



Manual and application description

Audio-Actuator AM 840

1. Device description

1.1 General

This device was developed according to the rules of the EIBA and EIBA certified. Condition for working with this device is specialized knowledge acquired by special training. For programming and start-up use only EIB-certified software.

1.2 Range of application

The Audio-Actuator is provided to control audio distribution in combination with other EIB devices. This device has no amplifier feature. For special application contact the manufacturer.

1.3 Installation

The device is provided for DIN rail mounting. The required space is 12 fuse units. Consider the national standards according to the „Handbuch Gebäudesystemtechnik“. We recommend also the use of high tension suppressing according to IEC 1024-1.

1.4 Description of function

The Audio-Actuator AM 840 is a processor controlled system with the following functions:

Audiomatrix

Mono: 8 audioinputs can be assigned to 4 audiooutputs .

Stereo: 4 audioinputs can be assigned to 2 audiooutputs .

Volume control

4 DC-control outputs 0-10V provide volume control of power amplifiers with DC control inputs like WHD AMP 10 DC. Several amplifiers can be controlled together.

Tone control

All 4 audiooutputs can be controlled independant in the low frequencies , the high frequencies and mid frequencies.

24VDC control output

4 DC-outputs control the power supply of power amplifiers with 24VDC supply voltage like AMP 10DC. They can be actuated independently.

Mute

Provides muting of all audio outputs.

Software

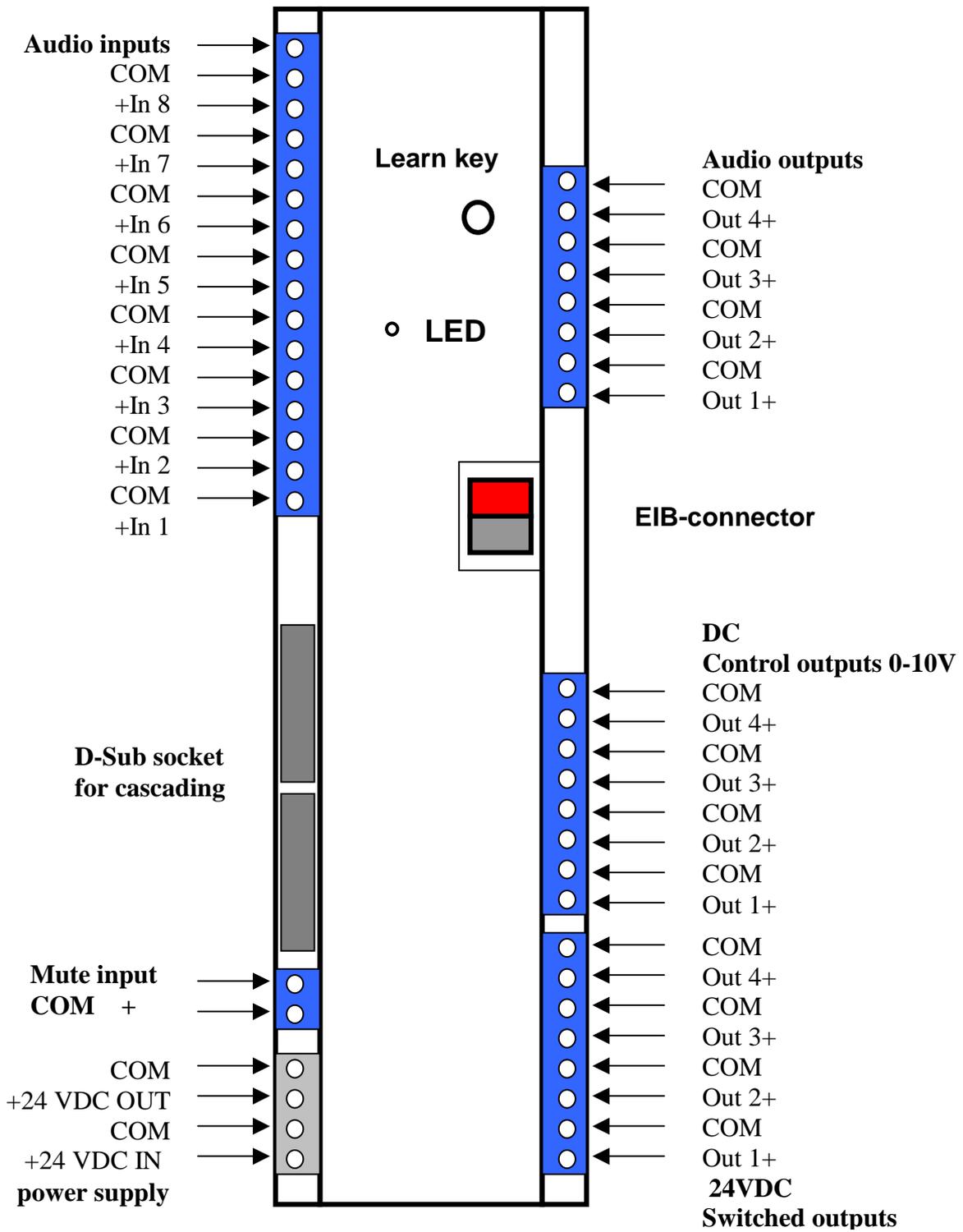
Additional featuers like zone or general broadcast can be programmed.

With the multichannel preamplifier PREAMP 600 and the power amplifier AMP 10DC a flexible high-end multiroom system can be easily installed.

1.5 Terminals

The audio-Actuator has 2 terminals for 24V DC supply voltage , to provide looping.

The audio inputs can be cascaded via 9-pole D-Sub cable.





1.6 Maximum current

It must be ensured that the maximum input current does not exceed 16A and the zone output current does not exceed 10A .

1.7 Protection

Polarity protection of supply voltage. Audio-outputs are short time short circuit proof .

1.8 Line fuse

16A, B- characteristic.

1.9 Remark

Mounting and start-up should be done with specially trained personal. Ensure that the power supply is switched off before you connect the device. Changes and replacement of internal parts only by the manufacturer.

Manipulation without permission will terminate warranty!

1.10 Technical data

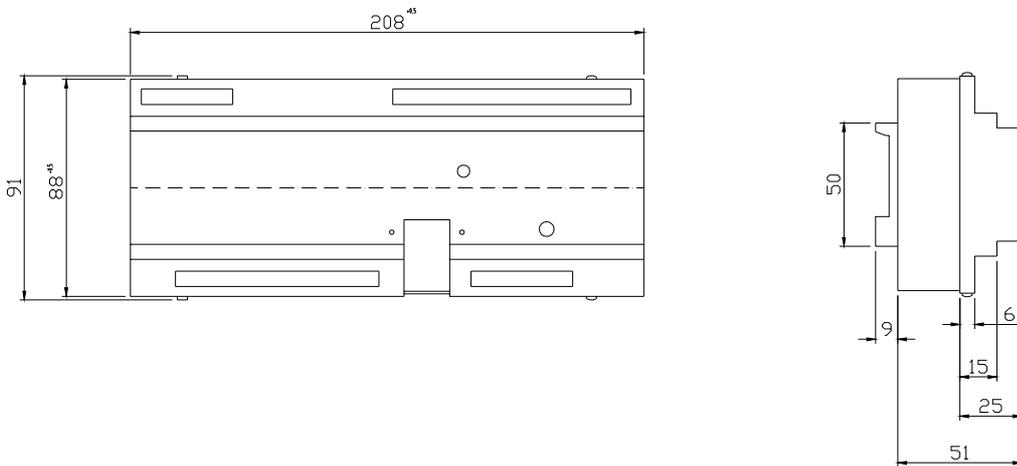
Supply voltage:	24 VDC
Audio-input voltage:	5 VAC
Audio-output voltage:	5 VAC
Mute voltage:	Threshold voltage 5 VDC
Control voltage:	0 – 10 VDC
Power consumption:	4W + number of power AMP 10 DC x 19W
Power consumption Standby:	1,5 W
Maximum DC input current:	16 A
Maximum DC output current of each zone:	10 A per zone
Input impedance:	100 K Ω
Output impedance:	50 Ω
Frequency range (-1,5 dB):	30-20000 Hz
Distortion:	< 0,1 %
Tone control range :	+/- 14 dB
Mid frequency filter:	- 4dB bei 3 KHz

1.11 General data

According to:	EN 55103-1
Class:	III
Operating temperature:	+5°C bis +45°C
Storage temperature:	-25°C bis +70°C
Case material:	metal
Colour:	silver RAL 9006
Dimensions:	208 x 88 x 60 mm
Weight:	0,7 kg
Mounting:	DIN rail

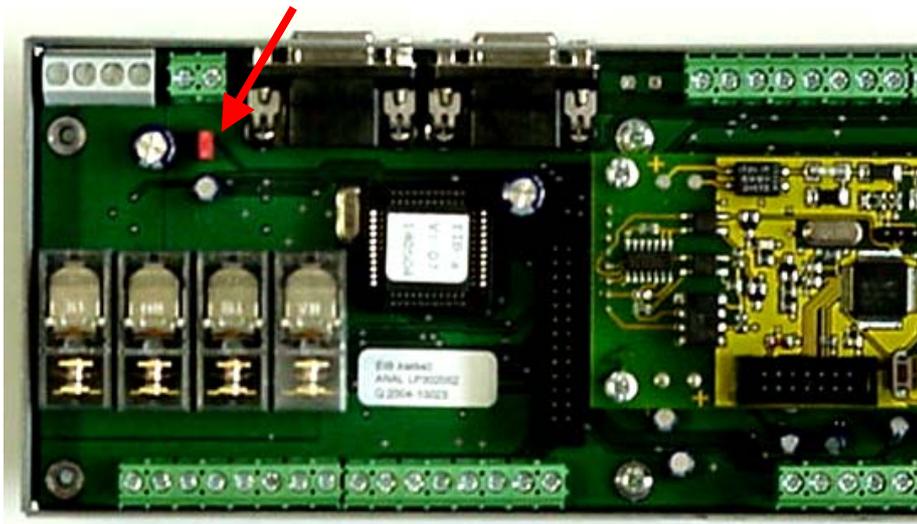


1.12 Dimension drawing



1.13 Remark

If you use the mute input ,you must remove the jumper on the PCB. Remove the top of the case first.



1.14 Remark

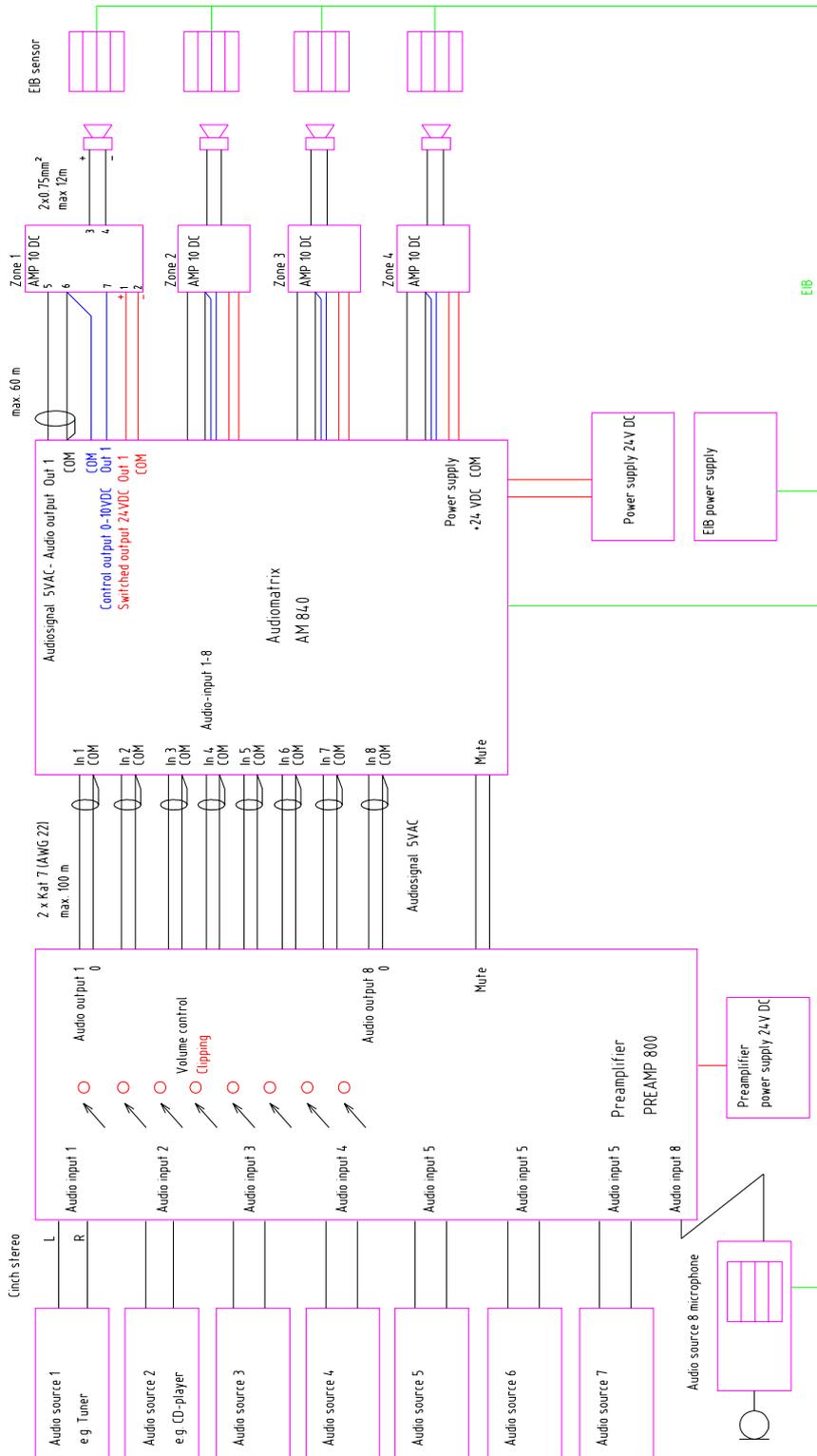
The number of amplifiers AMP 10 connected to the AM 840 depends on the maximum current of the terminals and the relay contacts, as well as the power consumption of the amplifiers.

Loudspeaker impedance	4 Ohm	8 Ohm	20 Ohm
Max.number of power amps AMP 10 DC	20	40	88
Max.number of power amps AMP 10 DC per zone (mono)	12	24	55



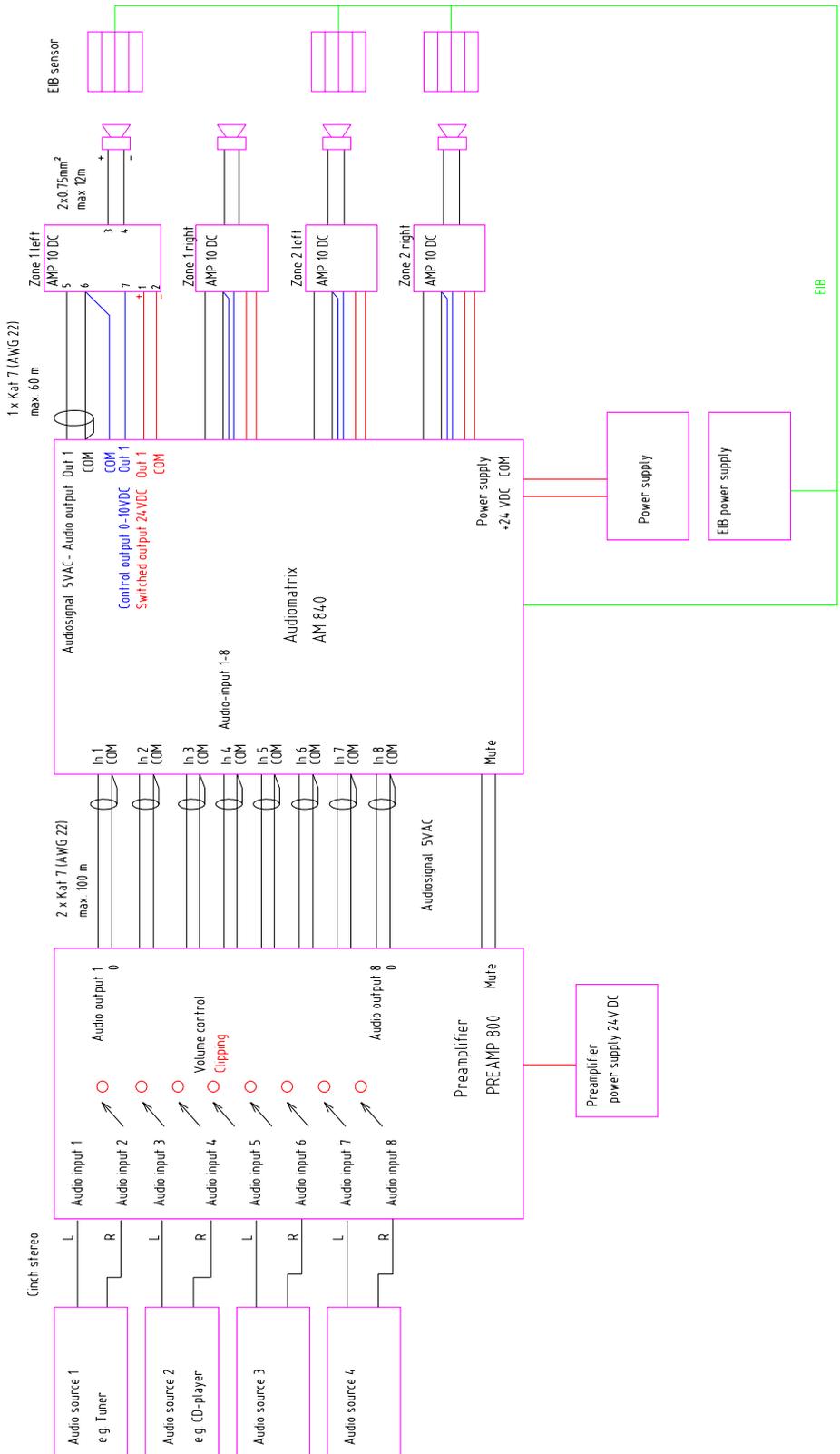
2. Wiring examples

2.1 Wiring example mono





2.2 Wiring example stereo





3. Cable recommendation

3.1 Wiring from the audio sources to PREAMP 800:

Cinchcable (Stereo), length max. 3 m

Mono : connect the left and right output of the source to the corresponding input of the PREAMP 800

The stereo signal is mixed inside the PREAMP 800 to a mono output signal.

Stereo : connect the left output of the source to input 1 and the right output to input 2 of the PREAMP 800 . Output 1 of PREAMP 800 is the left channel , output 2 is the right channel.

3.2 Wiring from PREAMP 800 to AM 840:

2 x CAT 7 (AWG 22) cable, length max. 100 m

Other cables with pair shielding are also suitable.

3.3 Wiring from AM 840 to amplifier AMP 10 DC:

1 x CAT 7 (AWG 22) cable, length max. 60 m

With star wiring the result is(2 wires connected parallel): 35m length=> app. 15% loss, 60m length app. 30% loss.

In the case of longer cable or several power amps to feed ,we recommend an additional cable with sufficient cross section for power supply and junction boxes.The supply terminals of the AMP 10 can handle a maximum cross section of 1.5 mm².

3.4 Wiring from amplifier AMP 10 DC to speaker:

Double sheath (to withstand mechanical stress) with a cross section of 2 x 0,75 mm², length max. 12 m.

Parallel connecting of speakers :The terminals of the AMP 10 can handle max 2 x 0.8 mm² single core.

3.5 Cascading of the AM 840:

If more than 4 mono (or 2 stereo) zones shall be covered , additional AM 840 actuators are necessary.

They can be easily wired via the built-in D-Sub sockets. We recommend a D-SUB cable with the following specification (available from WHD):

Length: 0,5 m

Plug type: male to male

Number of pins:9

Shield: common shield, including conector housing

Wiring: 1 : 1, no null-modem!



3.6 Power supply:

We recommend a stabilized ,short circuit proof, switched mode power supply.

To cover applications with higher current consumption we recommend power supplies able to be connected parallel. We offer three different types for DIN rail mounting:

Technical data	Type
24VDC/1,3A	PS 24/1,3
24VDC/4,2A	PS 24/4,2
24VDC/10A	PS 24/10

Dimensioning : The power supply must have the capability to meet the total current consumption of all devices.

Current consumption of one AM 840: 0,2 A

Current consumption of one AMP 10 DC: 0,8 A

Example:

System for 4 rooms (Mono) consisting of

1x AM 840 = 0,2 A

4x AMP 10 DC = 4*0,8 A = 3,2 A

Sum: 3,4 A

The power supply must provide at least this value ,

e.g. WHD „PS 24/4,2“ with 4,2 A.



4 Application description Audio-Actuator AM 840 mono

4.1 Overview

The application „Audio-Aktor AM 840 mono“ provides the control of the actuator with four independent zone outputs. All operations can be controlled via EIB.

The following operations are available:

- On/Off
- Mute
- Volume higher/lower
- Volume setting to a fixed value
- Input selection by a fixed value
- Input selection step by step
- Bass control step by step lower /higher
- Treble control step by step lower /higher
- Mid frequency filter on /off
- Balance right/left step by step (stereo version only)
- Zone call

The following operation is collective :

- Priority call

4.2 Default state of the device

Factory-new devices have the physical address 15/15/255, no group addresses , no application stored.

4.3 Maximum number of group addresses and associations

120 different group addresses and 120 different associations can be programmed in the application.



4.4 Communication objects

The following illustration shows an overview over the application and its communication objects displayed in ETS3.

Phys. Addr.	Description	Product	Order number	Program	Manufacture	Room	Line	Function		
no.	Group addresses	Function	Object name	Type	Priority	C	R	W	T	U
01.01.001		Audioaktor AM 840	111.310.02.000...	Audioaktor AM 840 Mono	WHD Wilhel...		Line 1			
0			Call all amps	1 Bit	Low	✓	✓			
1			Amp1: on/off	1 Bit	Low	✓	✓			
2			Amp1: Mute on/off	1 Bit	Low	✓	✓			
3			Amp1: Volume step up/down	4 Bit	Low	✓	✓			
4			Amp1: Volume absolute	1 Byte	Low	✓	✓			
5			Amp1: Source absolute	1 Byte	Low	✓	✓			
6			Amp1: Source step up/down	1 Bit	Low	✓	✓			
7			Amp1: Tune bass	1 Bit	Low	✓	✓			
8			Amp1: Tune treble	1 Bit	Low	✓	✓			
9			Amp1: Loudness on/off	1 Bit	Low	✓	✓			
10			Amp1: Call zone1	1 Bit	Low	✓	✓			
11			Amp1: Status on/off	1 Bit	Low	✓		✓		
12			Amp1: Status volume	1 Byte	Low	✓		✓		
13			Amp1: Status source	1 Byte	Low	✓		✓		
14			Amp2: on/off	1 Bit	Low	✓	✓			
15			Amp2: Mute on/off	1 Bit	Low	✓	✓			
16			Amp2: Volume step up/down	4 Bit	Low	✓	✓			
17			Amp2: Volume absolute	1 Byte	Low	✓	✓			
18			Amp2: Source absolute	1 Byte	Low	✓	✓			
19			Amp2: Source step up/down	1 Bit	Low	✓	✓			
20			Amp2: Tune bass	1 Bit	Low	✓	✓			
21			Amp2: Tune treble	1 Bit	Low	✓	✓			
22			Amp2: Loudness on/off	1 Bit	Low	✓	✓			
23			Amp2: Call zone1	1 Bit	Low	✓	✓			

4.5 General communication objects

Obj.	Function	Object Name	Type	Flags
0	On/off	Priority call on/off	1 Bit	KS
<p>This object controls the duty call. The duty call comprehends all zones . In the beginning a gong signal is activated , then all zones are switched to the duty call input and the volume is set to the duty volume. The system is locked as long as the duty call is activated.</p>				



4.6 Communication objects of amplifier 1-4

Obj.	Function	Name	Type	Flags
1	On/off	Amplifier no. 1 on/off	1 Bit	KS
This object switches the amplifiers on /off. The values for volume and status are sent by the communication objects 12 and 13. Off opens the relay , On close the relay contacts.				
2	On/off	Amplifier no. 1 mute	1 Bit	KS
This object mutes the amplifier.The volume value is set to the lowest possible,but the amplifier will not be switched off.				
3	Volume up/down	Amplifier 1 change volume step by step	4 Bit	KS
This object changes the volume of the amplifier step by step.When the amplifier has reached the defined value or received a stop telegram or has reached maximal or minimal value , the value will be fixed and volume and status are sent by the communication objects 12 and 13. The amplifiers cannot be switched off by this object. A complete sequence needs app. 4 seconds. Note : The communication objects 1(on/off),3(volume up/down) and 4 (volume absolute) are similar to a dimmer-actuator and can be used with all sensors that support the dim application.				
4	8-Bit-Value	Amplifier 1 volume absolute	1 Byte	KS
This object sets the volume to a fixed value.When zero is sent , the amplifier is switched off, other values will change the volume immediately.Balance is reset.Volume and status are sent by the communication objects 11 and 12.				
5	8-Bit-Value	Amplifier 1 source absolute	1 Byte	KS
This object sets the channel of the amplifier to a fixed value. It is possible to exceed the maximum channel number adjusted by parameters. The channel number is sent by communication object 13.				
6	Source up/down	Amplifier 1 source step by step	1 Bit	KS
This object switches the channels of an amplifier step by step . 1 decrease ,0 increase the channel number. It is not possible to exceed the maximum channel number set by parameters.When the maximum channel is reached the channel number is switched to the lowest value.The selected channel is sent by the communication object 13.				
7	Bass up /down	Amplifier 1 Bass	1 Bit	KS
This object changes the bass value step by step. 0 increase , 1 decrease the value until the limit is reached.				
8	Treble up/down	Amplifier 1 Treble	1 Bit	KS
This object changes the treble value step by step. 0 increase , 1 decrease the value until the limit is reached.				
9	On/Off	Amplifier 1 loudness on/off	1 Bit	KS
This object switches the mid frequency filter on/off.				
10	On/Off	Amplifier 1 zone call on/off	1 Bit	KS
This object switches the zone call on /off. The zone call provides broadcast only for amplifier 1. In the beginning a gong signal is activated , then amplifier 1 is switched to the zone call input and the zone call volume.The amplifier is locked , only duty call override the settings. (Object 0).				
11	On/Off	Amplifer 1 Status on/off	1 Bit	KÜ
This object is sent by the amplifier when switched on/off.				
12	8-Bit-Value	Amplifier 1 Status volume	1 Byte	KÜ
This object is sent by the amplifier when reaching a new volume value.				
13	8-Bit-Value	Amplifier 1 Status source	1 Byte	KÜ
This object is sent by the amplifier when the channel is changed.				



5. Parameter

The default values are displayed **bold**.

5.1 Parametersheet „General configuration“

Parameter	Configuration
Default volume (all amplifiers)	0 %; 10 % ; 20 %; 30 %; 40 %; 50 %; 60 %; 70 %; 80 %; 90 %; 100 %;
This parameter defines the volume value of the amplifiers after being switched on.	
Default source (all amplifiers)	1 ... 8(1)
This parameter defines the channel of the amplifiers after being switched on.	
Available sources	1 ... 8(6)
This parameter defines the channels for normal user access.	
Restore old config after power failure	Yes / NO
This parameter defines if the default settings of volume and channel ,or the values before power failure are used.	
Gong to be played at duty call (all amplifiers, 0 = Gong off)	0 ... 3 (2)
This parameter defines the gong sent at the beginning of the duty call.	



5.2 Parametersheet „Config amplifier 1“

Parameter	Configuration
Source of duty call	1 ... 8 (1)
This parameter defines the channel of amplifier1 at duty call.	
Volume of duty call	0 %; 10 %; 20 %; 30 %; 40 %; 50 %; 60 %; 70 %; 80 %; 90 %; 100 % ;
This parameter defines the volume of amplifier 1 at duty call.	
Source of zone call	1 ... 8 (1)
This parameter defines the source of amplifier 1 at zone call.	
Volume of zone call	0 %; 10 %; 20 %; 30 %; 40 %; 50 %; 60 %; 70 %; 80 %; 90 %; 100 % ;
This parameter defines the volume of amplifier 1 at zone call.	
Keep volume and source after switching off	Yes / No
This parameter defines whether the values before switching off are used or the default values.	
Gong to be played at zone call (all amplifiers, 0 = Gong off)	0 ... 3 (1)
This parameter defines the gong signal type to be played at zone call.	



Max. volume	0 %; 10 %; 20 %; 30 %; 40 %; 50 %; 60 %; 70 %; 80 %; 90 % ; 100 %;
This parameter defines the max volume of amplifier 1. It has only internal affect. The bus values are always 0 to 100%. The status object is not affected by this parameter.	

6 Application description Audio-Actuator AM 840 stereo

6.1. Communication objekts

The following illustration shows an overview over the application and it's communication objects displayed in ETS3.

Phys.Add	Description	Product	Order number	Program	Manufacturer	Room	Line	Function		
no.	Group addresses	Function	Object name	Type	Priority	C	R	W	T	U
01.01.001		Audioaktor AM 840	111.310.02.000...	Audioaktor AM 840 Stereo	WHD Wilhelm ...		Line 1			
0			Call all amps	1 Bit	Low	✓	✓			
1			Amp1: on/off	1 Bit	Low	✓	✓			
2			Amp1: Mute on/off	1 Bit	Low	✓	✓			
3			Amp1: Volume step up/down	4 Bit	Low	✓	✓			
4			Amp1: Volume absolute	1 Byte	Low	✓	✓			
5			Amp1: Source absolute	1 Byte	Low	✓	✓			
6			Amp1: Source step up/down	1 Bit	Low	✓	✓			
7			Amp1: Tune bass	1 Bit	Low	✓	✓			
8			Amp1: Tune treble	1 Bit	Low	✓	✓			
9			Amp1: Loudness on/off	1 Bit	Low	✓	✓			
10			Amp1: Call zone1	1 Bit	Low	✓	✓			
11			Amp1: Balance	1 Bit	Low	✓	✓			
12			Amp1: Status on/off	1 Bit	Low	✓	✓			
13			Amp1: Status volume	1 Byte	Low	✓	✓			
14			Amp1: Status source	1 Byte	Low	✓	✓			
15			Amp2: on/off	1 Bit	Low	✓	✓			
16			Amp2: Mute on/off	1 Bit	Low	✓	✓			
17			Amp2: Volume step up/down	4 Bit	Low	✓	✓			
18			Amp2: Volume absolute	1 Byte	Low	✓	✓			
19			Amp2: Source absolute	1 Byte	Low	✓	✓			
20			Amp2: Source step up/down	1 Bit	Low	✓	✓			
21			Amp2: Tune bass	1 Bit	Low	✓	✓			
22			Amp2: Tune treble	1 Bit	Low	✓	✓			
23			Amp2: Loudness on/off	1 Bit	Low	✓	✓			

1 of 1 selected PA 1.1

6.2 General Communication objekts

Obj.	Function	Object Name	Type	Flags
0	On/Off	Duty call on/off	1 Bit	KS
This object controls the duty call. The duty call comprehends all zones . In the beginning a gong signal is activated , then all zones are switched to the duty call input and the volume is set to the duty volume.				



6.3 Communication objects of amplifier 1 + 2

Obj.	Function	Name	Type	Flags
1	On/Off	Amplifier 1 on/off	1 Bit	KS
This object switches the amplifiers on /off. The values for volume and status are sent by the communication objects 12 and 13. Off opens the relay , On close the relay contacts.				
2	On/Off	Amplifier 1 mute on/off	1 Bit	KS
This object mutes the amplifier. The volume value is set to the lowest possible, but the amplifier will not be switched off.				
3	Volume up/down	Amplifier 1 volume dim	4 Bit	KS
This object changes the volume of the amplifier step by step. When the amplifier has reached the defined value or received a stop telegram or has reached maximal or minimal value , the value will be fixed and volume and status are sent by the communication objects 12 and 13. The amplifiers cannot be switched off by this object. A complete sequence needs app. 4 seconds. Note : The communication objects 1(on/off),3(volume up/down) and 4 (volume absolute) are similar to a dimmer-actuator and can be used with all sensors that support the dim application.				
4	8-Bit-Value	Amplifier 1 volume absolute	1 Byte	KS
This object sets the volume to a fixed value. When zero is sent , the amplifier is switched off, other values will change the volume immediately. Balance is reset. Volume and status are sent by the communication objects 12 and 13.				
5	8-Bit-Value	Amplifier 1 source absolute	1 Byte	KS
This object sets the channel of the amplifier to a fixed value. It is possible to exceed the maximum channel number adjusted by parameters. The channel number is sent by communication object 14.				
6	Source up/down	Amplifier 1 source step by step	1 Bit	KS
This object switches the channels of an amplifier step by step . 1 decrease , 0 increase the channel number. It is not possible to exceed the maximum channel number set by parameters. When the maximum channel is reached the channel number is switched to the lowest value. The selected channel is sent by the communication object 14.				
7	Bass up/down	Amplifier 1 Bass	1 Bit	KS
This object changes the bass value step by step. 0 increase , 1 decrease the value until the limit is reached.				
8	Treble up/ down	Amplifier 1 Treble	1 Bit	KS
This object changes the treble value step by step. 0 increase , 1 decrease the value until the limit is reached.				
9	On/Off	Amplifier 1 loudness on/off	1 Bit	KS
This object switches the mid frequency filter on/off.				
10	On/Off	Amplifier 1 zone call on/off	1 Bit	KS
This object switches the zone call on /off. The zone call provides broadcast only for amplifier 1. In the beginning a gong signal is activated , then amplifier 1 is switched to the zone call input and the zone call volume. The amplifier is locked , only duty call override the settings. (Object 0).				
11	Balance right/left	Amplifier 1 Balance	1 Bit	KS
This object sets the balance of the left and right output of amplifier 1. A zero value increases the volume value of the right output one step and reduces the volume of the left output one step. A 1 value will cause the opposite .				



12	On/Off	Amplifier 1 Status on/ff	1 Bit	KÜ
This object is sent by the amplifier when switched on/off.				
13	8-Bit-Value	Amplifier 1 Status volume	1 Byte	KÜ
This object is sent by the amplifier when reaching a new volume value.				
14	8-Bit-Value	Amplifier 1 Status source	1 Byte	KÜ
This object is sent by the amplifier when the channel is changed.				



7 Parameter

The default values are displayed **bold**.

7.1 1 Parametersheet „General configuration“

Parameter	Configuration
Default volume (all amps)	0 %; 10 % ; 20 %; 30 %; 40 %; 50 %; 60 %; 70 %; 80 %; 90 %; 100 %;
This parameter defines the volume value of the amplifiers after being switched on.	
Default source (all amps)	1 ... 4(1)
This parameter defines the channel of the amplifiers after being switched on.	
Available sources	1 ... 4(4)
This parameter defines the channels for normal user access.	
Restore old config after power failure	Yes / NO
This parameter defines if the default settings of volume and channel, or the values before power failure are used.	
Gong to be played at duty call (all amplifiers, 0 = Gong off)	0 ... 3 (2)
This parameter defines the gong sent at the beginning of the duty call.	

Parameter	Configuration
Default volume (all amplifiers)	0 %; 10 % ; 20 %; 30 %; 40 %; 50 %; 60 %; 70 %; 80 %; 90 %; 100 %;
This parameter defines the volume value of the amplifiers after being switched on.	
Default source (all amplifiers)	1 ... 4(1)
This parameter defines the channel of the amplifiers after being switched on.	
Available sources	1 ... 4(4)
This parameter defines the channels for normal user access.	
Restore old config after power failure	Yes / NO
This parameter defines if the default settings of volume and channel, or the values before power failure are used.	
Gong to be played at duty call (all amplifiers, 0 = Gong off)	0 ... 3 (2)
This parameter defines the gong sent at the beginning of the duty call.	



7.2 Parametersheet „Configuration amplifier 1“

Parameter	Configuration
Source of duty call	1 ... 4 (1)
This parameter defines the channel of amplifier1 at duty call.	
Volume of duty call	0 %; 10 %; 20 %; 30 %; 40 %; 50 %; 60 %; 70 %; 80 %; 90 %; 100 % ;
This parameter defines the volume of amplifier 1 at duty call.	
Source of zone call	1 ... 4 (1)
This parameter defines the source of amplifier 1 at zone call.	
Volume of zone call	0 %; 10 %; 20 %; 30 %; 40 %; 50 %; 60 %; 70 %; 80 %; 90 %; 100 % ;
This parameter defines the volume of amplifier 1 at zone call.	
Keep volume and source after switching off	Yes / No
This parameter defines whether the values before switching off are used or the default values.	
Gong to be played at zone call (all amplifiers, 0 = Gong off)	0 ... 3 (1)
This parameter defines the gong signal type to be played at zone call.	
Max. volume	0 %; 10 %; 20 %; 30 %; 40 %; 50 %; 60 %; 70 %; 80 %; 90 % ; 100 %;
This parameter defines the max volume of amplifier 1. It has only internal affect. The bus values are always 0 to 100%. The status object is not affected by this parameter.	



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