

Instruction Manual

MRC A/V 410

Art. No. 06001760

Art. No. 06001764

Version 1.13



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Chapter 1 Safety instructions

Please read the safety instructions carefully before switching on the unit. This is to ensure safe operation of the appliance. Store the instruction manual with the appliance to be able to look up hints. Note the warning-hints and follow the instructions in order to ensure a reliable use and a long life expectancy of your appliance.

- Please make sure the available voltage meets the requirements before plugging in your appliance.
- Don't let children play unsupervised with electric appliances. Children cannot always recognize dangerous hazards.
- Use the appliance only for the applications described in this instruction manual. KOMTECH doesn't take any liability for damages/ data loss as a result of improper handling or improper application.

Operation environment

- In extreme (cold) weather, acclimatization of the appliance before use is necessary. Otherwise condensing moisture inside the housing can cause damages.
- Keep the appliance and all connected appliances from moisture and avoid dust and heat.
- Keep the appliance clear from liquids such as rain or tipped over water-bottles.
- Make sure that no conductive substances or liquids get into the product. Do not expose to liquids. Don't place containers that contain liquids on or near the appliance.
- Pull the cord of the appliance immediately if liquid ran into it and contact an authorized technician.
- Don't switch on the appliance if liquid ran into the appliance and contact an authorized technician.

Not following these instructions can lead to malfunction or damage of the appliance. The guarantee is void in that case.

Ambient temperature

- The recommended ambient temperature for the device is 5° C to 45° C within a relative atmospheric humidity of 10% to 90% (none condensing).
- When turned off, the appliance can be stored in 0° C to 70° C.
- Make sure to store the appliance safely. Avoid high temperatures (for example when stored in direct sunlight).

Connection

If an appliance for the MRC is run with a power-supply plug, you should follow the instructions below:

- In order to interrupt the power supply of your appliance, pull the plug out of the electrical outlet.
- Run the appliance only at grounded electrical outlets. If you are not sure about the power supply at the location, please ask the responsible technician or energy provider.
- Only use with the enclosed power supply.
- We recommend using an overload protection device in order to protect the appliance from damage from voltage apexes or lightning from the electric lines.
- All power cables must be passed through so nobody can step on the cable or crush it with an object. It also must be taken care of that nothing can put strain on the cable. Do not bend lead ins and lead outs of the cable.

Electromagnetic compatibility

- For all additional components the „Policy for electromagnetic compatibility“ (EMC) must apply. Please see to it that only shielded cables are used when linking to external units from this appliance.
- When in use, electronic appliances cause electromagnetic radiation. These rays are harmless, however, other appliances can show signs of interference. Our appliances are tested and optimized for their electromagnetic compatibility.
We can not exclude that difficulties occur in which the appliance itself, as well as also the electronics in the surroundings can be involved. If you should have such a problem, please try to solve it by checking the grounding and changing the insulation and positions of the appliances.

Maintenance

- Always pull the power plug and all connection cables before cleaning.
- Clean the appliance only with a light moistened, lint-free cloth.
- Don't use any solvents, corroding or gaseous detergents.
- The product must be checked in the following cases by a specialist:
 - The main cable or the power-supply were damaged
 - A conductive substance or fluid entered the housing of the product.
 - The product was exposed to rain.
 - The product doesn't seem to work properly or shows a clear alteration of the performance.
 - The product was dropped or the case was damaged.
- If opening the appliance is necessary for maintenance, repair or replacement, the appliance must be disconnected from all voltage sources.
- Working on the opened appliance while under voltage can only be conducted by a high voltage trained and experienced specialist.

- Only fuses of the stated type and nominal amperage are allowed as replacements. The usage of repaired fuse or short circuiting of the fuse holder is forbidden.

Data security

- The assertion of claims for data loss and resulting consequential damage is impossible. Do backup copies on external storage mediums (for example CD-R or floppy disk) after every update of your data.

Environment instructions

- Protect your environment, do not dispose Electronic products in the trash.
- If you would like to dispose the appliance, remove the batteries and accumulators it may contain and send it back to KOMTECH.
- The package is recyclable. Please dispose the package in the right recycle bin.
- Please return the batteries and accumulators to a suitable collecting facility

Chapter 2 General Description

MRC A/V 410 is a multiroom controller which can switch 4 audio stereo and 4 video inputs to up to 10 outputs. The connection between the master and the breakout boxes is done by easy to install CATx cable.

The outputs of the AV signals are done by using the breakout boxes. These modules can be implemented in almost every light switch frame. The gain loss compensation can be regulated on every break out box module.

Every MRC A/V 410 has an integrated RS232 connection for control and setup. An integrated TCP/IP and/or EIB connection can be implemented as an add on. Channel selection or adjusting the 3 band audio equalizer are typical setups which are controlled externally.

The MRC A/V 410 is 19" mountable, 2 HE high and has an integrated power supply.

Shipment MRC A/V 410 Basic (Art. No. 06001764)

- MRC A/V 410 with
 - 1x controller module for RS232 connection
 - 2x Video Input modules
 - 2x Audio input modules
 - 4x A/V output modules
- Power cable, 2m
- Manual with configuration CD

Shipment MRC A/V 410 (Art. No. 06001760)

- MRC A/V 410 with
 - 1x controller module for RS232 and EIB/KNX connection
 - 2x Video input modules
 - 2x Audio input modules
 - 4x A/V output modules
- 4x Breakout Boxes as 8TE module
- Power cable, 2m
- Manual with configuration CD

Chapter 3 Connections

Front



LED powered Logo for
POWER Status

Window for IR command
learning (opt.)

Back



Place for LAN card

Place for IR card

Power 230V / 50Hz

Control module for
- RS232
- EIB (opt.)

Green LED= EIB Contact
Red LED = MRC Active
(blinks at UP/DOWN)

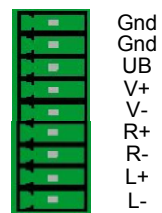
2x Audio Stereo IN

2x Video IN

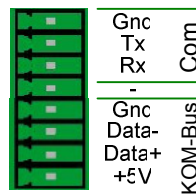
Green LED = Sync
detection

4-10 Output card modules

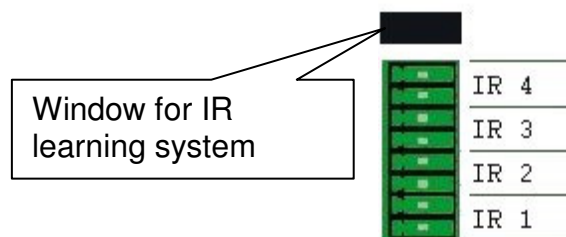
Connections Breakout Box and output module



Connections Controller Card



Connections IR card




Chapter 4 Configuration software „WinMRC“

By using WinMRC, you can configure your MRC A/V 410 depending on the needs of the project.

To start WinMRC insert the CD into you PC drive and start “Setup.exe”. To start the software after the installation click on “WinMRC.exe”.

Page 1 Introduction

The opening page is a welcome page.

WinMRC has a multilingual menu. To change the language, click on the symbol . After rebooting the software the menu language is displayed.

To get to the configuration menu, just click on „Next“.



Page 2 Search for MRC and connect

On page 2, basic settings are set and a connection to the MRC is established.
The connection for configuration can be established by the following systems:

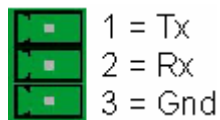
- RS232
 - The MRC and the configuration device must be connected via a RS232 cable.

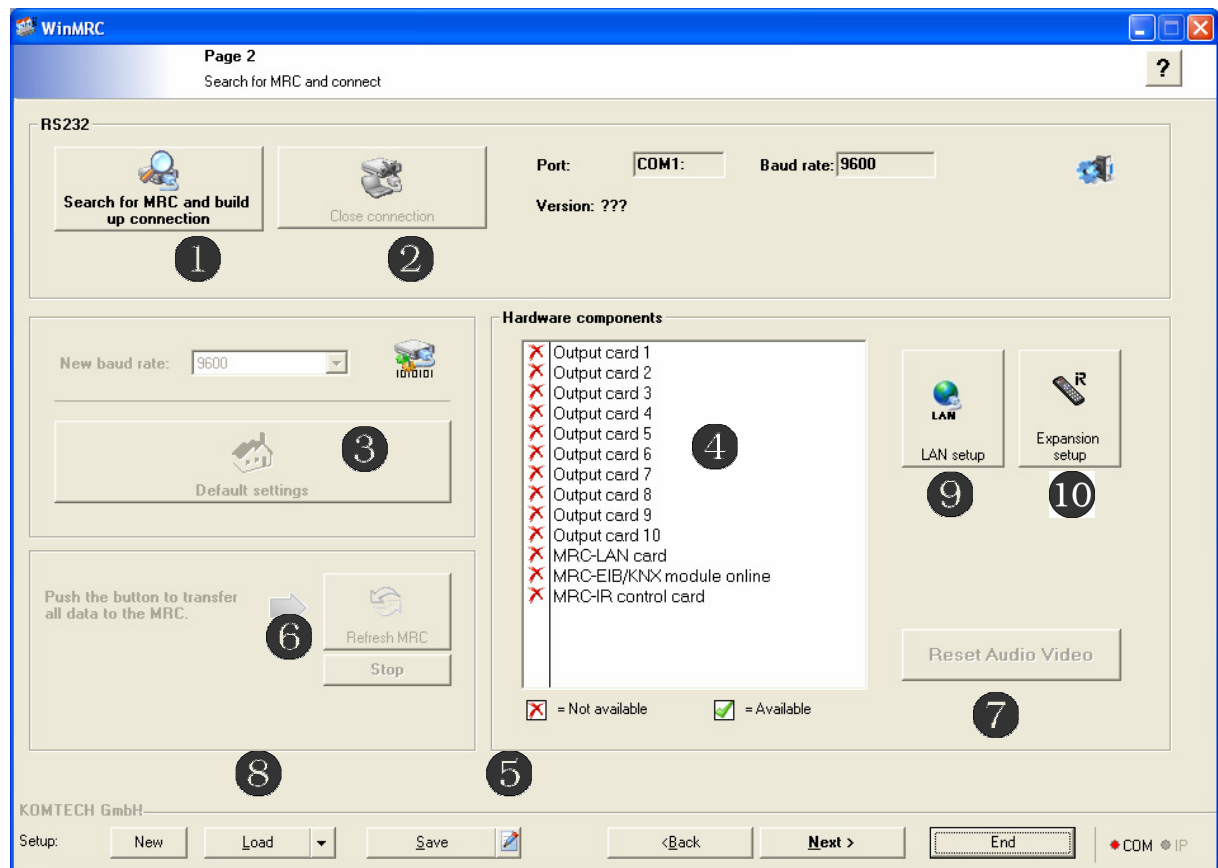
To get to the next menu, just click on „Next“.

Connection via RS232

The MRC and the configuration device must be connected via a RS232 cable.

Pin assignment on the MRC:





1 After pushing the button, WinMRC automatically searches for the right RS232 port with the used baud rate and establishes the connection between the MRC and the pc.

The found connection parameters are displayed next to the button. During the connection progress information of the firmware version is also displayed.

For better recognition the LED before "COM" lits green.





If you can't connect with the MRC, one of the following problems might be appeared:


- Cable isn't connected correctly on RS232 port COM2
- Power supply isn't connected properly
- The crossing of Rx & Tx in the RS232 cable isn't correct (RX/TX 2/3 to 3/2 or RX/TX 3/2 to 2/3)
- Another program on the pc uses the same connection port. Please shut down all not necessary programs and then try to establish the connection again.


2 Closes the RS232 Connection.

3 Loads the factory setting. The factory setting takes about 30 seconds. After finishing the MRC reboots to take over the changes.

4 After a successful connection build up the system looks, which card modules are activated in the system. The activated modules are displayed with a .

 The EIB/KNX module only appears in the list when the MRC is implemented in an active EIB/KNX area. The configuration of the EIB/KNX module in the MRC can be done.

 If the list of the active modules has to be refreshed, close the RS232 connection and rebuild the connection. The list is always refreshed due to actual status and doesn't depend on using elder or new MRC project data.

5 By clicking on  a window is loaded where additional project information can be written down. These information is displayed every time the project is loaded.

6 Sends the setup data to the MRC. Clicking on „STOP“ cancels the transmission.

7 Sets all Audio and Video outputs to standard. All outputs are set to channel 1. Every output is set to 0dB.

8 Settings for the opened project are set.

New: Starts a new PI/O project
Load: Loads an existing PI/O project

9 Load a surface for MRC-LAN controller card module. If there isn't a module connected, the setup isn't used.

10 Opens the configuration menu for the infrared module. If there isn't an IR module in your system typed in data is doing anything.

LAN module setup

A connection to a MRC via LAN can only be made by using a LAN controller module.

The setup for the module can be made via RS232 or LAN.

The screenshot shows a Windows-style application window titled "MRC-LAN". It has two tabs: "LAN Factory MRC-RS232" (selected) and "LAN Config MRC-LAN". The main area is titled "LAN Factory over MRC-RS232". It contains several input fields and buttons:

- Factory-Username: ?
- Factory-Password: ?
- Factory-Password: ?
- Factory-IP Mode: Static IP (dropdown)
- Factory-IP address: ?
- Factory-Subnetmask: ?
- Factory-Gateway: ?
- Factory-Listenport: ?
- Inactiv timeout sec = 0
- Buttons: "MRC-LAN Factory" and "Standard"


To change between the different setup types click on the tab with the system you want to use.

Setup via RS232

The screenshot shows the 'MRC-LAN' configuration window with the 'LAN Factory over MRC-RS232' tab selected. The configuration fields are as follows:

Field	Value
Factory-Username	admin
Factory-Password	admin
Factory-IP address	192.168.112.185
Factory-Subnetmask	255.255.255.0
Factory-Gateway	192.168.1.1
Factory-Listenport	6001
Factory-IP Mode	Static IP
Inactiv timeout sec	0

Buttons: 'MRC-LAN Factory' and 'Standard'.

By pushing the  button, the default settings are loaded in the surface. The default settings are in () in the following description:

Factory-Username = User Name for login (admin)

Factory-Password = Password for login. By activating the checkbox, the password is camouflaged in the display. (admin)

Factory-IP Mode = Choose static IP-address or DHCP (Static IP)

Factory-IP address = IP-address of the MRC while using static IP-address. DHCP mode ignores the IP-address. (192.168.1.185)

Factory-Subnet mask= Subnet mask of the MRC while using static IP-address. DHCP mode ignores the IP-address. (255.255.255.0)

Factory-Gateway = Gateway address of the MRC while using static IP-address. DHCP mode ignores the IP-address. (192.168.1.1)

Factory-Listen port = Listen port for the LAN connection. (6001)


The setup is transferred after pushing the “MRC-LAN Factory” button. The setup is activated after a reboot of the system.

Setup via TCP/IP


If the IP address of the MRC is known, one can directly type them in

LAN IP address

If the IP address isn't known, one can search for the MRC in an IP address area

by clicking on .

To search for the connected MRC device type in the TCP/IP address area or the MAC address of the MRC device you want to look after.

- 1 By pushing  the DHCP parts of the IP-address are displayed.
- 2 Starts a search after the typed in MRC IP module MAC address.
- 3 Starts a search for MRC devices and lists all MRC in the typed in MRC IP address area.

Found MRC are displayed in the list box. The MRC is chosen by double clicking on the chosen device.

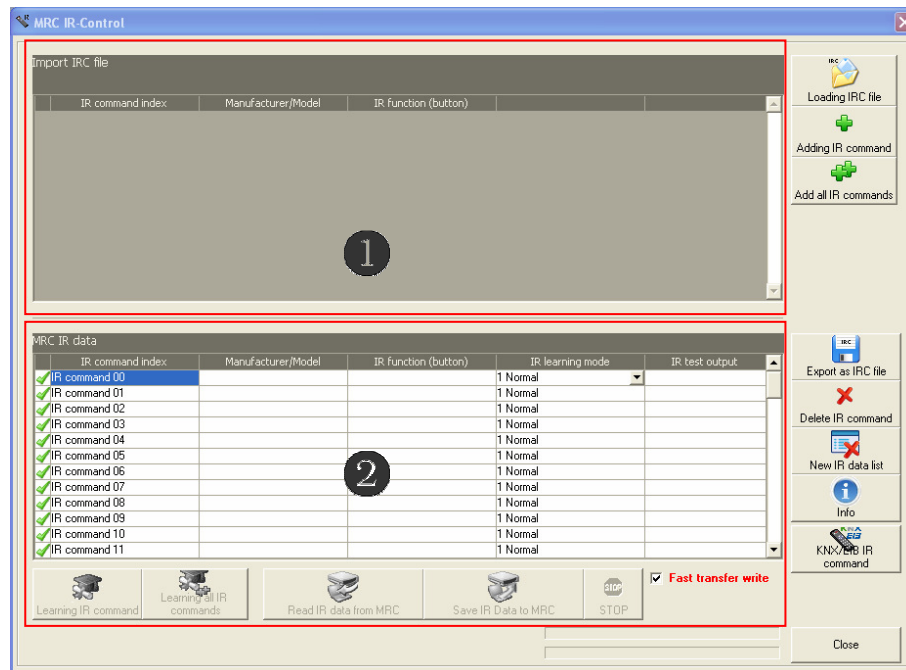


The IP address search can take several minutes.

After successful connection via LAN, the IP address of the MRC, the serial number, the MAC address and the firmware version of the LAN module is displayed. The setup can be changed in the following attributes:

Username	= User Name for login (admin)
Password	= Password for login. By activating the checkbox, the password is camouflaged in the display. (admin)
IP Mode	= Choose static IP-address or DHCP (Static IP)
IP address	= IP-address of the MRC while using static IP-address. DHCP mode ignores the IP-address.
Subnet mask	= Subnet mask of the MRC while using static IP-address. DHCP mode ignores the IP-address. (255.255.255.0)
Gateway	= Gateway address of the MRC while using static IP-address. DHCP mode ignores the IP-address.
Listen port	= Listen port for the LAN connection. (6001)
Inactiv timeout sec	= Counter until the connection is closed due to no traffic. If there is a 0 the connection isn't closed. (0)

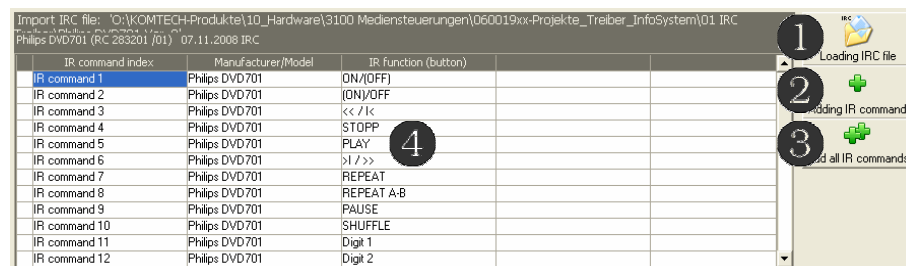
IR module setup



To implement IR commands you can load an existing IR-driver (window 1) and implement the wished commands in your MRC project (window 2).

Window IRC-file import

The IRC-file import window shows all command of the infrared file loaded in the display. The file can be a former infrared driver from an old MRC project or a file of the media room control system CF-MEDIA.



1 Loading IRC file opens a window where you can search on your PC for the infrared driver you want to implement. After choosing the IRC file the commands are displayed in the view 4.

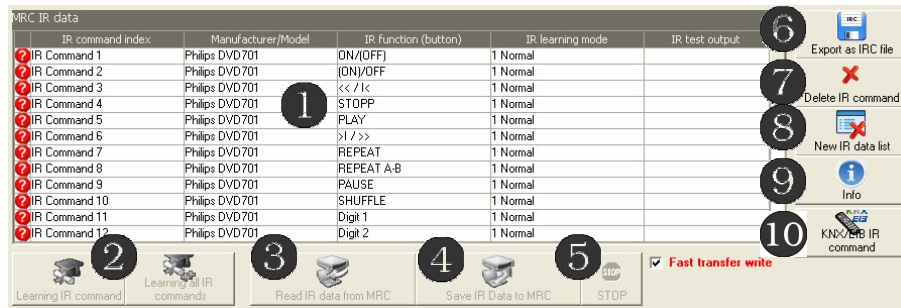
2 Adding IR command adds the chosen command to the chosen command line in the „MRC IR data“ window.

3 Add all IR commands Adds all driver commands in the „MRC IR data“ window.

- 4 Displays all commands of the chosen IR driver.

Window MRC IR command file

The MRC IR command file window shows all commands which are implemented in the current MRC project.



To lower the transmission time use ☒ **Fast transfer write**. If this checkbox is activated, the system only transmits changed data to the MRC and not the whole driver package.

- 1 Shows the IR commands which are implemented in the MRC project. There is additional information about
- which the name of the IR device is
 - which function the IR command has
 - which learning mode is used (normal is standard)

The symbols are showing the following states:

= IR command is successfully transmitted to the MRC

= IR command is implemented in the MRC project data, but not transmitted to the MRC.

- 2 and are both starting the IR learning system. To learn an IR code please

- choose the command line
- type in the Manufacturer/Model
- type in the IR function
- choose the IR learning mode (normal can be used for most IR RC5/6 codes.

More info please look at 9)







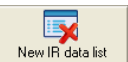


Starts the learning system to learn one command.

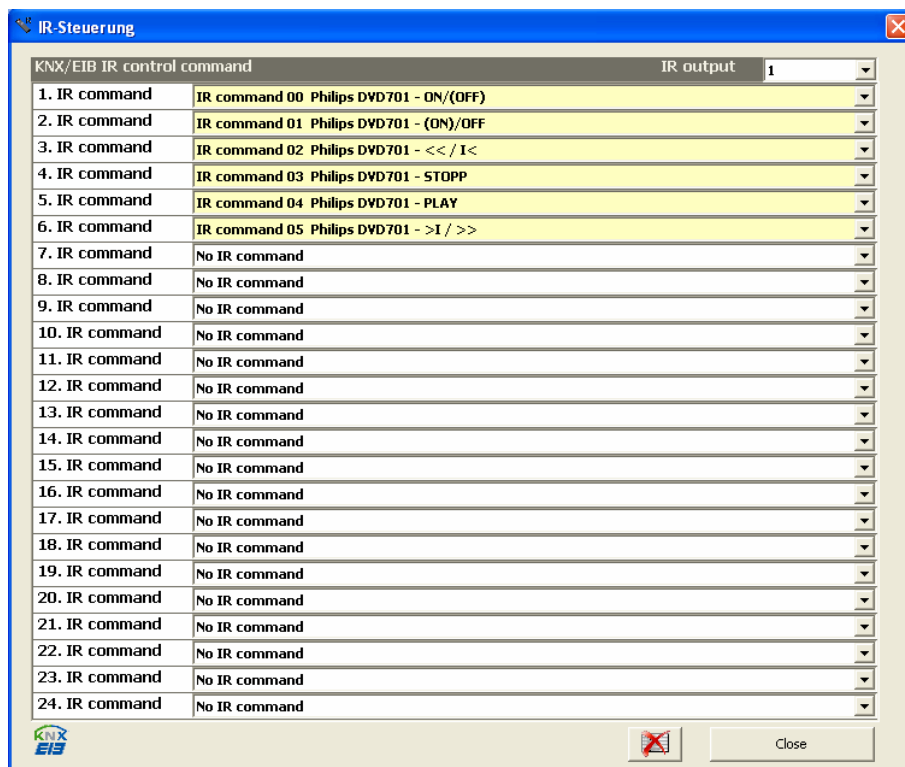


Starts the learning system to learn multiple commands.



Reads the IR data from the MRC.

- 4  Saves all files of the “MRC IR data” window in the connected MRC.
- 5  Stops current activities like data transmission.
- 6  Saves the MRC IR file on the local PC disc. The file ending is *.irc.
- 7  Deletes the chosen command line in the “MRC IR data” window.
- 8  Deletes all commands in the „MRC IR data“ window and establishes a plain list.
- 9  Shows more information about the different learning modes.
- 10  Opens a window where you can define, which IR commands of the IR driver list are connected to which of the 4 IR ports. Every IR port can have 24 commands implemented.




A command can be implemented in more than one IR command line.



Clears the command list of the specific IR port.



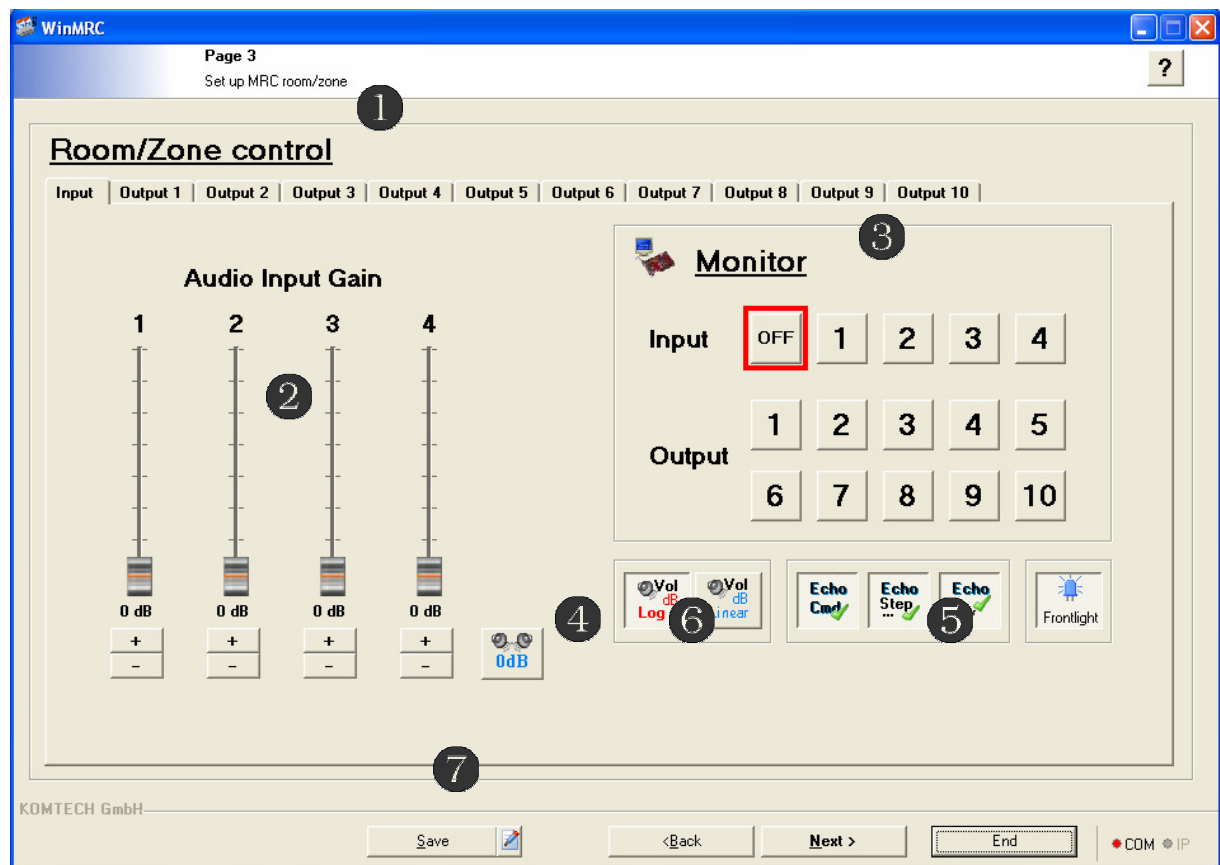
If you are connected with your MRC you can directly check the command on the specific IR port by clicking on .

Page 3 Set up MRC room/zone

On page 3 the setup for all in- and outputs is configured. The configuration is directly sent to the connected MRC. The setup is directly transmitted to the MRC.

Every output has its own tab window. All inputs are put on one tab window. The first tab shows the setup for the inputs.

Configuration Inputs



1 By clicking on the riders you can choose between the configuration of the inputs or of each output. The first rider shows the configuration of the inputs.

2 The gain of every Audio input channel can be set in 1dB steps between 0 and +15dB. You can use the leveller or the +/- button for setup.

3 If there is a monitor card in your MRC, you can set the video signal of an input or output channel directly on the video output of the monitoring card.

4 After pushing the button, all levellers are set to 0dB.

5 The following echo types can be switched off.



Command echoes, when sending a command via RS232 or LAN are switched off.



Command echoes, which are created when +/- command are send, are switched off.



„OK“ and „Error“ echoes are switched off.




Front LEDs of the logo are switched off.



Please be careful with switching off echo commands, because you may loose important feedback of your MRC A/V device.
When echoes are switched off documentation of the status is highly recommended.

6

By using the buttons you can choose between logarithmic  and linear




volume control. Depending on the connected devices either one or the other volume control can be useful.

7

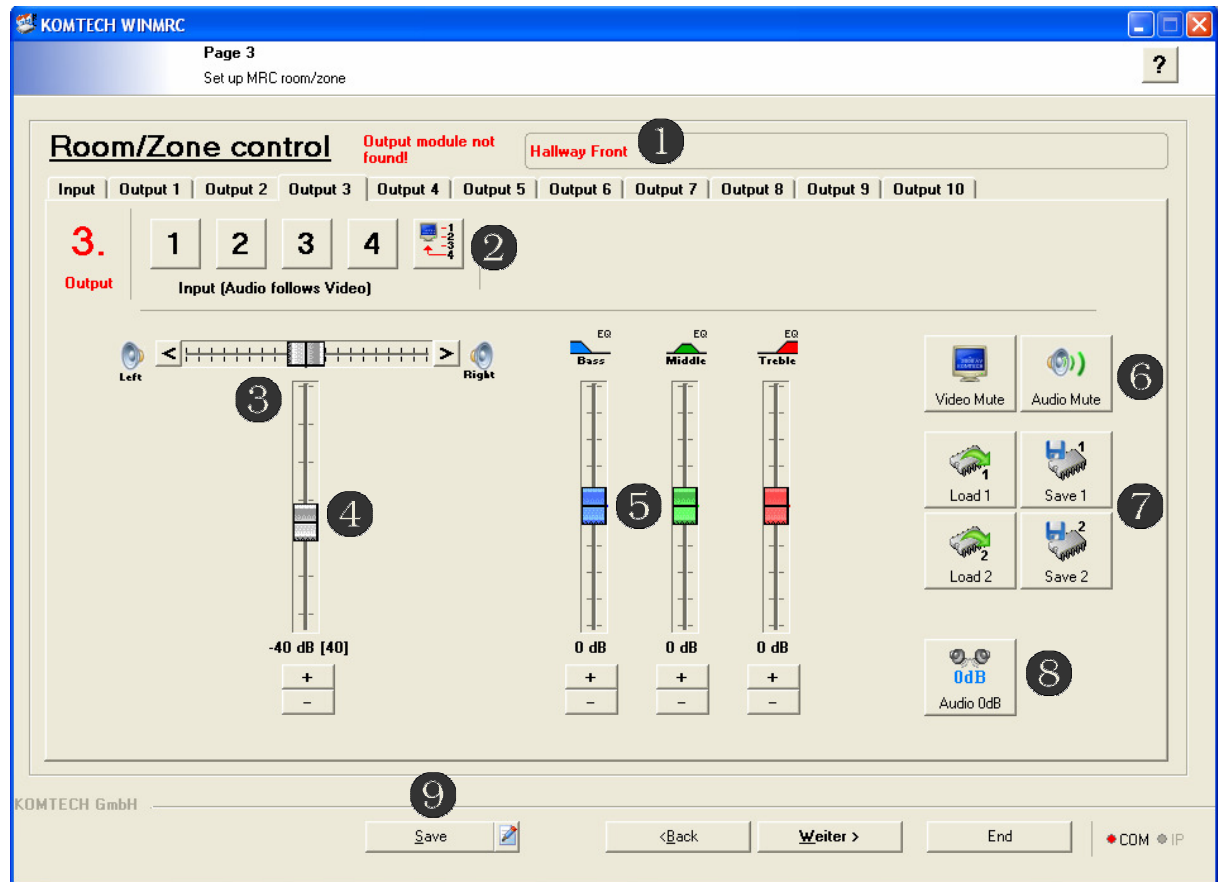
Saves the setup for further use.



By clicking on  a window is loaded where additional project information can be written down. This information is displayed every time the project is loaded.

Configuration Outputs

Every output has its own rider, where you can individually adjust the setup for every output.




1 By clicking on the riders you can choose between the configuration of the inputs or of each output. Every output has its own rider.



You can give every output a specific name for better project documentation.

2 A direct input selection is realized by pushing the specific button.

There is a auto mode for input selection. By clicking on , the auto mode is activated and the output shows the video and audio signal of the highest active input.

Input 1 has the highest, input 4 the lowest value.



If you are switching the inputs via WinMRC the audio signal always follows the video signal.

3 The balance between left and right is set up by the horizontal leveller. You can also use the < and > button for configuration.

4 The loudness of the output is set up. You can use the leveller or the +/- buttons for configuration. There are 96 steps from 0-95 at linear classification with logarithmic audio output. (0db @ value 80, +15dB @ value 95)

5 The fine tuning for bass, middle and treble can be arranged individually. Each tuning is done by using the specific leveller or +/- buttons. The value for configuration is between -15dB to +15dB. The steps are 1dB steps.

6 The audio and the video signal can be muted separately on demand.

7 There are two preset slots, User1 and User2, where you can save and load your setup for further use.



The actual setup of the output is saved in one of the two presets.




By pushing one button the saved preset is activated and the values of the preset are loaded in the actual output.



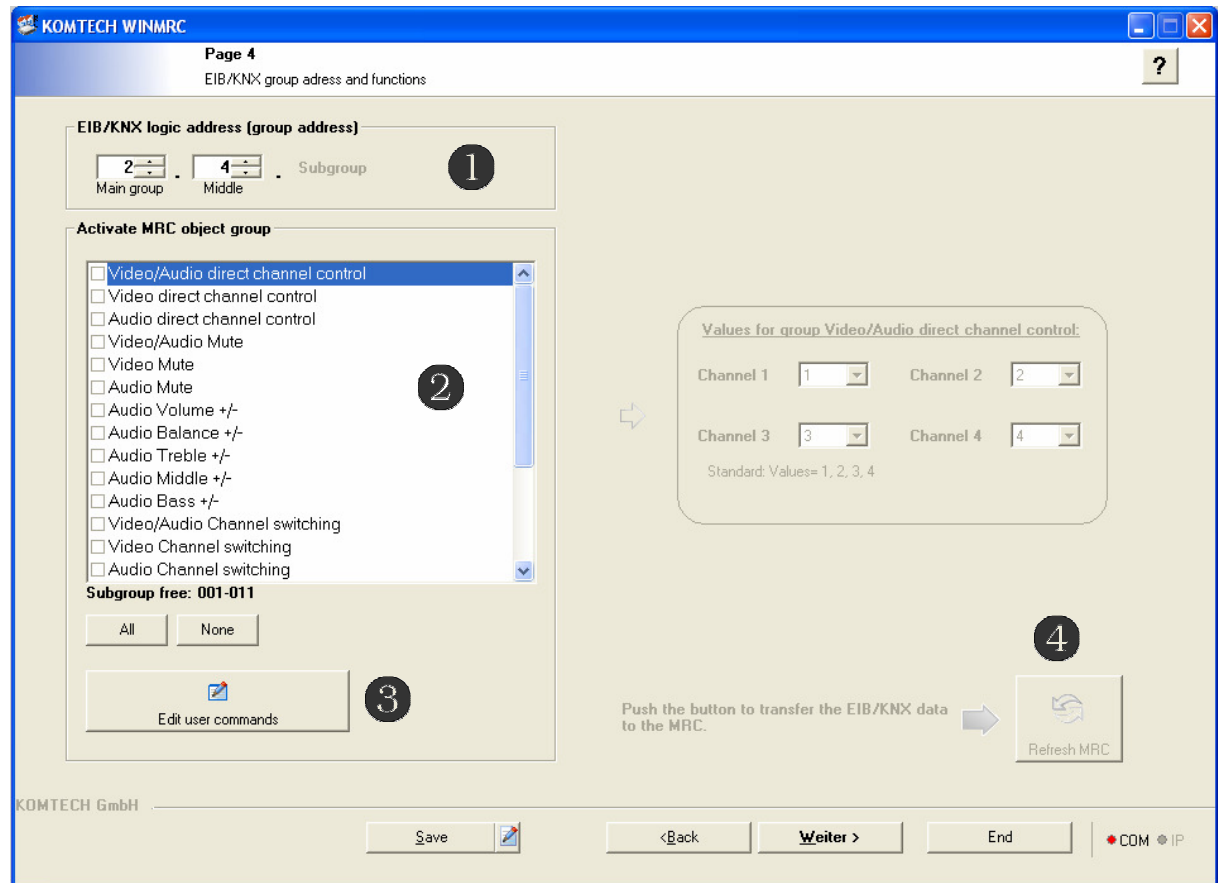
8 Sets all functions described in **3**, **4**, and **5** to 0dB.

9 Saves the setup for further use.


By clicking on  a window is loaded where additional project information can be written down. This information is displayed every time the project is loaded.

Page 4 EIB/KNX group address and functions

On page 4 basic settings for controlling a MRC A/V 410 via EIB/KNX is set. All functions of the MRC in an EIB/KNX area are set within a main and middle group. The address part of the subgroup with the value activates a specific command.



1 Set up the logic EIB/KNX main and middle group address. This address part is used for all actions which can be activated in **2**, so less address space is needed to control a MRC device.

By clicking on  the setup is transferred to the connected MRC.

2 The needed functions which are controlled via EIB/KNX are activated in the window. By activating a command type by clicking on the checkbox the following actions are taken automatically:

- ☒ **Usercommand**
- **Subgroup assign: 217-226** the subgroup address area is activated (217-226 in this case)

- On the right side the standard values of the command addresses are shown.

Example:

To activate user command 10 via EIB/KNX you have to transmit the following sequence via EIB/KNX:

- Address 2/4/219 with the value 2



Every object group with their subgroup address is displayed in chapter 5.2.



Some object groups can get other values.

The following object groups can be directly changed in this page:

- Audio Volume
- Audio Balance
- Audio Treble
- Audio Middle
- Audio Bass

To change values for other groups, please look at chapter „Page 5“ for more information.

There two buttons implemented to ease the configuration:


<input type="button" value="All"/>	Sets all functions to status „active“
<input type="button" value="None"/>	Sets all functions to status „nonactive“

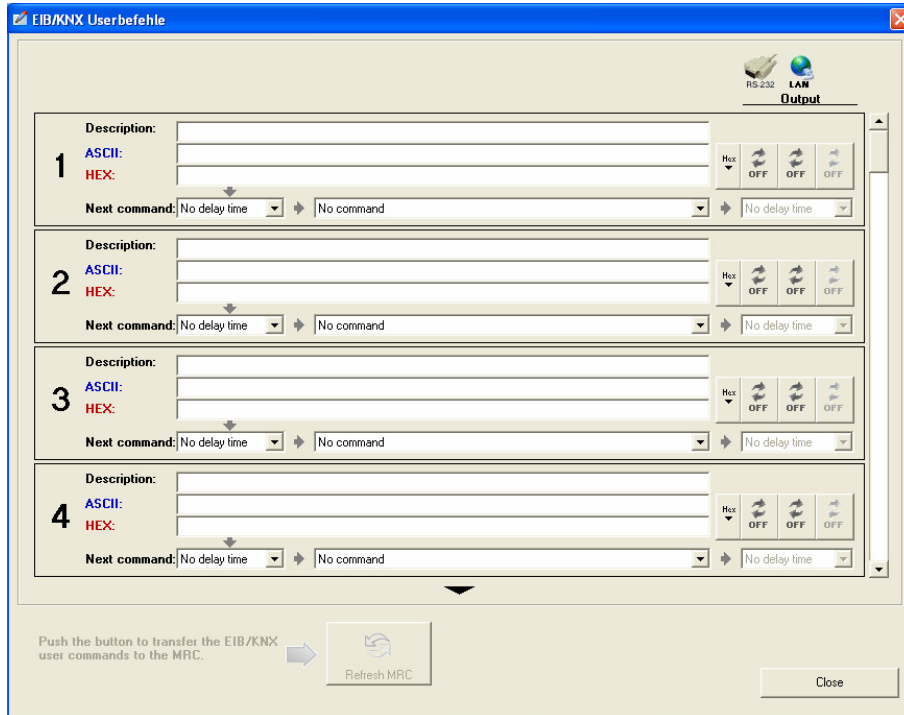
3

User commands

Every MRC has space for 40 user commands for example to control a beamer with a RS232 connection via EIB/KNX.


If a LAN control module is implemented two other different devices can be controlled via EIB/KNX (1x RS232 and 1x LAN).


By pushing  a configuration window is loaded.



The screenshot shows the 'EIB/KNX Userbefehle' window. It has a title bar with a blue background and a close button. Below the title bar, there are icons for RS-232 and LAN, and a section labeled 'Output'. The main area contains four numbered sections (1, 2, 3, 4). Each section has a 'Description:' label, followed by 'ASCII:' and 'HEX:' labels, and a text input field. To the right of each input field are three buttons: 'Hex', 'OFF', and 'OFF'. Below each input field is a 'Next command:' label, followed by a dropdown menu (currently showing 'No delay time') and a 'No command' label. At the bottom of the window, there is a 'Refresh MRC' button and a 'Close' button. A small text box at the bottom left says 'Push the button to transfer the EIB/KNX user commands to the MRC.' with an arrow pointing to the 'Refresh MRC' button.


The commands are typed in HEX or ASCII code. The following command can be delayed up to 120s.

By pushing  a help window pops up. In this window all HEX characters are shown in ASCII. After choosing a character and accepting it with „OK“ the chosen character is implemented in the command string.


By pushing  buttons, one can choose whether the command is send to the RS232 or/and to the LAN port.
If there isn't a LAN control module connected the commands aren't sent to the LAN port.



At the moment only RS232 devices with 9600/8N/1 can be controlled.

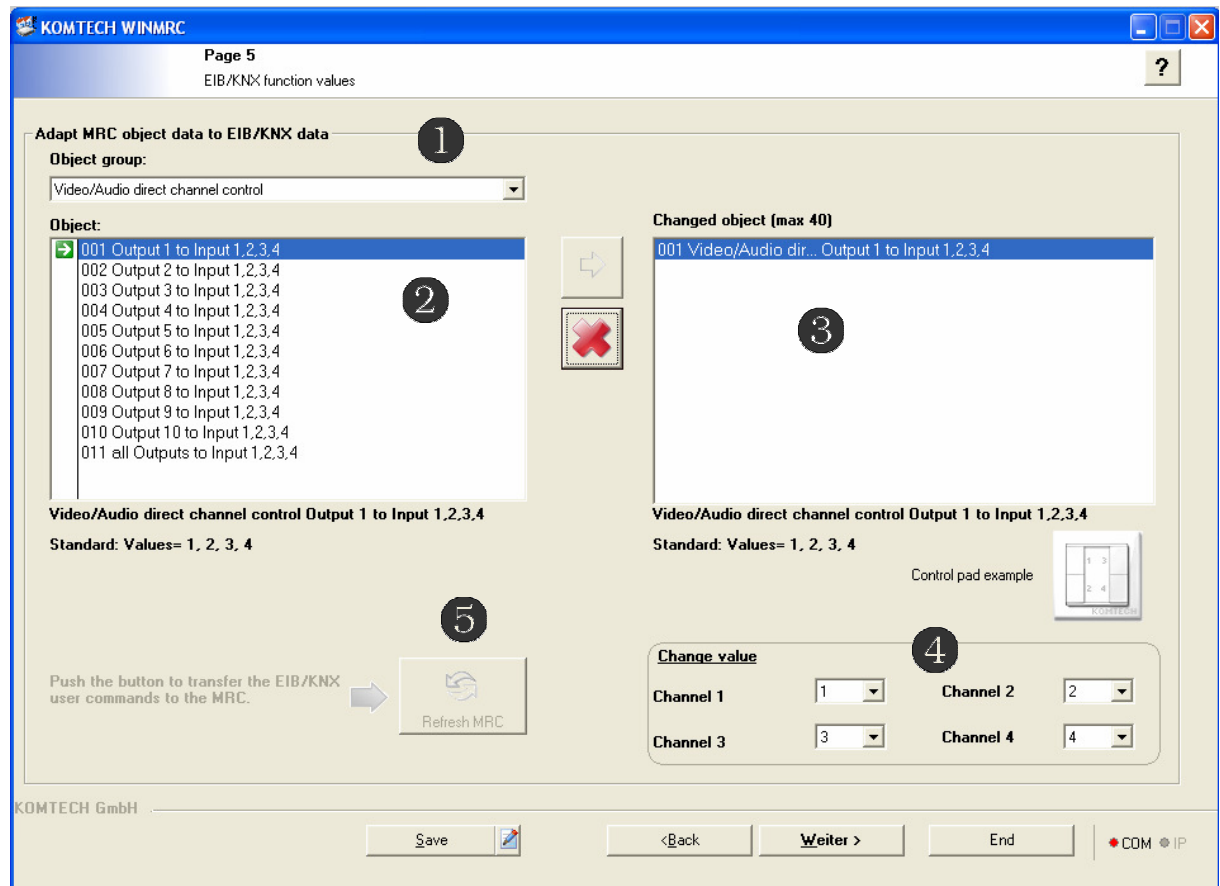
By pushing  the setup is sent to the MRC for configuration.

4

By pushing  in the main menu, the setup in on page 4 is transmitted to the MRC.

Page 5 EIB/KNX function values

On page 5 further setup is done for EIB/KNX connection. The values of up to 40 functions can be changed.



1 In the drop down menu are all functions displayed which can be controlled via EIB/KNX.

The following functions can be changed in the value of the command:

- Audio and/or Video direct channel switching
- Audio and/or Video Mute
- Audio and/or Video direct channel control
- Audio control (Volume, Balance, 3-Band Equalizer)
- Preset

Not the whole group is changed. Only the wished function number is changed in values. To change a value one has to take the following steps:

- Choose the wished Object group (Field ②)

Object group:
Video/Audio direct channel control

- Choose the wished function line

Object:
→ 001 Output 1 to Input 1,2,3,4

- Accept by clicking on



- By clicking on the function line in box ③ the values of the function line appear. Now the values of the function can be changed by clicking on the drop down menus in ④.

Changed object [max 40]

001 Video/Audio dir... Output 1 to Input 1,2,3,4


Video/Audio direct channel control Output 1 to Input 1,2,3,4

Standard: Values= 1, 2, 3, 4

Control pad example

Change value

Channel 1	1	Channel 2	2
Channel 3	251	Channel 4	4

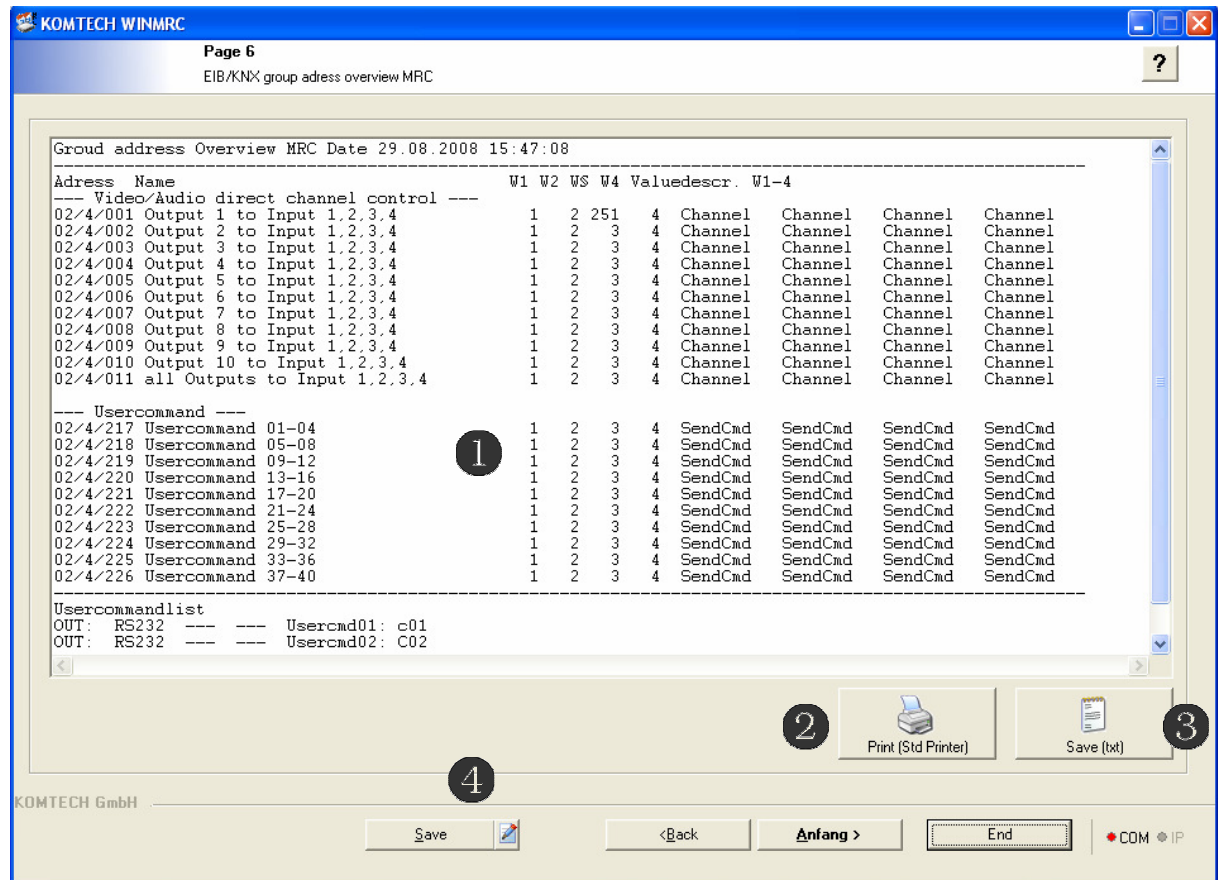
- By clicking on  the changed function values are transmitted to the MRC. (⑤).



Up to 40 functions can be changed.

Page 6 EIB/KNX group address overview MRC

Page 6 shows a printing screen for project documentation. Also the user commands are displayed in the sheet.




1 The window shows all activated EIB/KNX function addresses and the typed in user commands.
All function addresses are shown with its function values.
All user commands are shown in ASCII. The output port is also displayed in the list.

2 Prints the list in the standard printer of the connected pc.

3 Saves the print data in a *.txt file.

4 Saves the setup for further use.

By clicking on  a window is loaded where additional project information can be written down. This information is displayed every time the project is loaded.

Chapter 5 Protocol

5.1 RS232

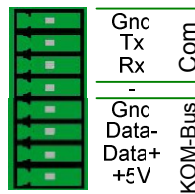
The following port parameters are factory settings:

Default RS232 port configuration

Baud rate: 9600 Baud
Data bits: 8
Parity: None
Stop bits: 1

RS 232 pinning on the 8pol. Phoenix connector on the MRC control module

Pin 1: Rx Receive Data
Pin 2: Tx Transmit Data
Pin 3: SG Signal Ground



Please look carefully on upper and lower case.

[illegible]

			OFF 0= Echo to all ports ON 1= Echo to all ports OFF Standard = PXM11110
Request Status Echo	PXM?? (CR)	PXMxyzab (CR)(LF)	X Y Z A B 0= Volume linear 1= Volume Logarithmic 0= Cmd Echo ON 1= Cmd Echo OFF 0= Step Echo ON 1= Step Echo OFF 0= OK/Error Echo ON 1= OK/Error Echo OFF 0= Echo to all ports ON 1= Echo to all ports OFF Standard = PXM11110
		ER (CR)(LF)	Error / unknown command

Category Mode	Commands for control			
	Command	Response		Info
Channel Control				
SET Audio & Video (Audio follow video)	CB xyy (CR)	CV xyy (CR)(LF) CA xyy (CR)(LF)	X Y	No. Output (01-11) 11= All outputs switch to input y No. Input (01-04)
SET Audio	CA xyy (CR)	CA xyy (CR)(LF)	X Y	No. Output (01-11) 11= All outputs switch to input y No. Input (01-04)
SET Video	CV xyy (CR)	CV xyy (CR)(LF)	X Y	No. Output (01-11) 11= All outputs switch to input y No. Input (01-04)
SET +/- Audio & Video (Audio follow Video)	CB xxCz (CR)	CV xyy (CR)(LF) CA xyy (CR)(LF)	X Y Z	No. Output (01-11) 11= All outputs switch to input y No. Input (01-04) Z=+ or – (Switch to higher or lower channel)
SET +/- Audio	CA xxCz (CR)	CA xyy (CR)(LF)	X Y Z	No. Output (01-11) 11= All outputs switch to input y No. Input (01-04) Z=+ or – (Switch to higher or lower channel)
SET +/- Video	CV xxCz (CR)	CV xyy (CR)(LF)	X Y Z	No. Output (01-11) 11= All outputs switch to input y No. Input (01-04) Z=+ or – (Switch to higher or lower channel)
MUTE /DEMUTE Audio & Video (Audio follow Video)	CB xxzz (CR)	CV xxzz (CR)(LF) CA xxzz (CR)(LF)	X Y Z	No. Output (01-11) 11= All outputs switch to input y No. Input (01-04) MU = Mute DE = Demute

MUTE /DEMUTE Audio	CAxxzz(CR)	CAxxzz (CR)(LF)	X Y Z	No. Output (01-11) 11= All outputs switch to input y No. Input (01-04) MU = Mute DE = Demute
MUTE /DEMUTE Video	CVxxzz(CR)	CVxxzz (CR)(LF)	X Y Z	No. Output (01-11) 11= All outputs switch to input y No. Input (01-04) MU = Mute DE = Demute
Video Priority	CBxxzz(CR)	OK (CR)(LF)	X Z	No. Output (01-11) 11=All Outputs ON = Video Priority switching ON OF = Video Priority switching OFF
Channel Monitor card	CMxx(CR)	OK (CR)(LF)	X	00 = OFF (manual selection) 01-10 = Outputs 1-10 11-14 = Inputs 1-4 (always Audio follow Video)
Audio Setup / Control				
SET Audio IN Gain	PG0xyy(CR)	PGxxyy (CR)(LF)	X Y	No. Input (1-4) Value (00-15) 00= 0dB 15=+15dB or SS = STOP SD = Down SU = UP
SET Audio OUT Loudness	PNxxyy(CR)	PNxxzz (CR)(LF)	X Y Z	No. Output (01-10) Value (00-15) 00= 0dB 15=+15dB or SS = STOP SD = Down SU = UP Value (00-15)
SET Audio OUT Volume	PVxxyy(CR)	PVxxzz (CR)(LF)	X Y	No. Output (01-10) Value (00-95) 00= >-80dB 01= -79dB 80= 00dB 95=+15dB or SS = STOP SD = Down

			Z	SU = UP Value (00-95)
SET Audio OUT Treble	PT xyy (CR)	PT xxzz (CR)(LF)	X Y	No. Output (01-10) Value (00-30) 00=- 15dB 15= 00dB 30=+15dB or SS = STOP SD = Down SU = UP
			Z	Value (00-30)
SET Audio OUT Middle	PM xyy (CR)	PM xxzz (CR)(LF)	X Y	No. Output (01-10) Value (00-30) 00=- 15dB 15= 00dB 30=+15dB or SS = STOP SD = Down SU = UP
			Z	Value (00-30)
SET Audio OUT Bass	PB xyy (CR)	PB xxzz (CR)(LF)	X Y	No. Output (01-10) Value (00-30) 00=- 15dB 15= 00dB 30=+15dB or SS = STOP SD = Down SU = UP
			Z	Value (00-30)
SET Audio OUT Left Speaker	PL xyy (CR)	PL xxzz (CR)(LF)	X Y	No. Output (01-10) Value (00-95) 00= >-80dB 01=- 79dB 80= 00dB 95=+15dB or SS = STOP SD = Down SU = UP
			Z	Value (00-80)
Load / Save Channel Preset	PP xyy (CR)	OK (CR)(LF)	X Y	No. Output (01-10) 01= Load Preset 1 02= Load Preset 2 11= Save Preset 1 12= Save Preset 2

Category Mode	Commands for monitoring (A/V)			
	Command		Response	Info
Channel selection				
Status Audio & Video (Audio follow Video)	CBxx??(CR)	CVxxyy (CR)(LF) CAxxyy (CR)(LF)	X	No. Output (01-11) 11=All outputs
			Y	No. Input (01-04)
SET Audio	CAxx?? (CR)	CAxxyy (CR)(LF)	X	No. Output (01-11) 11=All outputs
			Y	No. Input (01-04)
SET Video	CVxx?? (CR)	CVxxyy (CR)(LF)	X	No. Output (01-11) 11=All outputs
			Y	No. Input (01-04)
MUTE Audio & Video (Audio follow Video)	CBxxIM(CR)	CVxxyy (CR)(LF) CAxxyy (CR)(LF)	X	No. Output (01-11) 11=All outputs
			Y	MU = Mute DE = Demute
MUTE Audio	CAxxIM (CR)	CAxxyy (CR)(LF)	X	No. Output (01-11) 11=All outputs
			Y	MU = Mute DE = Demute
MUTE Video	CVxxIM (CR)	CVxxyy (CR)(LF)	X	No. Output (01-11) 11=All outputs
			Y	MU = Mute DE = Demute
Video Priority	CBxxIP(CR)	CBxxzz (CR)(LF)	X	No. Output (01-11) 11=All outputs
			Z	ON = Video Priority switching ON OF = Video Priority switching OFF
Monitor module	CM?? (CR)	CM??xx (CR)(LF)	X	00 = OFF 01-10 = Outputs 1-10 (Audio follow video) 11-14 = Inputs 1-4

Audio setup				
Audio Input Gain	PGxx?? (CR)	PGxxyy (CR)(LF)	X Y	No. Input (01-04) Value (00-15) 00= 00dB 15=+15dB
Audio Output Loudness	PNxx?? (CR)	PNxxzz (CR)(LF)	X Z	No. Output (01-10) Value (00-15)
Audio Output Volume	PVxx?? (CR)	PVxxzz (CR)(LF)	X Z	No. Output (01-10) Value (00-95)
Audio Output Treble	PTxx?? (CR)	PTxxzz (CR)(LF)	X Z	No. Output (01-10) Value (00-30)
Audio Output Middle	PMxx?? (CR)	PMxxzz (CR)(LF)	X Z	No. Output (01-10) Value (00-30)
Audio Output Bass	PBxx?? (CR)	PBxxzz (CR)(LF)	X Z	No. Output (01-10) Value (00-30)
Audio Balance L/R	PLxx?? (CR)	PLxxzz (CR)(LF)	X Z	No. Output (01-10) Value (00-80) 40= L/R 0dB

5.2 EIB

The EIB/KNX setup is made on WinMRC page 4. The following list shows all functions with its subgroup addresses which can be controlled via EIB/KNX.

Address	Function	Standard values
-- Video/Audio direct channel control --		
1 - 10	Output 1 – 10 to Input 1,2,3,4	Values= 1, 2, 3, 4
11	all Outputs to Input 1,2,3,4	Values= 1, 2, 3, 4
--- Video direct channel control ---		
12 - 21	Output 1 – 10 to Input 1,2,3,4	Values= 1, 2, 3, 4
22	all Outputs to Input 1,2,3,4	Values= 1, 2, 3, 4
--- Audio direct channel control ---		
23 - 32	Output 1 – 10 to Input 1,2,3,4	Values= 1, 2, 3, 4
33	all Outputs to Input 1,2,3,4	Values= 1, 2, 3, 4
--- Video/Audio Mute ---		
34 - 43	Output 1 - 10	1=Mute 0=Demute
44	all Outputs Mute	1=Mute 0=Demute
--- Video Mute ---		
45 - 54	Output 1 - 10	1=Mute 0=Demute
55	all Outputs Mute	1=Mute 0=Demute
--- Audio Mute ---		
56 - 65	Output 1 - 10	1=Mute 0=Demute
66	all Outputs Mute	1=Mute 0=Demute
--- Audio Volume +/- ---		
67 - 76	Output 1 - 10 up/down/Stop	0=STOP 1=DN 9=UP
77	all outputs up/down/stop	0=STOP 1=DN 9=UP
--- Audio Balance +/- ---		
78 - 87	Output 1 - 10 up/down/Stop	0=STOP 1=DN 9=UP
88	all outputs up/down/stop	0=STOP 1=DN 9=UP
--- Audio Treble +/- ---		
89 - 98	Output 1 - 10 up/down/Stop	0=STOP 1=DN 9=UP
99	all outputs up/down/stop	0=STOP 1=DN 9=UP
--- Audio Middle +/- ---		
100 - 109	Output 1 - 10 up/down/Stop	0=STOP 1=DN 9=UP
110	all outputs up/down/stop	0=STOP 1=DN 9=UP
--- Audio Bass +/- ---		
111 - 120	Output 1 - 10 up/down/Stop	0=STOP 1=DN 9=UP
121	all outputs up/down/stop	0=STOP 1=DN 9=UP

--- Video/Audio channel switching ---

122 - 130	Output 1 – 10 up/down	1=DN 9=UP
131	Output 10 up/down	1=DN 9=UP

--- Video channel switching ---

132 – 140	Output 1 – 10 up/down	1=DN 9=UP
141	Output 10 up/down	1=DN 9=UP

--- Audio channel switching ---

142 - 150	Output 1 – 10 up/down	1=DN 9=UP
151	Output 10 up/down	1=DN 9=UP

--- Audio Volume 0-100% ---

152 - 161	Output 1 - 10	Value area= 0-100
162	All outputs	Value area= 0-100

--- Audio Balance Left/Right 0-100 ---

163 - 172	Output 1 - 10	Value area= 0-100
173	All outputs	Value area= 0-100

--- Audio Treble 0-100 ---

174 - 183	Output 1 - 10	Value area= 0-100
184	All outputs	Value area= 0-100

--- Audio Middle 0-100 ---

185 - 194	Output 1 - 10	Value area= 0-100
195	All outputs	Value area= 0-100

--- Audio Bass 0-100 ---

196 - 205	Output 1 - 10	Value area= 0-100
206	All outputs	Value area= 0-100

--- Output channel Preset 1 + 2 ---

207 - 216	Output 1 – 10	1= Set Preset 1 2= Set Preset 2
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--- Send user command ---

217 - 226	4 commands per subgroup	Value area= 1-4
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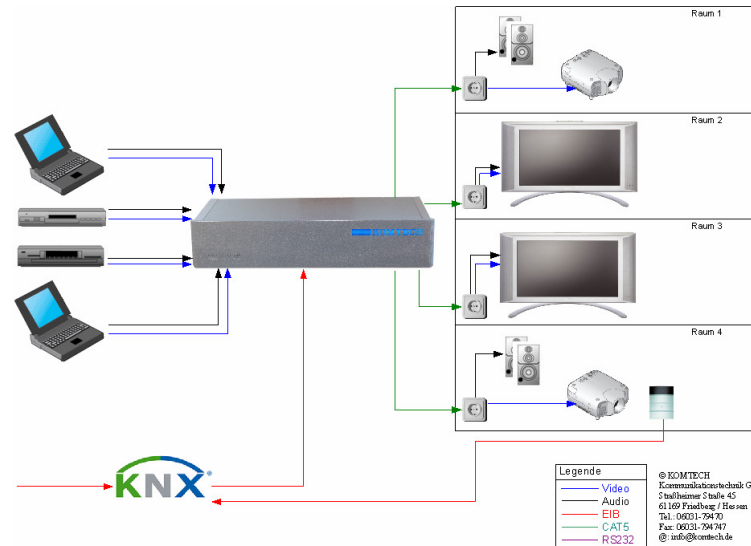
Chapter 6 Trouble Shooting

Problem	Solution
MRC Device Error	
The KOMTECH logo on front isn't shining or the MRC has no power.	<ul style="list-style-type: none"> • Power supply connected properly? • Power cable connected properly? • Right voltage to the power supply (230V)?
Operating Error	
Control via RS232 doesn't work	<ul style="list-style-type: none"> • Control device and MRC turned on? • Cable correct installed between control device and switcher? • Correct port chosen on the control device? • Correct assignment of the used cable? (RS232/422 or pure RS232 cable and Rx/TX crossed or not crossed.) • Correct baud rate implemented?
Control via EIB doesn't work	<ul style="list-style-type: none"> • Control device and MRC turned on? • Cable correct installed between control device and switcher? • Correct address with correct value implemented in EIB control device?
Control via LAN doesn't work	<ul style="list-style-type: none"> • Control device and MRC turned on? • Cable correct installed between control device and switcher? • Correct IP-address? • Cable correct pinning?
Switching / Signal Error	
No Picture	<ul style="list-style-type: none"> • Correct Input chosen? • Correct Output chosen? • Correct channel chosen? • Cables connected properly? • Source, MRC and monitor ON? • Connected cables OK? • Correct (switching) command send?
No Audio	<ul style="list-style-type: none"> • MUTE function ON? • Correct Input chosen? • Correct Output chosen? • Connected cables OK? • Cables connected properly? • Correct (switching) command send? • Source, MRC and monitor ON?

Chapter 7 Examples of Use

Example 1:

Solution with EIB control via integrated EIB interface

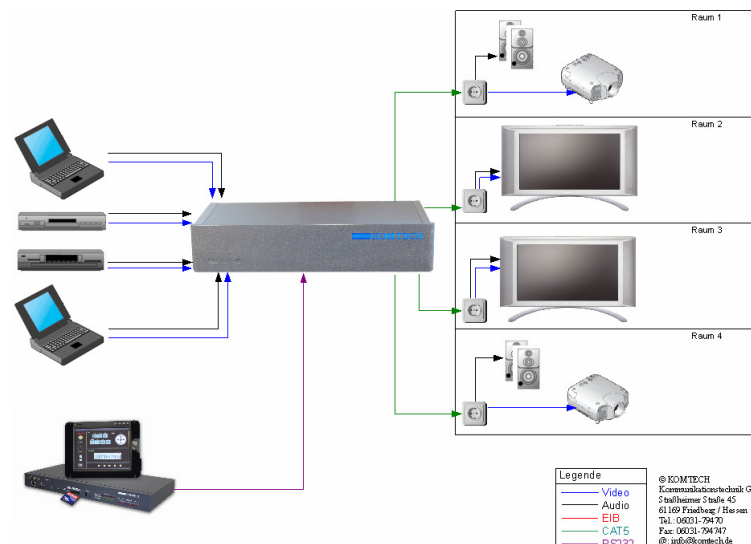


There are four audio and video sources connected to the MRC. Their signals are distributed to four independent rooms via CATx cable.

The control of the MRC is realized directly via EIB device like EIB key pads or touch panels. The control devices directly communicate with the MRC.

Example 2:

Solution with control via RS232

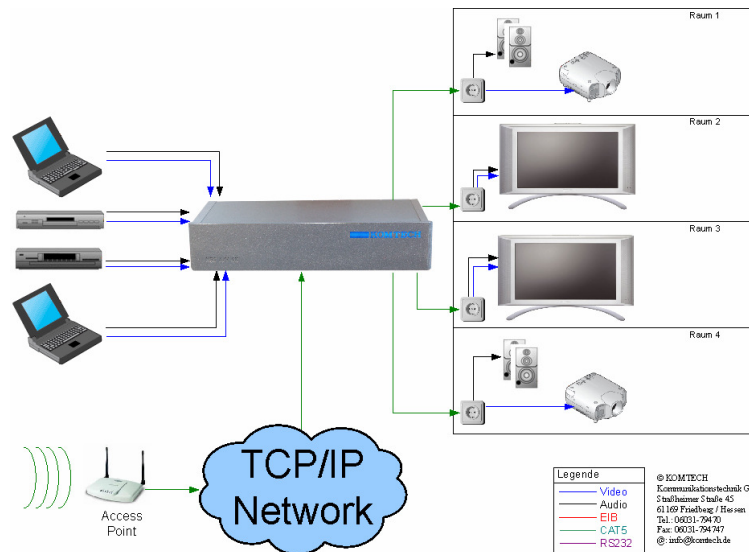


There are four audio and video sources connected to the MRC. Their signals are distributed to four independent rooms via CATx cable.

The control of the MRC is done by a device which is connected via RS232 with the MRC. In this example a media room control system like the CF-MEDIA system is integrated in the project to control the MRC.

Example 3:

Solution with control via LAN

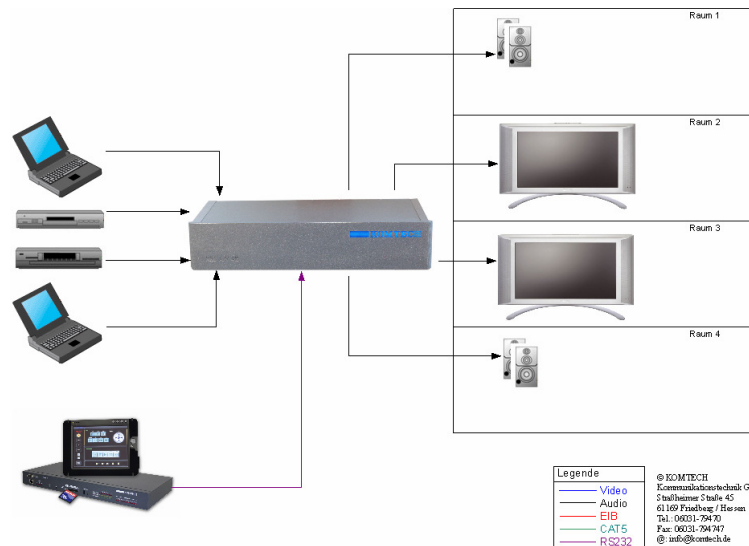


There are four audio and video sources connected to the MRC. Their signals are distributed to four independent rooms via CATx cable.

The control of the MRC is done by a device which is connected via LAN or WLAN with the MRC. In this example a PDA or mobile phone with WLAN is integrated in the project to control the MRC.

Example 4:

4-Room solution MRC A/V 410 Basic



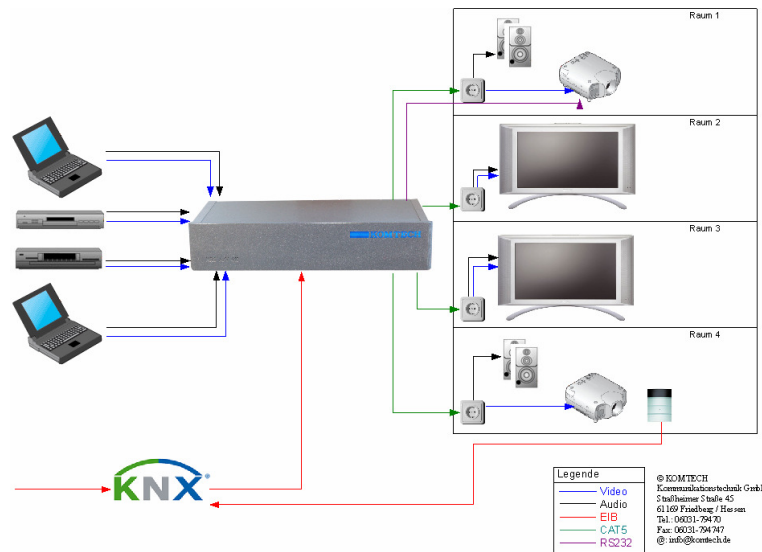
There are four audio and video sources connected to the MRC. Their audio signals are distributed to four independent rooms via CATx cable.

If there is a need to transmit video signals from the devices to the display, breakout boxes have to be installed. For more information look at example 3.

The control of the MRC is done by a device which is connected via RS232 with the MRC. In this example a media room control system like the CF-MEDIA system is integrated in the project to control the MRC.

Example 5:

4-Raum solution with RS232 device control



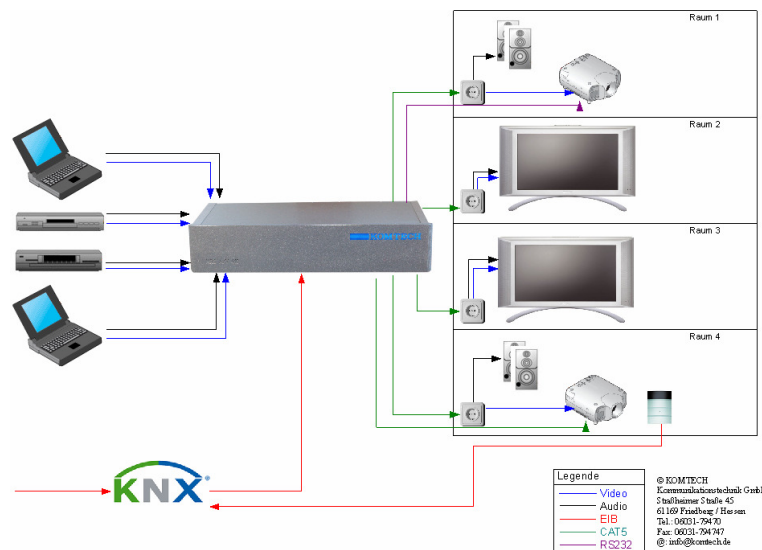
There are four audio and video sources connected to the MRC. Their signals are distributed to four independent rooms via CATx cable.

The control of the MRC is realized directly via EIB device like EIB key pads or touch panels. The control devices directly communicate with the MRC.

The beamer in one room is also controlled by EIB/KNX through the MRC by using the user commands for RS232 control.

Example 6:

4-Room solution with RS232 & LAN device control



There are four audio and video sources connected to the MRC. Their signals are distributed to four independent rooms via CATx cable.

The control of the MRC is realized directly via EIB device like EIB key pads or touch panels. The control devices directly communicate with the MRC.

The output devices in two rooms are also controlled by EIB/KNX through the MRC by using the user commands for RS232 and other user commands for LAN control.

Chapter 8 Technical Data

Technical data

Dimensions (W x H x D)	483mm x 88mm x 190mm (Height without front panel 88mm [2HE])
Power supply	230V/50Hz; Fuse 100mA
Environment temperature	5 – 45°C

Video

Inputs

Number	4
Connector Input MRC	RCA (Cinch) female
Connector Input Break Out Module	Phoenix connectors

Impedance Video	75Ω
Input coupling	AC
Input level max	1,2V

Outputs

Number	4-10
Connector Output MRC	Phoenix connectors
Connector Output Break Out Module	RCA (Cinch) female
Output impedance Video	75Ω
Output level	1V
Cable Equalizing Break Out Module	Up to 100m via CAT5e cable

Bandwidth

10 MHz	±0,5dB
--------	--------

Audio

Inputs

Numbers	4
Connector Input MRC	2x RCA (Cinch) female
Connector Input Break Out Module	Phoenix connectors

Input impedance	10KΩ
Input coupling	AC
Input level Umax (v=1)	+8dBu
Control Gain	0 to +15dB

Outputs

Number	4-10
Connector Output MRC	Phoenix connectors
Connector Output Break Out Module	3,5mm stereo female

Output impedance	<39Ω
------------------	------

Frequency response

20Hz to 18KHz	±0,2dB
---------------	--------

Channel characteristics

Output level Umax	+8dBu
Control Volume	-79dB to +15dB
Control Treble, Middle, Bass	-12dB to +12dB

Volume adjustable via Software	127 steps from 0 till Uout=Uin <-80dBq
--------------------------------	---

Noise (CCIR 468-3) RMS-THD+N, 1KHz, (0dBu)	<0,02%
---	--------

RS232 interface

Baud rate	9600 Baud
Data-bit	8
Parity-bit	None
Stop-bit	1

Part number	06001760	MRC A/V 410
	06001764	MRC A/V 410 Basic
Additional part numbers	06001763	MRC A/V 410 Output card
	06001761	MRC A/V 410 Break-out Box
	06001765	MRC A/V 410 LAN module
	06001766	MRC A/V 410 IR module