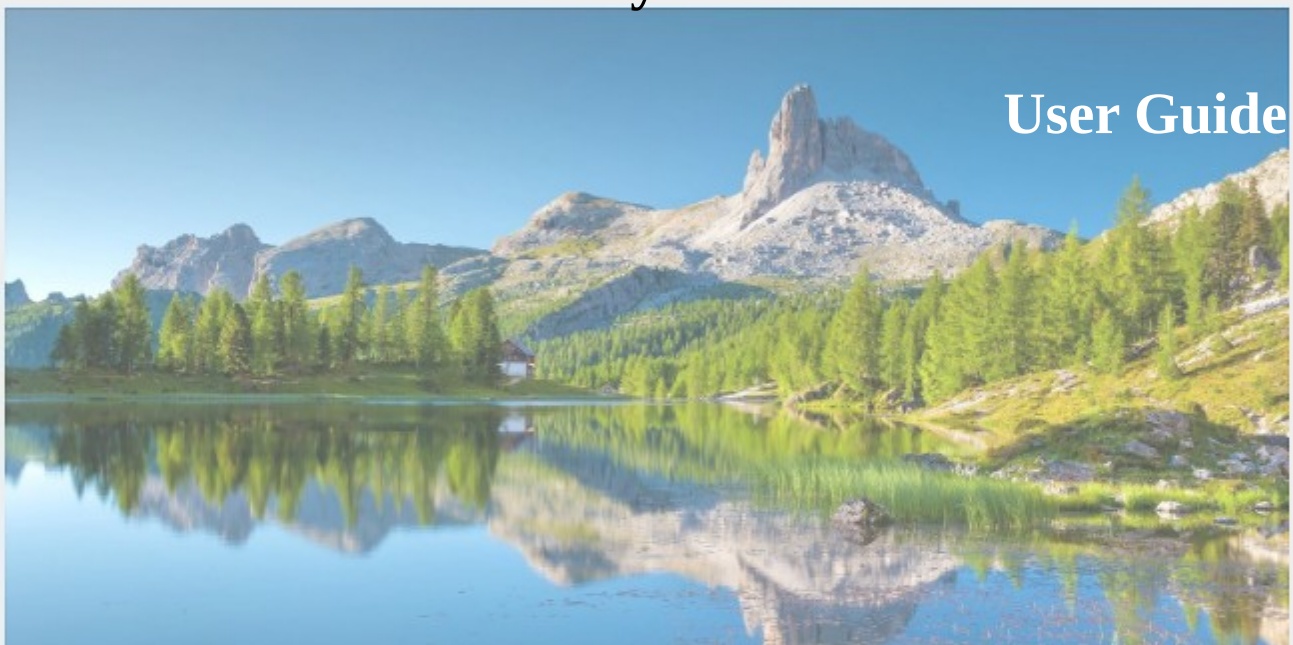




**MRX.CraneRadio:  
Assembly instruction mobile crane**



**Operating instructions**

**Version 1.2**  
June, 3<sup>rd</sup>, 2025

Article No.: 2101 9102 65.1 en

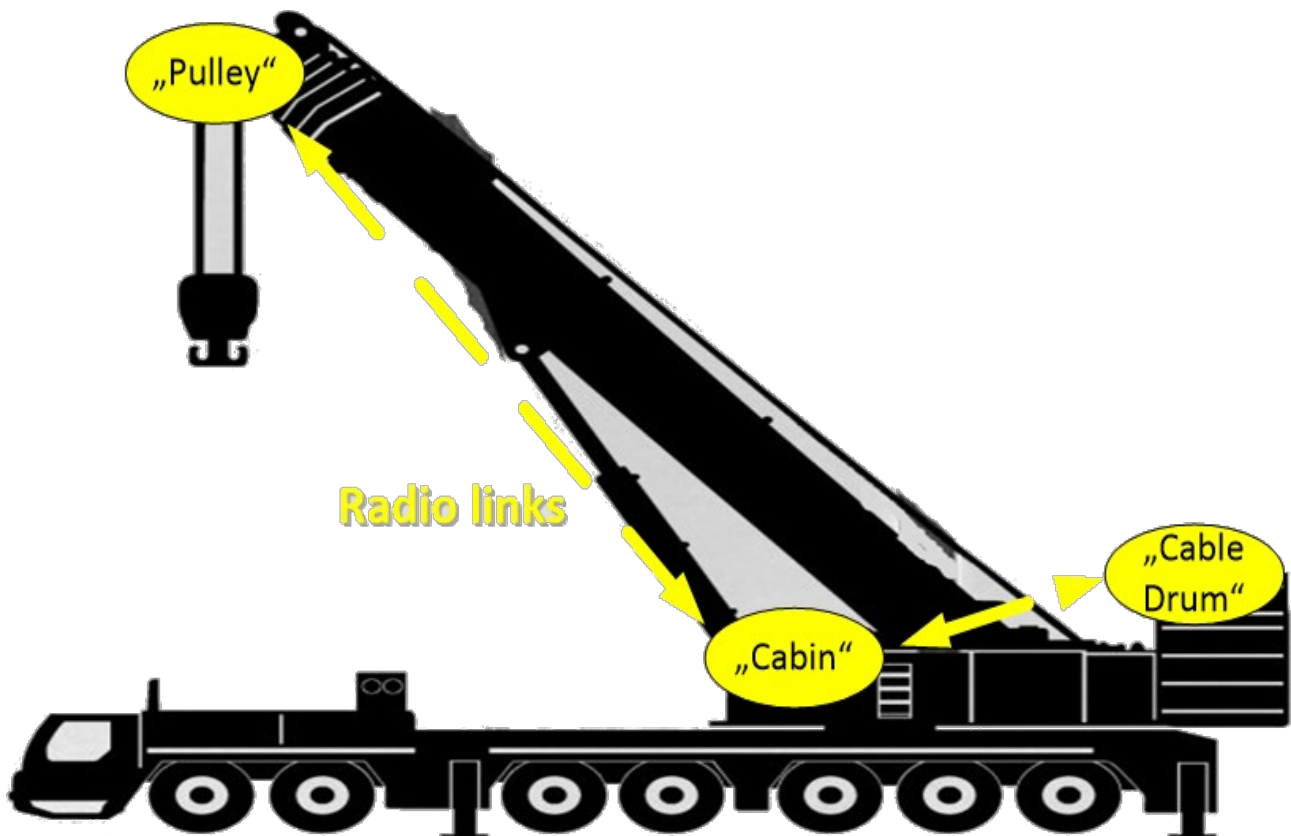
# 1 Introduction

The **MRX.KranFunk** radio system from AZG Tech is used to transmit video streams to construction machinery. The system consists of several components that work together:

- One device of the type **MRX.cabin** is installed in the cabin together with a touch monitor and external antenna (mounted on the cabin roof).
- One **MRX.pal** unit is installed at each of the cameras.

A normal operating case on the crane is the use of one **MRX.cabin** and one or two **MRX.pal**. The number of **MRX.pal** is not limited to two, this can be increased.

The two types of devices mentioned are transmission units that use AZG.mesh technology to establish a radio network on and around the crane to enable communication and data transmission from and to the cameras or monitor.



*Fig. 1: System overview*

The radio technology used is individually encrypted on each crane to ensure that the radio bubbles of neighbouring cranes do not interfere with each other and that communication is not misdirected.

## 1.1 Aim and purpose of the manual

This manual is intended for employees in production and service. Previous knowledge and training in the basic operation of **MRX.KranFunk** is assumed.

The manual describes the commissioning and testing of individual components during production as well as the procedure for necessary upgrades of the software on the units. Operation is via touch screen or other input devices such as mouse and joystick.

## 1.2 Important

Please take the time to read these operating instructions and the safety precautions carefully in order to familiarise yourself with safe and effective operation and to avoid mistakes. As far as possible, the operations presented here are implemented in such a way that incorrect operation is ruled out. However, the operations are system-relevant and the execution of an incorrect process can lead to malfunctions.

Access to the service menu is password protected. Please be extremely careful about giving the password to others who do not have the necessary background to operate it.

Although we make every effort to include the latest information in these operating instructions, details may change, which may also affect presentation, etc.

## 1.3 Copyright

The contents of this manual are subject to change without notice to improve performance. Copyright © 2025 AZG Tech GmbH. All rights reserved. The contents of this manual may not be reproduced, distributed or used in any form, in whole or in part, without written permission.

## 1.4 Publications

| Version | Author(s) | Date       | Remark                                                |
|---------|-----------|------------|-------------------------------------------------------|
| 1.2     | mjz       | 03.06.2025 | Mounting of MRX.planarAntenna has been changed.       |
| 1.1     | mjz       | 19.12.2023 | Note included for better alignment of the antenna(s). |
| 1.0     | mjz       | 13.09.2023 | Released version.                                     |
| 0.1     | mjz       | 03.06.2023 | Initial version.                                      |



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### 3 Explanation of the safety symbols

The terms DANGER, WARNING, CAUTION and NOTE are used throughout this manual to highlight important and critical information. You must read these instructions to ensure safety and avoid product damage.

The instructions are defined below.

| NAME                                                                                |         | MEANING                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Danger  | The term DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.                                                                                                      |
|    | Warning | The term WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. it is not avoided.                                                                                                                                                   |
|    | Caution | The term CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.                                                                                                                                                                                   |
|  | Note    | The term NOTE identifies information that is considered important but not dangerous (e.g. messages about property damage). The safety alert symbol must not be used with this signal word. When a signal word is used for messages related to property damage, NOTE is the choice of signal word. |

## 4 Safety precautions



**ATTENTION!** Always pay attention to safety when installing **MRX.KranFunk**. In case of improper use or improper installation, there is a risk of damage or even considerable injury.



**NOTE!** No guarantee is given for this product for applications other than those described in these operating instructions.

### 4.1 Service



**CAUTION!** Repairs to your unit that are not carried out by an engineer or partner of AZG Tech GmbH will void your warranty.



**NOTE!** Do not press hard on the LCD screen or the edge of the frame as this may cause the display to malfunction, such as interference patterns. If continuous pressure is applied to the surface of the LCD screen, the liquid crystal or LCD screen may be damaged.

**NOTE!** Do not scratch or press on the LCD screen with sharp objects as this may damage the LCD screen. Do not clean the screen with paper towels as this may scratch the screen.

**NOTE!** Stains on the surface of the cabinet and LCD panel can be removed by lightly moistening a soft cloth with water or using a screen cleaner. Chemicals such as alcohol and antiseptic solution may cause gloss changes, tarnishing and fading of the cabinet and LCD panel, and deterioration of the quality of the image. Never use thinner, benzine, wax or abrasive cleaners as they may damage the surface of the cabinet and LCD panel.

## 5 Overview

### 5.1 Tools

The following tools are required for mounting **MRX.CraneRadio** on the mobile crane:

- Screwdriver TX20
- Screwdriver slot, size 5.5
- Open-end or ring spanner SW7
- Open-end or ring spanner SW12

### 5.2 Overview of material

The system **MRX.CraneRadio** together with the **Assembly set MRX.CraneRadio, Tower crane** consists of the following components:

| Pos      | Article       | Name                                      | Description                                                                                              |
|----------|---------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>1</b> | <b>A-1044</b> | <b>MRX.CraneRadio SET</b>                 | <b>Transmission set for 1x analogue camera with touch monitor.</b>                                       |
| 1.1      | A-1069        | MRX.monitor 10" FullHD, Touch             | Monitor.                                                                                                 |
| 1.2      | A-1070        | MRX.planarAntenna, SMA                    | Outdoor antenna for <b>MRX.cabin</b> .                                                                   |
| 1.3      | A-1071        | MRX.pal, 2.4GHz, DC                       | Transmitter" transmission unit for 1x analogue camera.                                                   |
| 1.4      | A-1072        | MRX.cabin, 2.4GHz, DC                     | Receiving and control unit.                                                                              |
| 1.5      | A-1073        | HDMI cable, 5.0m                          | Video cable between <b>MRX.monitor</b> and <b>MRX.cabin</b> .                                            |
| 1.6      | A-1095        | USB cable, 5.0m                           | Communication cable between <b>MRX.monitor</b> and <b>MRX.cabin</b> .                                    |
| <b>2</b> | <b>A-1152</b> | <b>Mounting set MRX.CraneRadio MK</b>     | <b>Complete set for mounting the transmission set on a mobile crane.</b>                                 |
| 2.1      | A-1146        | Mounting set MRX.monitor (MK)             | For mounting <b>MRX.monitor</b> in the cabin.                                                            |
| 2.2      | A-1149        | Mounting set MRX.planarAntenna (MK)       | For mounting planar antenna on or on top of the cabin.                                                   |
| 2.2.1    | A-1140        | Low Loss cable, 4.0m, SMA plug/SMA socket | Antenna cable extension, 4.0m (2x available).                                                            |
| 2.3      | A-1150        | Mounting set MRX.pal/eth (MK)             | For mounting <b>MRX.pal</b> on battery cage.                                                             |
| 2.4      | A-1148        | MRX.oca, complete (MK)                    | Connection set for controlling and supplying <b>MRX.cabin</b> and <b>MRX.monitor</b> in the tower crane. |
| 2.4.1    | A-1129        | MRX.oca (MK)                              | Connection box for controlling and supplying <b>MRX.cabin</b> and <b>MRX.monitor</b> in the tower crane. |
| 2.4.2    | A-1130        | Connection cable #1                       | Connection cable between <b>MRX.oca</b> and <b>MRX.cabin</b> .                                           |
| 2.4.3    | A-1131        | Connection cable #2                       | Connection cable between <b>MRX.oca</b> and                                                              |

The following illustration shows all components, their installation locations and the connections to be made with the enclosed cables.

Some required components, e.g. analogue camera, come from third-party suppliers. These components are only mentioned here in passing and are shown in grey in the picture below.

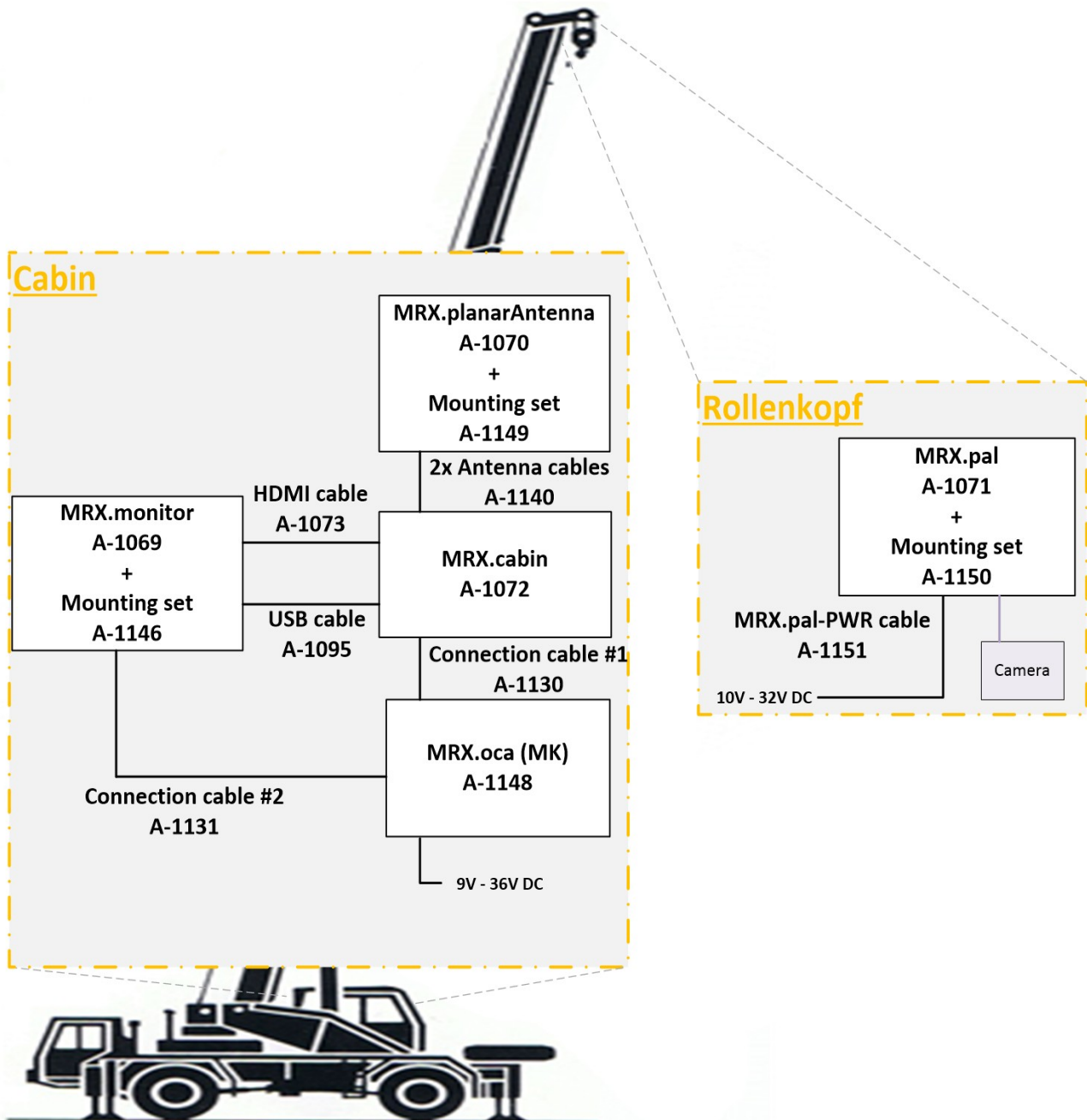


Fig. 2: Overview of components, cables and installation locations

## 6 Assembly instructions

### 6.1 Assembly in the cabin

The sequence of assembly of the individual components outlined here is exemplary. A different sequence is possible.

#### HINWEIS

**NOTE!** It is important that everything remains de-energised until the end of the assembly and wiring, or that everything is de-energised once at the end of the process and then switched on again. The easiest way to do this is to disconnect **MRX.oca (MK)** power supply connection.

The supplied cables and connecting leads have long lengths, but you should still consider how to set them up before mounting.

The following cable lengths and possible distances are given:

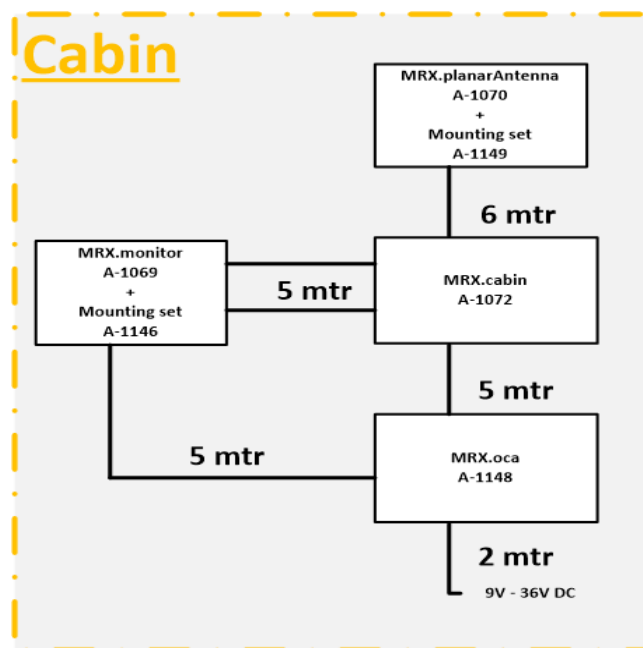


Fig. 3: Cable lengths between the individual components

#### 6.1.1 Laying cables and connecting to components

The cables can be laid before, during or after the installation of the components. There are no specifications here and the sequence is arbitrary.

Which cables are used between the individual components can be seen in fig. 2 (Overview of components, cables and installation locations).

## 6.1.2 Assembly MRX.monitor

**MRX.monitor** is mounted to the cabin with the help of the **Mounting set MRX.monitor (MK)**. Often there are already threaded holes for mounting in the cabin. If this is not the case, either holes with D=5mm or a thread (M4) must be drilled for the RAM mounting plate (ball head). The ball head itself serves as a drilling template.

### HINWEIS

**NOTE!** The installation location must be selected according to the local conditions in the cabin. Possible solar radiation must be taken into account.

### HINWEIS

**NOTE!** The distance between the **MRX.monitor** and the installation site of **MRX.cabin** must not exceed 5.0 metres for the two cables to be laid (A-1073 and A-1095).

For installation, open the connecting arm of **Mounting set MRX.monitor (MK)** (A-1069) so that one of the two ball heads can be removed. Then screw the VESA plate to the **MRX.monitor** with the enclosed screws (M4x10) and washers.

Attach the ball head to the chosen attachment point using the enclosed screws (M4x14), the washers and the locking screws.



Fig. 4: Mounting VESA on  
MRX.monitor



Fig. 5: Ball head mounting on rod

Then join the **MRX.monitor** and the pipe clamp together using the connecting arm and adjust the alignment. Then tighten the wing nut on the connecting arm.



*Fig. 6: Complete assembly MRX.monitor*

### 6.1.3 Assembly MRX.cabin

**MRX.cabin** is mounted in the cabin or in a control cabinet nearby using top-hat rail mounting.

#### HINWEIS

**NOTE!** The installation location must be chosen so that the "installation distance" between **MRX.cabin** and **MRX.monitor** is max. 5.0 metres.

AND

#### HINWEIS

**NOTE!** The installation site must be chosen so that the "installation distance" between the **MRX.cabin** and the planar antenna is max. 6.0 metres.

### 6.1.4 Assembly MRX.oca (MK)

**MRX.oca (MK)** is installed near **MRX.cabin**. A drilling template for fastening by means of four screws is enclosed with the unit.

Connect to **MRX.monitor** and **MRX.cabin** using the supplied cables #1 and cable #2. Connect the cable (#3B) permanently attached to **MRX.oca (MK)** to the power supply (9-36VDC). The unit has a very wide input voltage range to operate on different on-board voltages.

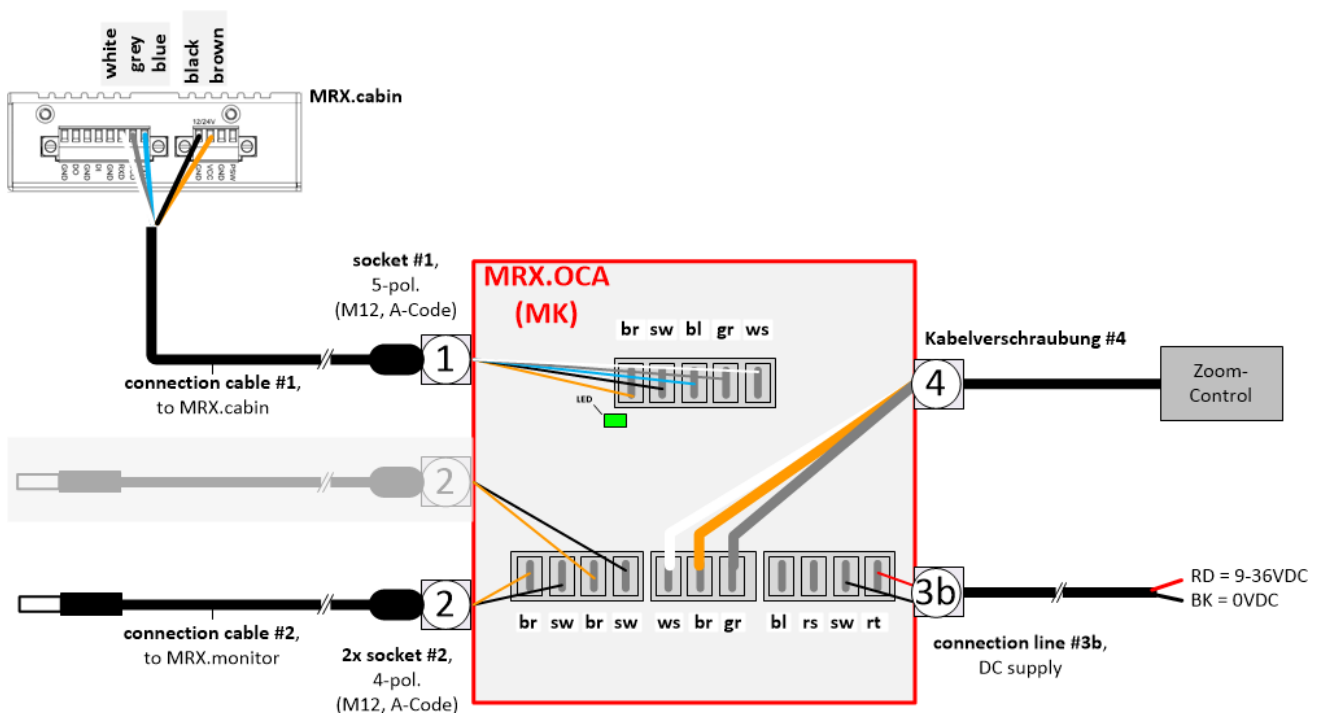


Fig. 7: Connections of MRX.oca (MK)

## 6.2 Assembly on the cabin

### 6.2.1 Assembly MRX.planarAntenna

**MRX.planarAntenna** is mounted on the outside of the cabin if possible. With the help of the **Mounting set MRX.planarAntenna (MK)** (A-1149) the antenna can be attached to the railing on the cabin.

First remove the pre-assembled antenna attachments; the 4 screws that need to be loosened for this will be needed again later.

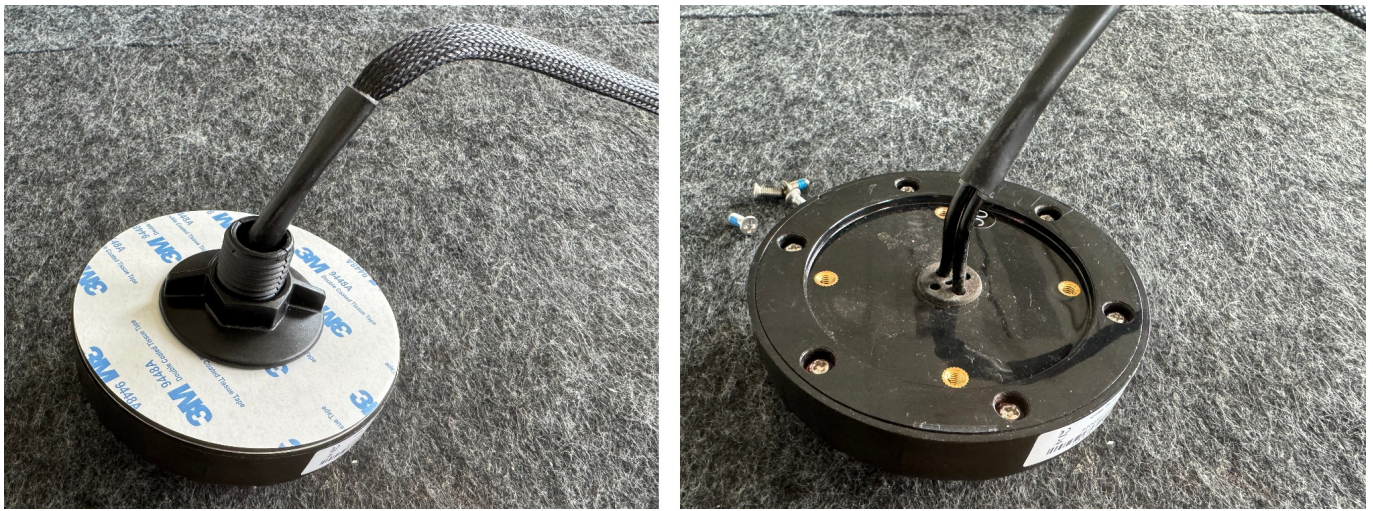


Fig. 8: Removing parts of the **MRX.planar antenna** that are not required

The ball head is attached to the **MRX.mountingPlate** from above using 3 screws. Make sure that the 3 screw positions shown in the picture are used. "TOP" on **MRX.mountingPlate** is the side with the countersinks and the drill holes.

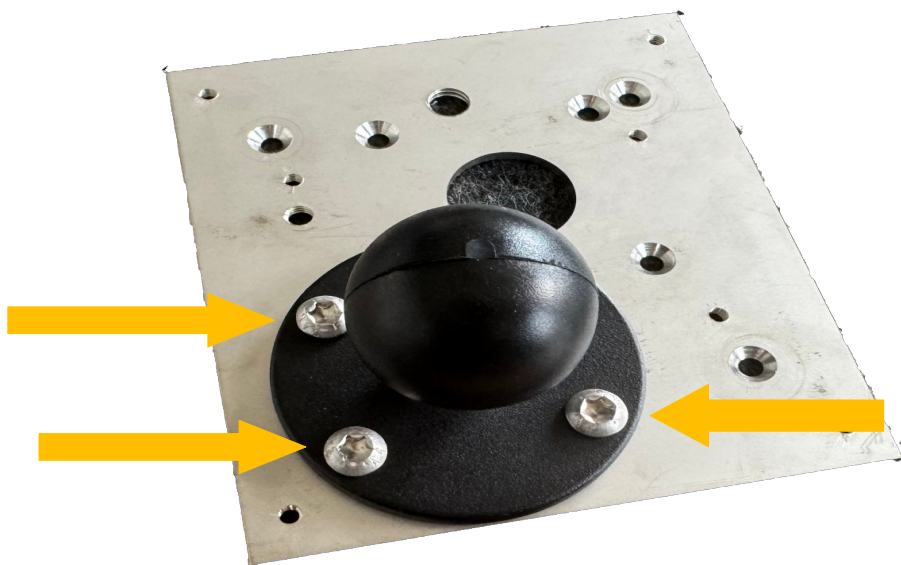


Fig. 9: Attachment of ball head to **MRX.mountigPlate**

Then attach the antenna to the **MRX.mountingPlate** from below using 3 screws. Insert the antenna cable through the hole provided beforehand.



*Fig. 10: Mounting **MRX.planarAntenna** to **MRX.mountingPlate***

Secure the antenna cables using the cable ties.

Attach the second pipe clamp to the railing of the cabin. The antenna is now attached with the help of the extension arm.

**HINWEIS**

**NOTE!** Alignment of the antenna: Align the semicircular side in the direction of the **MRX.pal** on the pulley or the nearest repeater.



Fig. 11: Assembly MRX.planarAntenna with magnetic base

## 6.2.2 Aligning the antennas

The antenna(s) can be optimally aligned using the user menu.

First press the symbol  to open the user menu and then open the info area by pressing the symbol. 

The attenuation values of the **MRX.planarAntenna** in relation to the other wireless modules are displayed in the info window. The value ("Connection") can be checked and optimised when aligning the antenna(s).

| System Overview                                                                                                                                                                                       |                                                                                                                                                                                                                       |                                                                                                                                                                                                                     |                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>MRX.cabin</b><br>Serial #: AZ22000002<br>Version: V1_3_7<br>master-b01477a<br>SW State: OK<br>Radio: DE Band A |  <b>MRX.pal</b><br>Serial #: AZ22000005<br>Version: V1_3_7<br>master-b01477a<br>SW State: OK<br>Zoom: ✓ 28%<br>Connection: -25 dBm |  <b>MRX.pal</b><br>Serial #: AZ22000025<br>Version: V1_3_7<br>master-b01477a<br>SW State: OK<br>Zoom: ---<br>Connection: -69 dBm |  <b>MRX.pal</b><br>Serial #: AZ22000026<br>Version: V1_3_7<br>master-a194a10<br>SW State: OK<br>Zoom: ---<br>Connection: -29 dBm |
| Back                                                                                                                                                                                                  |                                                                                                                                                                                                                       | Save Logs                                                                                                                                                                                                           |                                                                                                                                                                                                                       |

Fig. 12: Example for System-Overview w. Attenuation values of the radio link

**NOTE!** The higher the "Connection" value, the better. Attention, the value is always negative. -25dBm is better than -69dBm!

### 6.2.3 Laying cables and connecting to components

The connection diagram of the components in the cabin are shown as an overview in Fig. 3: Cable lengths between the individual components.

A detailed view can be found in Fig. 7: Connections of MRX.oca (MK). In this view, the necessary connection between **MRX.cabin** and **MRX.monitor** is missing. For this purpose, the HDMI cable and USB cable must be routed between the two devices.

#### HINWEIS

**NOTE!** When laying the cables, make sure that the cables are not kinked or pinched.

The plug connections must be pressed on firmly, the screw connections must be hand-tightened.

## 6.3 Assembly on the pulley

### 6.3.1 Assembly MRX.pal/MRX.eth

**MRX.pal** or **MRX.eth** are mounted on the pulley or as repeaters on the crane. Use the **Mounting set MRX.pal/eth (MK)** (A-1550) for this purpose.

For mounting, the supplied mounting plate is fixed to the underside of **MRX.pal** or **MRX.eth** with 4 M4x8 screws. To do this, open the two coloured brackets with the aid of a flat-blade screwdriver and screw the screws to the mounting plate through the holes in the bottom of the housing using a TX20 screwdriver. Finally, close the coloured brackets again.

Attach the supplied ball head to the pulley. Then join the **MRX.pal** or **MRX.eth** and the ball head with the connecting arm and adjust the alignment. Then tighten the wing nut on the connecting arm.

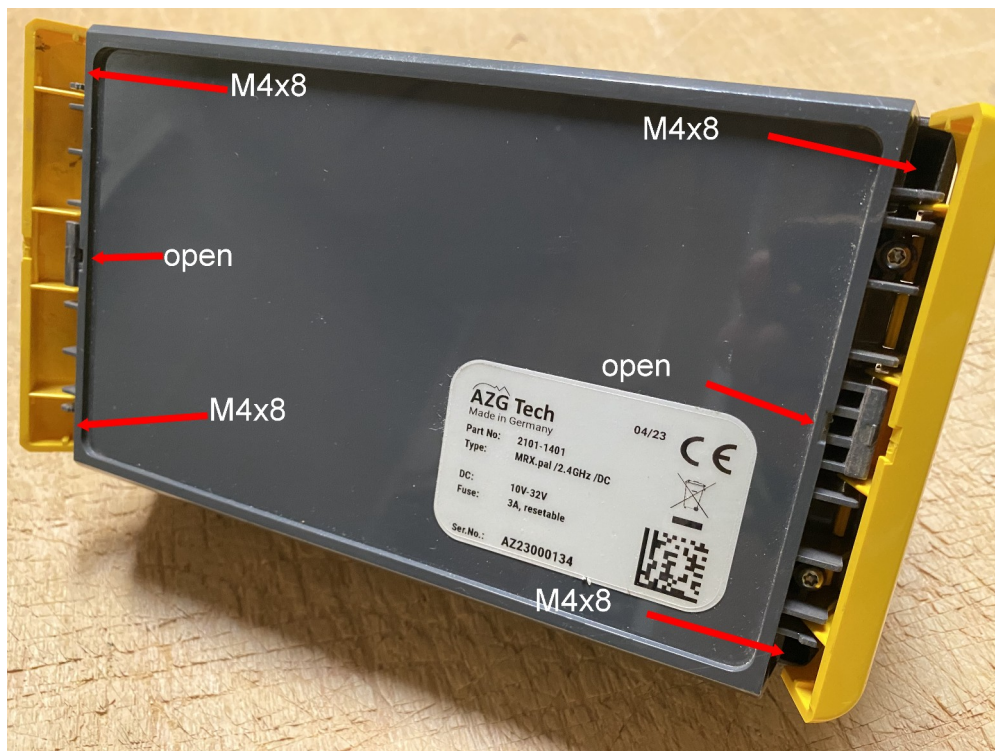
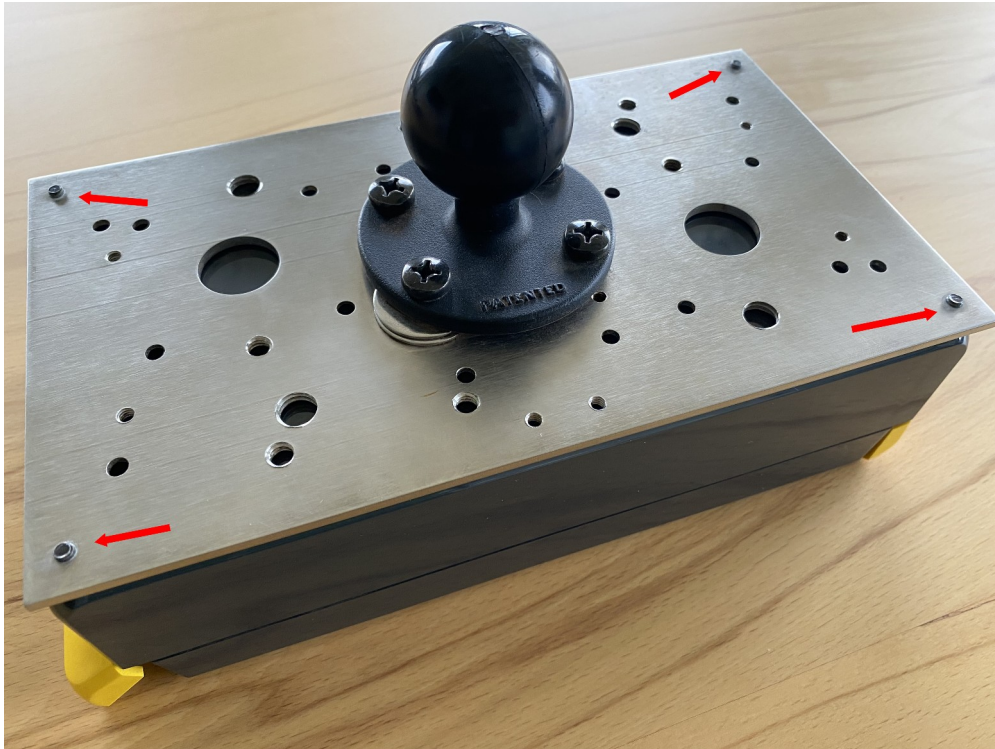


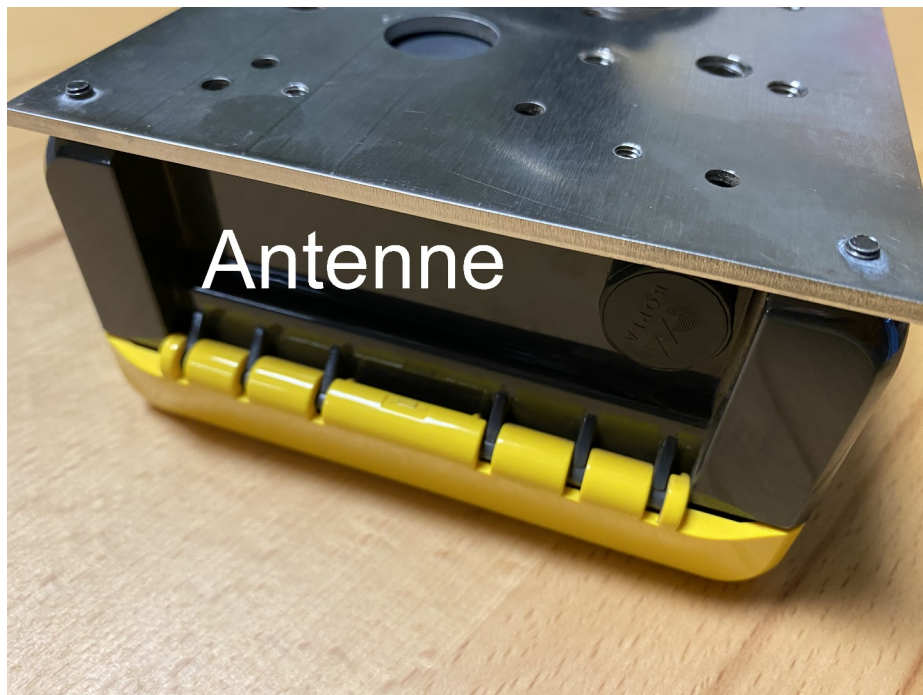
Fig. 13: Assembly MRX.pal/MRX.eth on mounting plate



*Fig. 14: MRX.pal/MRX.eth mounted on mounting plate*

**HINWEIS**

**NOTE!** Alignment of **MRX.pal** or **MRX.eth**: Align the enclosure wall (shown in Fig. 15, w/o connectors) towards the **MRX.planarAntenna** on the cabin or the nearest repeater.



*Fig. 15: Align this side towards the cabin*

**MRX.pal** or **MRX.eth** can be aligned using the attenuation display for the radio link in the user menu. The procedure is described in chapter 6.2.2 Aligning the antennas on page 16.

### 6.3.2 Laying cables and connecting to components

After mounting **MRX.pal** or **MRX.eth**, connect the devices to the battery or power supply of the crane. Also connect the camera to the unit.

The cables used between the individual components can be found in Fig. 2: Overview of components, cables and installation locations.







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