

Analogue Intercom AIR-8 / AIR-4



The Zaehl AIR-series is an intercom-solution for up to 8 connections.

Filling the gap between common intercom and digital matrix-systems, the AIR-8 and AIR-4 are designed for the use with reportage- and SNG-units, for mobile broadcast setups and small studio applications.

In consideration of the needs of broadcast-productions, several sophisticated functions have been added such as

- flexible control inputs and outputs (GPIs), remote options
- comfortable talkback configuration for the use with reporters
- multiple IFB inputs
- link function for connecting two units

A small cover in the front part hides switches and trimmer potentiometers which are used for setting up the unit. When closed after configuration, easy handling and safe operation is guaranteed.

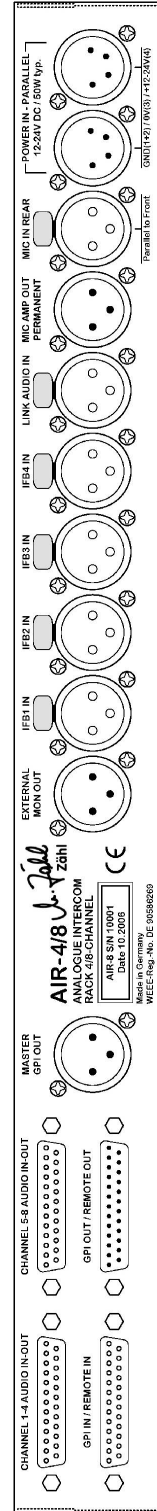
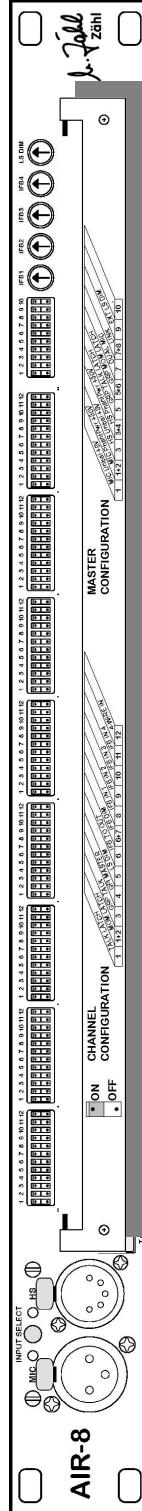
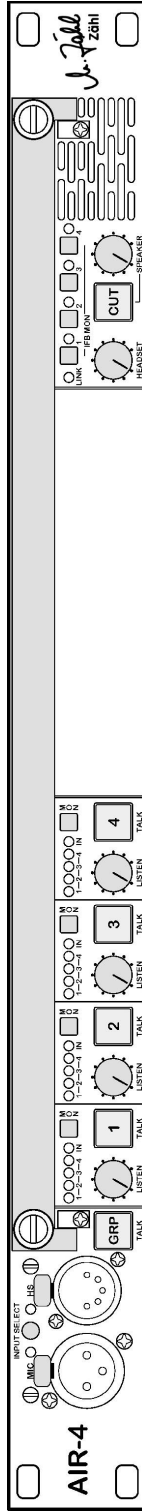
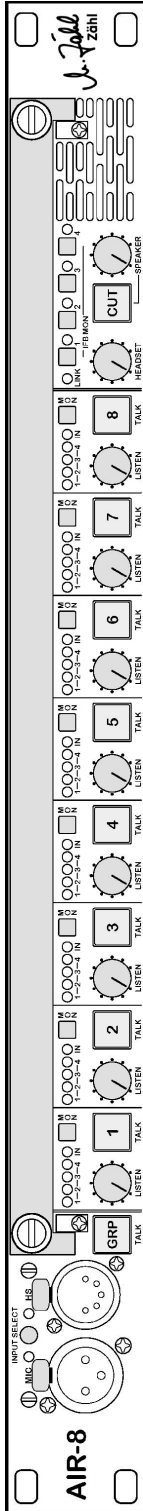
The AIR-8 is designed for eight talkback connections; the AIR-4 manages four. All other functions are identical.



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1. Drawings



2. Important Notes and Safety Instructions

Before unpacking and operating the equipment read these Notes and Safety Instructions carefully.

More notes and instructions can be found in the following chapters of this manual. Follow all notes and instructions.

The term „equipment“ stands for the AIR-8/AIR-4 unit as well as the provided power supply.

- 2.1. The equipment must only be used for the purpose described in this manual.
- 2.2. Keep the manual for further reference. When passing the equipment on, enclose the manual.
- 2.3. Do not operate the equipment at
 - very high air humidity (>85% relative humidity)
 - high ambient temperature (>40°C) or in the vicinity of heat radiating equipment or objects
 - places which are exposed to solar radiation
 - at very low temperatures (<5°C)
- 2.4. Ensure appropriate air ventilation.
- 2.5. Do not block the ventilation slots of the equipment. Keep free a minimum of 20mm around the equipment.
- 2.6. When rack-mounting the unit, always provide slide bars to prevent excessive strain of the front panel by transport shocks or cable & connector weight.
- 2.7. Do not store the equipment at temperatures below -20°C or above +50°C.
- 2.8. Do never expose the equipment to environmental conditions which can lead to the incidence of condensation water.
- 2.9. Do not expose the equipment to mechanical stress or shock.
- 2.10. Ensure that liquids cannot get into the equipment.
- 2.11. Ensure that foreign objects cannot get into the equipment.
- 2.12. Only clean the equipment with smooth cleaning tissues and soft detergents.
- 2.13. Never open the equipment.
- 2.14. Only operate the unit with the provided power supply. When operating with other power supplies, warranty will be void.
- 2.15. In case the equipment has been dropped or there is any external or functional damage, do not continue to operate the equipment. Have the equipment checked at your dealer's workshop or a person who is qualified to do such checks.
- 2.16. Only connect the equipment to a legally approved, earthed, mains power supply.
- 2.17. In case of any damage of mains cable or power supply there is the risk of a perilous electrical shock! Replace the mains cable immediately. Have the power supply checked or replace it. Regularly check mains cable and power supply for any damage.
- 2.18. When shipping use a package which protects the equipment from environmental impact such as mechanical shock or humidity.
- 2.19. The equipment applies to EU directives RoHS and WEEE. Disposal has to be carried out according to WEEE. As this equipment is classified as professional equipment for industrial use (B2B), manufacturer and purchaser conclude the following agreement: According to ElektroG §10 Abs. 2 Satz 3 (ref. to German/EU law) the manufacturer takes over the disposal if the purchaser sends back the equipment at his own expense. Alternatively the purchaser disposes of the equipment according to WEEE at his own expense. In case the purchaser passes on or sells the equipment, this agreement has to be passed on. Manufacturer WEEE register number: DE 90586269

- 2.20. Manufacturer's warranty covers the equipment to be free from defects of quality at the time of delivery for a period of 24 month presumed that
- the equipment was treated properly according to its intended use
 - all information and safety instructions given in this manual have been followed
 - the equipment shows no external damage
 - the equipment is shipped to the manufacturer or to an authorised repair-shop free of charge
 - a proof of purchase is supplied
 - a detailed failure description is supplied
- The manufacturer takes over cost of parts and labour incurred by repair.
Any other costs including shipping and packaging will be charged.
- 2.21. We expressly exclude any liability for incidental or consequential damages which might arise from operating the equipment, including failure of the equipment.
- 2.22. All information in this manual has been carefully reviewed. It has been updated at the time of passing for press. Nevertheless we do not take over any liability for sufficiency or errors.
- 2.23. EEC Declaration of Conformity: The equipment applies to applicable EMC rules 89/336/EEC.



3. Scope of Delivery

- 3.1. Unit AIR-8 or AIR-4 – 19" 1U rack mount format
- 3.2. Power Supply
- 3.3. Mains Cable (not for all countries)
- 3.4. Manual

4. Connection

4.1. Power Supply

- 4.1.1. Plug the 4pole XLR connector which is mounted to the cable fixed to the power supply into one of the 4pole XLR connectors designated "POWER IN" on the back panel of the AIR-8/AIR-4 unit.
- 4.1.2. Connect the power supply to a correctly earthed mains power socket. You may connect the power supply to 100-240VAC at 47-63Hz mains voltage without the need of selecting a voltage range.

Important Note: Always connect the power supply in the order described above. Otherwise there is a risk of damaging the power supply and/or the unit.

- 4.1.3. AIR-8/AIR-4 units provide two power inputs. You can connect two power supplies at the same time in order to ensure a fail-safe operation. If power at one of the inputs fails, the other one will take over.
- 4.1.4. 12V-24V regulated DC is allowed at the power inputs. We deliver power supplies within this voltage range. You can connect power supplies with differing voltages at the same time. The one with the higher voltage supplies the unit. If it fails, the one with the lower voltage will take over.

4.2. Audio

4.2.1. Microphone Inputs

The microphone inputs are suitable for input levels from -65dBu to -20dBu. Depending on the input configuration they are transformer-balanced, transformer-balanced with 30V phantom power or unbalanced with 9V AB-powering.

Important Note: Before connecting a microphone always check if the input configuration on your AIR-8/AIR-4 complies with the microphone data. In case of incompatibility there is a risk of damaging your microphone.

4.2.2. Headphones Output

The Headphones output delivers voltages up to 10Veff.

Important Note: Always set the phones level potentiometer labelled „HEADSET“ to minimum (fully counter-clockwise) before you connect your headphones. Otherwise there is a risk of damaging your ears by high sound pressure level. Furthermore there is a risk of damaging your headphones.

4.2.3. Other Audio Inputs and Audio Outputs

All other audio inputs and audio outputs are transformer balanced and designed to a reference level of +6dBu and maximum levels of +18dBu (typ.).

Important Note: Connecting DC exceeding 1V is not allowed and can lead to damages inside the unit.

4.3. Control ports

All control inputs and outputs are designed to be interfaced with 5V logic circuitry.

Important Note: Connect DC in the 0-5V range to the control inputs only. Control outputs may only be connected to circuits which operate in the 0-5V DC range. Never connect any supply voltage directly to a control output. Refer to chapter „Technical Data“ to find information about maximum allowable current. Exceeding any limits can cause damage on the unit or the circuitry you connect.

Refer to chapter „Technical Data“ for more details about circuitry and connection.

More details about technical data, functions and connector pin-outs are specified in the following chapters of this manual.

5. Basic Functions

This chapter is dedicated to basic functions only. When you work with AIR-8/AIR-4 for the first time, we recommend setting all pushbutton switches on the front panel to the idle (not depressed) position. Turn speaker and headset volume controls to minimum (counter-clockwise position).

Enhanced functionality and comprehensive configuration are described in the following chapter.

5.1. Configuration

All configuration switches are accessible on the front panel, normally hidden behind a cover. For access loosen the two knurled head screws on the left and right end of the cover and flap it down.

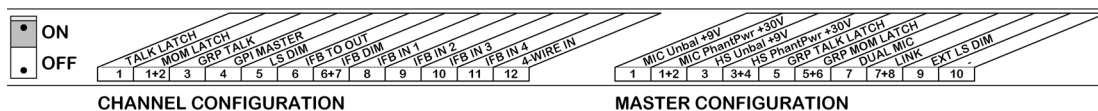
On the inside of the cover you find labels with short descriptions of the switch functions.

There are 9 switch arrays (AIR-4: 5 arrays): Respectively one array per channel „CHANNEL CONFIGURATION“ and one for global settings „MASTER CONFIGURATION“.

The rocker switches are off, when they are actuated to the lower position; they are on, when they are actuated to the upper position.

On the right there are 5 configuration trimmer potentiometers. Normal working position is the centre position.

When you get started with AIR-8/AIR-4 and this manual, we assume that all configuration switches are in the off position and all configuration trimmers are in the centre position.



5.2. Talk

5.2.1. Connecting Microphones

You can select between two microphone inputs.

- MIC: 3pole XLR socket on the front panel (labelled MIC). This input is available in parallel on the back panel of the unit (labelled MIC IN REAR). You may only use one at a time.
- HEADSET: 5pole XLR socket (labelled HS) on the front panel.

Use the latching pushbutton switch above the XLR input sockets to either select MIC or HEADSET.

Your selection is indicated by one of the LEDs above either input socket.

Perform a configuration setup for the input you want to use before connecting your microphone. Refer to the MASTER CONFIGURATION switch array.

Switches 1 and 2 are assigned to MIC input, switches 3 and 4 are assigned to HEADSET input.

MIC configuration

- 1 and 2 off: transformer-balanced input
 - 1 on, 2 off: unbalanced input with 9V AB-powering
 - 1 and 2 on: transformer-balanced input with 30V phantom power
- (Switch position 1 off, 2 on is not defined, same evaluation as 1 and 2 off.)

HEADSET configuration

- 3 and 4 off: transformer-balanced input
 - 3 on, 4 off: unbalanced input with 9V AB-powering
 - 3 and 4 on: transformer-balanced input with 30V phantom power
- (Switch position 3 off, 4 on is not defined, same evaluation as 3 and 4 off.)

Gain Setting

Each input provides its own gain setting right above the respective XLR input socket. Set optimum gain on these (trimmer-) potentiometers.

The LEDs above the XLR input sockets provide further information:

As described before, the LEDs indicate, which input is selected. Different colours on these LEDs provide level metering as well thus making gain setting comfortable.

Green: Input is selected, post microphone amplifier level is lower than -25dB

Yellow: Input is selected, post microphone amplifier level is higher than -25dB but lower than 0dB

Red: Input is selected, post microphone amplifier level is higher than 0dB

(All dB-values are related to the unit's reference level of +6dBu.)

Limiter

If post microphone amplifier level exceeds reference level, the signal is controlled by the integrated limiter circuit (As the limiter provides a soft-knee technique, in fact signals somewhat below reference level are controlled as well.). When the LED indicates red colour, there is an internal minimum headroom of 12dB left. Only if the signal exceeds the headroom, relevant distortion will because audible, though the output level of the limiter will remain nearly stable.

Please consider that a too high gain setting in combination with a limiter can lead to a loss of speech comprehensibility. E.g. background noise may be audible in speech intervals.

We recommend a setting that will make the LED indicate yellow at normal speech level with short red indications at level peaks.

Note 1: *Switching from MIC to HEADSET or vice versa can lead to high level switching noise especially when the input configuration is differing, e.g. if you switch from transformer-balanced input with 30V phantom power to unbalanced input with 9V AB-powering. In order to protect you from these noise peaks the microphone signal is muted for about 1 sec. each time you actuate the input switch.*

Note 2: *When working with headset, usually you will not need the internal loudspeaker. It may be even disturbing, if the speaker is not switched off. The internal logic will switch off the loudspeaker ("CUT" pushbutton indicates red) each time you switch from MIC to HEADSET. If you want, you can switch the loudspeaker back on again, even if HEADSET is selected.*

5.2.2. Connecting to a Remote Unit

Use one or more channel audio outputs to connect to the remote unit, which you want to talk to. There are eight (AIR-4: four) channel audio outputs. The connectors are located on the back panel of the unit: 25pole Sub-D connectors labelled „CHANNEL 1-4 AUDIO IN-OUT“ and „CHANNEL 5-8 AUDIO IN-OUT“ (AIR-8 only). The channel outputs are designated „TB OUT“ in the pin-out table.

5.2.3. TALK Function/TALK Button

Push a TALK button on one of the channels to activate the TALK function and talk to a remote unit. The TALK button will indicate red, when TALK function is active.

TALK button switching action can be configured individually by the CHANNEL CONFIGURATION switches:

Configuration of TALK button switching action

CHANNEL CONFIGURATION switch 1 „TALK LATCH“, switch 2 „MOM LATCH“

1 and 2 off: Momentary

1 on, 2 off: Latching

1 and 2 on: combined Momentary/Latching

(Switch position 1 off, 2 on is not defined, same evaluation as 1 and 2 off.)

- Momentary: TALK is active as long as you hold the TALK button in the depressed position.
- Latching: Push once to activate TALK, push again to deactivate TALK.
- Combined Momentary/Latching: Pushing the button short will result in a latching action, pushing the button long will result in a momentary action.

5.3. Listen

5.3.1. Connection to a Remote Unit

Use one or more of the channel audio inputs to connect to the remote unit that you want to listen to. There are eight (AIR-4: four) channel audio inputs. The connectors are located on the back panel of the unit: 25pole Sub-D connectors labelled „CHANNEL 1-4 AUDIO IN-OUT“ and „CHANNEL 5-8 AUDIO IN-OUT“ (AIR-8 only). The channel inputs are designated „4-WIRE IN“ in the pin-out table.

5.3.2. Channel LISTEN Volume Control

Each channel provides a volume control. Centre position can be seen as a default position if your remote unit delivers audio signals at a reference level of +4dBu...+6dBu. In case there are lower levels, the maximum clockwise position of the channel volume control provides 15dB gain.

5.3.3. Channel Modulation Indication/CALL Indication

Incoming audio signals are indicated on the TALK button: If the signal level exceeds -20dBu, the button will light up yellow. The indication is held for about 8 sec. after the signal has been removed in order to clearly signalize short "calls".

As soon as you activate TALK, CALL indication will be cleared at once.

If TALK function and CALL indication are active at the same time, the TALK button will light up orange. While TALK function is active, CALL indication is not held. The indication directly follows the incoming audio signal. It will change to red colour, as soon as modulation is removed.

5.3.4. Listen with the Internal Loudspeaker

Volume control and CUT button for the internal loudspeaker are located on the right hand side of the front panel.

After powering-up the unit the loudspeaker is switched on, i.e. the CUT button indication is off. Push the CUT button to switch the loudspeaker off, the indication will light up. Pushing the button again will switch the loudspeaker back on, the indication will extinguish. The loudspeaker volume control is labelled SPEAKER, use centre position as a default.

DIM function

In order to avoid feedback or to enhance speech comprehensibility you can dim loudspeaker level when TALK function is active.

Whether a TALK function triggers loudspeaker DIM function or not can be set individually on each channel. Put CHANNEL CONFIGURATION Switch 5 „LS DIM“ to the on position to activate DIM function on this channel.

DIM level can be globally adjusted from -6dB to about -30dB by the configuration trimmer potentiometer labelled "LS DIM".

5.3.5. Listen with Headphones/Headset

Plug your headphones or headset into the HEADSET 5pole XLR socket (labelled „HS“). A separate HEADSET volume control is provided. Headphones output is not affected by any settings for loudspeaker monitoring.

5.3.6. Listen with External Monitor

Your AIR-8 (AIR-4) provides a line output for external monitoring. The audio signal is present at the XLR socket labelled „EXTERNAL MON OUT“ on the back panel of the unit. It is independent from loudspeaker or headphones settings with one exception:

Setting MASTER CONFIGURATION switch 9 „EXT LS DIM“ to the on position will make the output follow the DIM function of the loudspeaker stage.

6. Enhanced Functions

6.1. IFB/Interrupted Foldback

AIR-8/AIR-4 provide 4 independent IFB audio inputs (XLR sockets on back panel labelled „IFB1 IN“ ... „IFB4 IN“).

6.1.1. Gain Setting

Adjust IFB input gain with four configuration trimmer potentiometers „IFB1“ ... „IFB4“. Center position complies with unity gain (0dB). The configuration trimmers cover a gain range of +/-12dB.

6.1.2. Assigning to Channels

You can assign the IFB audio signals to each channel output („TB OUT“).

Setup the respective CHANNEL CONFIGURATION switches 8-11:

8 on: IFB 1

9 on: IFB 2

10 on: IFB 3

11 on: IFB 4

Your selection is indicated on each channel by four LEDs labelled „1-2-3-4“ in green colour.

IFB audio is fed to the channel output depending on the state of the TALK function and your configuration setting of CHANNEL CONFIGURATION switches 6 „IFB TO OUT“ and 7 „IFB DIM“:

6 and 7 off: Selected IFBs are always present at channel output.

6 on, 7 off: When TALK is active, IFB signals are muted.

6 and 7 on: When TALK is active, IFB signals are dimmed by about 15dB.

(Switch position 6 off, 7 on is not defined, same evaluation as 6 and 7 off.)

6.1.3. Monitoring and Level Metering

Independent from assigning IFBs to channels there is an IFB monitor function in the master section.

With the four pushbutton switches „IFB MON 1 ... 4“ the normal monitoring function of the unit is disabled. Instead only the selected IFB signals are monitored on loudspeaker/headphones/external monitor.

In addition the LED to the right of the respective IFB MON switch indicates selection and audio level:

Green: IFB is selected for monitoring, level post input stage is below -25dB

Yellow: IFB is selected for monitoring, level post input stage is higher than -25dB but below +9dB

Red: IFB is selected for monitoring, level post input stage is higher than +9dB, danger of overload

(All dB-values are related to the unit's reference level of +6dBu.)

6.2. Channel Input to Channel Output Feed

In certain setups it is essential to feed the channel input signal „4-WIRE IN“ to the output of the same channel „TB OUT“.

Configure this function by switching CHANNEL CONFIGURATION switch 12 „4-WIRE IN“ to the on position. The function is indicated in the channel section by the LED labelled „IN“ (green colour).

The feed/mix behaviour to the channel output is identical to your setup for the IFB signals (CHANNEL CONFIGURATION switches 6 and 7, see above).

6.3. Channel Monitor Function

As described above, you can feed/mix IFB and channel input signals to the matching channel outputs.

Use the channel monitor function to listen to the sum of the selected signals for each channel. The normal listening signal (channel input) is switched off when channel monitor function is active. Your monitor level is still being controlled by the LISTEN volume control.

Actuate the pushbutton switch “MON” in a channel section. The LEDs „1-2-3-4-IN“ indicate the activation:

- LEDs which already lit up in a green colour before (input is selected) change to yellow
- LEDs which were off before indicate red colour

6.4. External Microphone/DUAL MIC

In addition to or instead of a microphone connected to MIC or HEADSET input you may feed a line signal into the unit which will be processed the same way as the microphone signal, but bypassing microphone input selection and pre-amplification.

Connect a line signal to the XLR input labelled LINK AUDIO IN on the back panel and set MASTER CONFIGURATION switch 7 „DUAL MIC“ to the on position.

The line signal should provide a level of approx. +6dBu. It is summed with the post preamplifier microphone signal and then passes through the internal limiter (ref. to section “Connecting Microphones”).

Note 1: When using LINK AUDIO IN *instead* of MIC or HEADSET input consider that the signal is summed to the microphone amplifier output. Adjust microphone gain to minimum in order to avoid amplifier noise and interference noise from a non-terminated microphone input.

Note 2: In case LINK function is selected on the MASTER CONFIGURATION switch array, the behaviour of LINK AUDIO IN is different. Read the respective section of the manual.

6.5. Audio Output MIC AMP OUT PERMANENT

At the XLR connector labelled MIC AMP OUT PERMANENT on the back panel the microphone signal (post microphone amplifier/post limiter) is present. If DUAL MIC is selected, LINK AUDIO IN signal as well.

Use this output to feed the microphone signal to other equipment within your intercom or studio setup. The output is always needed when you link up two AIR-8 (AIR-4) units using the LINK function.

Note: In case LINK function is setup on the MASTER CONFIGURATION switches, LINK AUDIO IN signal is not summed to MIC AMP OUT PERMANENT.

6.6. GROUP TALK

The GROUP button, left hand on the front panel (labelled „GRP“), allows you to operate several channel TALK functions at the same time. Set switch 3 of the CHANNEL CONFIGURATION switch array to the on position for all channels, which shall be operated by the GROUP button.

As for the TALK button, switch action can be selected for the GROUP button. Set MASTER CONFIGURATION switches 5 „GRP TALK LATCH“ and 6 „GRP MOM LATCH“ to the designated positions:

- | | |
|--------------|-----------------------------|
| 5 and 6 off: | Momentary |
| 5 on, 6 off: | Latching |
| 5 and 6 on: | combined Momentary/Latching |

(Switch position 5 off, 6 on is not defined, same evaluation as 5 and 6 off.)

- Momentary: GROUP TALK is active as long as you hold the button in the depressed position.
- Latching: Push once to activate GROUP TALK, push again to deactivate.
- Combined Momentary/Latching: Pushing the button short will result in a latching action, pushing the button long will result in a momentary action.

Interaction of TALK and GROUP TALK:

- If a channel TALK function is in the deactivated state, GROUP TALK is able to switch it on or off
- If a channel TALK function is activated, it cannot be switched off by GROUP TALK.
- If a channel TALK function has been activated by GROUP TALK, it cannot be switched off by the channel TALK button.

6.7. Control Output MASTER GPI OUT

MASTER GPI OUT can be triggered by a channel TALK function. CHANNEL CONFIGURATION switch 4 „GPI MASTER“ is dedicated to this feature.

MASTER GPI OUT is activated, when the TALK function of one or more of the adequately configured channels is active.

Example of use: Connect this GPI output to the control logic of your mixing desk in order to switch off or dim a control monitor while you talk.

6.8. TALK REMOTE

Use control inputs REMOTE IN/GPI IN for remote controlling the TALK buttons of your AIR-8 (AIR-4).

An activation of a REMOTE IN/GPI IN input does the same as pressing a matching TALK button. Thus the configured switch action (Momentary, Latching, combined Momentary/Latching) is effective as well.

REMOTE OUT/GPI OUT control outputs provide status tallys for TALK function as well as CALL signalisation for each channel.

Using both, control in and control out signals, you can easily emulate the comprehensive functionality of all TALK buttons in a remote control.

Note 1: *Seen from logic circuitry, a TALK button and the matching control input are arranged in parallel. Thus, in case you configured a latching action, you can activate a channel TALK function by pressing the TALK button, and deactivate it by an activation of the matching control input. Furthermore, keeping a TALK button depressed will block the evaluation of the matching control input. Vice versa, while a control input is activated, an actuation of the matching TALK button will have no effect. So be concerned to always drive the control inputs with momentary switches or logic pulses.*

Note 2: *In case LINK function is setup on the MASTER CONFIGURATION switches, REMOTE IN/GPI IN inputs will show different behaviour. Refer to the respective chapter of this manual.*

6.9. Linking two Units /LINK Function

Link up two AIR-8 or AIR-4 units to significantly expand functionality.

Note: When LINK mode is configured, DUAL MIC and REMOTE functions are not available.

Configuration of the LINK function is done by setting both MASTER CONFIGURATION switches 7 „DUAL MIC“ and 8 „LINK“ to the on position. The LINK LED lights up red to indicate LINK mode.

Proceed as follows:

- Use a fully equipped 1:1 25pole Sub-D cable to connect REMOTE OUT/GPI OUT of unit A to REMOTE IN/GPI IN of unit B
- Connect audio output MIC AMP OUT PERMANENT of unit A to audio input LINK AUDIO IN of unit B
- Configure LINK function on unit B

Activate a channel TALK function on unit A to talk to the matching channel of unit B as well. All local TALK functionality of unit A and unit B is preserved.

More details:

- TALK function is only indicated on the TALK button of the unit, on which it has been activated.
- when TALK function is active on unit A, unit A microphone signal is fed to the local channel as well as to the matching channel of unit B.
- when TALK function is activated on a channel of unit B, only the local microphone signal is fed to the local channel.

The unit's inputs ("4-WIRE IN") have to be connected as usual. If you need to listen to the incoming 4-Wire signals on both units, connect them in parallel to both unit's "4-WIRE IN connectors" using "Split"-cables.

Note: When LINK mode is active, LINK AUDIO IN signal does not pass through the limiter (differing from DUAL MIC mode). Reason: The microphone signal has already passed through the limiter in the other unit.

You may also link up two units bi-directional:

- Use a fully equipped 1:1 25pole Sub-D cable to connect REMOTE OUT/GPI OUT of unit A to REMOTE IN/GPI IN of unit B
- Use a fully equipped 1:1 25pole Sub-D cable to connect REMOTE OUT/GPI OUT of unit B to REMOTE IN/GPI IN of unit A
- Connect audio output MIC AMP OUT PERMANENT of unit A to audio input LINK AUDIO IN of unit B
- Connect audio output MIC AMP OUT PERMANENT of unit B to audio input LINK AUDIO IN of unit A
- Configure LINK function on both units

Simply derive the functionality of the bi-directional linking from the normal linking. Both units behave to one another as described above for the normal case.

7. Connectors/Pin-Out

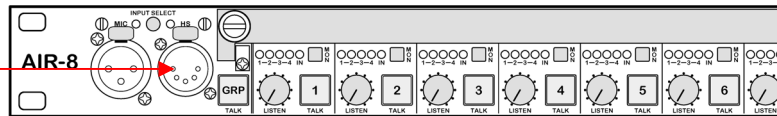
7.1. Audio Inputs/Audio Outputs

7.1.1. All Standard 3pole XLR

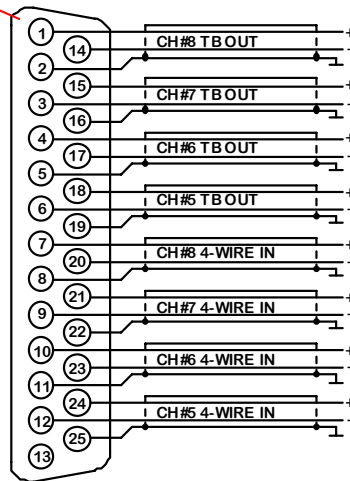
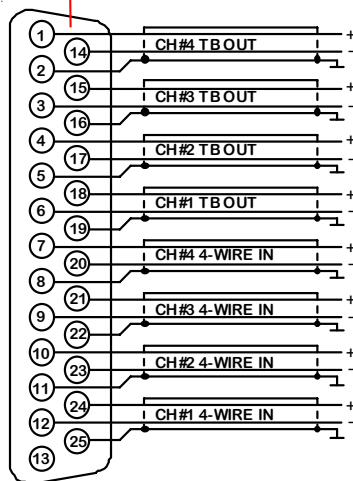
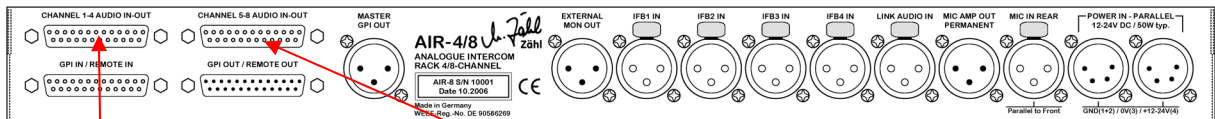
- Pin 1 Shield
- Pin 2 + / hot
- Pin 3 - / cold

7.1.2. Headset 5pole XLR

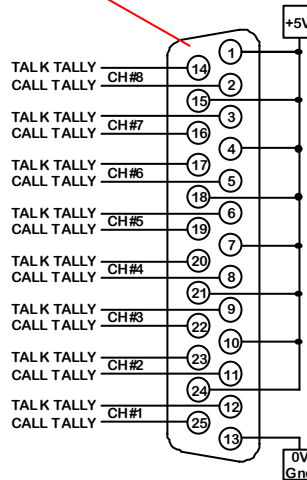
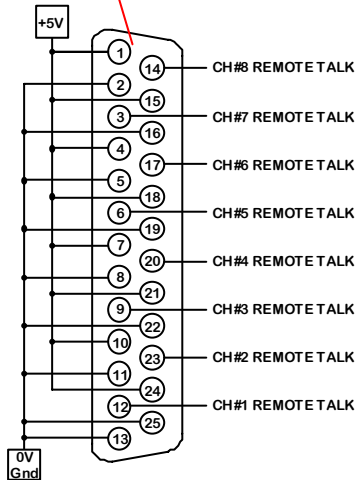
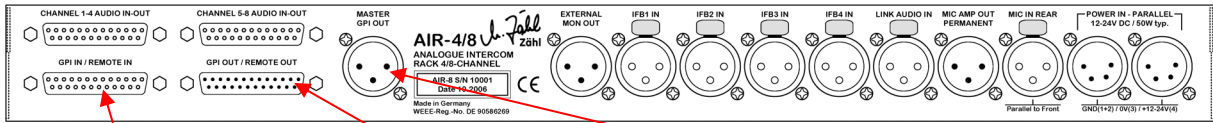
- Pin 1 Microphone - / cold
- Pin 2 Microphone + / hot
- Pin 3 Shield / Ground
- Pin 4 Headphones Right
- Pin 5 Headphones Left



7.1.3. Channel I/O 25pole Sub-D



7.2. Control I/O (GPI)

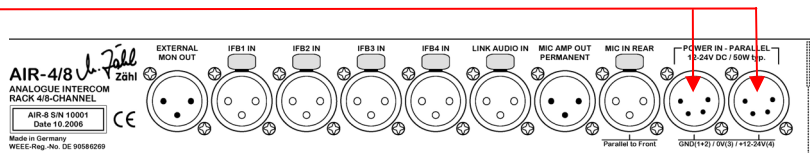


3pole XLR
 Pin 1 0V / Gnd
 Pin 2 +5V
 Pin 3 MASTER GPI OUT

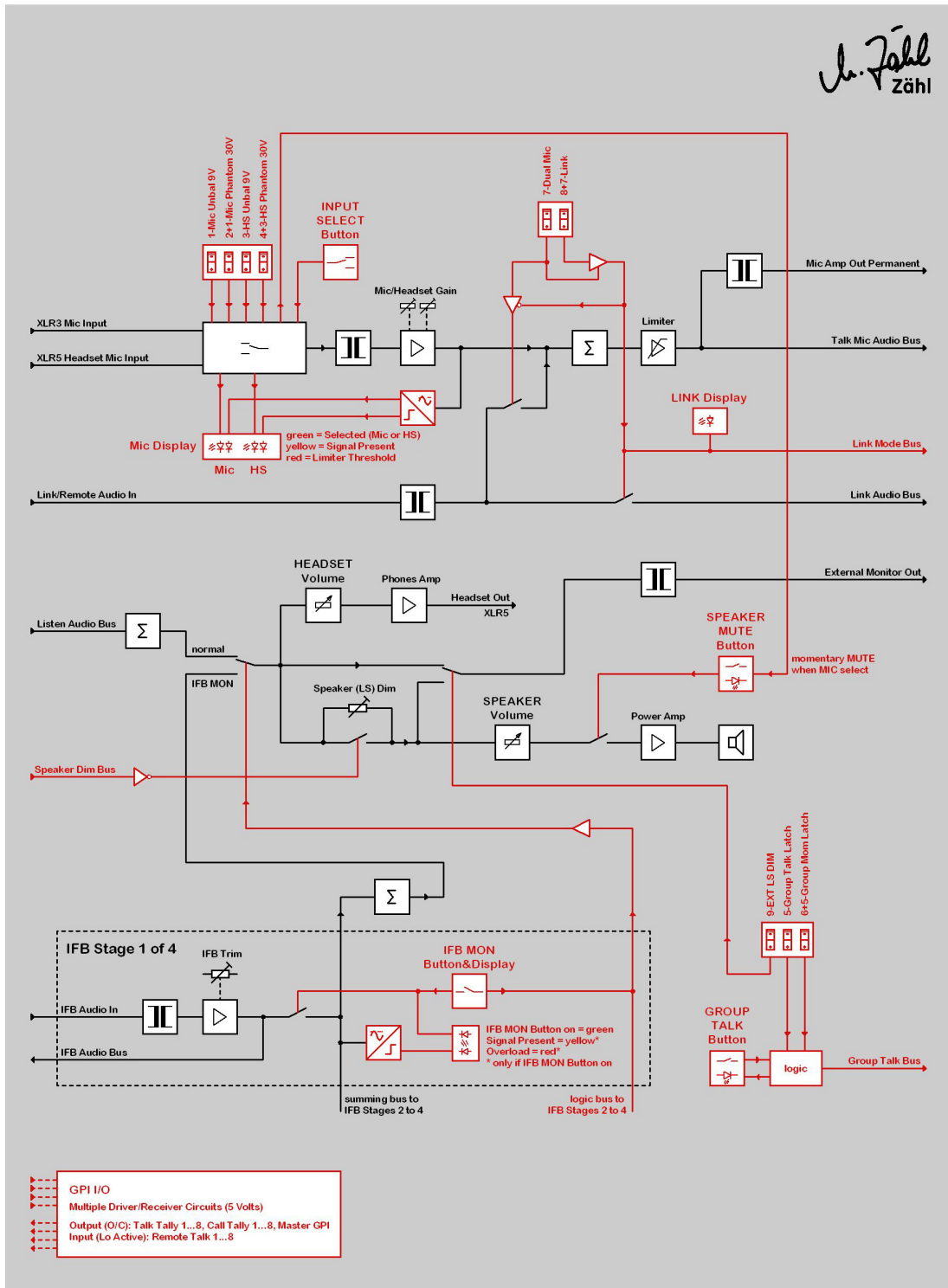
7.3. Power Supply

4pole XLR

- Pin 1 Gnd / Protective Earth
- Pin 2 Gnd / Protective Earth
- Pin 3 0VDC
- Pin 4 +12V...+24VDC



8. Block Diagrams

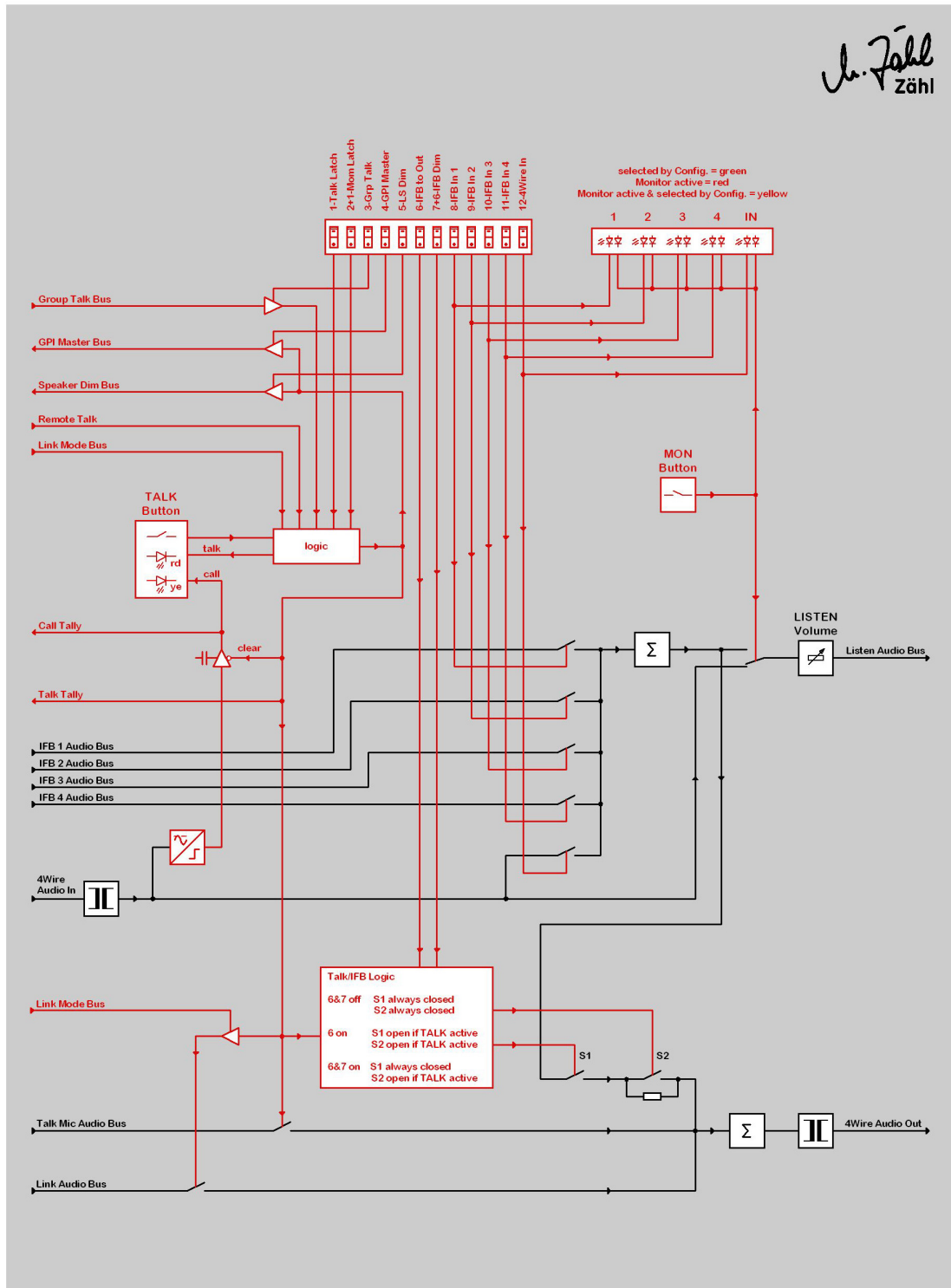


ZÄHL AIR-8/AIR-4 Block Diagram

Page 1 of 2 - Master Section

Block Diagram shows circuit overview but cannot explain the entire functionality of a unit. Always refer to manual for comprehensive information.

Rev. 2 / 08.04.2009



ZÄHL AIR-8/AIR-4 Block Diagram

Page 2 of 2 - Channel Section (1 of 8)

Block Diagram shows circuit overview but cannot explain the entire functionality of a unit. Always refer to manual for comprehensive information.

Logic / Control ————
 Audio —————

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9. Technical Data

9.1. Microphone Inputs

transformer balanced
input impedance typ. $1\text{k}\Omega$
input level range -20dBu ... -65dBu
maximum input level -3dBu
frequency response 60Hz ... 15kHz -3dB
switchable characteristic: - balanced
- unbalanced with 9V AB-powering
- balanced with 30V phantom power

9.2. Line Inputs

transformer balanced
input impedance typ. $10\text{k}\Omega$
reference level $+6\text{dBu}$
maximum input level typ. $+18\text{dBu}$
frequency response 60Hz ... 15kHz -3dB

9.3. Line Outputs

transformer balanced
output impedance typ. 60Ω
reference level $+6\text{dBu}$
maximum output level typ. $+18\text{dBu}$, with limiter $+6\text{dBu}$ ($-1/+2\text{dB}$)
frequency response 60Hz ... 15kHz -3dB

9.4. Headphones Outputs

dedicated output stages for left and right
output impedance typ. 25Ω
maximum output level $+20\text{dBu}$ w/o load, $+16\text{dBu}$ with 100Ω load
frequency response 60Hz ... 15kHz -3dB

9.5. Power Inputs

AIR-8 (AIR-4) require well regulated DC in a range of $12\text{-}24\text{V}$. A maximum of 27V DC must not be exceeded even by short voltage spikes.

A stable mains protective earth (PE) on a power supply input is mandatory.

The 0V pins of both AIR-8/AIR-4 power inputs are short circuited inside the unit. The positive pins of the power inputs are decoupled by diodes. I.e. both inputs may be operated at the same time.

If both power supplies deliver the same voltage, load is shared. If they deliver different voltages, the one with the higher voltage is loaded only.

Power consumption is typically 15W ... 50W , but for short periods of time these values may be exceeded substantially. The power supplies we deliver with AIR-8/AIR-4 have been selected to be capable for such operation. Hence we assume that the units are operated with these power supplies. In case AIR-8/AIR-4 are operated with other power supplies we do not guarantee for correct function of the units or any damage. Furthermore warranty will be void.

9.6. Control Inputs/GPI IN

Important: Follow all warnings and hints given in chapter 4, Connection

Control inputs are designed in 5V logic circuitry.

deactivated state: > 4V

activated state: < 1V

All control inputs are connected with pull-up resistors to 5V internally.

Connect to 0V or a voltage lower than 1V to activate.

Note: A single pole switch (SP) is sufficient for correct operation. Preferably switch a control input to the 0V potential which is present on several pins of the GPI IN/REMOTE IN connector.

In case there is a need of long cable runs or if electromagnetic interference is likely to happen, we recommend the use of a single pole double-throw switch (SPDT). Switch over the center contact from 0V to 5V. Preferably use the 0V and 5V potentials which are present on several pins of the GPI IN/REMOTE IN connector.

You may supply relays and lamps directly from the 0V/5V pins of the GPI IN/REMOTE IN connector. The same applies for the GPI OUT/REMOTE OUT and the MASTER GPI OUT connector.

Consider that an overall maximum current must not exceed 250mA. When loading the unit's 5V pins with 250mA, voltage will drop to approx. 4,5V.

9.7. Control Outputs/GPI OUT

Important: Follow all warnings and hints given in chapter 4, Connection

Control outputs are designed as „open collector“ circuitry.

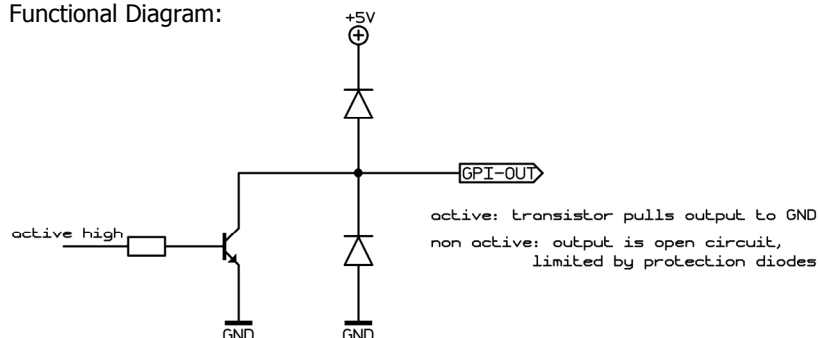
In the idle state they are high-impedance, but still connected to 5V by protective diodes. So never apply voltages higher than 5V.

In the active state they interconnect to 0V. Do not exceed a maximum current of 100mA per output. A maximum of 500mA is allowed for all outputs together.

You may supply relays and lamps directly from the 0V/5V pins of the GPI OUT/REMOTE OUT and the MASTER GPI OUT connector. The same applies for the GPI IN/REMOTE IN connector.

Consider that an overall maximum current must not exceed 250mA. When loading the unit's 5V pins with 250mA, voltage will drop to approx. 4,5V.

Functional Diagram:



10. Measures and Weights

10.1. AIR-8 (AIR-4) Unit

case 19"/1HU	
overall measure W x H x D	483 mm x 44,5 mm x 320 mm
insertion depth	296 mm
thickness of front panel	3 mm
weight	4,75 kg

10.2. Power Supply

measure W x H x D	146 mm x 75 mm x 44 mm or smaller version
weight	0,6 kg (max.)
length of fixed cable (DC to unit)	approx. 1,6 m
length of mains cable	1,5 m - 2,0 m

10.3. Delivery Form

cardboard box	approx. 610 mm x 470 mm x 180 mm
gross weight	approx. 7,6 kg