

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 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 contol 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 highend 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.

<u>1.7 Protection</u> Polarity protection of supply voltage. Audio-outputs are short time short circuit proof .

<u>1.8 Line fuse</u> 16A, B- characteristic.

1.9 Remark

Mounting and start-up should be done with specialy 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!

<u>1.10 Technical data</u> Supply voltage: Audio-input voltage: Audio-output voltage: Mute voltage: Control voltage:	24 VDC 5 VAC 5 VAC Threshold voltage 5 VDC 0 – 10 VDC
Power consumption: Power consumption Standby: Maximum DC input current: Maximum DC output current of each zone:	4W + number of power AMP 10 DC x 19W 1,5 W 16 A 10 A per zone
Input impedance: Output imbedance: Frequency range (-1,5 dB): Distortion: Tone control range : Mid frequency filter:	100 KΩ 50 Ω 30-20000 Hz < 0,1 % +/- 14 dB - 4dB bei 3 KHz
1.11 General data According to: Schutzklasse: Operating temperature: Storage temperature: Case material: Colour: Dimensions: Weight: Mounting:	EN 55103-1 III +5°C bis +45°C -25°C bis +70°C metal silver RAL 9006 208 x 88 x 60 mm 0,7 kg DIN rail



1.12 Dimension drawing





 $\frac{1.13 \text{ Remark}}{\text{If you use the mute input ,you must remove the jumper on the PCB. Remove the top of the case first.}$



<u>1.14 Remark</u> 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 600:

Cinchcable (Stereo), length max. 3 m

Mono : connect the left and right output of the source to the corresponding input of the PREAMP 600 The stereo signal is mixed inside the PREAMP 600 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 600 . Output 1 of PREAMP 600 is the left channel , output 2 is the right channel.

3.2 Wiring from PREAMP 600 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 mecanical stress) with a cross section of 2×0.75 mm², length max. 12 m. Parallel connecting of speakers :The terminals of the AMP 10 can handle max 2×0.8 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	s: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 supplys able to be connected parallel. We offer three different types for DIN rail mounting:

Technical data	Туре
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 ASum: 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 it's communication objects displayed in ETS3.

	Phys.Addr. Description	Product	Order number Program		Man	ufactu	re Room	Line	Function	
	no. Group addresses	Function	Object name	Туре	Priority	CR	WTU	J	·	
	01.01.001	Audioaktor AM 840	111.310.02.000 Audioakto	r AM 840 I	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 trebble	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 trebble	1 Bit	Low	~	~			
	22		Amp2: Loudness on/off	1 Bit	Low	~	~			
	23		Amp2: Call zone1	1 Bit	Low	~	~			-
•										
					1 of 2 sele	ected			PA 1.1	

4.5 General communication objects

Obj.	Function	Object Name	Туре	Flags
0	On/off	Priority 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.				
The system is locked as long as the duty call is activated.				



4.6 Communication objects of amplifier 1-4

Obj.	Function	Name	Туре	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 switched of	mutes the amplifier.The f.	e volume value is set to the lowest po	ssible,bu	t the amplifier will not be	
3	Volume up/down	Amplifier 1 change volume step by step	4 Bit	KS	
This object or received status are s complete s	changes the volume of a stop telegram or has sent by the communicat equence needs app. 4 s	the amplifier step by step. When the a reached maximal or minimal value, t on objects 12 and 13. The amplifiers seconds.	amplifier the value cannot b	has reached the defined value will be fixed and volume and be switched off by this object. A	
actuator an	d can be used with all s	ensors that support the dim application	on.		
4	8-Bit-Value	Amplifier 1 volume absolute	1 Byte	KS	
This object change the and 12.	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 number adj	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 not possible the channe 13.	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				
7	Bass up /down	Amplifier 1 Bass	1 Bit	KS	
This object	changes the bass value	e step by step. 0 increase , 1 decreas	e the val	ue until the limit is reached.	
8	Treble up/down	Amplifier 1 Treble	1 Bit	KS	
This object	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 amplifer v	when switched on/off.			
12	8-Bit-Value	Amplifier 1 Status volume	1 Byte	KÜ	
This object	is sent by the amplifer v	when reaching a new volume value.			
13	13 8-Bit-Value Amplifier 1 Status source 1 Byte KÜ				
This object	This object is sent by the amplifer when the channel is changed.				



<u>5. Parameter</u> The default values are displayed **bold.**

5.1 Parametersheet "General configuration"

Edit Parameters	×
General config Config amplifier 1 Config am	plifier 2 Config amplifier 3 Config amplifier 4
Default volume (all amps)	10 %
Default source (all amps)	1
Available sources	6
Restore old config after power failure	No
Gong (0 = Gong off)	2
To be played at duty call	, <u>s</u>
OK Cancel <u>D</u> efault	Info Low Access Help

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 a	amplifiers after being switched on.		
Default source (all amplifiers)	1 8(1)		
This parameter defines the channel of the amplifiers after beeing switched on.			
Available sources	1 8(6)		
This parameter defines the channels for normal u	user access.		
Restore old config after power failure	Yes / N0		
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"

Edit Parameters	×
General config Config amplifier 1	Config amplifier 2 Config amplifier 3 Config amplifier 4
Source of duty call	
Volume of duty call	100 %
Source of zone call	1
Volume of zone call	100 %
Keep volume and source after switching off	Yes
Gong (0 = Gong off) To be played at zone call	1
Max. volume	90 %
OK Cancel <u>D</u>	efault

Parameter	Configuration	
Source of duty call	1 8 (1)	
This parameter defines the channel of amplifier	l 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 2	l 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 amp values are always 0 to 100%. The status object	lifier 1. It has only internal affect. The bus 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		Manufact	urer F	Room	Line	Function	_I.
no. Group addresses	Function	Object name	Туре	Priority	CR	. W T U			
01.01.001	Audioaktor AM 840	111.310.02.000 Audioaktor AM	840 Stereo	WHD Wilhe	elm		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	\checkmark	~			
4		Amp1: Volume absolute	1 Byte	Low	\checkmark	~			
5		Amp1: Source absolute	1 Byte	Low	\checkmark	~			
6		Amp1: Source step up/down	1 Bit	Low	\checkmark	~			
7		Amp1: Tune bass	1 Bit	Low	\checkmark	~			
8		Amp1: Tune trebble	1 Bit	Low	\checkmark	~			
9		Amp1: Loudness on/off	1 Bit	Low	\checkmark	~			
10		Amp1: Call zone1	1 Bit	Low	\checkmark	~			
11		Amp1: Balance	1 Bit	Low	\checkmark	~			
12		Amp1: Status on/off	1 Bit	Low	\checkmark	~			
13		Amp1: Status volume	1 Byte	Low	\checkmark	~			
14		Amp1: Status source	1 Byte	Low	\checkmark	~			
15		Amp2: on/off	1 Bit	Low	\checkmark	~			
16		Amp2: Mute on/off	1 Bit	Low	\checkmark	~			
17		Amp2: Volume step up/down	4 Bit	Low	\checkmark	~			
18		Amp2: Volume absolute	1 Byte	Low	\checkmark	~			
19		Amp2: Source absolute	1 Byte	Low	\checkmark	~			
20		Amp2: Source step up/down	1 Bit	Low	\checkmark	~			
21		Amp2: Tune bass	1 Bit	Low	\checkmark	~			
22		Amp2: Tune treble	1 Bit	Low	\checkmark	~			
23		Amp2: Loudness on/off	1 Bit	Low	\checkmark	~			-
			1 0	f1 selecte	ed			PA	1.1

6.2 General Communication objekts

Obj.	Function	Object Name	Туре	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 objekts of amplifier 1 + 2

Obj.	Function	Name	Туре	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 obj will not b	ect mutes the amplifier. be switched off.	The volume value is set to the lowest	t possible	but the amplifier,	
3	Volume up/down	Amplifier 1 volume dim	4 Bit	KS	
This obj the defir value wi The amp seconds Note : T similar t	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 dimmor 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 obj other va by the c	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 obj maximu commur	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 obj limit is re	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 obj volume 1 value	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		KÜ
This object is sent by the amplifer when switched on/off.				
13	13 8-Bit-Value Amplifier 1 Status volume 1 Byte KÜ			
This object is sent by the amplifer when reaching a new volume value.				
14 8-Bit-Value Amplifier 1 Status source 1 Byte KÜ				
This object is sent by the amplifer when the channel is changed.				



<u>7 Parameter</u> The default values are displayed **bold.**

7.1 1 Parametersheet "General configuration"

Edit Parameters	X
General config Config amplifier 1 Config amp	lifier 2
Default volume (all amps)	10 %
Default source (all amps)	
Available sources	4
Restore old config after power failure	No
Gong (0 = Gong off)	2
i o de played at duty can	_
OK Cancel <u>D</u> efault	Info Low Access Help

Parameter	Configuration			
Default volume	0 %; 10 % ; 20 %; 30 %; 40 %; 50 %;			
(all amplifiers)	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 beeing switched on.				
Available sources	1 4(4)			
This parameter defines the channels for normal user access.				
Restore old config after power failure	Yes / N0			
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	0 3 (2)			
This percent the percent of the beginning of the duty coll				
i his parameter defines the gong sent at the beginning of the duty call.				



7.2 Parametersheet "Configuration amplifier 1"

lit Parameters	
General config Config amplifier 1 Cor	nfig amplifier 2
Source of duty call	
Volume of duty call	100 %
Source of zone call	1
Volume of zone call	100 %
Keep volume and source after switching off	Yes
Gong (0 = Gong off) To be played at zone call	1
Max. volume	90 %
OK Cancel Defa	ult Info Low Access Help

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.				



Wilhelm Huber + Söhne GmbH + Co.KG www.whd.de

WHD, Wilhelm Huber + Söhne GmbH + Co. KG Bismarckstr. 19 D-78 652 Deißlingen, Germany

Phone: ++ 49 (0) 74 20 / 8 89-0 Fax: ++ 49 (0) 74 20 / 8 89-51 info@whd.de www.whd.de