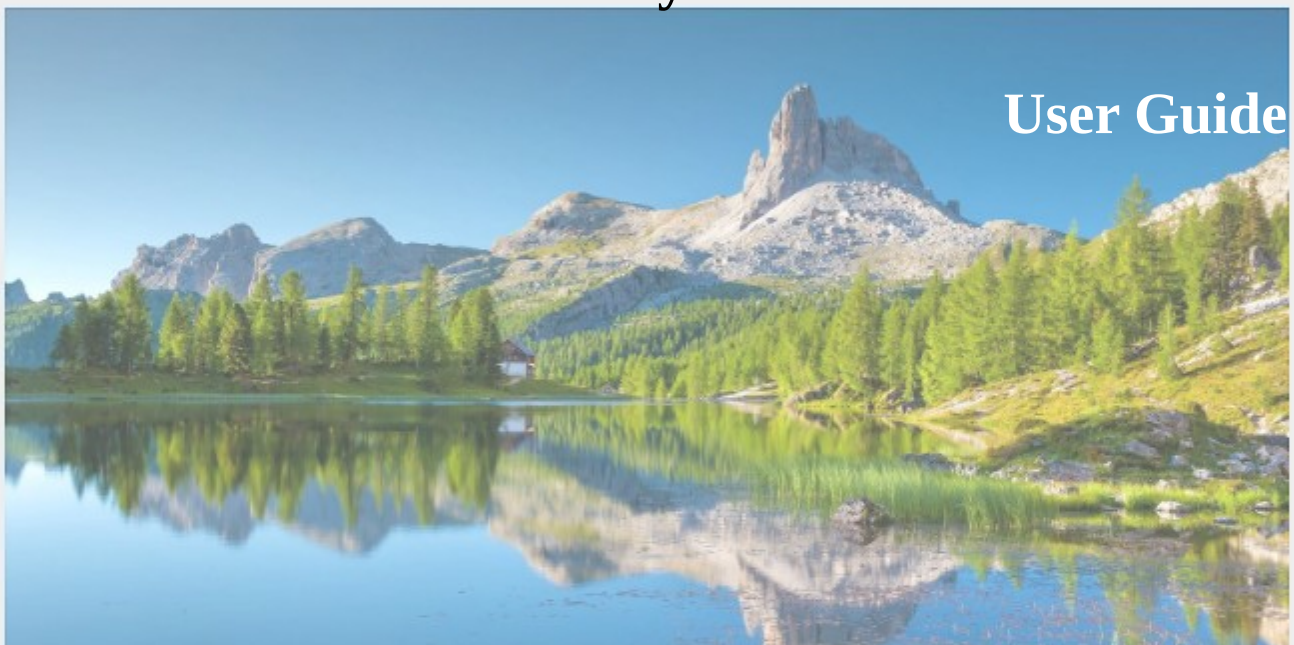




**MRX.CraneRadio:
Assembly instruction tower crane**



Operating instructions

Version 2.0
July, 5th, 2026

Article No.: 2101 9101 65.1 en

1 Introduction

The **MRX.CraneRadio** wireless system from AZG Tech is designed to transmit video streams to construction machinery. The system consists of several components that work together:

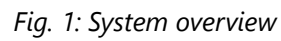
- An **MRX.cabin** unit is installed in the cab, together with a touchscreen monitor (**MRX.monitor**) and an external antenna (**MRX.planarAntenna**).
- For the cameras, one MRX.eth or MRX.pal unit is installed per camera, provided the camera is connected via radio.
- For cameras connected directly via CAT cable, a PoE injector or PoE switch is used.
- Additional devices are available to enable universal use of the **MRX.CraneRadio** system and to configure it according to the specific application.

This manual primarily describes installation and use on tower cranes and mobile tower cranes. A separate manual is available for use on mobile cranes. Further applications on a wide variety of crane types are possible and may require specific mechanical adaptations.

A typical operating scenario on a crane involves the use of one **MRX.cabin** and one or two **MRX.eth** or **MRX.pal** units. The number of cameras is not limited to two; it can be increased almost indefinitely.

The device types mentioned are transmission units which, using **AZG.mesh** technology, establish a wireless network on and around the crane to enable communication and data transmission to and from the cameras or monitor.

Digital (ETH/IP) Variant



Version 2.0

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.CraneRadio** 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
2.0	mjz	05.07.2026	Revision/upgrade for MRX.camera, MRX.eth, MRX.battery and the available accessories.
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	13.08.2023	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 imminent dangerous situation that will result in death or serious injury if not avoided. This signal word should be reserved for the most extreme situations.
	Warning	The term WARNING indicates a potentially hazardous situation that could result in death or serious injury if not avoided.
	Caution	The term CAUTION indicates a hazardous situation that could result in minor or moderate injury if not avoided.
	Note	The term NOTE indicates information that is considered important but not hazardous (e.g., reports of property damage). The safety alert symbol must not be used with this signal word. If a signal word is used for reports related to property damage, NOTE is the signal word of choice.

Tab. 1: Overview of Safety Symbols

4 Safety precautions



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

NOTE

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

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 tower crane:

- Screwdriver TX20
- Screwdriver slot, size 5.5
- Open-end or ring spanner SW11

5.2 Overview of material

Various kits have been defined for the **MRX.CraneRadio** system to make it easy to order standard solutions. These kits are available for the transmission components alone and for the installation of the components.

Please refer to your delivery note to see which components are included in each kit, or ask your sales representative.

The following illustration shows possible components, their installation locations and the connections to be made using the available cables.

Some required components, e.g. an analogue camera, may be sourced from third-party suppliers. Provided they have been approved by AZG Tech, these components can be used without any problems. The mounting hardware for these may also need to be purchased from the third-party supplier.

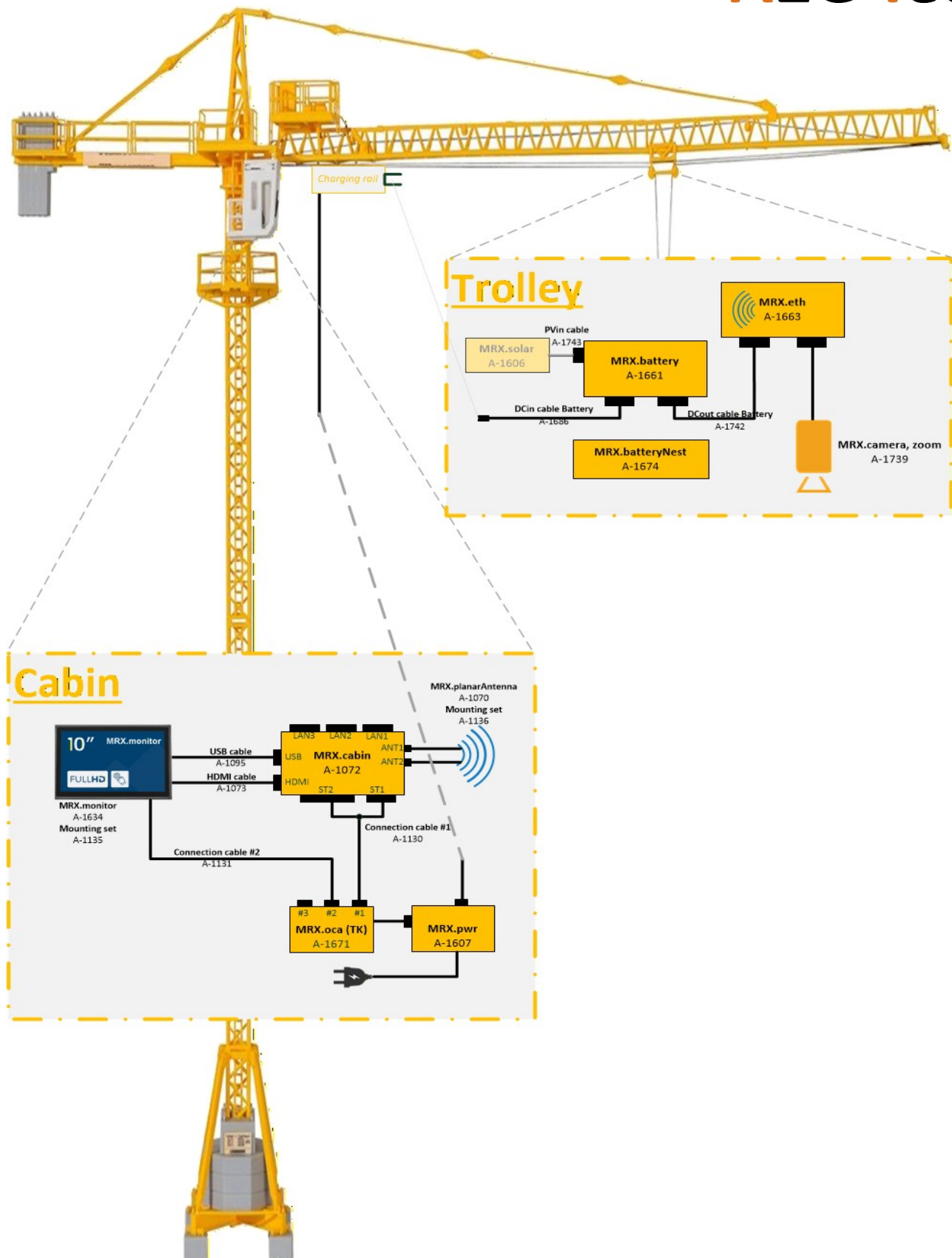


Fig. 2: Overview of components, cables and installation locations

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.

NOTE

NOTE! It is important to keep everything de-energised until the end of the assembly and wiring, or to de-energise everything once at the end of the operation and then switch it on again. The easiest way to do this is to disconnect **MRX.oca** from the PowerBox, or to disconnect the PowerBox from the AC supply.

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:

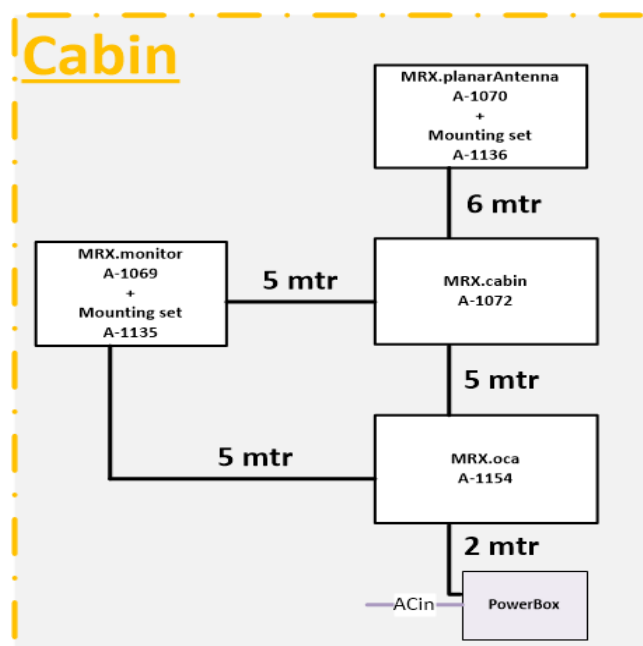


Fig. 3: Cable lengths between the individual components

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 a pole in the cabin using **Mounting set MRX.monitor (TK)**.

NOTE

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

NOTE

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 (TK)** (A-1135) 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 and attach the ball head with pipe clamp to the selected mounting rod (max. D= 40mm):



Fig. 4: Mounting VESA on MRX.monitor



Fig. 5: Ball head mounting on rod

CAUTION! To prevent injury, place the four protective caps on the ends of the pipe mounting brackets.

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.

NOTE

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

AND

NOTE

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

6.1.4 Assembly MRX.oca (TK)

NOTE

NOTE! MRX.oca (TK) is an accessory designed to simplify installation. This item is not strictly necessary; installation can also be carried out without **MRX.oca (TK)**.

MRX.oca (TK) is installed near **MRX.power** and **MRX.cabin**. A drilling template for fixing the unit with four screws is supplied with the device.

Use the supplied Cable #1 and Cable #2 to connect to **MRX.monitor** and **MRX.cabin**. Connect the cable (#3A) permanently attached to **MRX.oca (TK)** to **MRX.power**. It does not matter whether socket A or B on **MRX.power** is used.

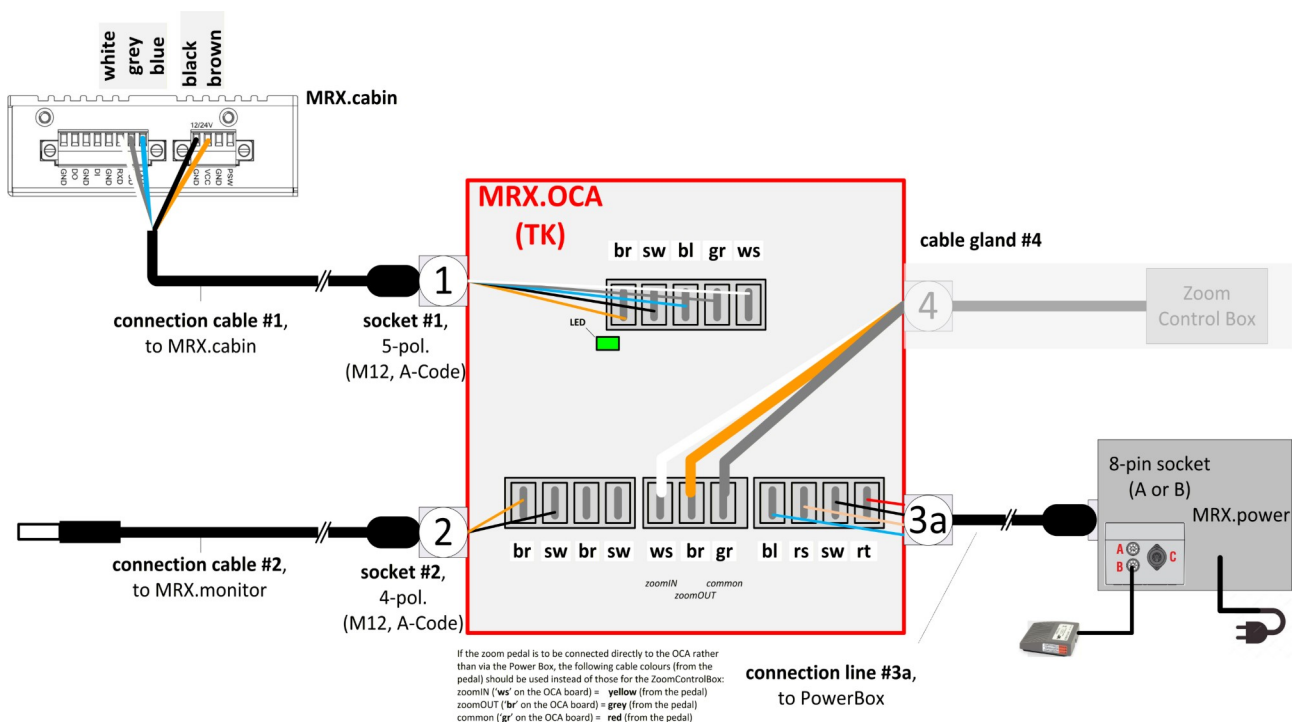


Fig. 7: Connections of MRX.oca (TK)

A 'hand-held controller' for zooming the camera image can be connected to **MRX.oca (TK)**, provided you do not wish to use the foot pedal. The hand-held controller's cable is routed through KV#4 and connected inside the housing. The cable colours listed above correspond to the hand-held controller manufactured by Orlaco.

 CAUTION

CAUTION! If other handheld devices are to be used, it is important to first identify which cable is the common signal (COMMON). Connecting this incorrectly may damage the **MRX.cabin**.

NOTE

NOTE! If the zoom pedal is to be connected directly to **MRX.oca (TK)** rather than via **MRX.power**, this can be done by using the hand-control connections described above. However, the plug must first be removed from the zoom pedal. The following cable colours (from the pedal) should be used instead of those from the ZoomControlBox:

- zoomIN ('ws' on the OCA board) = yellow (from the pedal)
- zoomOUT ('br' on the OCA board) = grey (from the pedal)
- common ('gr' on the OCA board) = red (from the pedal)

6.1.5 Mounting MRX.power

NOTE

NOTE! MRX.power is an accessory designed to supply power to equipment in the cabin and on the charging rail from a 230VAC socket. **MRX.power** is an AC/DC converter with a 24VDC output. Other power supplies capable of delivering the same output power may also be used, subject to qualification by AZG Tech.

Required output for devices in the cabin: 24 V DC (stabilised), 2 A.

MRX.power is installed in the cabin. A drilling template for fixing the unit with four screws is supplied with the device.

The 230 V AC connection should be protected by its own fuse.

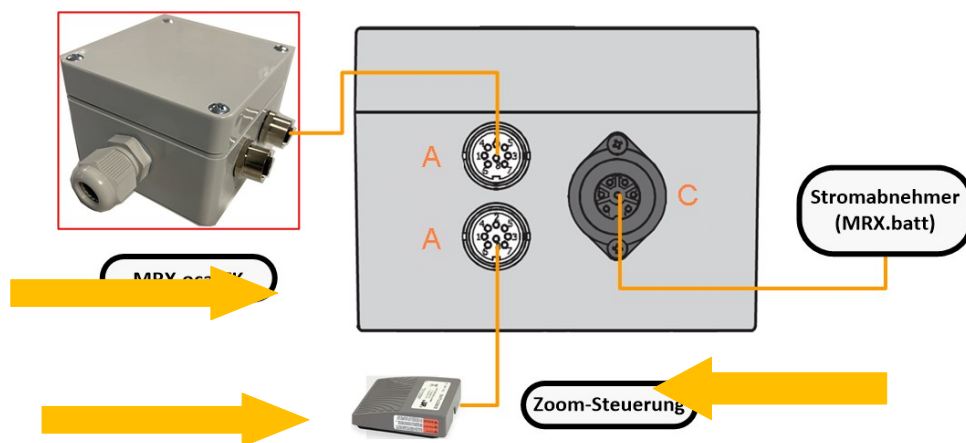


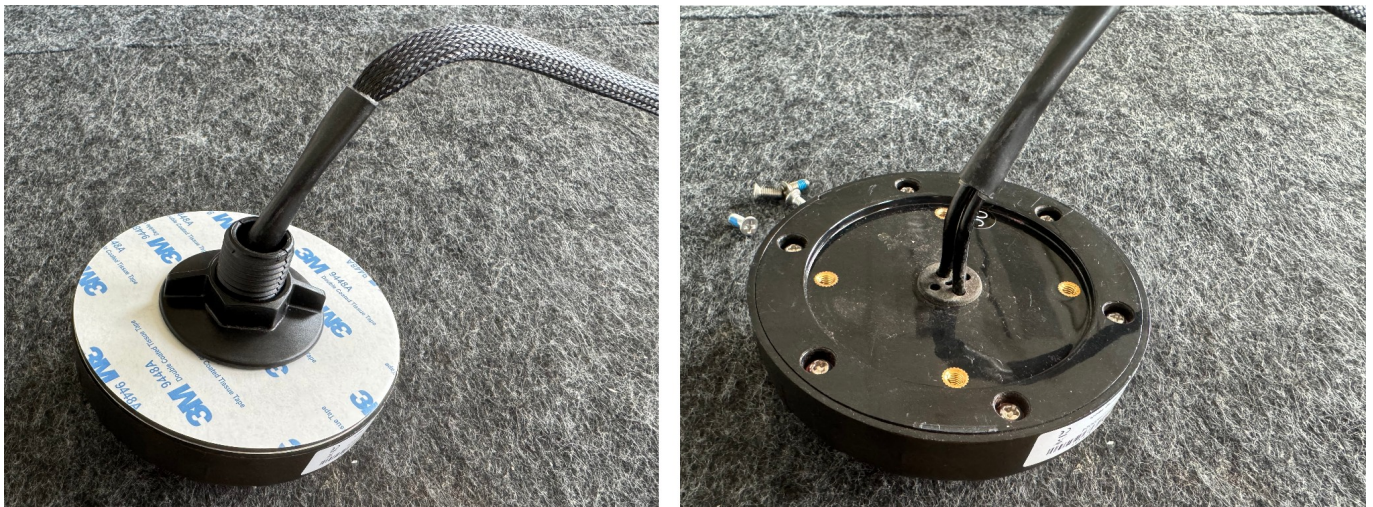
Fig. 8: Verdrahtungsschema **MRX.power**

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 **Mounting set MRX.planarAntenna (TK)** (A-1136), the antenna can be magnetically attached to or 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. 9: 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.

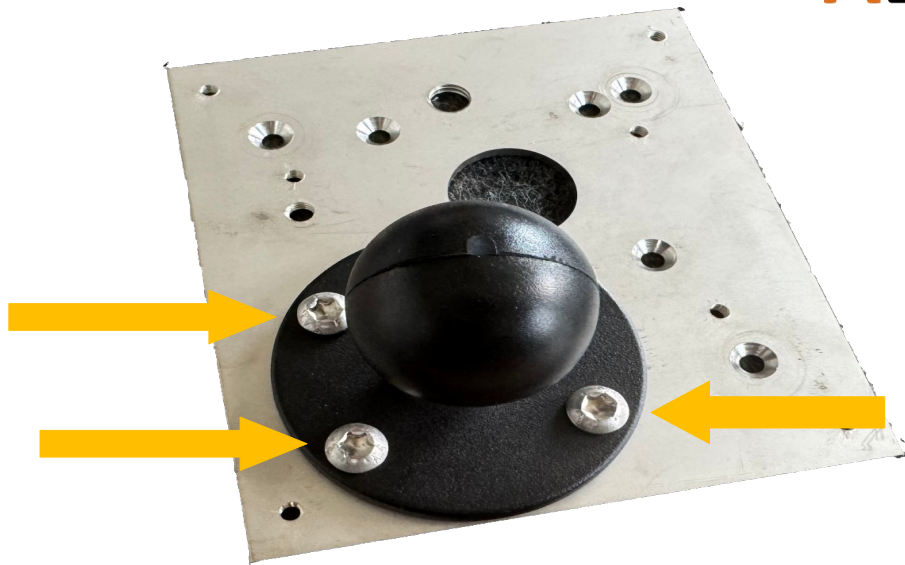


Fig. 10: Attachment of ball head to **MRX.mountingPlate**

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

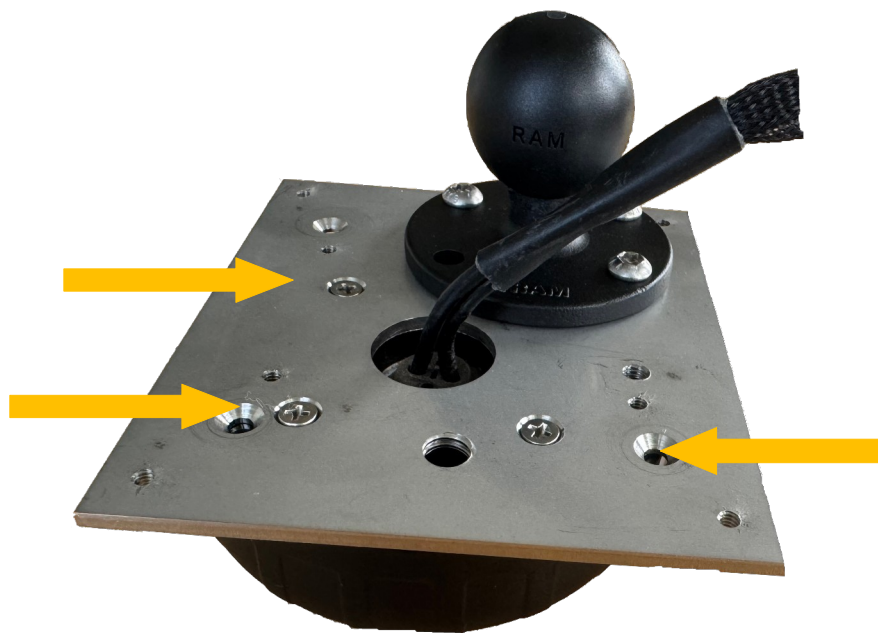


Fig. 11: Mounting **MRX.planarAntenna** to **MRX.mountingPlate**

Secure the antenna cables using the cable ties.

NOTE

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



Fig. 12: 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).



Fig. 13: Example for System-Overview w. Attenuation values of the radio link

NOTE

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 (TK). 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.

NOTE

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 trolley

6.3.1 Assembly MRX.pal/MRX.eth

MRX.pal or **MRX.eth** are mounted on the trolley or as repeaters on the crane. Use the **Mounting set MRX.pal/eth (TK)** (A-1547) 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 trolley or battery basket. 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.

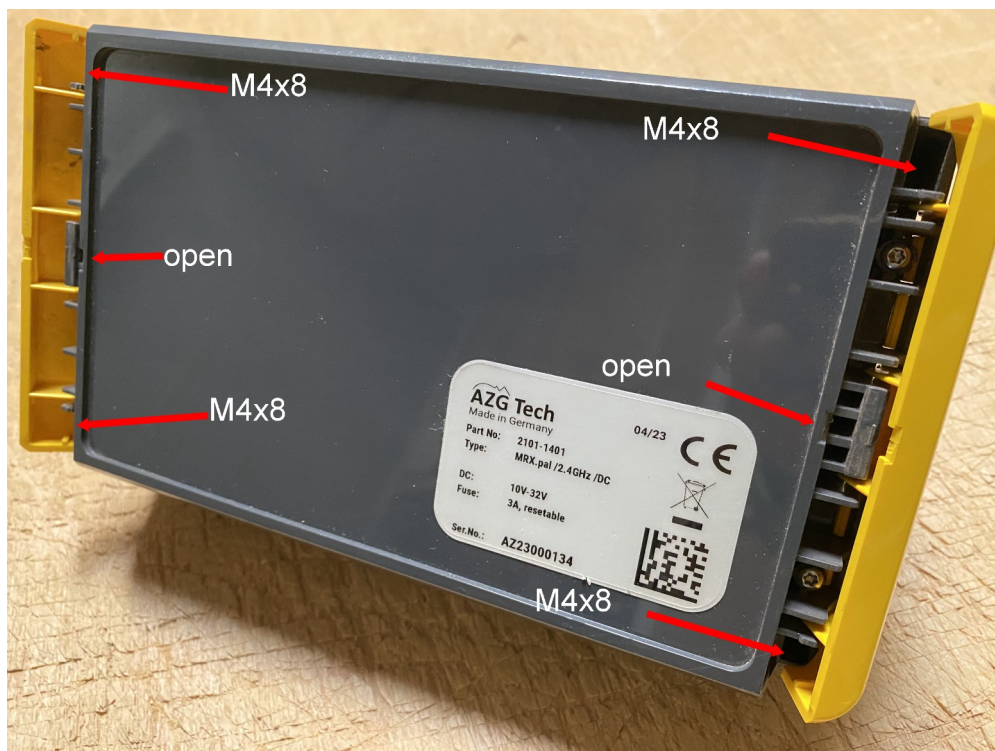


Fig. 14: Assembly MRX.pal/MRX.eth on mounting plate

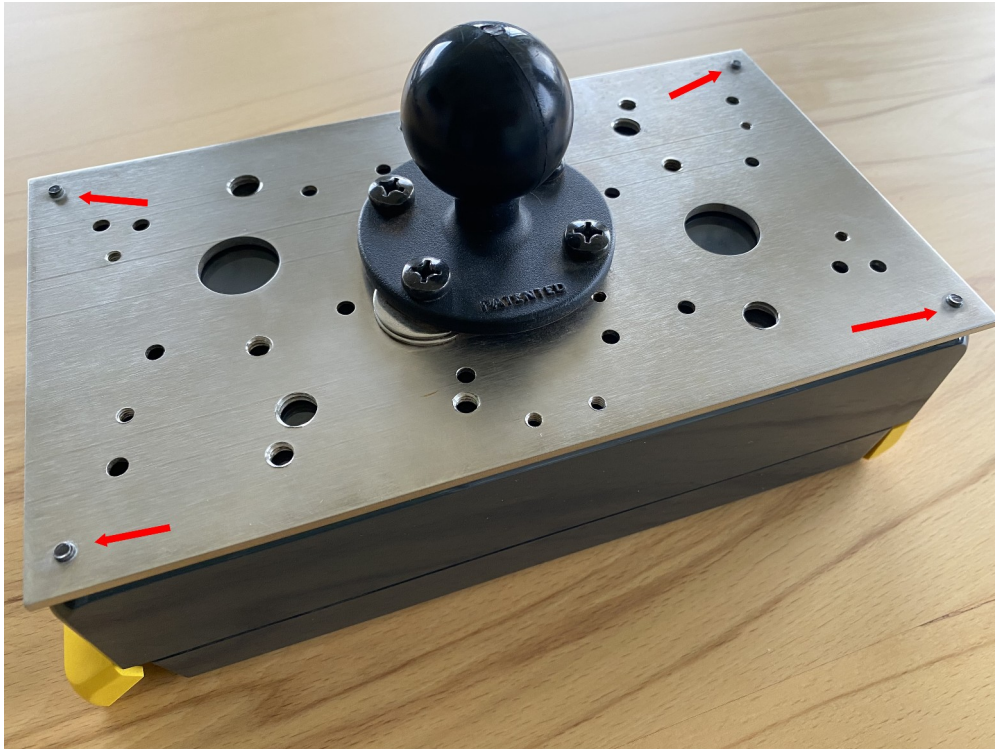


Fig. 15: MRX.pal/MRX.eth mounted on mounting plate

NOTE

NOTE! Alignment of **MRX.pal** or **MRX.eth**: Align the enclosure wall (shown in Fig. 16, w/o connectors) towards the **MRX.planarAntenna** on the cabin or the nearest repeater.

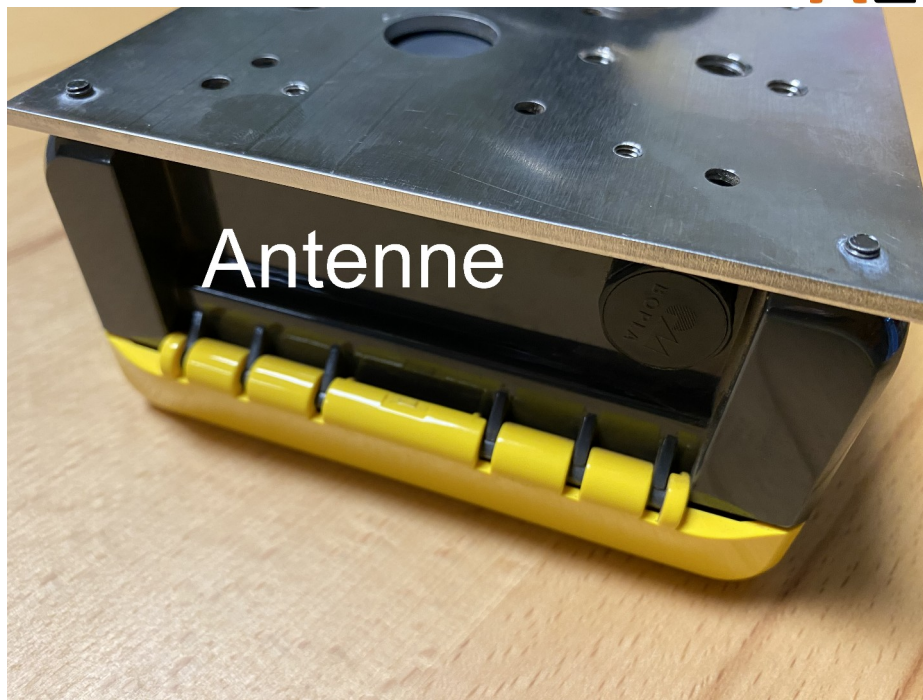


Fig. 16: Align this side towards the cabin

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 19.

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.

6.3.3 Mounting MRX.battery

MRX.battery can be bolted directly onto the jib or trolley, provided the appropriate drill holes are present.

If this is not possible, **MRX.battery** is installed using **MRX.batteryNest**. To do this, insert **MRX.battery** into the designated compartment and then connect the cables.

Once **MRX.battery** has been installed, connect all the cables and switch on the device. To commission **MRX.battery**, press the 'On/Off' push-button on the front of the housing.

NOTE

NOTE! It takes approx. 2 seconds for the **MRX.battery** to start up after pressing the switch!

When the switch is off, it disconnects the actual MRX.battery-pack located inside the device from the charge controller for transport and storage, in order to minimise self-discharge as much as possible.

6.3.3.1 Connections

Connection „I“	DC input for charging the battery. The power supply must be capable of delivering an output power of at least 150W (even under high thermal load!).
Connections „S“	Input socket for solar module.
Connection „O“	Output socket for the load (MRX.pal or MRX.eth). This interface is also used for communication with the MRX.CraneRadio system.

Tab. 2: **MRX.battery** connections

6.3.4 Mounting MRX.batteryNest

The **MRX.batteryNest** is mounted on a cross-beam. The two individual baskets are mounted back-to-back, with the cross-beam in the middle. There are several mounting holes to allow for adjustment.

One screw, one nut, one washer and, finally, the lock nut are fitted and tightened securely to create a firm connection.

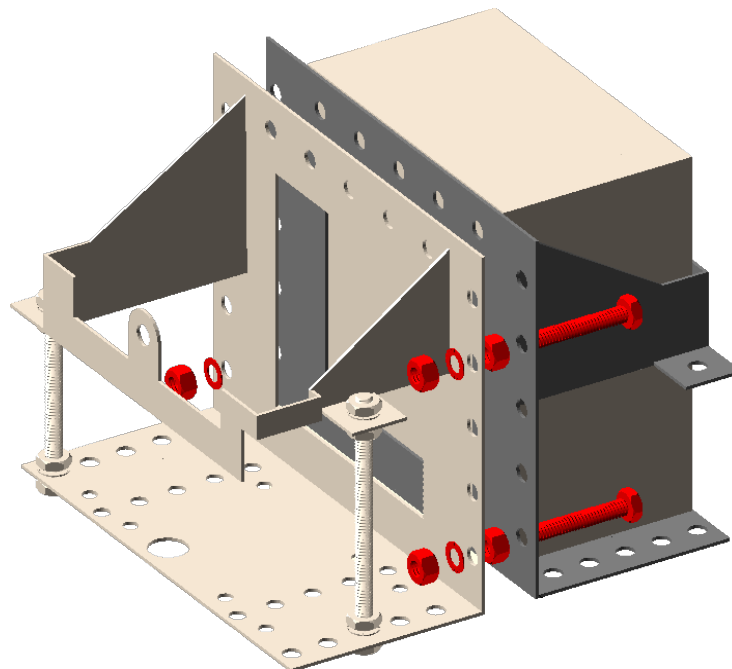
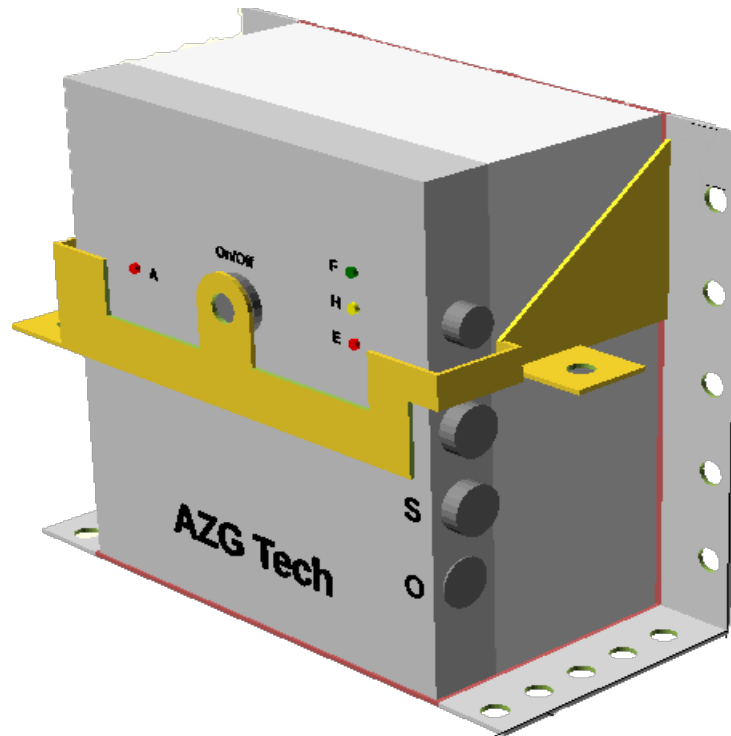


Fig. 17: **MRX.batteryNest** back-to-back

The **MRX.battery** is inserted into the part of the assembled **MRX.batteryNest** where there are NO vertical screws.

The battery is simply inserted and the connection cables are secured. Once the cables are attached, the battery is secured and cannot pop out of the mounting basket.



*Fig. 18: **MRX.battery** inserted*

6.3.5 Mounting MRX.camera

The camera is mounted on the 'empty' battery cage – that is, the cage in which no **MRX.battery** is inserted.

Using the screws, nuts and washers provided, the mounting bracket or the camera itself can be secured directly to the cage in various positions.

To align the camera along the Z-axis, the two long screws are pre-fitted to the holder. These are used to align the mounting plate. Once alignment is complete, tighten the nuts again to ensure a secure, permanent fix.

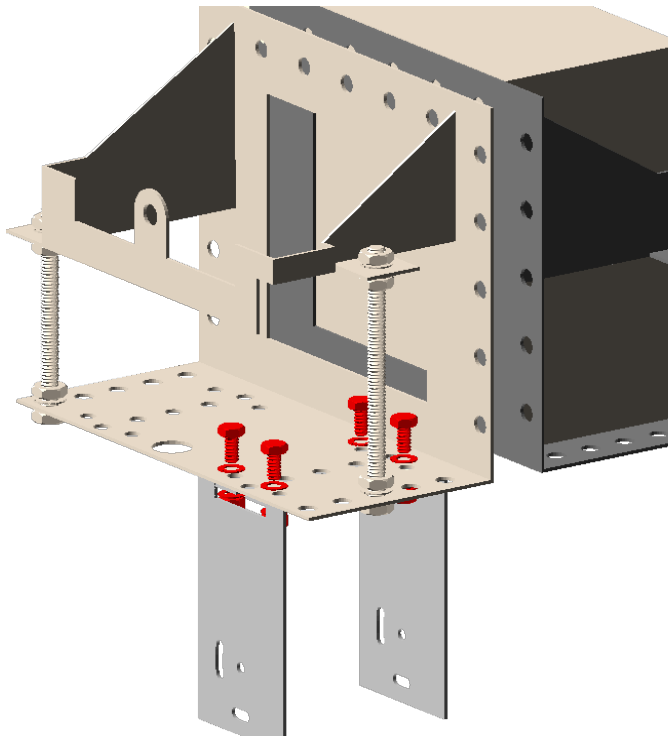


Fig. 19: Mounting **MRX.camera**

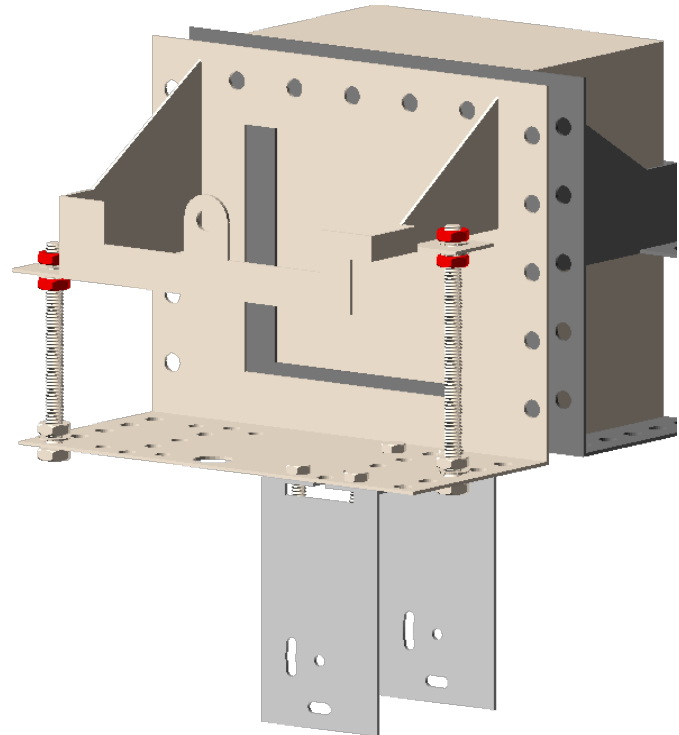


Fig. 20: Adjustment **MRX.camera**

6.3.6 Mounting MRX.solarPanel

The **MRX.solarPanel160** is attached to the 4 eyelets using cable ties. Care must be taken to ensure that the module is taut. The **MRX.solarPanel160** is flexible, so slight bends are possible. The orientation (H/V) of the MRX.solarPanel160 is irrelevant.

It is recommended to connect a second **MRX.solarPanel160** in series. This increases the likelihood of capturing solar energy in all orientations of the boom, provided the two modules are mounted to the left and right of the boom.

The **MRX.solarPanel160** is connected to the **MRX.battery** using the M-1794 adapter cable ('PVin cable, 2.0m'). The adapter cable has an MC4 plug on one end and an MC4 socket on the other. These are connected to the plug and socket on the MRX.solarPanel160.

The other end of the adapter cable is an M16 socket, which is connected to the 'S' (Solar) input on the MRX.battery.

Connecting two **MRX.solarPanel160** units in series may be advisable.

Separate earthing of the **MRX.solarPanel160** is not necessary.

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