



dwcs2.4 wireless digital conference system

User Manual

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FCC Information

FCC ID: O8O-DWCS24-SYS

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation. In accordance with FCC requirements, changes or modifications not expressly approved by IRP professional sound products, LP could void the user's authority to operate this product.

dwcs2.4 Digital Wireless Conference System

System Description



dwcs2.4 is a new wireless conference system, developed by „IRP professional sound products“, which operates in the 2,4GHz range. The data and audio transfer is full digital and all audio signals are digitally encoded. The changing digital signal encoding makes an unwanted hearing of the spoken words practically not possible. (hearing security is the fundamental problem of all wireless conference systems, since these units use the UHF analog audio transmission. With an accordingly equipped UHF device it is easily possible to receive the discussions of a confidential conference in a neighbouring space.)

A further considerable advantage is the circumstance that the signal transmission is licence-free in the 2,4GHz range. Thus a local installation or a mobile system used at different locations is very simplified. The installation and the operation of the devices are comparatively simple. Except the connections of the antennas and the power cord no further cables are necessary. The installation of the two antennas is also likewise problem-free and easy. The microphone stations are carried in a special carrying case with integrated battery charger and are immediately ready for use.

2.4
GHz
digital technology



Front View of the Main Unit

Changes to improve the design or performance are reserved.

Being connected to the world is NOT always what you want ..
the dwcs2.4 with digital encoding gives you full privacy when you need it!

100% Privacy - Licence-free

FCC Certification

This equipment has been tested and found comply with the limits for class A digital device, pursuant to Part 15 of the FCC rules.

CE

Possible System and Delivery Configurations

A:

one Mainframe,
one Audio Board,
one Controller Board,
one Antenna Splitter Board **2x 1in4**,
seven SMA Antenna Patch Cables (prewired),
one Controller Patch Cable (prewired),
two Antenna Cables (N-Steckverbinder),
two Antenna Cable Adapters (N-Connector to SMA Connector) for furniture installation,
two Antennas 2,4GHz (SMA-Connector),
the appropriate number of regular Microphone Stations,
one Chairman Microphone Station,
one (two) Carrying Cases with integrated battery charger (12 Microphone Stations each,
two cases combined to one carrying and charger unit).

B:

two Mainframes,
two Audio Boards,
one Controller Board,
two Antenna Splitter Boards **1x 1in8**,
one blind panel,
eleven SMA-Antenna Patch Cables (prewired),
two Controller Patch Cables (prewired),
two Antenna Cables (N-Connector),
two Antenna Cable Adapters (N-Connector to SMA-Connector) for furniture installation
two Antennas 2,4GHz (SMA-Connector),
the appropriate number of regular Microphone Stations,
one Chairman Microphone Station,
one (two) Carrying Cases with integrated battery charger (12 Microphone Stations each,
two cases combined to one carrying and charger unit).

C:

the appropriate number of Microphone Stations as single units,
single Battery Chargers for the Microphone Stations (no carrying case with integrated
battery charger),
one or two Mainframes inclusive Boards, Cabling and Antennas as described above.

System Setup

1. Scope of Supply

Before the installation, insure that all accessories were completely supplied. If something from the scope of supply is missing, please call your dealer.

2. Battery Charger (Microphone Stations)

All microphone stations should be fully charged before the first use. Depending on the scope of supply, use the carrying case with integrated charger unit or the individual battery charger.

Using the carrying case with integrated charger the following is to be considered:

All microphone stations should be locked in their position in the foam material inserted. Check the fixed position of the microphone stations. With appropriate fixing to the foam material insert a safe contacting to the charge connector is ensured.

If you have a double carrying case for 24 microphone stations, connect both parts with the supplied connection cable.

Connect the power connection cord to the appropriate wall outlet.

The charging time is about 3.5 hours. The integrated battery is a NiMH and doesn't require complete unloading before the new charging.

3. Checking the individual Boards and Cabling of the Main Frame

Depending upon delivery version, all boards should be installed into the mainframe and connected completely. If necessary check the wiring. See figure "Module Wiring" on page ...

Check all connectors for tight connection and mechanical stability.

NOTE: the radio net address of the system and the radio channel number of the radio circuits are factory-installed. If you should use several systems in the same environment at the same time, it is necessary to change the radio net address. Thus it is prevented that the systems influence each other. Both the audio board and the microphone stations must be modified. These procedures should be executed by qualified personnel only.

4. Power On

Connect the power connector on the main unit with the supplied power cord to a power outlet (please check the appropriate voltage range, 230V or 110V, labelled at the rear side of the power supply board in the main unit).

Immediately after switching on the power, three blue LEDs on the front of the main unit light up. These blue LEDs display the status of the power supply (three different DC-voltages: 5V, +18V, -18V).

After approximately 2 seconds on each installed audio board four green LEDs light up. These LEDs indicate that the individual radio circuits are operating.

5. Complete System Setup

After the complete battery charge of the microphone stations, these units are immediately ready to work. On the rear side of the microphone station is an On/Off-switch. After switching on the unit a small green LED on top of the station (in front on the right) lights up and signals the ready status. As long as the talk button (MICRO) is activated, this green LED is off. Instead the red LED in the MICRO button is on. After deactivating the talk button, the green LED lights up again.

After pressing the talk button on the microphone station the connection to main unit is made. The audio transmission is assigned to one audio channel. The appropriate green LED on the audio board changes to red (two-color LED). A maximum of four microphone stations can be activated at the same time. With four active stations the fifth pushed talk button generates only a short acknowledgement (red LED of the talk button) and switches to the regular status again. Only after deactivating one of the other stations a new station can be activated.

That applies only to the use of ONE audio board. Using two audio boards, further more four channels are selectable. The number of active microphone stations increases thereby to eight.

The mixed signal of all active microphone stations is audible over the individual loudspeakers in the microphone stations (with the correct prewiring of the main unit). Always the active station itself does not receive this audio foldback signal for the prevention of acoustic feedbacks. The loudspeaker of the active unit is switched off.

The chairman microphone station is equipped with three buttons instead of the single button on the regular station. Using the PRIORITY button, all other stations are muted. The PRIORITY button itself works in the same way as the MICRO button (It is not necessary after pressing the PRIORITY button to press the MICRO button. The PRIORITY button works as a talk button.). The active time is terminated here also by pressing the button for the second time.

More details see: Microphone Stations, page ...

6. Using a Sound Reinforcement System

For the use of a separate sound reinforcement system it is necessary to use one of the „audio out“ connections on the audio board. By setting the jumpers on the audio board it is determined whether single channels or the mixed signal are fed through these connections. The audio output are ballanced with a maximum level of +10 dBu.

7. Feeding an external Sound Signal into the System

Using the second audio input on the controller board it is possible to feed an external signal into the systems audio chain. This signal is added to the mixed signal audible in the loudspeakers of the microphone stations.

Main Unit

The main unit of the conference system dwcs2.4 consists in its basic configuration of one mainframe, which contains all necessary single modules. This mainframe is factory-installed with the necessary boards, configured and prewired. The wiring between the individual modules should only be changed to reconfigure the entire system.

The mainframe is intended for the installation into 19"-rack, but could be used also as free standing single device. IRP however always recommends the installation into an appropriate housing, since then all the wiring between the modules is protected against accidental disconnection and injuries. Every male connection in the prewired system would lead to unnecessary problems. Your specialized dealer can offer a range of 19"- housings for one or more mainframes.

In case of a fixed rack-installation a sufficient ventilation should be guaranteed at any time. Unsuitable for the operation and storage of the devices are spaces with too high air humidity or high dirt load.

Single Modules of the Main Unit:

1. Power Supply

The power supply for the conference system dwcs2.4 is integrated into the mainframe. It is factory-adjusted to the necessary voltage (110V or 230V) and accordingly marked.

The power supply supplies three single voltages, which are necessary for the operation of the system: +5V, +18V and -18V. The operating condition for the three individual voltages is displayed on the front panel by three blue LEDs. After switching the system on, all three LEDs light up and display the ready status of the device. If one of the LEDs should not light up, please call your specialist dealer.

Verwenden Sie zum Netzanschluß nur entsprechend zugelassene Netzkabel bzw. das werksseitig beigelegte Schutzkontakt/Kaltgerätekabel.

Use only the supplied power cable or a specified main power cable. The device should not be switched off and on again without interruption (like all processor-controlled electronic devices). Please wait at least 5 seconds after switching the unit off, until switching it on again. By using several mainframes for one system, all mainframes must be switched on at the same time in a time window of maximum two seconds.

2. Controller-Board

The controller board provides for the system control, controlling the log-in and log-out processes of the individual microphone stations and assigns the appropriate radio channels and transmission cycles.

The dwcs2.4 operates as a FDMA/TDMA system (Frequency Devision / Time Devision) with dynamic channel assignment.

Each microphone station calls in first (after pressing the talk button) at the controller board. In case of an available audio channel in the system, the station is assigned to this channel with the certain transmission cycle. The station receives the command to send the awaiting audio data via this channel. In case all channels are busy, the call is rejected.

The individual boards of the system are connected by a Netlink control data bus (RJ-11 connector).

The assignment of the microphone stations in the controller board takes place in the base version via an automatic self selection process. Up to four or eight microphone stations can be activated at the same time. In a further system version it is possible to administer the microphone station management over an attached control computer.

The controller board is equipped with the two audio input connectors. The two incoming signals are mixed together and fed to the foldback channel. This channel is transmitted to every microphone station and the signal is audible in every single station's loudspeaker. This digital signal is encoded also to ensure the proposed privacy of the entire system.

In the regular setup one of the two audio inputs is connected to one audio output of the audio board to enable the foldback channel (mix of all microphone stations in the stations' loudspeakers). The second input can be used to feed an external signal (sound signal of any media device, PC, video player, etc..).

Farther for the external control and configuration of the system a RS-232 connection is attached to the controller board (9-pin Sub-D connector). The connection to a PC or a media control system is made by a serial 1:1 cable.

By pressing the AUX button on the chairman microphone station a reed relay on the controller board is activated to supply a contact closure for special purposes. The contact output (open/closed relay contact) is accessible on a Phoenix 2-pin connector. The contact output is loadable with max. 50V and 1A.

The controller board is equipped with two transmitting and one receiving antenna connections. These are connected by SMA patch cables with the antenna splitter board.

Via an eight-pin DIP-switch on the controller board the radio net address of the system is determined. This radio net address is necessary, in order to be able to operate different systems in the same environment. Also each microphone station belongs to a certain radio net address. On the microphone stations the address is changed internally via the programmer port.

3. Audio-Board

The audio board is equipped with two radio circuits for four audio channels. Each radio circuit is assigned to two audio channels using different transmission cycles. For the radio circuit eight radio channels are available (channel zero to channel seven). Via two address jumpers on the audio board every radio circuit is assigned to a certain radio channel. Using two or even more audio boards, these channels must be set up in the way that every radio circuit is transmitting a separate channel. Setting the jumper to channel "eight" switches the circuit off.

(See also figure: Audio-Board, Jumpers on page .. and figure Modul-Wiring on page ..)

The audio data are transmitted in individual packets in the given transmission cycles. The package size to the data is constant. The received audio data is decoded on the audio board into a steady digital audio signal and afterwards decoded into an analog audio system. After proper amplification the audio signal is fed to the certain audio output connector on the audio board. The maximum output level of the electronically balanced outputs is +10dBu.

Each of the two radio circuits is connected to the antenna splitter board via one send and one receive antenna patch cable. Thus a total of four SMA patch cables are connected to the audio board.

The available four audio outputs channels can be used in two different ways. Via jumpers on the board the outputs are configured. For every channel can be chosen whether it carries the individual channel's audio signal or the mix of all four channels of this audio board. For a separate sound reinforcement system it is recommended to use the individual channels of all four outputs and mix these signals with an automatic mixer (IRP Voice-Matic) to increase the gain before feedback. Thus a significant higher reinforcement level is achievable.

The audio board is also equipped with four LEDs to indicate the operational status. Four LEDs belong to every radio circuit. Two of this four LEDs are two-color LEDs and display the status of the radio transmission. After switching on the system these LEDs display GREEN. This indicates that the circuits are locked to the system and ready to transmit/receive data. As soon as a microphone station is activated and a channel of the radio circuit is occupied, the LED will change to RED. The other two LEDs of each group of four indicate the real audio level transmitted from the microphone station.

4. Antenna Splitter Board

There are two versions of the antenna splitter board: "2x 1in4" and "1x 1in6". For the use of one audio board in the system (four audio channels) the antenna splitter "2x 1in4" is used. Using two audio boards it is necessary to use two antenna splitter boards "1x 1in6".

Each antenna splitter board is equipped with N-connectors for the connection of the antenna cables. The transmitting and the receiving antenna are identical and have no differences in the handling. The individual splitter outputs of the antenna splitter are connected by SMA patch cables to the appropriate boards. Each audio board has two antenna inputs and two antenna outputs. The controller board has one antenna input and two antenna outputs. The remaining unconnected SMA connector must be terminated with a 50-Ohm-termination connector.

(See figure: Module Wiring)

Abb. Module-Wiring (System with one Audio-Board):

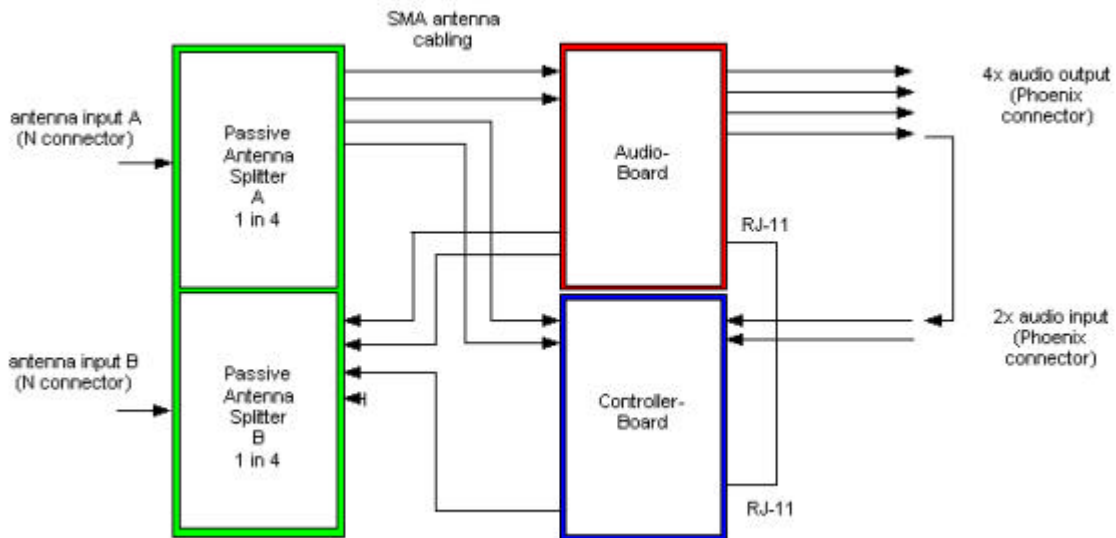


Abb. Module-Wiring (System with two Audio-Boards):

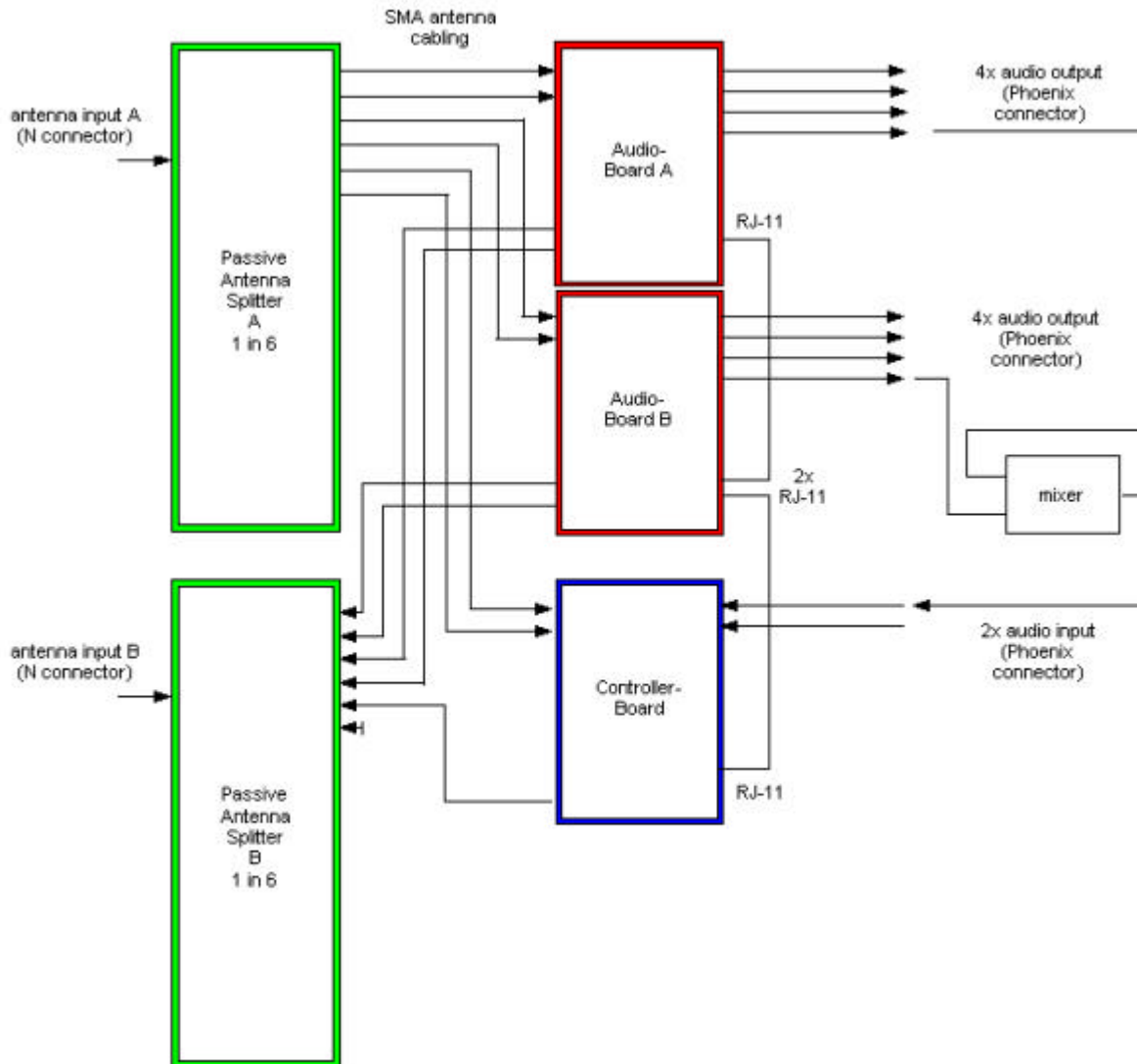


Abb. Block Diagram Audio-Board

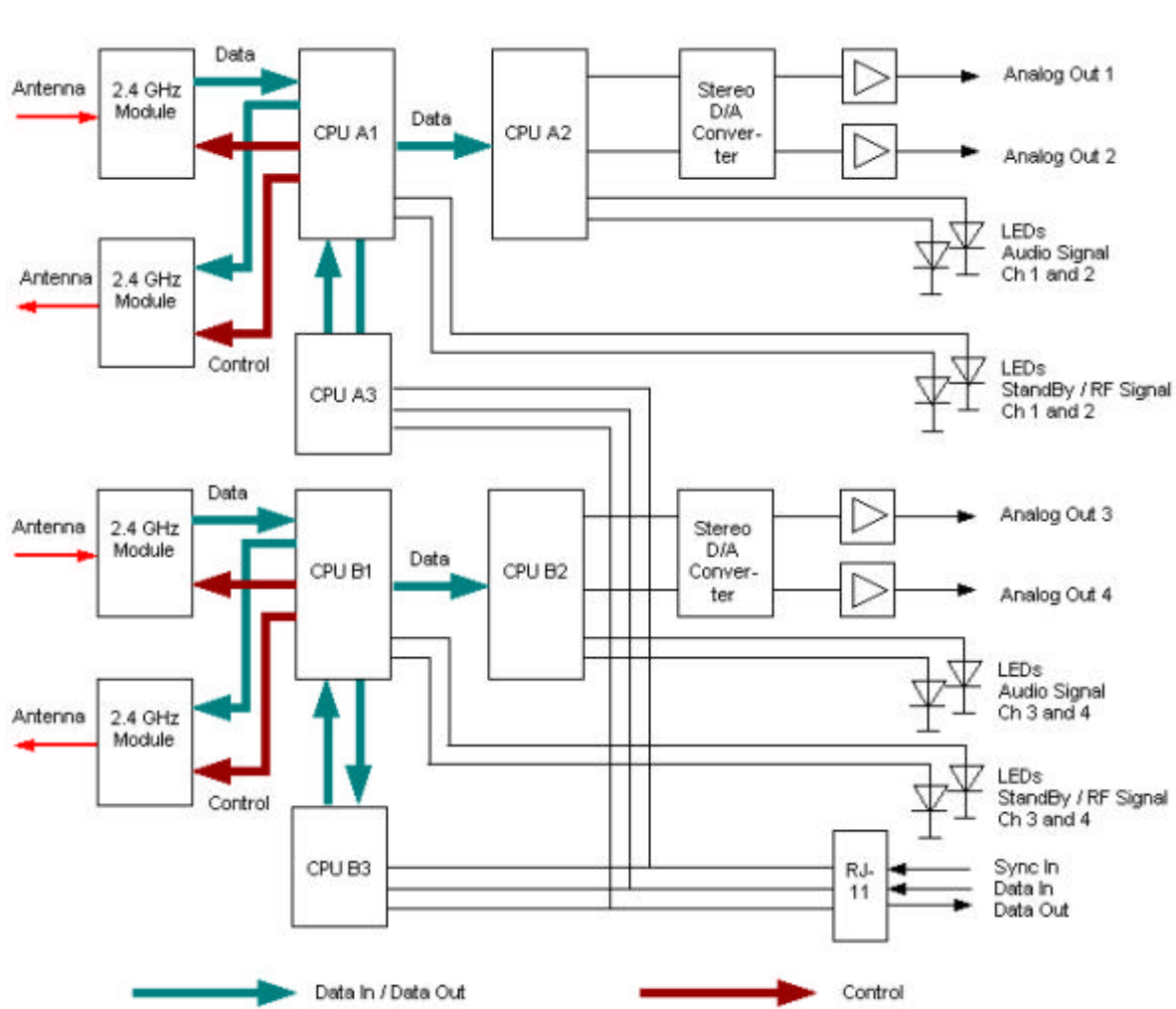


Abb. Block Diagram Controller-Board

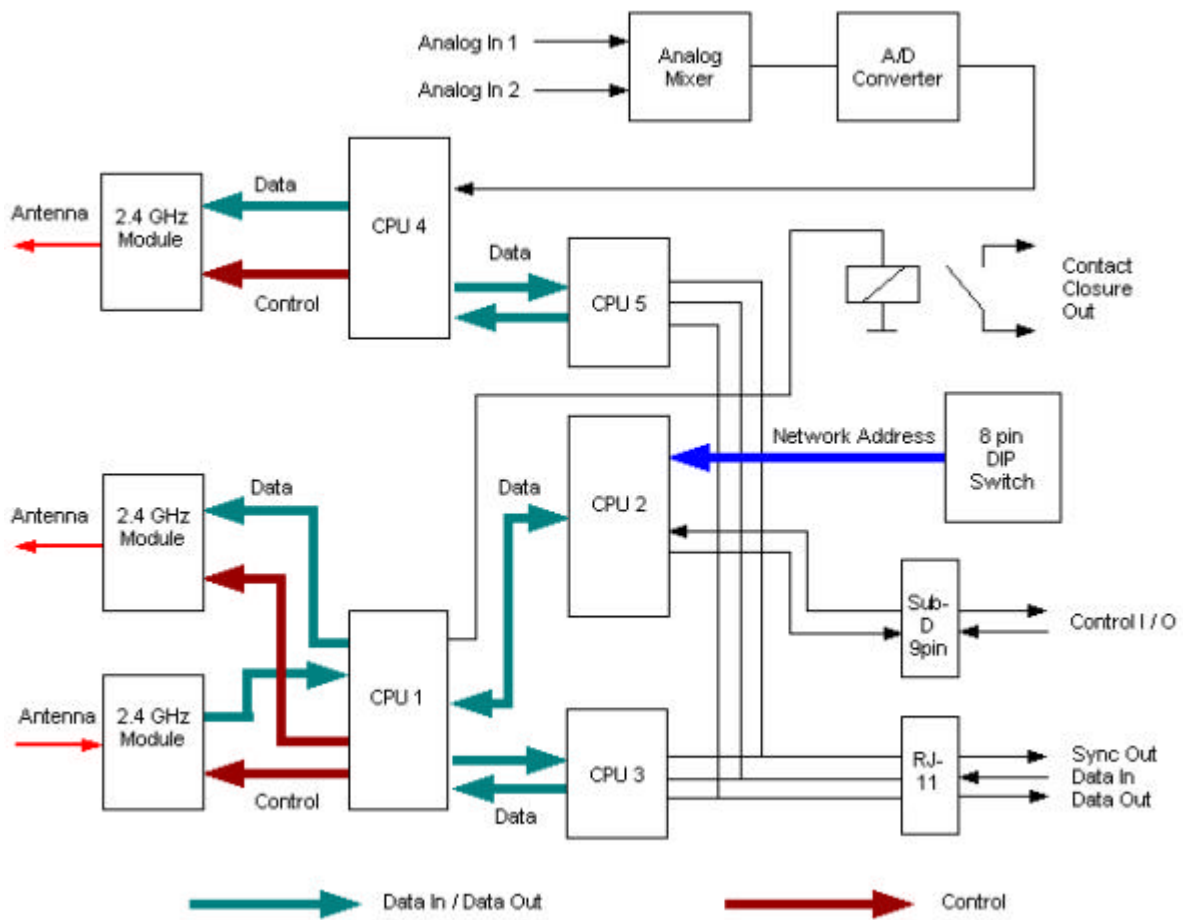
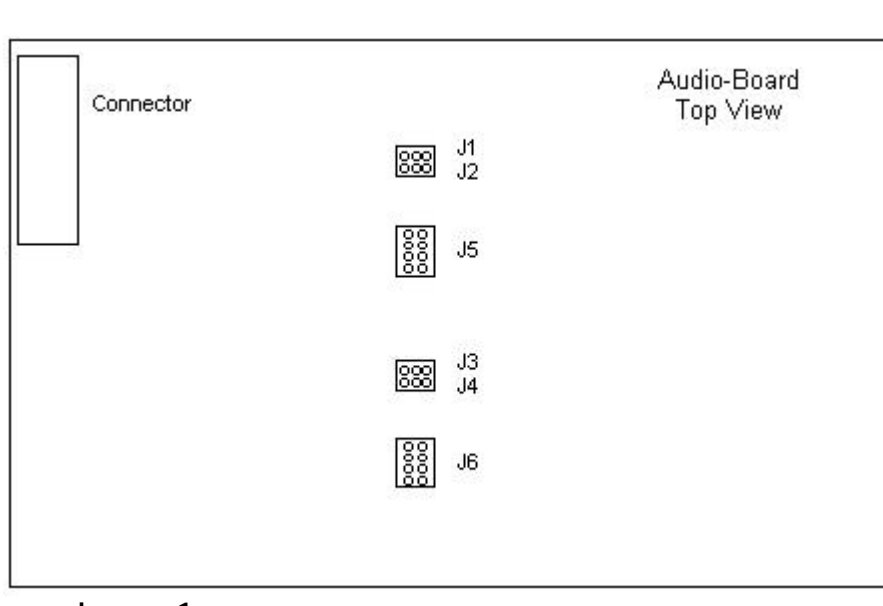


Abb. Audio-Board, Jumper Settings



Jumper 1

Left and Center bridged = Audio Channel 1 Mixed Signal
 Center and Right bridged = Audio Channel 1: Single Channel 1

Jumper 2

Left and Center bridged = Audio Channel 2 Mixed Signal
 Center and Right bridged = Audio Channel 2: Single Channel 2

Jumper 3

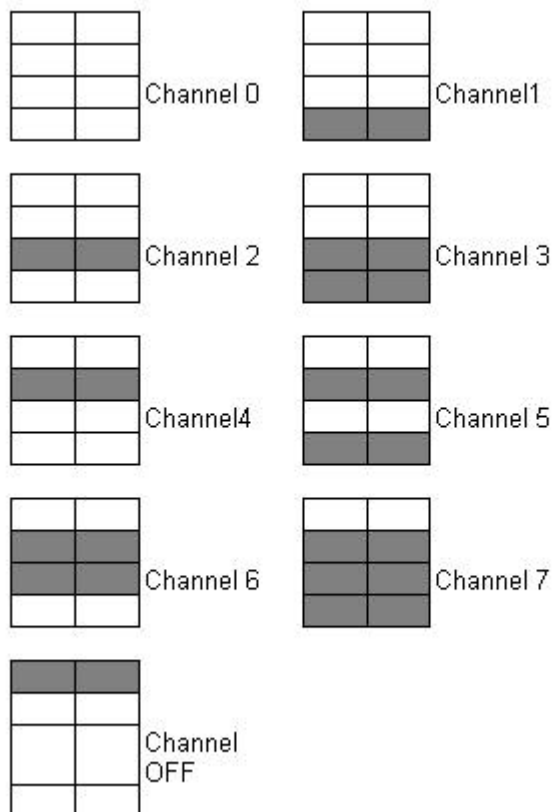
Left and Center bridged = Audio Channel 3 Mixed Signal
 Center and Right bridged = Audio Channel 3: Single Channel 3

Jumper 4

Left and Center bridged = Audio Channel 4 Mixed Signal
 Center and Right bridged = Audio Channel 4: Single Channel 4

Jumper 5, 6

Binary Code to determine the radio channel of the first and the second radio circuit:



Microphone Stations

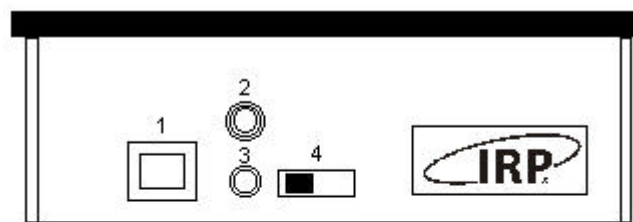


Two versions are available:

The regular microphone station **dwcs2.4DM** and the chairman microphone station **dwcs2.4CM**.

Regular Microphone Station:

On the rear side of the microphone station is the On/Off switch. After switching on the unit with a fully charged battery, a green LED lights up on the front panel of the station. (It applies also here that the unit should not be switched on directly after switching it off. Please wait at least 5 seconds, before switching the unit on again.)



microphone station rear side

- 1 programming connector RJ-11
- 2 battery charger connector 15V DC
- 3 headphones connector
- 4 on/off switch

Also on the rear side is the connector for the battery charger and the headphone connector. Connecting a pair of headphones to the station switches the internal loudspeaker off.

The RJ-11 connector is used for programming purposes and should not be used without purpose. A necessary reprogramming and reconfiguring of the microphone station should be handled only by specialized personnel.

Each microphone station is equipped with a rechargeable battery. The actual working time of the fully loaded battery is at least eight hours. The battery is charged by the optional highspeed charger or with the microphone station accordingly attached into the carrying case with integrated battery charger. No special maintenance of the battery is necessary. In the case of a defect the battery it can be exchanged any time and problem-free.

On top of the microphone station the high-quality electret goosyneck microphone with lighting ring and the 1/4-wavelength antenna for the wireless communication is attached. The antenna should not be covered during the use of the substation with the hand or by any devices.

After pushing the MICRO button the red LED in the button and the red ring on the microphone light up. If a free audio channel is available the microphone station is locked to the main unit and starts sending digital encoded audio data. The red LED and the red ring light continuously. If there is no audio channel available, the red LED and the ring switch off and the green stand-by LED lights up again. The MICRO button (and also the PRIORITY button in the chairman station) need to be pressed once and the connection will hold as long as the button is not pressed the second time. After pressing the button the second time, the connection is terminated and the red LED is switched off.

As long as the microphone station is active, i.e. as long as the microphone is connected through, the internal loudspeaker of this station is switched off. That is necessary to avoid feedbacks.

The electronics in the individual station has to fulfill two functions: communication with the main unit to connect and log-in the station and second the transfer of the audio signal of the microphone itself. The audio signal will be digitally encoded and transmitted as 2.4GHz radio signal to the main unit.

Each microphone station has its own integrated loudspeaker. The mixed signal of all audio channels is (also digitally encoded) transmitted to all microphone stations. Thus using the dwcs2.4 conference system it is not necessary to use a separate sound reinforcement system. Further any audio signal (max level of +10dBu) can be fed into the controller board in the main unit. This way e.g. the sound signal of a media presentation can be made audible over the microphone stations.

The number of possible microphone stations in one system is almost unlimited (up to 8000).

Chairman Microphone Station

The chairman microphone station enables the activating of the microphone in two ways. First the chairman station can be used as a regular microphone station: Pressing the MICRO button enables the connection to the main unit and if an audio channel is available, the connection is made. If there is no free audio channel, no audio transmission is possible. The second possibility is to use the PRIORITY button. Pressing this button, all other microphone stations are muted and the connections cancelled. Only the chairman microphone station is connected and put through. The audio signal will be transmitted until the PRIORITY button is pressed the second time and during this time no other microphone station is able to log-on to the system.

It is possible to use several chairman microphone stations in one system. These stations are all able to be activated in the PRIORITY mode at the same time.

Pinouts

ZENTALEINHEIT

Audio Connection (Audio Board and Controller Board):

Phoenix-Connector MC 1,5 / 3-ST-3,5 3-pin

Pin 1:

Pin 2:

Pin 3:

Auxiliary Connection (Controller Board):

Phoenix-Connector MC 1,5 / 2-ST-3,5 2-pin

Pin 1:

Pin 2:

Antenna Connections:

Main Antenna Connections:

N-Connector

Antenna Patch Cables:

SMA-Connector

Power Connection:

Standard Power Cord 110 / 220V AC

MICROPHONE STATIONS

Highspeed Charger Connection:



Headphones Connection:

3,5 mm Mini-Jack

Data and Programmer Connection (for service only):

RJ-11, 4-pin

Technical Specifications

- 2,4 Gigahertz, no licensing, no restrictions
- Encoded digital transmission for 100% privacy
- Up to 8.000 transmittermics per system
- Up to 8 open channels at the same time
- Autonomous switch on/off of mics
- System response within 10 msec
- Optional request to speak operator software
- IRP System-Signalprocessing
- Chairman- Override/ Priority
- 8 hours permanent transmission/16 hrs. Standby
- intelligent search for unused channels
- Design Tabletoptransmitters and mics
- Easy Setup
- Easy mobile use
- Premium audio quality
- Almost invisible antennas
- Battery remote surveillance
- Intelligent quick charge within 3 hours
- Worldwide service

System

- Data and Audio Transmission: 2,4GHz Range (2400 MHz - 2483,5 MHz)
- Transmission: 1 mW
- Audio Channels: max 16 plus 1 Foldback Channel
- Power Supply: integrated Power Supply 230 / 110 V (50 / 60 Hz)

Audio-Modul

- Output Impedance: 200 Ohm
- Max. Input Level: +4dBu (+10dBu Peak)

Controller-Modul

- Audio Inputs (Foldback Channel): electronically balanced
- Input Impedance: 20 kOhm (unballanced connection: 10 kOhm)
- Max. Input Level: +4dBu (+10dBu Peak)

IRP professional sound products L.P.

U.S. Corporate Headquarters
1225 Greenbriar Dr. Ste R
Addison, Illinois 60101

Phone: 630-860-1993
Fax: 630-860-1997
e-mail: info@irp.net
Website: www.irp.net

AVM-IRP audio products GmbH

European Corporate Headquarters
Mülheimer Freiheit 132,
D-51063 Köln/ Germany

Phone: 0221-640-3335
Fax: 0221-640-2184
e-mail: info@avm-irp.net
Website: www.avm-irp.net