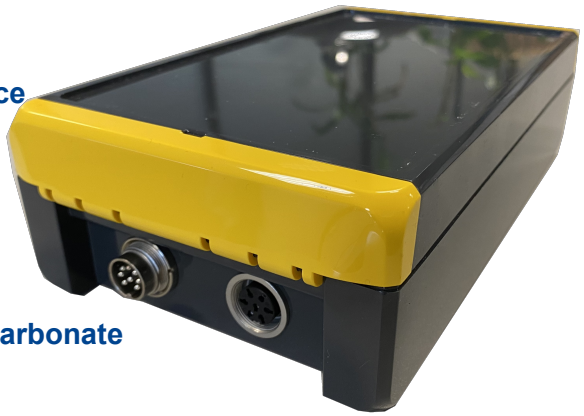
Kran Funk

x

MRX.pal

Video processing and mesh nodes for MRX.KranFunk (MRX.Crane Radio)

- **x High speed video encoder**
- **x Remote radio unit for MRX.KranFunk**
- **x Transmitter and repeater function in one device**
- **x High date rate (up to 400 Mbit/s)**
- **x Encrypted/meshed radio based on IEEE 802.11s (AZG.mesh)**
- **x PAL interface for analogue camera**
- **x Zoom control for the camera via RS-232**
- **x Plastic housing made of UL certificated polycarbonate**



The MRX.KranFunk system transmits analogue camera images from different positions on cranes to a touch monitor in the crane operator's cabin. Data is transmitted via a robust, encrypted and meshed radio network.

MRX.pal is a converter unit that digitises analogue camera images and then sends them to the central unit. One MRX.pal is required per camera. Thanks to the meshed radio technology, several MRX.pal can be installed on the crane to enable multiple cameras.

Introduction

MRX.pal is part of the MRX.KranFunk system.

MRX.pal receives the analogue video data and encodes them. The digitised video streams are sent via the KranFunk interface to the central unit (MRX.cabin), where they are decoded and displayed on the monitor.

MRX.pal is equipped with a powerful video encoder (video frame grabber) to minimise processing time and allow for the lowest possible "glass-to-glass" (camera to screen) latency.

In addition to video coding, MRX.pal has a measuring unit to measure the input voltage and current. The results are used to determine the remaining runtime of any battery connected upstream to supply the device and transmitted to the central unit for display.

In order to avoid unnecessary strain on the battery when the system is not in use, the power supply to the camera can be switched off on the MRX.pal.

The crane operator gives the command to do this in the cab via the radio network.

MRX.pal can be used as a repeater/amplifier in the radio network. This allows ranges to be increased and, above all, potential "radio obstacles" to be overcome.

MRXpal is optimised for use on construction machinery and for operation with and without batteries. The input voltage range is 12-32VDC. The specified temperature range is from -20°C to +70°C. The unit does not require a fan.

The built-in radio interface works according to the IEEE 802.11s standard with 2x2 MIMO antenna technology. The MRX.pal antenna is built into the housing to provide maximum protection against mechanical stress.

Kran Funk

Technical specifikations

Overview

- Wireless Router + Video Processing
- Fully encrypted wireless meshed network
- 1x Mesh-IF

Mesh Radio

- 2x2 MIMO
- 2.4GHz:
  - BW: 20/40MHz
  - Std: 2.412 ~ 2.472GHz
  - max. 20dBm
- 5GHz:
  - BW: 20/40MHz
  - Std: 5.180 ~ 5.825GHz
  - max. 23dBm
  - DFS supported
- Data rate: up to 400 Mbit/s
- Modulation techniques
  - OFDM: BPSK, QPSK, DBPSK, DQPSK, CCK, 16-QAM, 64-QAM
- Antenna inside

Mesh Features

- IEEE 802.11s
- Fully encrypted
  - SAE key exchange
  - AES-SIV (RFC5297)
- HWMP routing
  - self forming & self healing
- Up to 32 units per mesh system

Video Features

- supported analogue video formats
  - PAL, NTSC
- supported digitale video formats
  - MPEG4
- Video Frame Grabber
  - HW encoding for low latency
  - Latency: ~250ms (over all)

Video interface

- PAL, NTSC
- Plug: 7-pol.

Measuring unit battery

- Measuring range: 10-32VDC
- Accuracy: 1%

Security

- Encryption of the entire radio transmission
- Secured login to device

System management

- Web-GUI
- SNMPv2c, SNMPv3

Hardware

- CPU: 880MHz
- RAM: 256MB
- Flash: 128MB

Physics

- Fan less
- Weight: 750g
- Dim: 231x125x60mm (BxHxT)

Housing: Plastics

- Material: PC UL 94 V0
  - flame retardant, self-extinguishing
  - UV-stable (f1-listing acc. UL 746C)
  - R22 acc. DIN EN 45545-2
- Protection: IP67
- Mounting:
  - Wall mounting
  - Pole mounting

Power

- Power supply:
  - DC: 10-32V
  - Connector: 8-pol. plug
- Power demand
  - 5.5W (w/o camera)

Environment

- Operation: -20 .. +70°C, ambient w/air
- Storage: -20 .. +70°C
- Rel. humidity: 5-95%, non cond.

Certifications

- CE, eMark regulations
- RoHS

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