MRX.CraneRadio with Repeater

Introduction

The MRX.CraneRadio system from AZG Tech offers digital data transmission on mobile and tower cranes. The range between transmitter and receiver is approx. 200 metres.
As with any radio system, connection problems can occur if the transmitter and receiver no longer have a line of sight because buildings or similar are "in the way". With cranes in particular, this so-called "tear-off edge" can naturally occur quickly during operation:

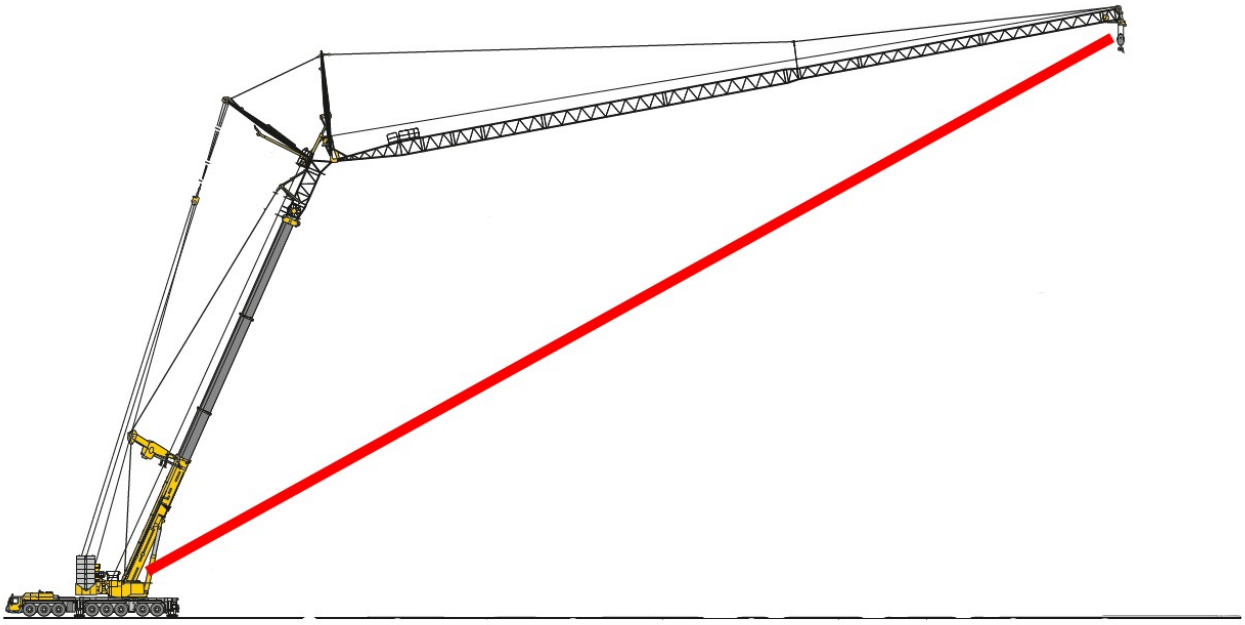

Figure 1: Direct wireless connection between camera and cabin

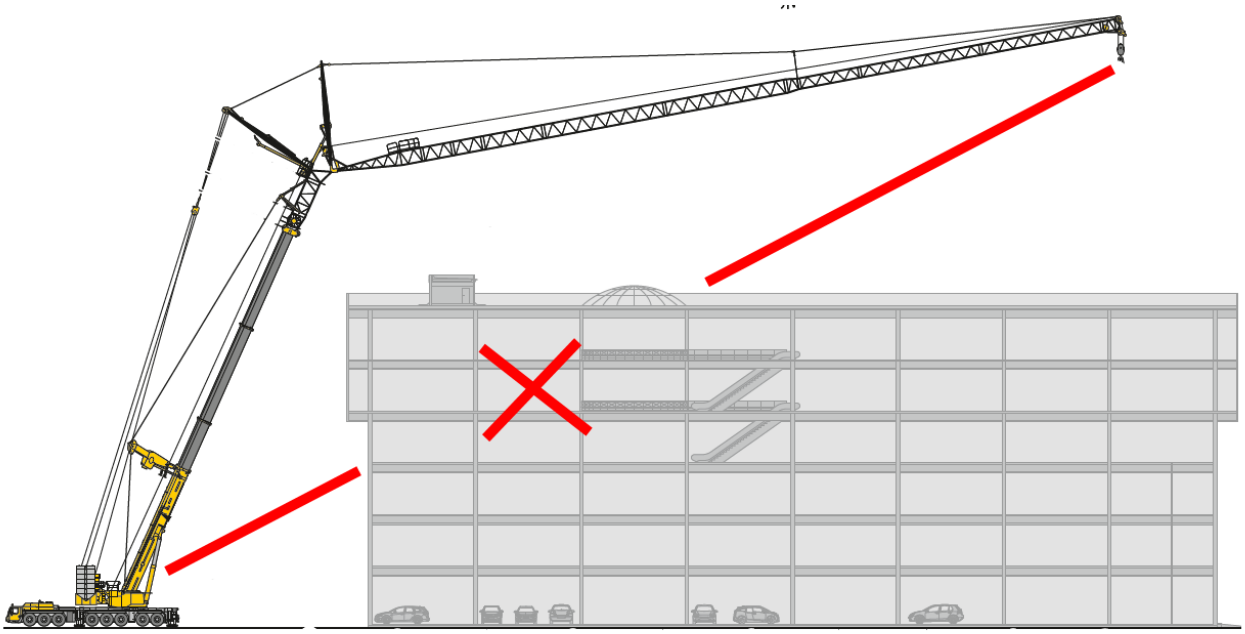

Figure 2: Direct wireless connection between camera and cabin not possible

While the camera data can be transmitted without any problems in the setup shown in Figure 1, problems must be expected when using Figure 2.
The radio waves cannot be transmitted "across corners".

Repeater

If it were now possible to establish the radio connection around the obstacle at Figure 2, the problem would be solved and the camera connection would also work here. The crane operator has a video image in the cab.
A repeater fulfils this function. If the repeater is installed in the bend point of the crane, there can no longer be a tear-off edge, as the radio transmission always runs parallel to the crane where there are no obstacles.

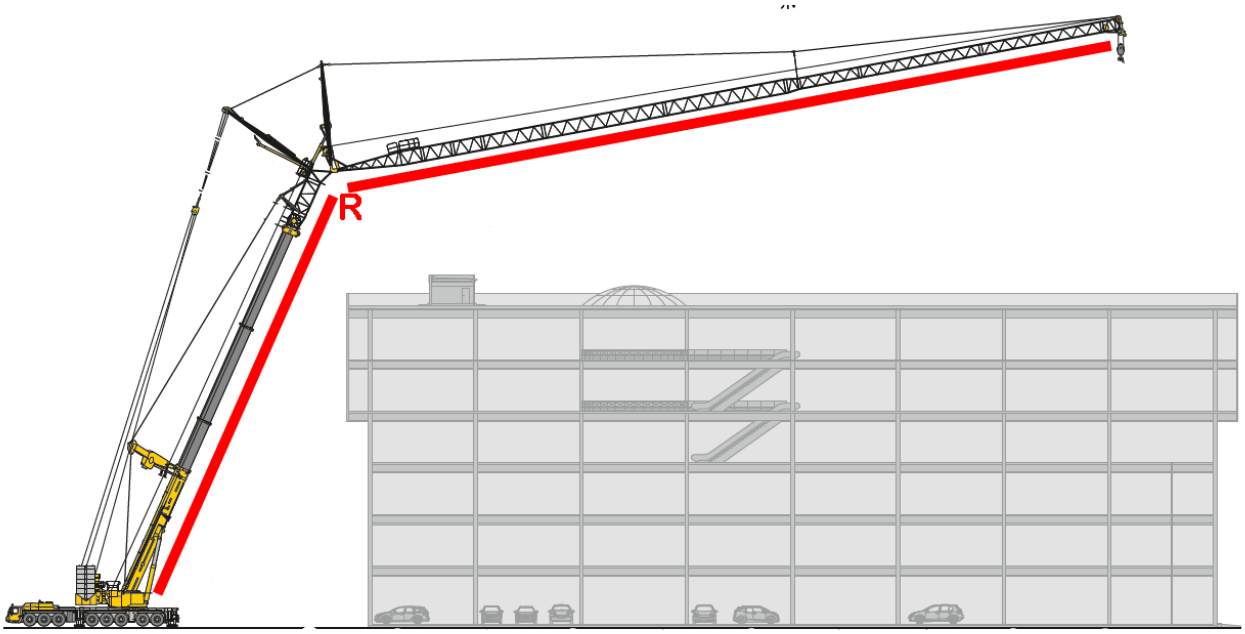

Figure 3: Indirect radio link between camera and cabin

As shown in Figure 3, the repeater ensures that a connection can always be guaranteed.

Repeater solution from AZG Tech

AZG Tech has developed a repeater based on the previous transmitter (MRX.pal), with which the problems shown above can be easily solved on (large) cranes.
The hardware is completely identical to the previous transmitter, only the configuration of the "MRX.crane radio with repeater" system needs to be adapted. This saves the installation of new devices and simplifies warehousing.
It is also possible to simply "relocate" the camera if the auxiliary boom is not required. This makes the system multifunctional and can be used as required.
The wide beam angles of AZG Tech's transmission technology make it possible to support all application areas and inclination angles of the two crane arms. (0 ... 90° on the main boom, -30° ... +90° on the auxiliary boom).
The range of EACH radio link is approx. 200 metres.

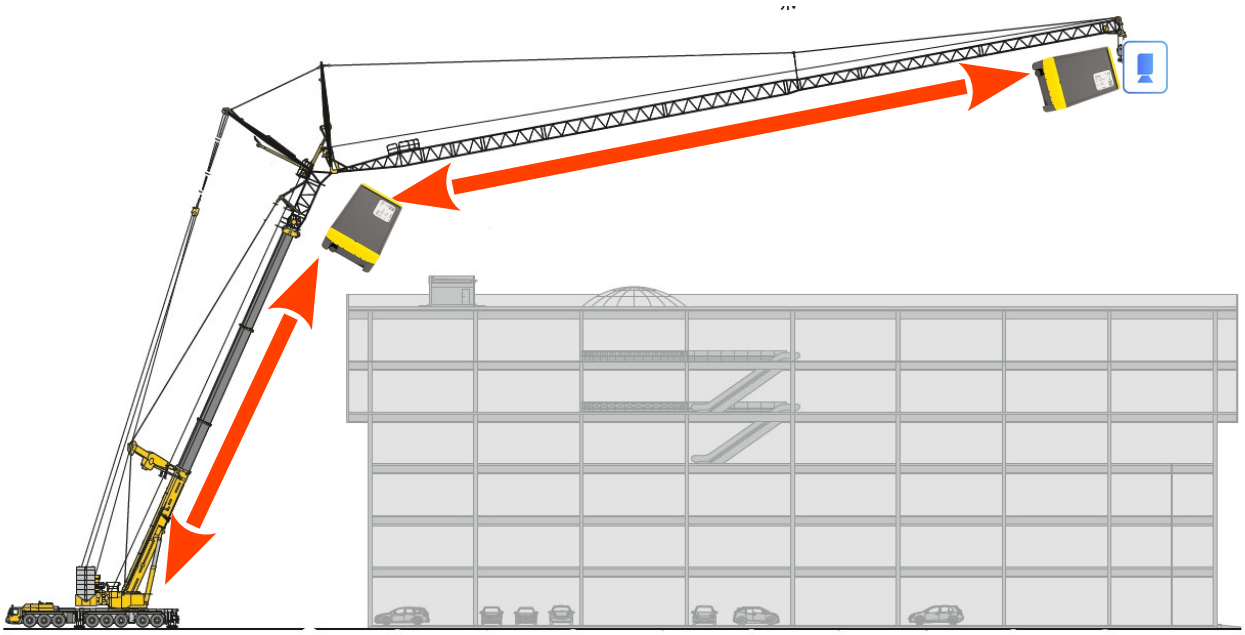

Figure 4: Repeater and transmitter from MRX.CraneRadio with camera

The system is configured when the crane is set up and can therefore be customised when MRX.CraneRadio is installed. Dual use of the repeater as both a repeater and a transmitter is possible at any time WITHOUT further configuration.

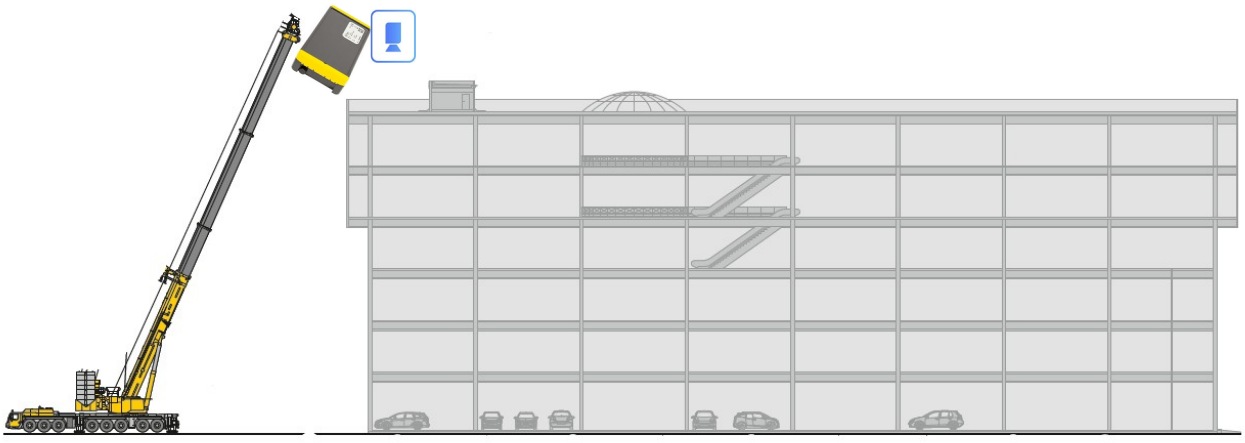

Figure 5: Repeater as transmitter with camera

Field test

The arrangement shown above was successfully tested on a Tadano crane (AC7.450-1). The components were attached to existing installation points. The electrical supply was connected to prepared contacts.

The different angles of the main boom and auxiliary boom were tested. There were no problems with the transmission of the video data. A sharp image and control of the zoom function was possible at all times. As far as possible, buildings were also included in the test as obstacles. No tear-off edge could be observed.
The ranges that were possible on the crane for testing posed no problems.
During the field tests, it was particularly emphasised that the cable drum previously used to connect the camera to the HA was no longer required.

Range extension

The repeater from MRX.CraneRadio can not only be used to transmit "around the corner", but also to increase the range. So if distances of more than ~200m between transmitter and receiver occur, a repeater can also be used here. The number of repeaters is not limited by technology. And a camera can always be connected to a repeater.

Conclusion

With the "Repeater" function for the MRX.CraneRadio system, AZG Tech is expanding the applications for wireless video transmission on construction machinery.
Technical problems inherent to radio transmission (radio shadows, range) can be easily overcome with the repeater.
By using the same devices as transmitters and repeaters, different and highly customised combinations can be created that can be used for many applications.

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