ats Elektronik

OPERATING INSTRUCTIONS

Bridge

IOP904

Manual Version 1.00

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We appreciate any completion or suggestion.

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We appreciate any completion or suggestion.

Operating instructions version 1.00 of December 1, 2014
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Contents

1 About these instructions

This manual describes the IOP904 bridge.

One distinctive feature of ATS products is their continued further development. Therefore, it might be possible that print documentation does not always reflect the most recent state.

NOTE

Before you use the product, please read the manual carefully.
Keep this manual for the entire useful life of the product for reference purposes.

NOTE

This manual addresses trained service technicians and specialized radio traders. It is, therefore, assumed that programming skills and knowledge about how to install radio technology and its functions are given.

1.1 Scope of delivery

Scope of delivery

Before you start with the installation please make sure that your delivery is complete and free from damage:

- IOP904
- MOTOTRBO, TETRA DIN drawer release lock bracket
- this manual

ATS Elektronik GmbH reserves the right to change the scope of delivery without prior notice.

Required components

To operate the device you require the following components which are not included in the scope of delivery:

- TETRA mobile radio set MTM5400 R27.000.8536
- DMR mobile radio set DM4601 R02.30.01
- aerials suitable for the radio sets

1.2 Intended use

The IOP904 serves as a bridge between Motorola DMR and Motorola TETRA radio sets. The IOP904 is designed for indoor use only. The IOP904 is not suitable for use in the open air as well as in spaces with permanently high humidity, and underwater.

The IOP904 enables cross-network group paging. Individual calls are not possible.

1.3 Warranty provisions

If you purchased the device from ATS Elektronik GmbH directly, the statutory warranty provisions shall apply as well as the General Terms and Conditions of ATS Elektronik GmbH. The delivery date of ATS Elektronik GmbH shall govern the commencement of the warranty period. Any warranty claims shall lapse in case of

- operating or programming errors,
- defects caused by the customer,
- wilful damages,
- improper installation/removal.

If a warranty case occurs, please return the defective device together with a copy of the delivery note or invoice to ATS Elektronik. We will check whether a warranty claim is justified for the device. If your claim is rejected you will receive a cost estimate for repair or exchange. ATS Elektronik GmbH shall refrain from covering any costs arising from the failure to adhere to the warranty provisions. If you did not directly purchase the radio from ATS Elektronik, the respective warranty terms of your supplier shall apply.

1.4 Disposal

European Union (EU) Waste Electrical and Electronic Equipment Directive (WEEE):

Any product that is brought onto the market in EU member states must be marked with a crossed-out waste bin symbol (in individual cases the packaging may be marked). The WEEE Directive specifies that customers and end users in member states of the European Union (EU) may not dispose of electronic or electrical equipment and electronic or electrical accessories in the household waste. Within the EU, please contact your local representative or the customer service department of your supplier. They can give you information on the disposal or collection of waste equipment.

2 IOP904

The IOP904 is a bridge which connects a TETRA radio set and a DMR radio set enabling voice communication (group paging) across the networks.

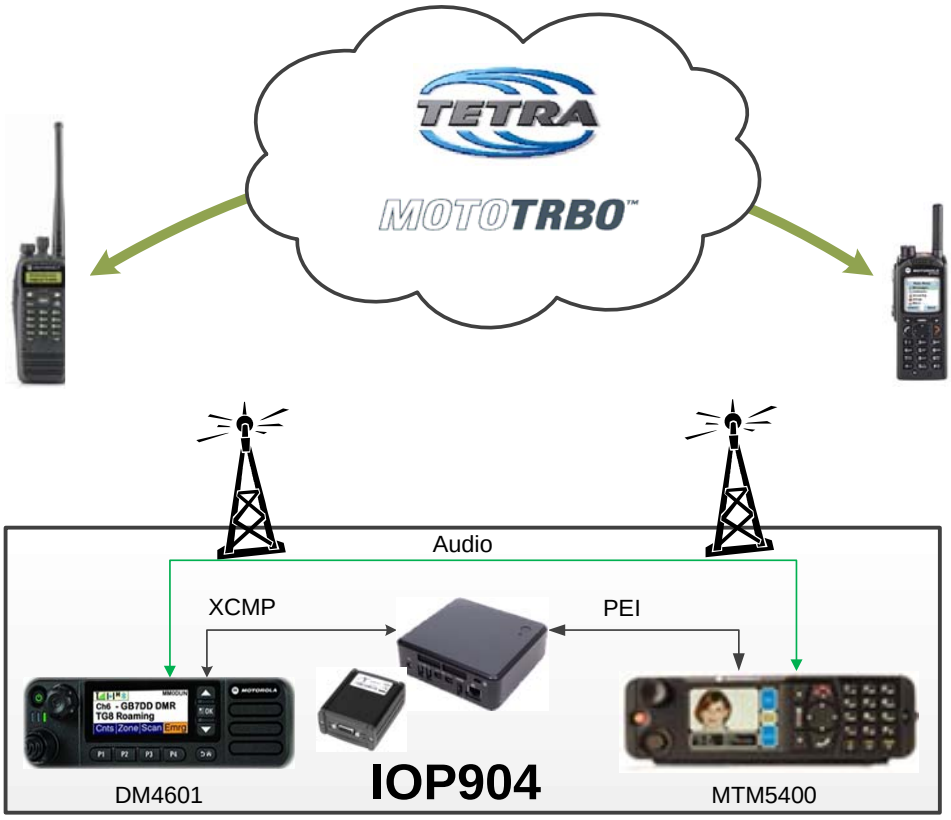

Fig. 2-1 IOP904 system sketch

A TETRA and DMR radio set each are installed in the IOP904. Each radio set receives an own aerial.

Display elements

At the front of the IOP904 there are two LEDs and a push button.

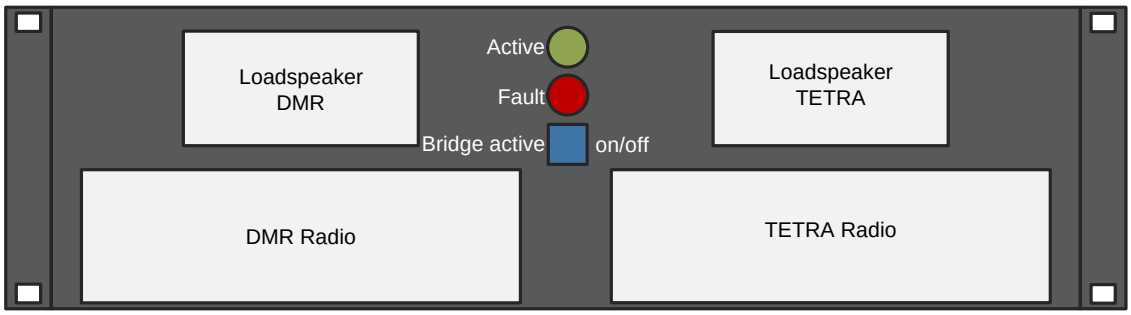

Fig. 2-2 Front view with display elements

- **Green LED** at the top: blinking: system is booting / lights up = operative / off = inoperative
- **Red LED** in the middle: lights up = error, e.g. due to a switched off radio set, an error of internal PC or a radio is not in service / off = system in operation.
- **Blue push button**: blinking = bridge active at the moment / lights up = bridge function activated / off = bridge function deactivated

At the back there are two LEDs each for the power supplies, the left-hand LEDs belong to the power supply of the TETRA radio set, the right-hand LEDs belong to the power supply of the DMR radio set.

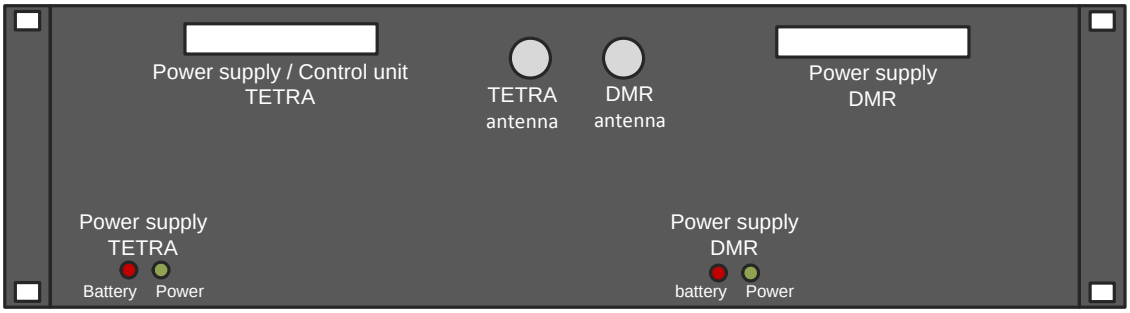

Fig. 2-3 Back view with display elements

- **Green LED**: on = mains supply / off = no mains supply
- **Red LED**: on = system uses the optional external battery / off = no external battery

IOP904 operation

Pre-condition: The relevant radio set installed in the IOP904 is in the same group as the end devices.

WARNING

Connect first the power supply of the DMR radio device and thereafter the power supply of the TETRA radio device, or connect both power supplies simultaneously.

1. If the radio sets do not switch on automatically when connecting to power supply, they have to be switched on manually. After complete start-up of the system, the transfer function is ready for use (blue push button lights up).

2. Now all group calls received by the group set up in the IOP904 radio will automatically be sent via the group set up in the other IOP904 radio.
3. To exit the bridge function press the blue push button again (the blue push button is off).
4. Activate the bridge function with the blue push button (the blue push button illuminates).

Operation via TETRA

The IOP904 can be controlled by SDS from TETRA end devices.

1. To query the status of the bridge function, send the SDS text **`BRIDGE?`** to the IOP904 TETRA radio.
   The TETRA radio returns an SDS with the status information:
   `Bridge active yes/no; Tetra talkgroup; MOTOTRBO channel`
2. To activate the bridge function send the SDS text **`Bridge active yes`** to the IOP904 TETRA radio.
   The TETRA radio returns an SDS with the status information:
   `Bridge active; Tetra talkgroup; MOTOTRBO channel`
3. To deactivate the bridge function, send the SDS text **`Bridge active no`** to the IOP904 TETRA radio.
   The TETRA radio returns an SDS with the status information:
   `Bridge not active; Tetra talkgroup; MOTOTRBO channel`

3 Installation

When programming the radio sets to be used with the IOP904 some issues need to be considered. The radio devices must be programmed before their installation.

3.1 Programming of radio devices

Special programming parameters need to be set before installing the radio devices in the bridge.

NOTE

This manual addresses trained service technicians and specialized radio traders. It is, therefore, assumed that programming skills and knowledge about how to install radio technology and its functions are given.

Unless otherwise provided for in the following, please program the basic data such as output, channel, etc. in the usual way.

3.1.1 TETRA

When programming the TETRA radio device please set the following parameters:

- Under **Data Services – SDS Remote Control – AT commands** activate the options:
  - **ETSI Group Setup Format**
  - **ETSI AT SDS/Status Format**
  - **Extended ETSI Addressing**

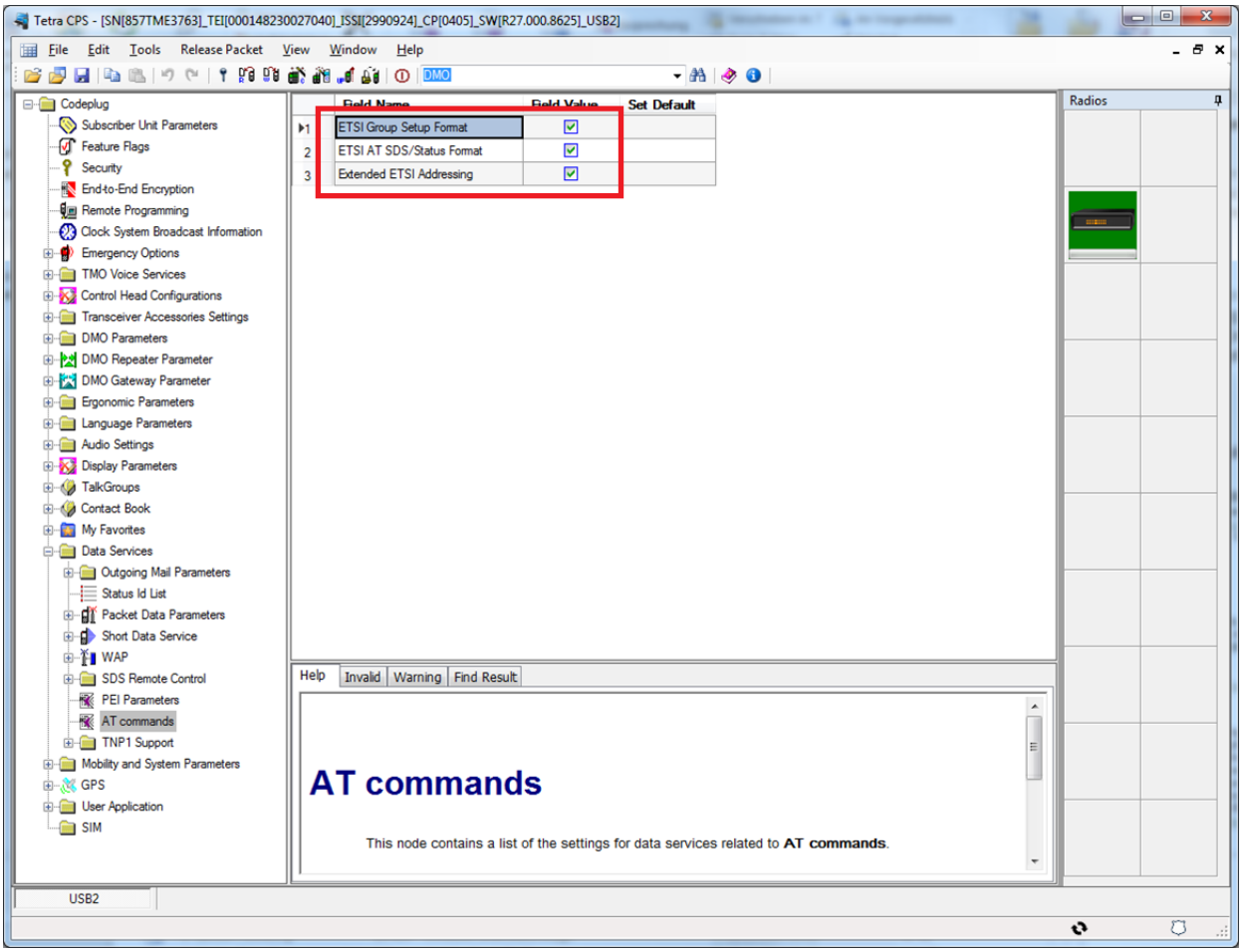

Fig. 3-1 TETRA – AT Commands

- In the **Transceiver Accessories Settings** menu set the **RX Audio Line Output Type** to **+14dBr Point**.

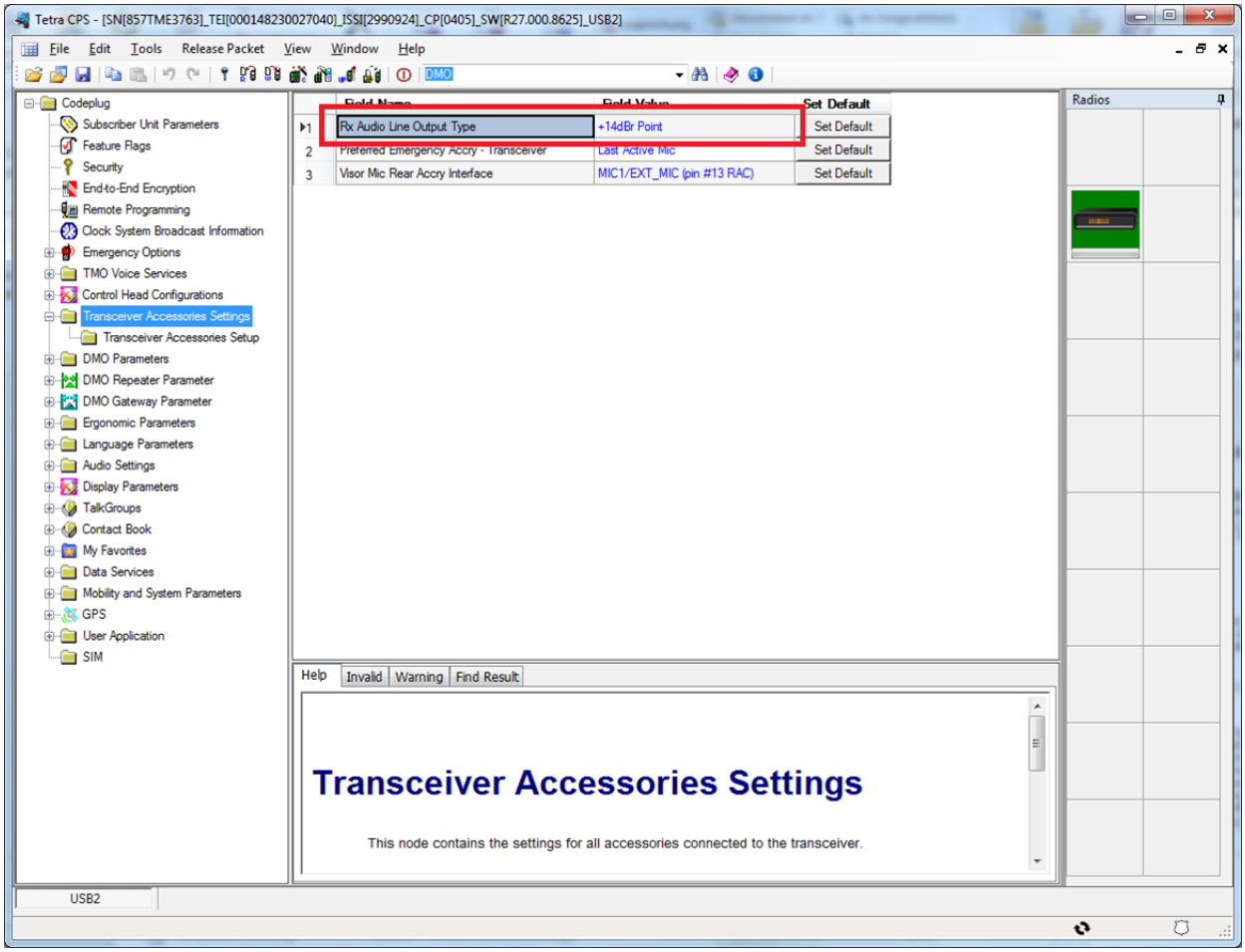

Fig. 3-2 TETRA – Transceiver Accessories Settings

- In the **Transceiver Accessories Settings** – **Transceiver Accessories Setup** menu set the **Line In Rear Accry** option to **LINE-IN**.

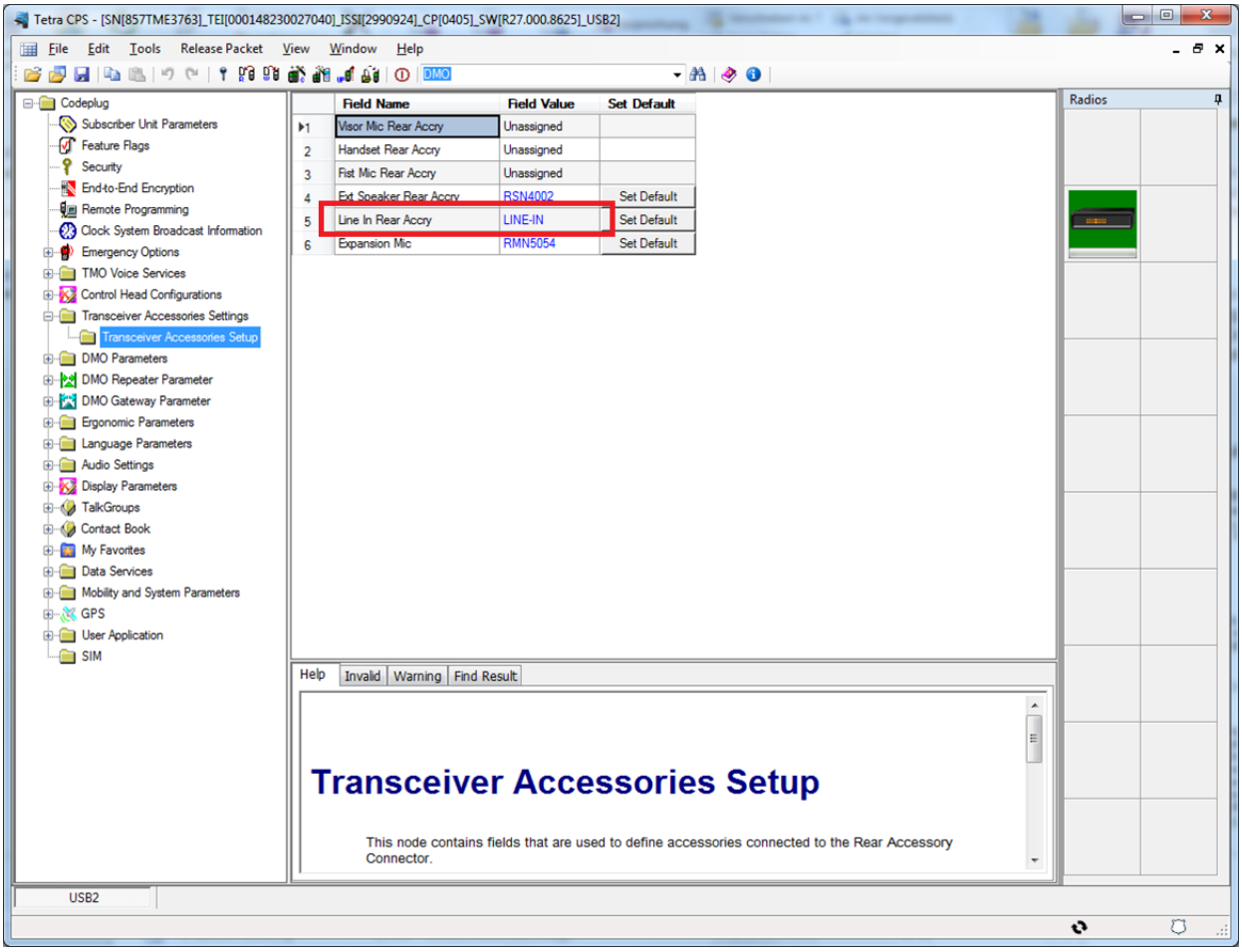

Fig. 3-3 TETRA – Transceiver Accessories Setup

3.1.2 DMR

When programming the MOTOTRBO radio device please use the following parameters:

- Under **General Settings deactivate** all **AGC**s:
  - Deactivate **Analog Mic AGC**
  - Deactivate **Digital Mic AGC**

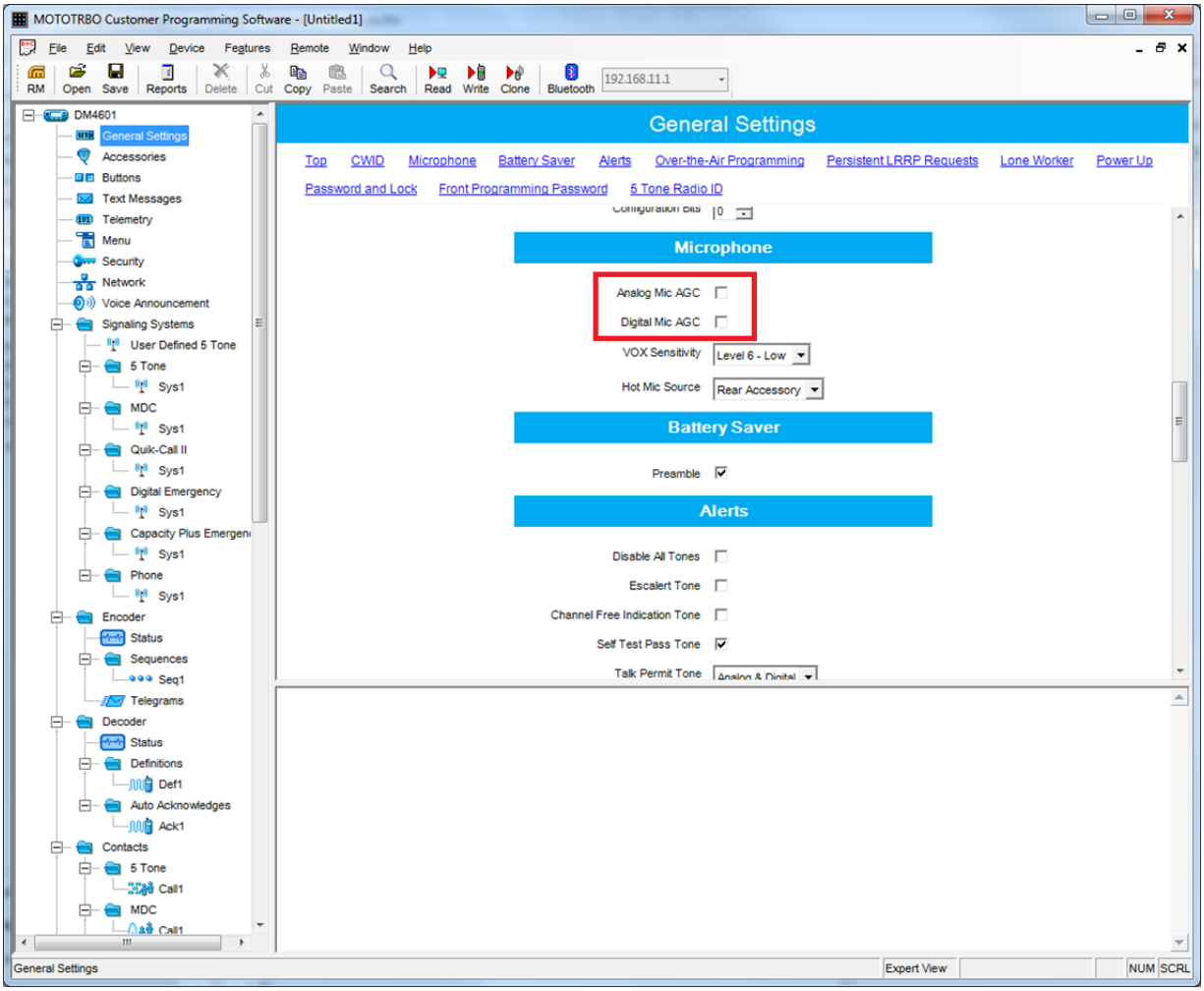

Fig. 3-4 MOTOTRBO – General Settings

- In **Accessories** set all gain values to default:
  - **Analog Front Mic Gain (dB)**: -2
  - **Digital Front Mic Gain (dB)**: 2
  - **Analog Rear Mic Gain (dB)**: -2
  - **Digital Rear Mic Gain (dB)**: 2
- Set the **Cable Type** to **Rear PC & Audio**

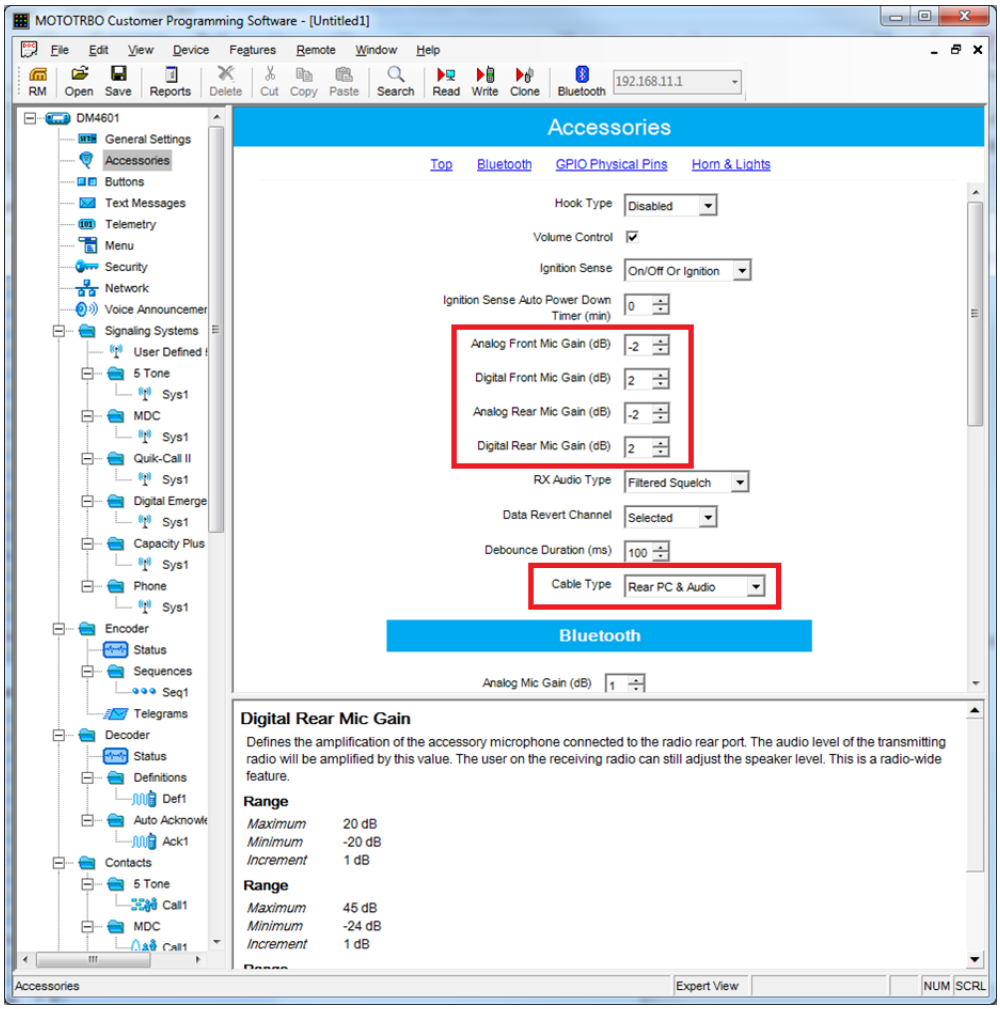

Fig. 3-5 MOTOTRBO – Accessories

- In **Network** allocate the **192.168.10.1 Radio-IP** (standard) to the radio set.
- Set the **Forward to PC** option to **Via USB**.

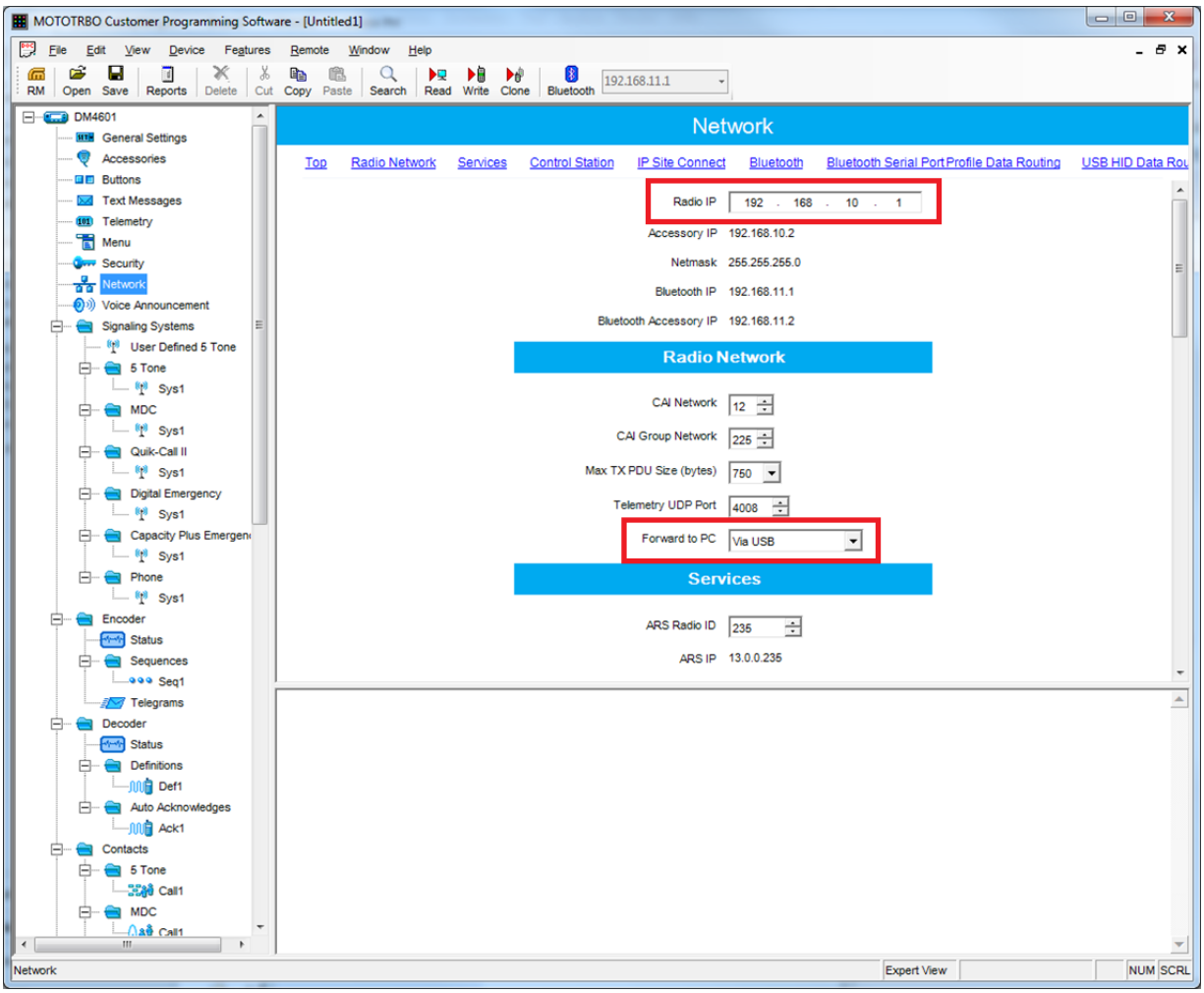

Fig. 3-6 MOTOTRBO – Network

3.2 Installing the radio devices

In the IOP904 the necessary connection cables are ready for use for both radio sets.

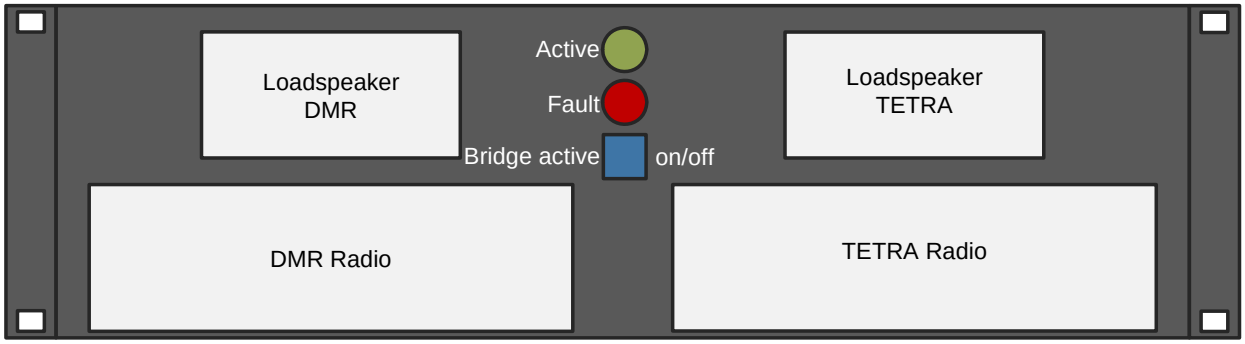

Fig. 3-7 IOP904 front

1. For audio transmission connect the TETRA or DMR connection cables.
2. Plug in the aerial cable. Please ensure to use the proper side.
3. Plug in the power supply cables. Please ensure to use the proper side.
4. Insert the radio sets into the drawers.
5. When you take the radio sets out, please pay attention to the cable lengths.

3.3 IOP904 connections

After the installation of the radio sets, the power supply and aerials have to be connected at the back.

WARNING

Connect first the power supply of the DMR radio device and thereafter the power supply of the TETRA radio device, or connect both power supplies simultaneously.

When the device is connected to the power supply, the green power supply LED illuminates.

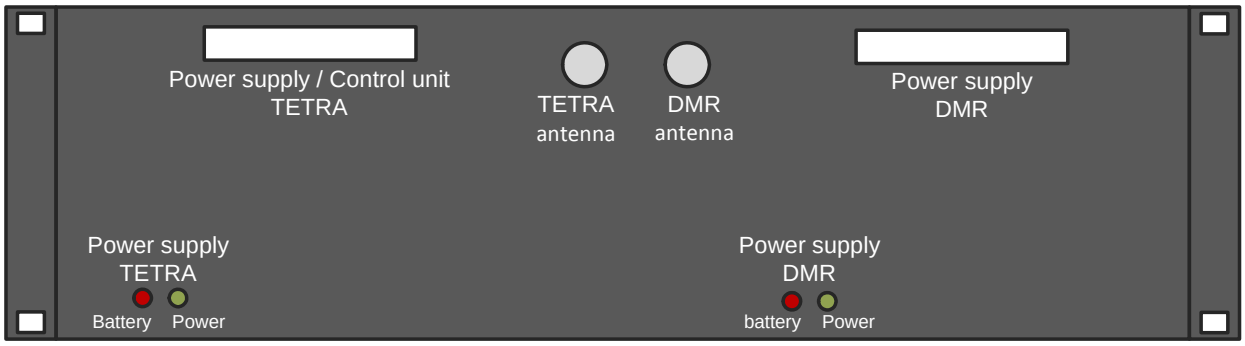

Fig. 3-8 IOP904 back

3.4 Layout

WARNING

Only trained service technicians are allowed to open the IOP904. The power supply must be separated from mains supply.

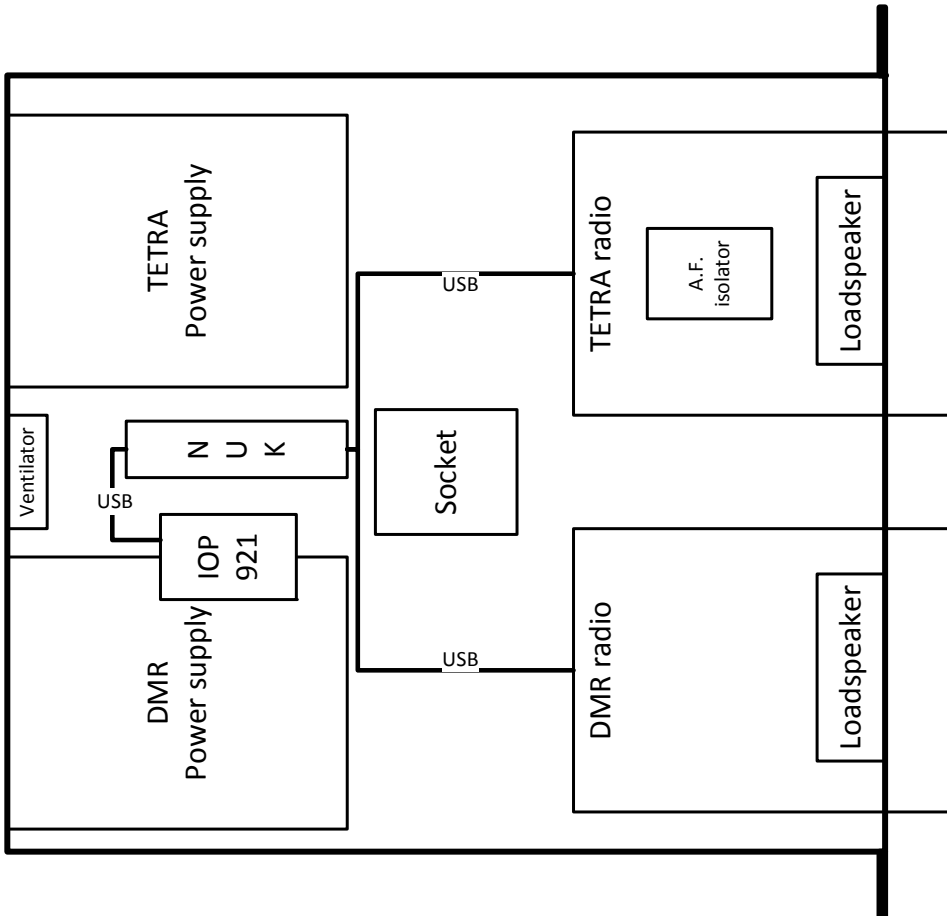

Fig. 3-9 Layout IOP904

4 Technical Specification

Description	Value
Power supply	2 Switched-mode power supply, range 98 to 254 V AC
Power input	**max**. 68 W **idle** 35 W
Environmental specifications	**Operation** 0 °C to +40°C temperature range, avoid condensing humidity **Storage** -40°C to +60°C temperature range, avoid condensing humidity Avoid direct insolation
Dimensions:	580 mm x 483 mm x 133 mm (L x W x H) (19“ rack)
Weight	about 17,5 kg including 2 radio sets
Packaging	powder coated steel plate
Mounting method	19“ rack mount
Connections	2 BNC connectors (aerials)
Cable ports	2 grounded mains connections
Display elements	3 LEDs in the front; 4 LEDs in the back
Transmit power	**max**. DMR 30 W (DM4601) **max**. TETRA 10 W (MTM5400)
Frequency range	Dependent on the radio sets used

Tab. 4-1 Technical Specification

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