Camera system

Extended functions - Interfaces - Camera Control Software - On-Screen-Display

Extended Manual

Camera system with digital transmission of analogue A/V signals

Contents

1 Important Safety Notice

§

This extended manual is only valid in combination with the base manual

- Follow all instructions of the base manual
- In particular follow the safety instructions of the base manual
- Disregard can lead to hazard and harm

2 Extended Functions of the Receiver

2.1 General

Receivers include/contain additional functions depending on type and selected options.

Extended functions of the receiver itself are explained in this chapter.

Communication interfaces of the receiver are explained in chapter 3.

Extended functions, that are available through the Camera Control Software, are explained in chapter 4.

Controlling text insertion by sending commands from your own software or device is found in chapter 5.

The basic functions of the receiver are already explained in the base manual and are not repeated in the extended manual.

2.2 Configuration of Inputs and Outputs

Receivers can be customized flexibly with inputs and outputs, depending on the selected options.

For this purpose physical slots are equipped with input/output cards, which, depending on the selected options, can be equipped with different connectors.

2.2.1 Optical Input / AV-Output Card

This card contains, depending on the selected options, one VGA/DVI/HDMI output, one SDI output, one CVBS video output and/or one audio output.

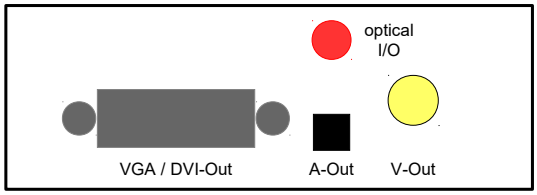


Figure 2-1:Connectors of the optical input / AV output card

Initially the receiver automatically sets the **video output format**. The automatic settings can be manually overwritten by using the Camera Control Software, see chapter 4.3.7.1. The receiver display, the remote control and the Camera Control Software display symbolic names for all outputs, for example they show the name of the connected display. Symbolic names can be configured by using the Camera Control Software, see chapters 4.4.3 and 4.3.9.2.

You can connect optical inputs with either a camera or a relay card from another receiver (see chapter 2.2.3). The **video input format** is automatically set according to the device that is connected to the optical input.

This card is also available as pure audio output card.

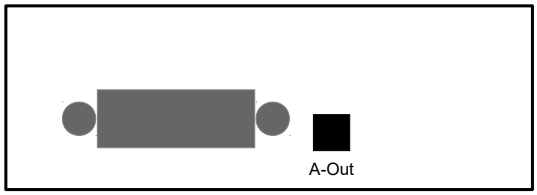


Figure 2-2: Connectors of the audio output card

When option SDI video output is selected, the card does not have a CVBS cinch connector. Instead, CVBS and audio are available through a combined audio/video (TRRS) female connector, see figure 2-3. To activate the SDI video output, the mode of the card must be changed to „Enhanced“, see chapter 4.3.7.1.

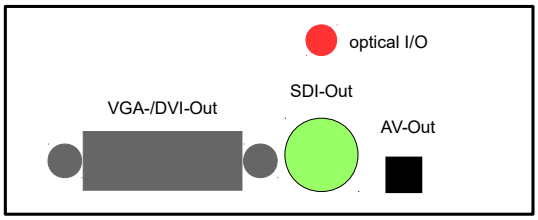


Figure 2-3: Connectors of output cards with option SDI

2.2.2 Audio/Video Input Card

The AV-input card is used to feed audio and video signals into the receiver.

It is only available for receiver type matrix.

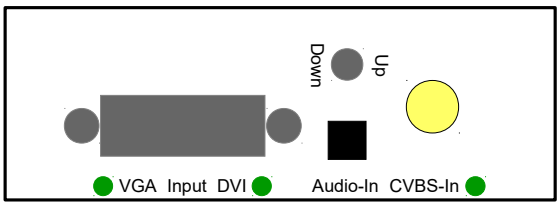


Figure 2-4: Connectors and operating controls of the AV-input card

2.2.2.1 Selection of the Video Input

The AV-input channel contains two physical connectors (DVI and Cinch) for the video input. You can connect an analogue CVBS-signal to the Cinch connector. To the DVI-connector you can connect either DVI-signals, HDMI-signals, or VGA-signals using an appropriate adapter.

Select the video input to be used in the receiver as follows:

- **Switch/LEDs at the AV-input channel card**
  Switch and LEDs are optional. Using the toggle switch you can select between VGA, DVI/HDMI and CVBS. Move the switch into the desired direction as indicated on the AV-input channel card. The LEDs indicate, which input is selected. After using the switch, it takes about 5 seconds before the video input can be changed again. This is shown by the blinking of the LED.

- **Camera Control Software**
  see chapter 4.

Following table shows all supported resolutions for each video input type. Depending on the selected options of the AV-input card these resolutions can vary.

Resolution	Frequency	DVI / HDMI	VGA	CVBS
1920 x 1080	60 Hz	X	X	
	60 Hz / 50 Hz (Interlaced)	X	X	
	25 Hz / 30 Hz / 50 Hz	X		
1600 x 1200	60 Hz		X	
1680 x 1050	60 Hz	X	X	
1440 x 900	60 Hz	X		
1366 x 768	60 Hz	X		
1360 x 768	60 Hz	X		
1280 x 1024	60 Hz	X	X	
1280 x 960	60 Hz	X	X	
1280 x 768	60 Hz	X	X	
1280 x 720	60 Hz	X	X	
1152 x 864	75 Hz	X	X	
1024 x 768	60 Hz / 70 Hz / 75 Hz	X	X	
800 x 600	56 Hz /60 Hz / 70 Hz / 75 Hz	X	X	
720 x 480	60 Hz	X	X	
	60 Hz (Interlaced)			X
720 x 576	50 Hz	X	X	
	50 Hz (Interlaced)			X
640 x 480	60 Hz / 72 Hz / 75 Hz	X	X	

Table 2-1: Supported input resolutions and frequencies depending on the format

2.2.2.2 Selection of the Audio Input

The AV-input board contains two physical connectors (analog and digital) for the audio input. For digital signals use DVI/HDMI, for analog signals use a phone jack (3.5 mm).

The audio format/source that the receiver processes can only be selected using the camera control software (see chapter 4).

2.2.2.3 Extended Display Identification Data (EDID)

„Extended Display Identification Data“ (EDID) give a video source (PC, measuring equipment,…) all necessary

informations about the connected monitor. This way the video source recognizes whether it is connected to an analog (VGA) or digital (HDMI/DVI) interface and which resolutions and frame rates can be displayed. This data is stored in an EPROM and is read over an I2C interface. HDMI, DVI and VGA cables provide a I2C line for this purpose.

The AV input card has one EPROM each for VGA EDID and HDMI/DVI EDID. Since the input board has no separate connector for VGA (VGA can only be connected using a VGA→DVI adapter), it has to be switched between the two EPROMs (see figure 2-5). If VGA (DVI) is selected, data will be read from the VGA (DVI) EPROM.

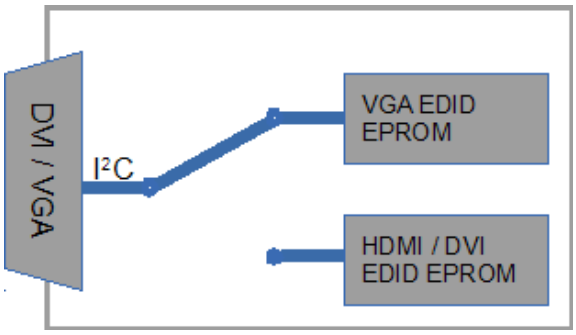


Figure 2-5: Reading EDID from the EPROM of a AV input card

The data will be read only once after connecting a VGA (DVI) source. The following has to be considered:

If a DVI source is plugged in and the AV input card is set to VGA, the DVI source will read the EDID for VGA. This way it recognizes an „analog monitor“ and therefore does not send DVI video signals. If the AV input card is switched to DVI, the DVI source still won't send a signal, because it does not re-read the EDID. This can be resolved by unplugging the connector. After plugging the connector back in again, the EDID for DVI will be read. If you use a PC as video source, you can also trigger the re-read of the EDID manually. See the manual of your operating system on how to detect monitors. You should see a monitor called MK VIDEO DVI.

2.2.3 Relay Card

The relay card is used to optically output AV signals to feed them into an optical input of another receiver (see chapter 2.2.1).

This is only available for receivers of type matrix.

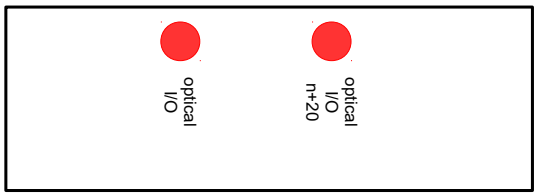


Figure 2-6: Connectors of the relay card (option with two outputs)

Depending on the selected option the relay card can contain one (for the 4HU and 8HU matrix) or two (only for the 4HE matrix) connectors.

The first optical output is always identified via the physical slot (channel) on the receiver. The second optical

output is identified by the logical channel resulting from the number of the slot plus 20. This is displayed in the Camera Control Software, see also chapter 4.3.7.1.

A configuration of the relay card is not necessary.

Relaying AV signals from one receiver to the next is described in chapter 2.3.

2.3 Relaying from Source to Destination Receiver

Several receivers can be connected to each other using a relay card (only type matrix, see chapter 2.2.3) and an optical input card (see chapter 2.2.1). To do this, use **optical fibre** in order to connect the output of the relay card to the input of the optical input card, see figure 2-7. An optical connection allows simultaneous relay of an AV signal from the source receiver to the target receiver. Both AV signals from cameras and AV input cards can be relayed.

In addition, target and source receiver must be connected via LAN. At the target receiver, the source receiver must be configured as a client using the Camera Control Software, see chapter 4.3.9.3. There is exactly one TCP/IP connection between the source and target receivers at the same time, regardless of the number of relayed AV signals.

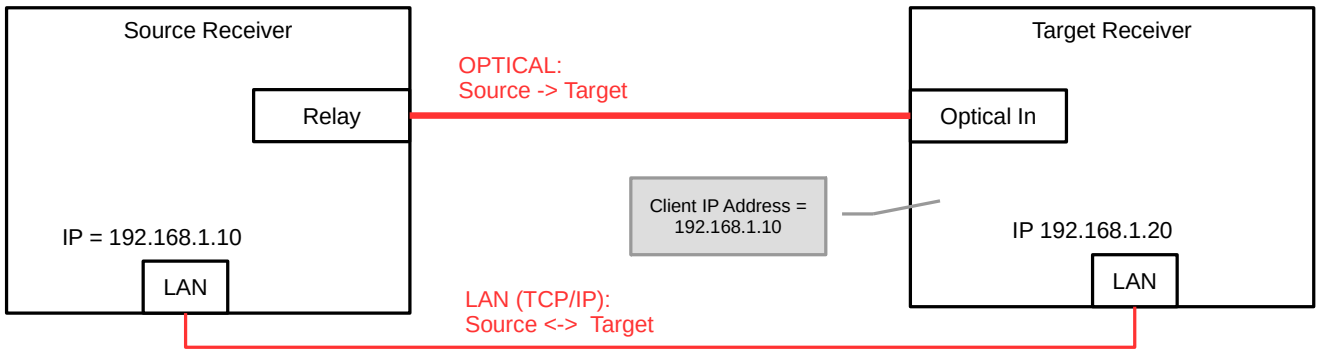


Figure 2-7: Cabling and configuration for relaying AV signals

To relay an AV signal to a target receiver and display it there, an input signal must first be connected to the source receiver (e.g. camera ID 1) and a display or recording device to the destination receiver (e.g. TFT 2). Then

- the optical input to which the source is connected must be connected to the output of the relay channel at the source receiver.
- the optical input at the target receiver must be connected to the corresponding output on which the source is to be output.

The connections can be switched either on the receiver or remote control unit (see basic manual) or via the Camera Control Software (see chapter 4.3.6).

Don't relay AV signals from one source to the same destination receiver multiple times

An AV signal from one source (e.g. camera) must not be relayed from one source receiver to the same destination receiver via multiple relay channels. This can lead to malfunctions at the target receiver.

If you want to display a relayed source at several outputs of the target receiver, connect these outputs with the corresponding source ID at the target receiver instead.

Different source IDs for source and target receivers

When relaying, note that all IDs used in the system must be different. For example, only one camera with ID 1 may be directly connected to one of the source and target receivers.

If you relay a camera to a destination receiver, you can operate the camera remotely. This function is identical to a camera connected directly to this target receiver, see base manual.

Please note that camera messages (e.g. pan/tilt head positions) can only be received if you have connected the camera to an output at the destination receiver.

3 Communication Interfaces

Depending on the selected options receivers can have following communication interfaces:

- RS 232: serial interface
- RS 485: serial interface
- LAN: Ethernet, TCP/IP network
- USB: virtual serial interface

The RS 485 interface is exclusively used to connect the optional remote control unit. Please refer to the base manual on how to connect and operate the remote control unit.

The interfaces USB and LAN can be used to remotely control a receiver using the camera control software. Depending on the selected options the camera control software also offers functions for displaying text on an on-screen display. Please refer to chapter 4.2.2 for instructions on how to connect a receiver to the camera control software.

Aditionally you can use the interfaces RS 232, USB and LAN for communication with your own software or the software of a third party manufacturer.

Please configure the interfaces in your own device as follows:

RS 232 and USB

- Data bits: 8
- Parity: none
- Stop bits: 1
- Handshake: no
- Baud: 9600 (RS 232) / 57600 (USB)

Different baud rates for RS 232 are optionally available. Please contact the manufacturer for more information.

LAN

- IP address of the receiver: Network settings of the receiver are configured using the camera control software, see chapter 4.3.9.3
- TCP Port of the receiver: 19308
- Please take into account that your device and the receiver must be in the same subnet.
  If you want to connect to devices outside of the same subnet, you can configure the IP gateway in the receiver (see chapter 4.3.9.3) and create a valid route between the subnets.

Currently you can use these interfaces to configure the on-screen display for displaying text.

OSD commands are described in chapter 5.

4 Camera Control Software

4.1 Installation

To install the software, simply unpack all files from the archive to a (local) target folder on your PC. No further installation is required.

The software has been tested under Windows 7, Windows 8 and Windows 10. You may have to download and install some components of the .NET framework.

For the connection with the receiver using virtual COM ports an appropriate driver has to be installed.

4.2 Starting the Software

Start the software by double clicking on the file „camera_control_software.exe“ in the target folder or create a shortcut for it on the desktop for example.

!	**Security warning when starting the software** If the target folder with the software is located on a network drive, a security warning may show up when you start the software. Click on „OK“ to ignore the warning. To avoid this warning, you should move the folder, if possible, to a local drive on your PC.

4.2.1 Main Window

After the start of the software you will see the following window. The number of visible tabs can vary depending on the selected options.

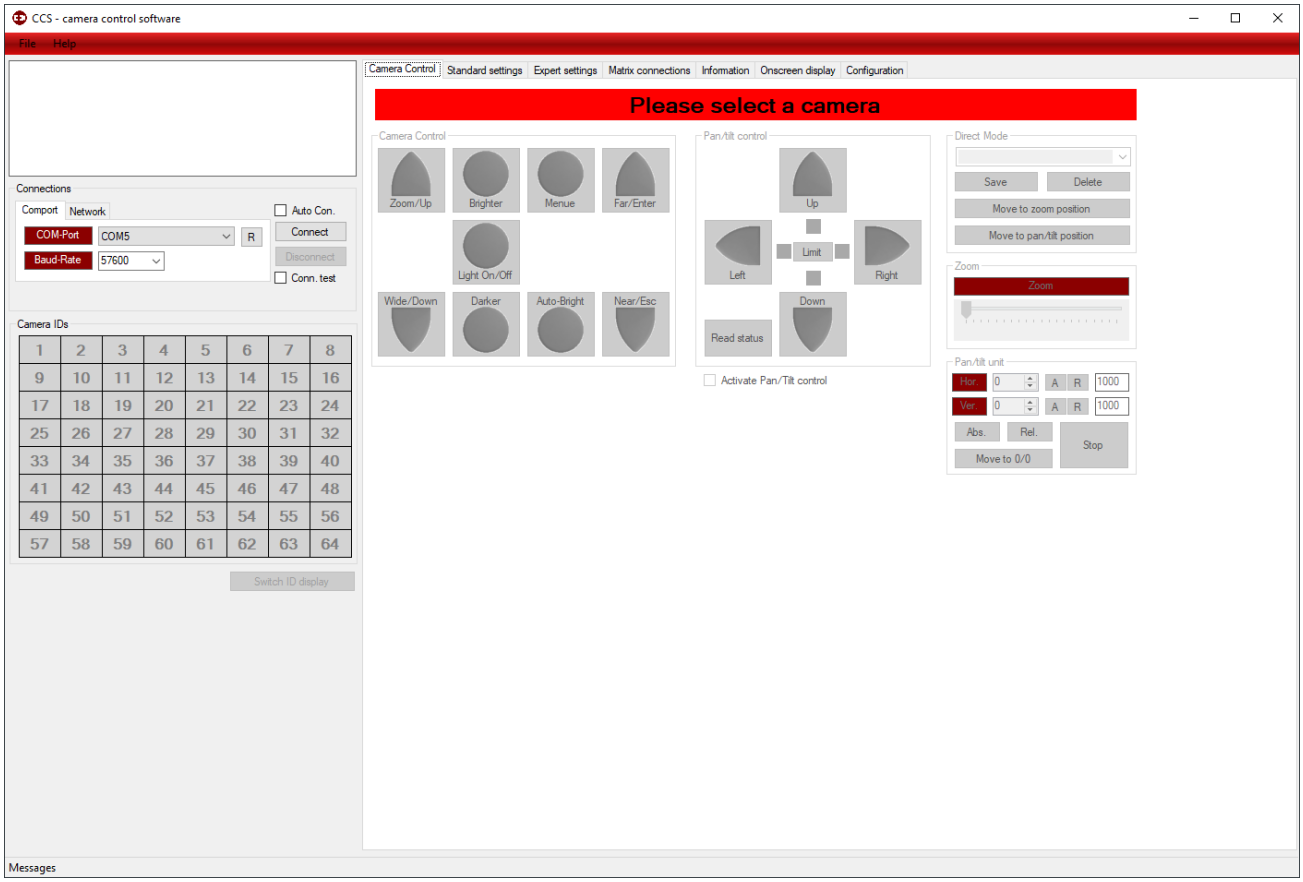


Figure 4-1: Startup screen of the camera control software (CCS)

4.2.2 Connection with the Receiver

To connect with the receiver there are the following options **[1]**:

4.2.2.1 COM Port (Virtual COM Port over USB)

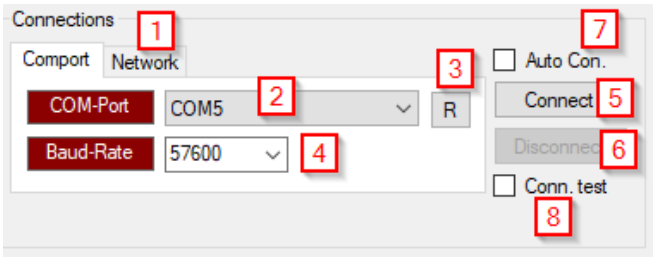


Figure 4-2: Options for the connection with the receiver over USB

With USB you can establish a point to point connection to the receiver. Select the correct COM port **[2]** and the correct baud rate **[4]**. The standard baud rate is 57600. You can assign a COM port your own meaningful name (see chapter 4.4.1).

To connect to the receiver click on button „Connect“ **[5]**. To disconnect use button „Disconnect“ **[6]**.

Clicking button „R“ **[3]** rescans the PC for available COM ports and refreshes the list.

If Auto Connection (Auto Con.) **[7]** is checked, the software will try to connect to the last successful connected receiver (USB or LAN) immediately after the software starts. You don‘t have to click on „Connect“.

Checking the „Connection test“ **[8]** (Conn. test) periodically checks, if the receiver is still connected.

4.2.2.2 Network

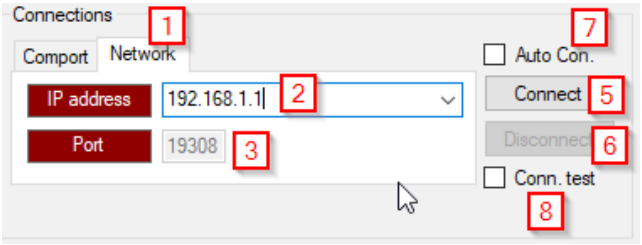


Figure 4-3: Options for the connection with the receiver over Network

Using LAN you can connect up to eight PCs to one receiver. Enter the correct IP address of the receiver into field **[2]**. The network settings of the receiver can be configured on tab „Configuration“, see chapter 4.3.9.3. The port cannot be changed and is only displayed here for information, so that you can unblock it on your PC or in your external firewall. Whether this is required, depends on the topology of your local network.

You can also assign your own meaningful names to IP addresses (see chapter 4.4.2). Addresses entered in the field **[2]** will be saved permanently and can be easily selected again.

To establish the connection, click on button „Connect“ **[5]**.

To close the connection, click on button „Disconnect“ **[6]**.

If Auto Connection (Auto Con.) **[7]** is checked, the software will try to connect to the last successful connected receiver (USB or LAN) immediately after the software starts. You don‘t have to click on „Connect“.

Checking the „Connection test“ **[8]** (Conn. test) periodically checks, if the receiver is still connected.

4.2.2.3 Notes

As long as the PC is not connected to the receiver, most of the functions of the software are not available and are displayed as disabled (see figure 4-1). In addition some pages show the information, that no camera has been selected yet, since this can only be done after a successful connection.

4.2.3 Connection Successful

After a succesful connection some fields are disabled, so that connection settings can not accidently be changed during runtime.

To connect again, the established connection has to be disconnected first.

4.2.3.1 Selection of the Active Camera

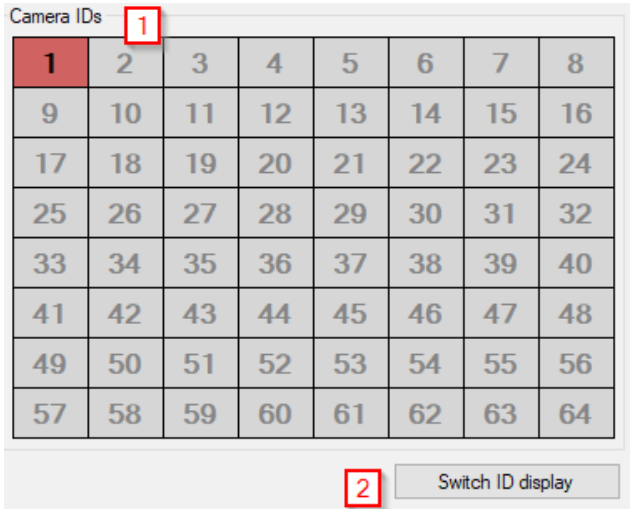


Figure 4-4: Selection of the active camera

In area **[1]** all available cameras are shown with a white background, unavailable cameras remain gray, the selected camera is displayed with a red background. At any time only one camera can be selected.

As soon as a camera has been selected, the red hint on some tabs, that no camera has been selected, is replaced by a green hint with the selected camera ID.

4.2.3.2 Switch ID Display On/Off

With button **[2]** the display of the camera ID in the video image can be turned on or off. This way it can be avoided, that it overlays important parts of the video image. The camera is still selected and addressed using this ID.

4.3 Operating the Software

Different functions are grouped into tabs. To access certain functions of the connected receiver, select the tab with the desired function group. Depending on the purchased options not all of the tabs shown here may be available.

4.3.1 Camera Control

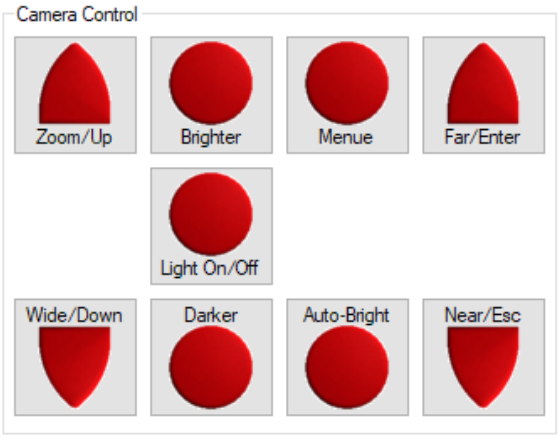


Figure 4-5: Control functions of the camera

These buttons correspond to the hardware buttons of camera and receiver and are described in more detail there (see base manual).

4.3.2 Pan/Tilt Control

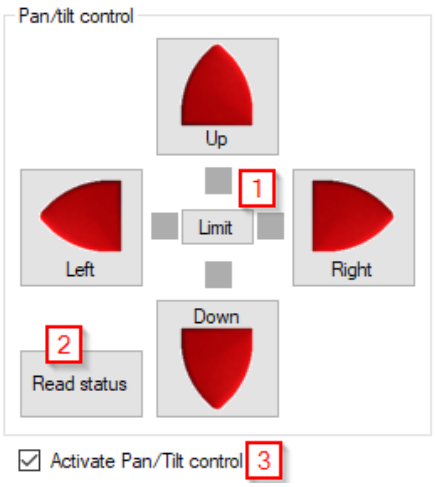


Figure 4-6: Control functions of the pan/tilt unit

These buttons move a pan/tilt unit and correspond to the hardware buttons of the receiver. They are described in more detail there (see base manual).

With these buttons **[1]** the user can set or delete the user contollable limits of the pan/tilt unit. Clicking a button sets the actual pan/tilt position as limit (control turns green) or deletes the limit (control turns gray). To enable the setting of the limits, the Button „Limit“ has to be clicked first (the grey limit markers will get a black border). Click the button again to disable the setting of the limits again.

Button **[2]** reads all status data from the pan/tilt unit again. This can be neccessary, if someone changed the limits at the pan/tilt unit directly, which will not be sent to the PC automatically.

Button **[3]** will enable the controlling of the pan/tilt unit even if the camera could not detect the pan/tilt unit,

which can happen with older hardware.

4.3.3 Saving and Restoring the Actual Pan/Tilt Unit Position and Camera Zoom

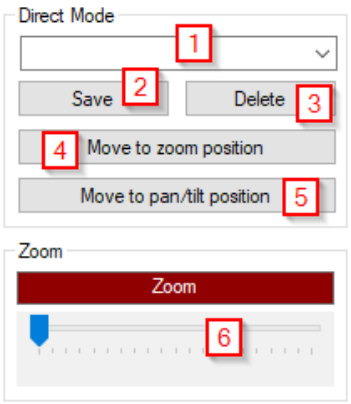


Figure 4-7: Saving and restoring of the positions

With these control elements the zoom position and the position of both pan/tilt axes can be saved to disk, to be restored later.

4.3.3.1 Saving

To save a position, provide a meaningful name in input field **[1]**. Then press button **[2]**.

4.3.3.2 Restoring

To restore a saved position, select the desired data record from the list **[1]**. After clicking on button **[4]** the camera will zoom to the saved position. With button **[5]** you can restore the saved position of the pan/tilt units axes.

i	When moving a pan/tilt unit automatically, the currently set limits will be taken into account, so that it can happen, that the pan/tilt unit will stop moving before reaching the desired position. Please refer to the base manuel for additional information regarding limits of a pan/tilt unit.

4.3.3.3 Deleting

To delete a saved position, select it from the list and press button „Delete“ **[3]**.

4.3.3.4 Zoom Slider

With the zoom slider **[6]** the optical zoom of the camera can be changed absolutely. The left position correlates to the maximum wide range, the right position to the maximum tele range. The digital zoom can not be influenced here!

4.3.4 Standard Settings

On this tab you find controls for direct access to the settings of the internal camera menue, including the configuration of camera audio.

In the audio settings you can choose between an automatic and a manual mode (see figure 4-8 [1]).

4.3.4.1 Audio Settings (Automatic)

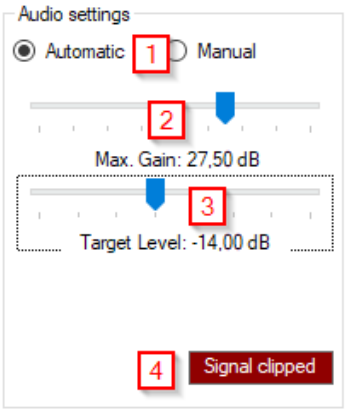


Figure 4-8: Automatic audio mode

The Target Level **[3]** specifies the audio level, that shall be kept constantly. Loud signals can be damped, quiet signals are amplified.

Using the Max. Gain **[2]** you can set the maximum amplification, that shall be used to reach the target level.

Panel **[4]** indicates, if the signal has been clipped ("Signal clipped", red background) or not ("Signal ok", green background). Not all camera models support this information.

4.3.4.2 Audio Settings (Manual)

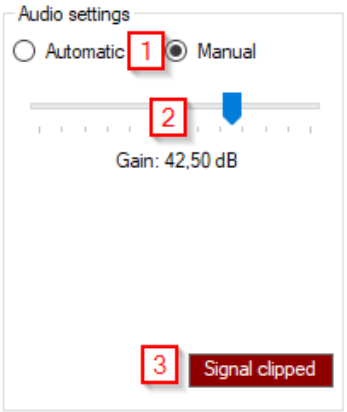


Figure 4-9: Manual audio mode

In manual mode **[1]** the amplification of the audio signal can be adjusted using the gain from 0 dB up to 60 dB **[2]**.

Panel **[3]** indicates, if the signal has been clipped ("Signal clipped", red background) or not ("Signal ok", green background). Not all camera models support this information.

No further adjustments are possible here.

4.3.4.3 Camera Settings

With this dropdown list the internal ID of the selected camera can be changed.

!	The new ID is immediately active. Changing the ID can lead to a situation, where two cameras in the system can have the same ID, which will cause problems in the receiver. There must never be two or more cameras with the same ID connected to the same receiver! After changing a camera ID it is recommended to restart the receiver.

4.3.4.4 Camera Menue Page 1 (Standard Cameras)

These buttons and dropdown lists correspond to the functions of the internal menue of a camera and are explained in more detail there, see the base manual.

4.3.4.5 Camera Menue Page 2 (Standard Cameras)

These buttons and dropdown lists correspond to the functions of the internal menue of a camera and are explained in more detail there, see the base manual.

4.3.4.6 Camera Reset (Standard Cameras)

Triggering this button will reset the camera to its initial state.

4.3.4.7 Micro Camera

Micro-HD cameras provide some different settings then standard cameras. These are described in the following.

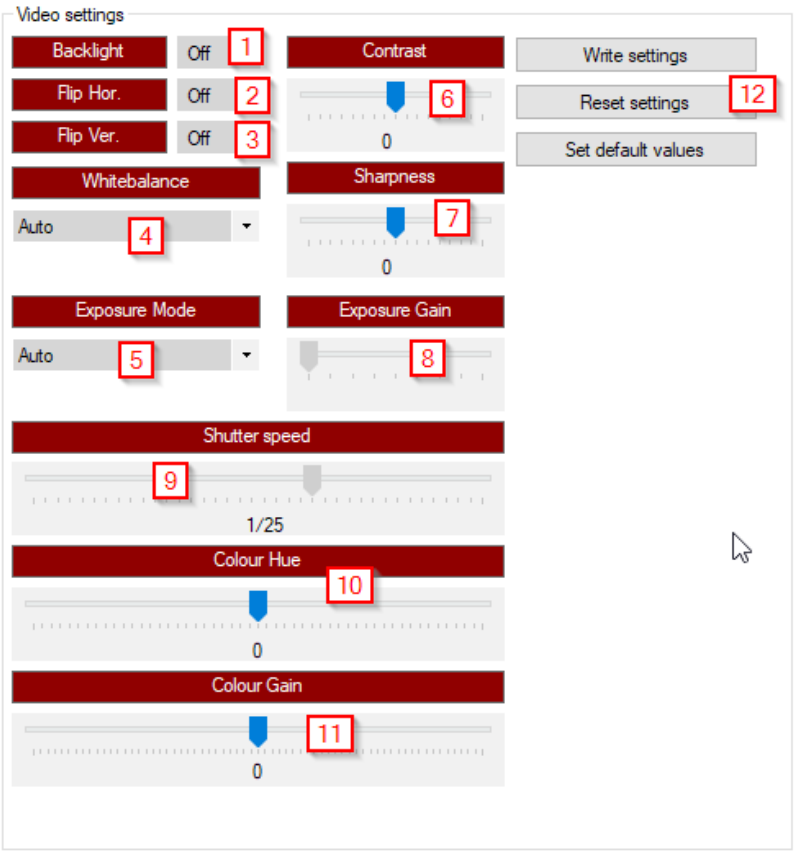


Figure 4-10: Micro-HD adjustments

With button **[1]** you can turn the backlight adjustment on or off. Buttons **[2]** and **[3]** mirror the image horizontally and vertically. The whitebalance can be adjusted by using the values from the dropdown list **[4]** ,exposure mode with dropdown list **[5]**. Contrast and sharpness are adjusted using the sliders **[6]** and **[7]** , electronical gain by using slider **[8]**. With slider **[9]** you can adjust the shutter speed, provided you have selected the correct exposure mode. Color hue and color gain can be adjusted using scrollbars **[10]** and **[11]**.

Using buttons **[12]** you can save your settings in the camera, reset them or set them to their default values.

4.3.5 Expert Settings

With these functions many settings can be done directly in the camera module. This is especially useful in bad or unusual lighting situations or when using a motion detection software. Since extensive knowledge of cameras in general is needed to use these functions reasonably, you first have to confirm a warning message **[1]**!

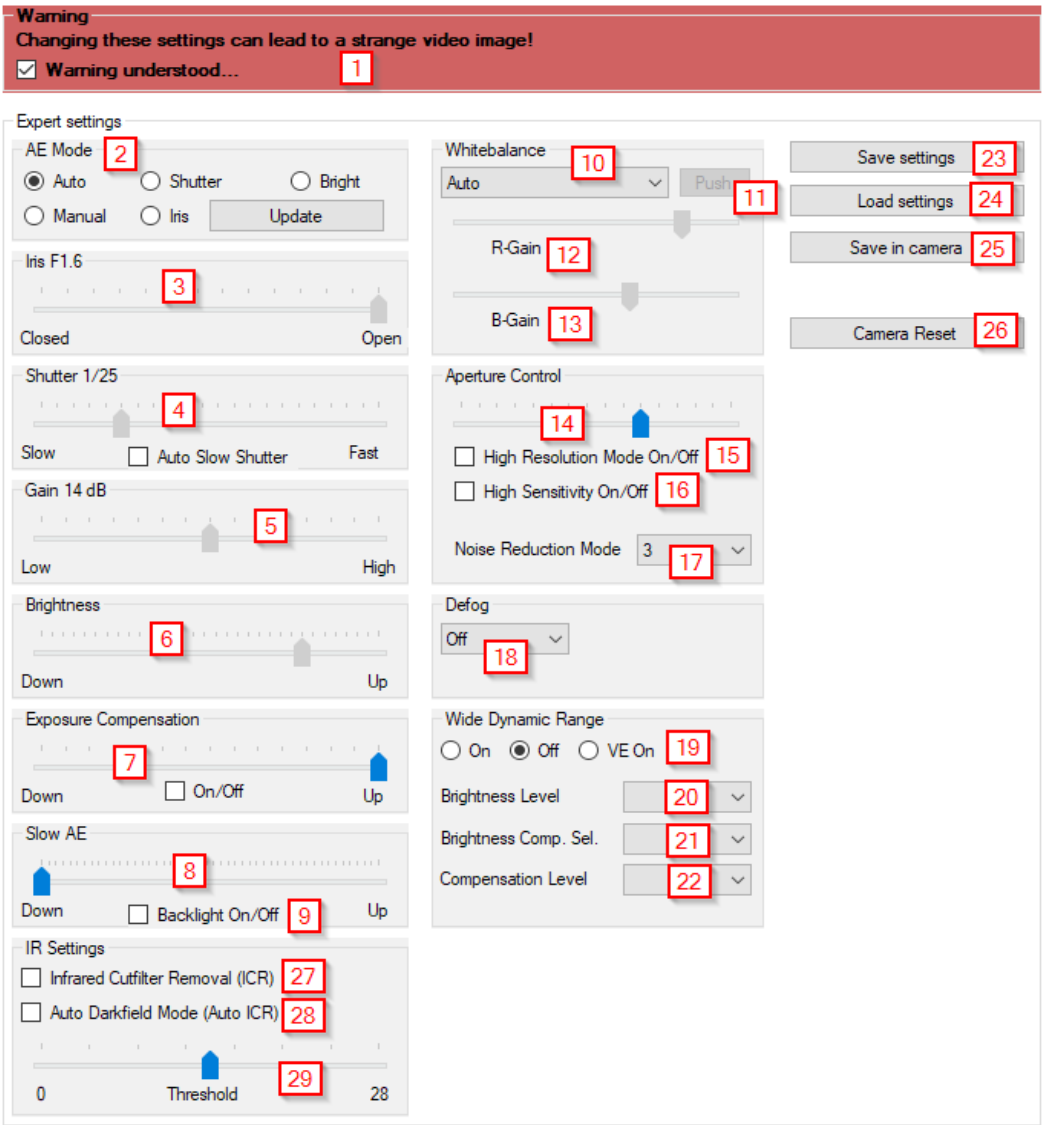


Figure 4-11: Expert Settings

!	Changes at these settings can lead to video images which on the one hand might suggest that the camera is defect, or make the camera unusable for other lighting situations until it is reset to its default state.

4.3.5.1 AE Mode (Auto Exposure Mode)

In this area **[2]** you can choose between different modes of exposure.

- **Auto**: all relevant parameters for the exposure are set automatically.
- **Shutter**: shutter speed can be changed manually, all other parameters are set automatically.
- **Bright**: brightness can be changed manually, all other parameters are set automatically.
- **Iris**: iris can be changed manually, all other parameters are set automatically.
- In manual mode all parameters for the exposure can (and must be for a suitable image) be adjusted manually. This includes Iris **[3]**, Shutter **[4]** and Gain **[5]**.
- If button „Update“ is clicked, data is read from the camera and the sliders are adjusted accordingly.

4.3.5.2 Iris [3]

With this slider you can adjust the iris of the camera.

4.3.5.3 Shutter [4]

With this slider you can adjust the shutter speed of the camera.

4.3.5.4 Gain [5]

With this slider you can adjust the electronic gain of the camera.

4.3.5.5 Bright [6]

With this slider, you can adjust the overall brightness of the video image. The camera first tries to keep the shutter speed constant and to adapt the brightness only by using iris and gain.

Only if the surrounding light is extremely weak, the shutter speed will be reduced, but never below a minimum value, which depends on the type of camera (usually 1/6 second).

Should this also not be sufficient, the option „Auto Slow Shutter“ can be activated, which will reduce the shutter speed even further. This leads to a significant latent reaction of the camera!

4.3.5.6 Exp Comp [7]

With this slider the internal brighness reference can be adjusted in steps of 1.5 dB.

4.3.5.7 Slow AE [8]

To avoid or at least slow down permanent automatic adjustment of the exposure at fast changing brightness levels (for example when observing fast flashing lights), this slider can be used. However some other adjustments can also be slowed down significantly.

With this checkbox **[9]** the automatic backlight adjustment can be turned on or off.

4.3.5.8 Whitebalance **[10]**

With this dropdown list the desired kind of whitebalance can be selected.

Auto	The whitebalance is automatically calculated over the complete video image
ATW	Automatically between 2000K and 10000K
Indoor	3200K
Outdoor	5800K
One Push WB	A single whitebalance calculation is done when button **[11]** is cklicked
Manual WB	The whitebalance can be done manually using the sliders **[12]** and **[13]**
Outdoor Auto	Automatic mode for outdoor recordings, especially in the morning and evening
Sodium Auto	An automatic mode for sodium lamps
Sodium Fix	A fixed mode for sodium lamps
Sodium Lamp Outdoor Auto	An automatic mode for sodium lamps for outdoors

Table 4-1: Whitebalance modes

4.3.5.9 Aperture Control **[14]**

This slider changes the sharpness of the image, which can lead to increased noise.

4.3.5.10 High Resolution Mode **[15]**

This mode replaces the video image by a two-color image to make edges more visible.

4.3.5.11 High Sensitivity Mode **[16]**

In this mode, the maximum electronic gain is increased again, but this can lead to high image noise.

4.3.5.12 Noise Reduction Mode **[17]**

This mode tries to reduce the image noise in up to 5 steps. With moving images, this can lead to stripes in the image.

4.3.5.13 Defog **[18]**

This mode tries to make areas with low contrast (e.g. fog) clearer.

4.3.5.14 Wide Dynamic Range and VE Mode **[19]**

These modes attempt to balance very bright and very dark areas of the video image by darkening bright areas and brightening dark areas.

With the selection lists **[20]**, **[21]** and **[22]** these ranges can be further refined. Changes to these values are usually only visible and useful in extreme lighting conditions.

4.3.5.15 Save/Load/Reset

With button **[23]** user settings can be saved to hard disk, with button **[24]** these settings can be reloaded. They must then be sent to the camera with a click on button **[25]**.

Especially important is button **[26]**, which can be used to reset all settings back to their default values.

4.3.5.16 IR Settings

Enabling checkbox **[27]** removes the Infrared Cutfilter, thus making the camera more sensitiv to low light situations.

Checking checkbox **[28]** enables the automatic removal of the Infrared Cutfilter depending on the actual light situation. The sensitivitiy can then be adjusted using the threshold slider **[29]**.

4.3.6 Matrix Connections

This tab can only be used meaningfully if the receiver is of type matrix.

With the help of this tab the inputs (cameras, AV input boards,...) of a receiver of type are connected to the outputs (monitors, relay,...). With button **[1]** the connection data can be reloaded from the receiver, e.g. if there was a connection problem and the software is no longer synchronized with the receiver.

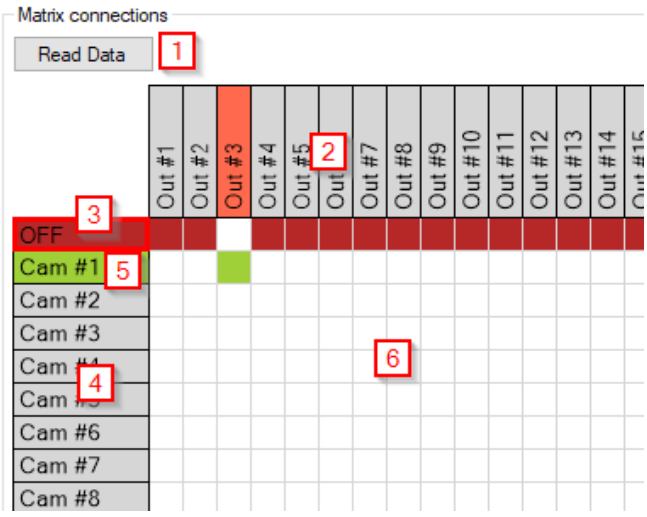


Figure 4-12: View of the Matrix Connections

4.3.6.1 View

- The top row **[2]** displays all outputs available in the system.
- In the left column, all inputs defined in the system are displayed. Currently inactive inputs (e.g. cameras turned

off) are displayed in gray **[4]**, while active inputs (e.g. AV input channels that have detected a valid input signal) are highlighted in green **[5]**. If you want to turn output of a certain channel off, click in the top row **[3]**.

- The selection field **[6]** shows which input is connected to which output. Green fields indicate that the connection is currently active, e.g. that the camera is turned on and displayed on the monitor. Red fields mean that the input is not available, but should be displayed at the corresponding output as soon as the input becomes available.

4.3.6.2 Operation

To establish a connection between an input and an output, click into the corresponding field. In this way, connections can also be created that are not currently available.

4.3.6.3 Labelling

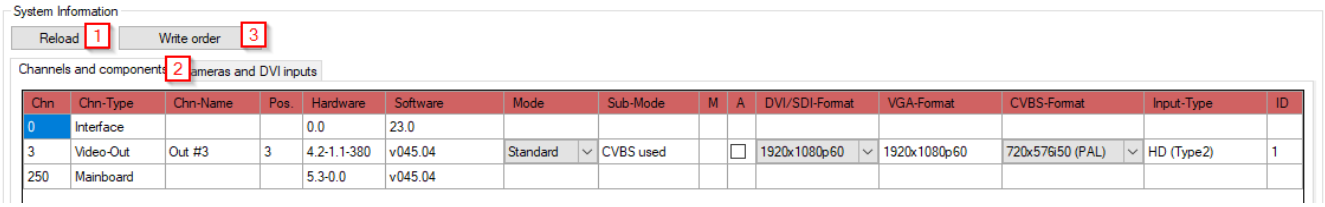
The names of the inputs and outputs can be freely defined to a certain extent, see chapter 4.4.3 and 4.3.9.2.

4.3.7 Information

This tab displays all important information about the connected receiver. In addition, some settings, e.g. for the resolution of an output, can be made here. Press button **[1]** to read the information from the device again. You can switch between the tabs **[2]** "Channels and Components" and "Cameras and DVI Inputs".

Clicking button **[3]** will write the position of the channels to the front display of the receiver (receiver of type matrix only)

4.3.7.1 Channels and Components



Chn	Chn-Type	Chn-Name	Pos.	Hardware	Software	Mode	Sub-Mode	M	A	DVI/SDI-Format	VGA-Format	CVBS-Format	Input-Type	ID
0	Interface			0.0	23.0									
3	Video-Out	Out #3	3	4.2-1.1-380	v045.04	Standard	CVBS used		☐	1920x1080p60	1920x1080p60	720x576i50 (PAL)	HD (Type2)	1
250	Mainboard			5.3-0.0	v045.04									

Figure 4-13: Channels and components

Explanation of the columns:

- **Chn:** the internal channel number, which can also be found on the back of the device.
- **Chn-Type:** The type of channel, such as Video-Out for an AV output card to which a monitor can be connected.
- **Chn-Name:** The user definable name of the channel (see also chapter 4.4.3) can be changed by clicking in the field and typing in a new name.
- **Hardware:** The hardware version of the card.
- **Software:** The software version of the card.
- **Mode:** The video mode (only for AV output channels) can be switched between "Standard" and "Enhanced". In enhanced mode, an optionally available SDI interface is activated and the resolutions of DVI output and VGA output can be switched separately, which is not the case in standard mode.
- **Sub-Mode:** A secondary mode that, in enhanced mode, determines whether the VGA output or the CVBS

output is activated. VGA and CVBS together can only be active in standard mode.

- **M (ute):** Audio of DVI-Input cards can be muted here.
- **A (utomatic):** (Function not supported yet)
- **DVI/SDI-Format:** In standard mode, the output resolution for both DVI and VGA is displayed and can be changed. In Enhanced Mode, the resolution for SDI and DVI output is displayed and set here.
- **VGA-Format:** In standard mode, the resolution of the VGA output is displayed here. It cannot be changed, but always corresponds to the resolution of the DVI/SDI output. In Enhanced Mode, the resolution for the VGA output can be changed here independently of the DVI/SDI output, provided the sub-mode is set to "VGA-used". Otherwise the VGA output is not usable (an image is output, but it has the color format of DVI/SDI and is therefore displayed with the wrong colors).
- **CVBS-Format:** In standard mode, the resolution of the CVBS output is displayed and set here. In Enhanced Mode, the resolution can only be changed if the sub-mode is set to "CVBS-used". Otherwise the CVBS output is switched off.
- **Input-Type:** The type of input device (usually a camera). Here you can see which camera type (SD, HD, Mini, etc.) is physically connected to the corresponding channel.
- **ID:** This is the ID of the camera physically connected to this channel or the ID of the AV input card. In case of an AV input card, the assigned ID can also be changed here directly.

4.3.7.2 Cameras and AV Input Cards

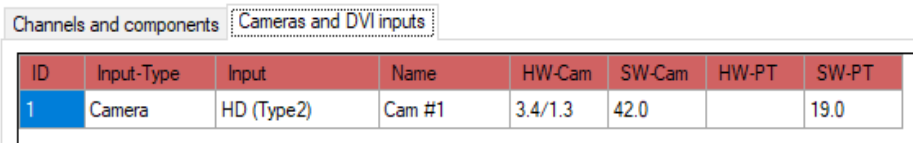


Figure 4-14: Cameras and AV input channels

Explanation of the columns:

- **ID**: The ID of the camera or AV input channel (=DVI input).
- **Input-Type:** The type of input, either "camera" or "DVI input“
- **Input:** The exact name of the input type.
- **Name:** The name of the input, which is user definable and can be changed by clicking in the field and typing in a new name. This name is also displayed on the tab „Matrix connections“ (optional) as the row name.
- **HW-Cam:** The hardware versions of the camera.
- **SW-Cam:** The software version of the camera or AV input channel.
- **HW-PT:** The hardware version of the optional pan/tilt unit connected to the camera.
- **SW-PT:** The software version of the optional pan/tilt unit connected to the camera.

4.3.8 On-Screen Display

Using the text overlay functions of the receiver, texts can be displayed in the video image using commands (see chapter 5) These texts are usually generated every second by external software and sent to the receiver, which

then displays them. (e.g. frequency and field strength for EMC measurements).

4.3.8.1 Permanent On-Screen Display

The permanent display can be used to display the current date, the current time and up to four user definable text lines, independent of external software. This permanent display can be defined separately for each channel and is displayed immediately after switching on the receiver.

4.3.8.2 Selecting Display Channels

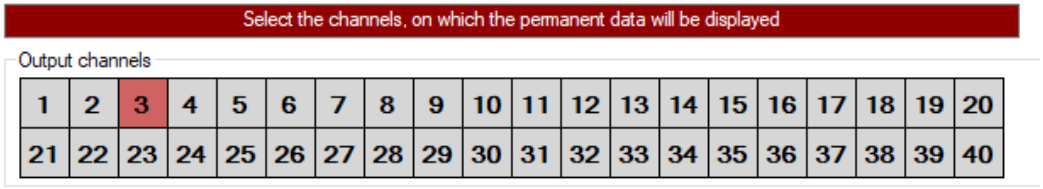


Figure 4-15: Available output channels

Select the output channels, on which the permanent text shall be displayed.

4.3.8.3 Functions

In column **[1]** you can specify a font size for each text component (text line, time, date). Possible font sizes range from „small“ to „large“, the value „none“ means that this component will not be displayed.

The columns **[2]** and **[3]** define the position of the text to be displayed, in coordinates of the first character (depending on the font size) with the origin in the upper left corner of the screen.

Column **[4]** defines the foreground color (font color) of the text, column **[5]** the background color.

Enter the text to be displayed in the input field **[6]**. These texts can be max. 31 characters long.

If the check mark is set at **[7]**, the screen is cleared before the first writing.

Buttons **[8]** sends the configuration to the receiver, where it is displayed immerdiately. The configuration is NOT stored in the receiver permanently, to do this, you have to click on button „Write“ **[16]**.

You can configure the position and font size for the battery messages with the settings **[9]**, the colors and texts with the fields **[10]**. Button **[11]** sends the configuration to the receiver. The configuration is NOT stored in the receiver permanently, to do this, you have to click on button „Write“ **[16]**.

You can use the settings **[12]** and **[13]** to configure the format of the displayed date and time either by selecting a predefined ISO format, or by selecting each single part and seperator.

[14] shows a preview of the selected settings.

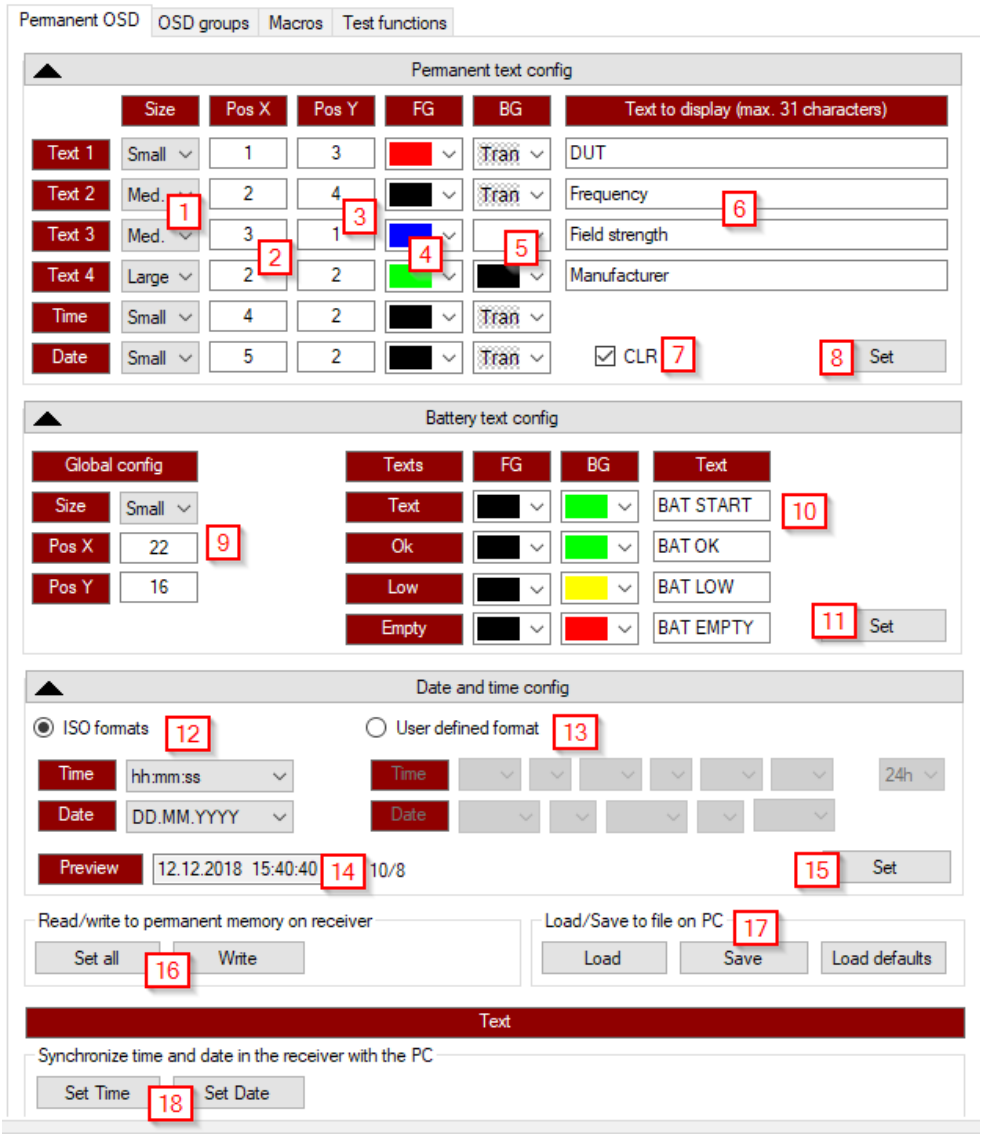


Figure 4-16: Operating window of the permanent display

4.3.8.4 OSD Groups

With the help of the OSD groups, several cameras can be combined into a group, which can then be addressed together via the OSD commands (see chapter 5) A maximum of 15 groups can be created.

With the selection list **[2]** the group to be edited is selected first. If the group already exists, all camera IDs belonging to the group are marked in table **[1]**. Here you can add or deselect any cameras (as usual under Windows with the "Shift" and "Ctrl"-key). Then the group can be saved in the receiver using the **[3]** button. Use button **[4]** to delete the entire currently selected group. With button **[5]** the information can be read from the receiver again.

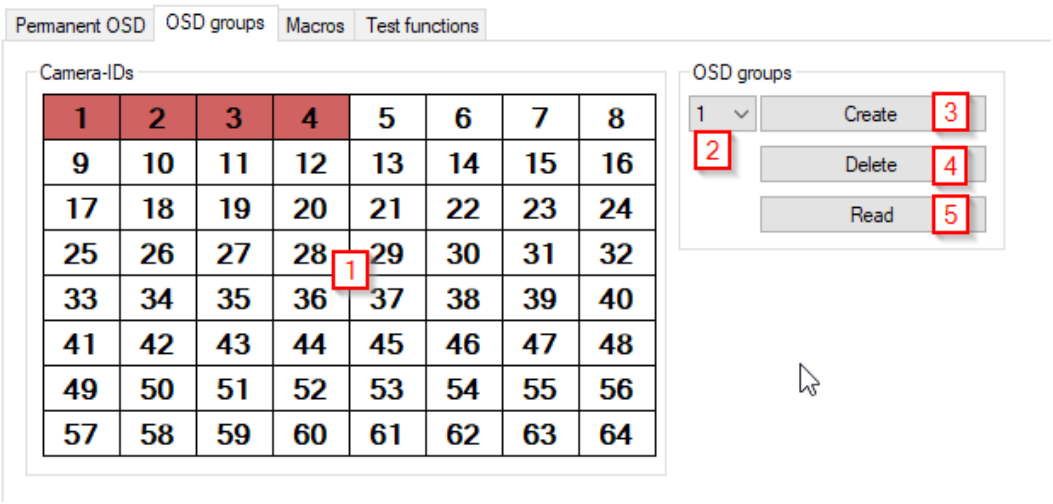


Figure 4-17: Editing the OSD groups

Each camera can only be present in a maximum of 2 groups at the same time. If the camera is selected for a third group, the group can be created, but the camera is not added to the group!

4.3.8.5 Macros

For simple overlays without the aid of external software, two macros can be defined here. The second is sent cyclically to the receiver.

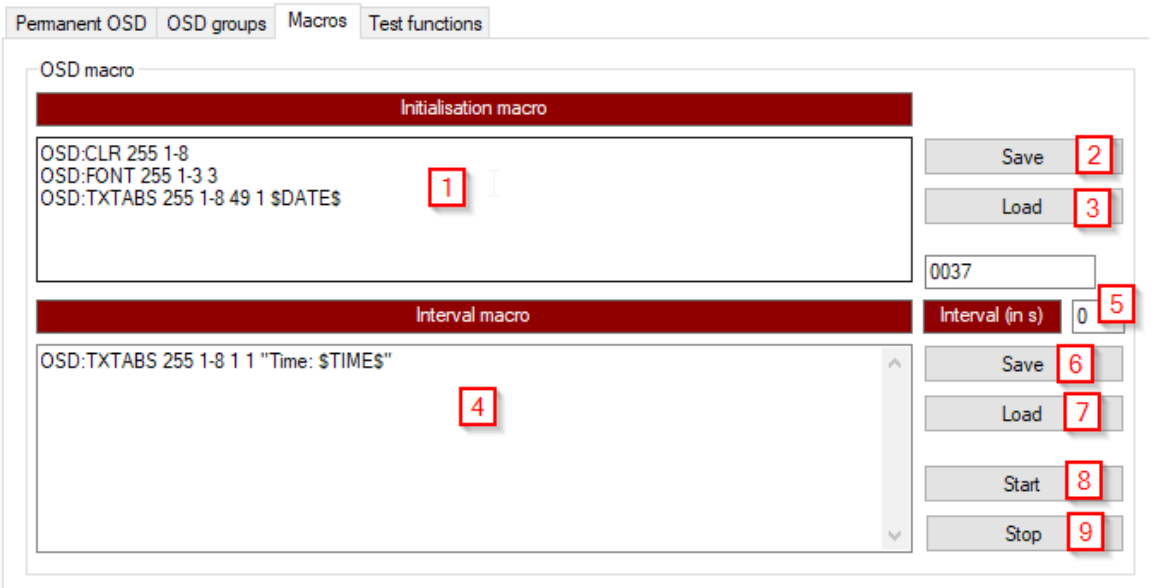


Figure 4-18: Editing the OSD macros

The initialization macro is defined in the input field **[1]**. This macro is executed only once. It is usually used to set font sizes and colors, to display the date and a fixed text, and to clear the screen. Button **[2]** saves this macro on the hard disk. Button **[3]** loads the macro from the hard disk.

The macro defined in the input field **[4]** can be sent cyclically to the receiver. The cycle is defined in the input field **[5]** as an interval of seconds. The macro can also be saved **[6]** and loaded **[7]**. Button **[8]** sends both macros to the receiver, whereby the interval macro is repeated in the defined interval. Clicking button **[9]** terminates the transmission and clears the screen.

4.3.8.6 Test Functions

This page contains the possibility to test some functions of the OSD, e.g. to test color combinations or to find suitable coordinates for text output. These functions are not useful in productive operation and should not be used there. To determine on which outputs these functions are to be displayed, these cameras must be selected on the "OSD Groups" tab.

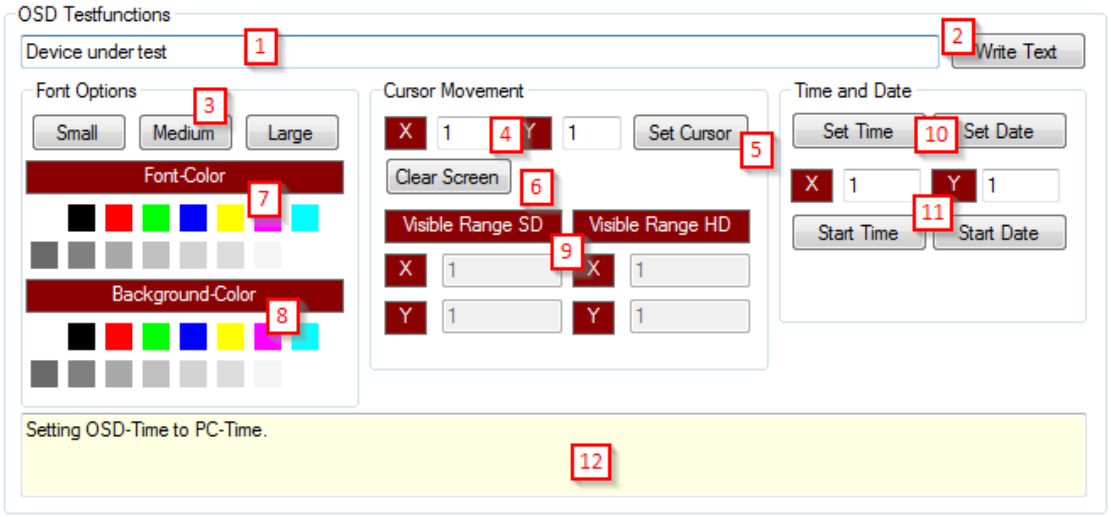


Figure 4-19: OSD test functions

The text entered in the input field **[1]** is written to the current position of the OSD by pressing the button **[2]** with the currently set colors and the currently set font size.

The font size can be set with the buttons **[3]**, all further write actions now use this font size. Tables **[7]** and **[8]** can be used to set the font color and background color for all further writing actions.

The current write position is defined by coordinates **[4]** and set with button **[5]**. Button **[6]** clears the screen but does not (!) change the current cursor position. The text fields **[9]** show the possible coordinate ranges for SD and HD cameras depending on the selected font size, provided the output resolution has not been changed. (see chapter 4.3.7.1)

Buttons **[10]** can be used to set the internal time and date of the receiver to the time/date of the connected PC. These values are then used for the permanent display.

The buttons and input fields **[11]** have no function at the moment.

The text field **[12]** displays a short description text for each function as soon as the function is touched with the mouse.

Not every receiver type has an internal real-time clock, so the commands for setting the time and date have no function here.

4.3.9 Configuration

The functions on this tab are used to configure internal settings of a receiver. Not every function is supported by every type of receiver.

4.3.9.1 Device Name

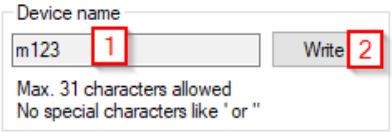


Figure 4-20: Specifying the device name

The name entered in the text field **[1]** can be set with button **[2]**. The device name is then displayed in the title bar so that you always know which receiver you are currently connected to. Some configuration files may also depend on the device name (see chapter 4.4.3.2)

4.3.9.2 Front and Remote Control Unit Display

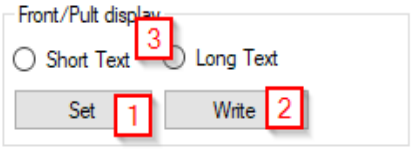


Figure 4-21: Configuring the display texts of the devices display

The texts shown in the display of some receiver and remote control types can be defined via configuration files (see chapter 4.4.3) and stored in the device using the functions shown here.

Button **[1]** sets the data in the receiver, where it is immediately shown on the display. If one is satisfied with the display, the texts can be permanently written to the receiver using button **[2]**.

The selection buttons **[3]** are used to decide whether to use the short or long text variant. The smaller black and white displays can only display the short texts and the larger color displays the long text. However, you can also use the short texts for the large color display.

If a remote control unit with a display is connected to the receiver, the texts are also sent to this remote control unit. If you want to prevent this, the remote control unit must be unplugged first!

4.3.9.3 Network Configuration

Some receiver types can optionally be equipped with a network interface (see chapter 3). In this case, some

settings must be configured in the receiver.

!	To configure a network device, basic knowledge of the network in which the device is operated is required. Therefore, this configuration should only be carried out by appropriately trained persons.

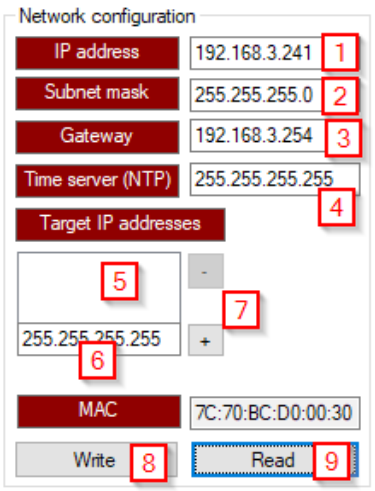


Figure 4-22: Network configuration

The IP address **[1]** of the device is defined here, as well as the subnet mask **[2]** and the default gateway **[3]**. The gateway is only required if the receiver must communicate with other devices outside its own subnet, e.g. a time server.

The IP address of the time server **[4]** can be configured here. If no time server is to be used, this address must be 255.255.255.255.

In receivers of type Matrix, slots can be equipped with relay cards to relay AV signals (see chapter 2.3) to other receivers. In this case, the target systems (max. 3) must be created in the list **[5]**. This is done by entering the IP address of the desired target system in the entry field **[6]** and adding it with the button "+" **[7]**. You can also delete a selected address in the list with the "-" button.

Once all entries have been made, the configuration must still be written to the receiver using the **[8]** button. With button **[9]** the current configuration can be read from the receiver.

4.3.9.4 Network Time Configuration

If the internal clock of the receiver is to be synchronized with an external time server, some settings must be configured, e.g. the IP address of the server (see above).

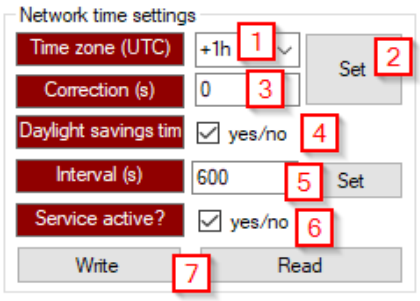


Figure 4-23: Configuration of the network time

The time zone in which the receiver is located must be configured here **[1]**. Due to network latencies, this time may differ from the real time, so a correction in seconds can be configured under **[3]**. This data is set using the **[2]** button. The daylight saving time correction can be switched on or off via **[4]**. The query interval of the time server is set in **[5]**. Whether the service should be generally active can be defined via **[6]**.

Once all data has been configured, the entire data set must still be written to the receiver using the **[7]** button. The Data can be read with the Read button.

4.4 Configuration Files

In the directory of the software, there are some text files which can be used to define settings such as display texts.

4.4.1 camera_control_software.ini

In this file, more meaningful names can be assigned to the individual serial interfaces. This is done per line with the following syntax:

COMx=Text

where x stands for the number of the interface and text represents a user definable text, e.g.

COM3=Receiver

means that the term "COM3" does not appear in the selection list of COM ports, but the text "Receiver" does instead.

Lines beginning with a space are ignored, as are lines beginning with "#". This can be used for comments.

4.4.2 ips.ini

A meaningful name can be assigned to each stored IP address in this file. This is done per line with the following syntax:

Address=Name

where "Address" stands for an IP address in the form aaa.bbb.ccc.ddd and "Name" is a user definable text, e.g.

192.168.3.123=Receiver 1

means that the selection list of IP addresses displays the text "Receiver 1" instead of the address 192.168.3.123.

If new IP addresses are entered in the selection field, they are automatically entered in the file, whereby the text corresponds to the IP address, e.g.

192.168.1.45=192.168.1.45

The text after the"=" can then of course be changed as desired.

4.4.3 matrix.ini

In these files (a separate file can exist for each existing receiver) the names of the individual outputs (video-out for monitors, relay...) and inputs (cameras, DVI inputs...) are defined.

4.4.3.1 Basic structure

The outputs correspond to the columns in the matrix display and therefore start in the file with the text "Col" and the number of the channel, e.g. "Col1" for the first output channel. The rows correspond to the inputs and therefore start with the word "Row" and the ID of the input, e.g. "Row3".

Both a long and a short text can be defined for the outputs. Long texts are displayed in the software and on the large colour display on the receiver, short texts on the small displays on the receiver and remote control unit.

Long texts may have a maximum length of 11 characters, whereby a space should be entered after 5 characters at the latest, which leads to a line break on the large colour display.

Short texts may not be longer than 3 characters. Long and short text versions are separated in the line by a";", e.g.

Col2=Mon. #1;M-1

means that output 2 (Col2) is displayed in the software as "Mon. #1", as well as on the colored display of the receiver, where the texts "Mon." and "#1" are displayed one below the other, while the small display shows the text "M-1".

Row3=Cam. #3;C03

means that in the 3rd row of the matrix view of the software the text "Cam. #3" is shown, on the colored display also, where "Cam" and "#3" are shown below each other, and on the small display the text "C03" is shown.

The last line of the file must contain the highest selectable ID in the form

MaxId=x

with x being the highest ID that can be selected in the system, for example

MaxId=17

means that the rotary knob of the matrix receiver can only be turned up to the input with ID 17.

Only columns and rows defined in this file are displayed in the software.

4.4.3.2 Multiple Files

If there are several receivers in the network, a separate file can and should be created for each receiver. The names of these files must then follow the following convention:

matrix_receivername.ini

where "receivername" is the name of the receiver, which can be assigned on the configuration page (see chapter 4.3.9.1). If the corresponding file does not exist, the "matrix.ini" file is used.

5 Text Overlay on the On-Screen Display (OSD)

5.1 General Information

Receivers offer the possibility to display text over the live video image, e.g. the current frequency and field strength for EMC tests. This insertion can be controlled

- by using the Camera Control Software (refer to chapter 4.3.8)
- by sending OSD commands (see this chapter) on one of its interfaces RS232, USB, or LAN

Check that settings for communication between your device and the receiver comply with chapter 3.

Text is only displayed on AV output cards (see chapter 2.2.1). Relay cards (see chapter 2.2.3) route the original video signal of an input (e.g. a camera) to another target receiver. The text to display must then be configured for video output cards on the target receiver.

5.2 Syntax of Commands

OSD commands consist of a prefix, a colon, a command name, a target address and a variable number of parameters. Following rules apply:

- Prefix and command name must be written in capital letters.
- Command name, target address and parameters must be separated by spaces. Text parameters that contain spaces themselves must be enclosed in quotation marks.
- All commands must be terminated by a newline charakter ("\n").
- "Text" parameters being transmitted must not be longer than 32 characters.

Example: OSD:TXT 255 3 "This is a text"

5.3 Transient OSD Commands

Transient OSD commands have following properties:

- select output by Camera IDs: an AV output cards inserts text if its Camera ID matches the list defined in the OSD command.
- insert transient text: inserted text can be erased by sending OSD:CLR. Changing the input of an AV output card also erases the text inserted by this card.
- used by 3rd party software: typically EMC software sends these commands to insert information about the current EMC test, such as frequency or field strength.

5.3.1 Description of Commands

Table 5-1 shows transient OSD commands. These are supported by **all types of receivers**.

OSD:TXT, **OSD:TXTABS,** and **OSD:TXTREL** use colours set by **OSD:COL** and font size set by **OSD:FONT**. After writing a text, they position cursor behind this text.

The first parameter selects which AV output cards insert a text (see chapter 5.3.2.2).

Command	Address	Parameters				Description
		1	2	3	4	
OSD:COL	255	Camera List	FG-Color	BG-Color	-	Sets foreground (FG) and background (BG) colour.
OSD:FONT			Font-size	-	-	Sets font size.
OSD:POSABS			x	y	-	Sets cursor to absolute position (x, y).
OSD:POSREL			dx	dy	-	Sets cursor to position (x + dx, y + dy) relative to its current position (x, y).
OSD:RET			-	-	-	Moves cursor to the beginning of the current line.
OSD:TXT			"Text"	-	-	Writes "Text" at current cursor position.
OSD:TXTABS			x	y	"Text"	Writes "Text" at absolute position (x, y).
OSD:TXTREL			dx	dy	"Text"	Writes "Text" at position (x + dx, y + dy) relative to the current cursor position (x, y).
OSD:CLR			-	-	-	Clears transient text from screen. Does not clear permanent text, time, and date (see chapter 5.4).

Table 5-1: Transient OSD commands

5.3.2 Description of Parameters

5.3.2.1 Address

The target address 255 sends a broadcast command to all channels. You can select AV output cards using the camera list in the next parameter.

5.3.2.2 Camera List (Parameter 1)

OSD commands are executed by all AV output cards that display one of the camera IDs from the camera list.

This camera list may contain following items:

- Camera IDs separated by commas. **Example: 1,3,4,5,6,8,10**
- Range of camera IDs. **Example: 3-6**
- Combination of both. **Example: 1,3-6,8,10**
- Predefined group of camera IDs. **Example: g2**

Groups are only supported by receivers of type matrix. They can either be created using the group command (see table 5-2) or by using the optional Camera Control Software.

The receiver stores a defined group permanently. Instead of a camera list you can then use the group name (g1 to g15) to address the selected cameras. If camera Ids change, you only need a change the group and not the camera list in the command.

Command	Address	Param 1	Param 2	Description
SYS:GRP	250	Group ID	ACSII List	Assigns camera IDs of the ASCII List to the group with the specified ID. Group ID = The value of the ID must be between 1 and 15. ASCII List = Each camera ID is listed as a separate character. The ASCII code of the character is calculated from camera ID + 47. The camera ID must be between 1 and 64. Omit ASCII List to delete all camera IDs from the selected group. **Example:** SYS:GRP 250 2 0:C assigns camera IDs 1, 11 and 20 to group 2.

Table 5-2: OSD Commands for grouping AV output cards (only receiver type matrix)

5.3.2.3 X-/Y-Position (Parameters 2, 3)

The maximum number of columns (x) and rows (y) on the OSD depends on the output screen resolution and the font size. Table 5-3 shows the most common combinations.

For other combinations, you use the character widths and heights listed table 5-4 for your own calculation.
Example: If the horizontal output resolution is 1080 px wide and you set font size "small" (width=12 px), the maximum OSD row is y = 1080 / 16 = 67.

Output Resolution	Font Size	Maximum	
		Column (x)	Row (y)
720 x 576 (SD, PAL)	1	60	36
	2	30	18
	3	22	12
704 x 480 (SD, NTSC)	1	58	30
	2	29	15
	3	22	10
1280 x 720 (HD)	1	106	45
	2	53	22
	3	40	15
1920 x 1080 (FHD)	1	160	67
	2	80	33
	3	60	22

Table 5-3: Maximum x-/y-position by output resolution and font size

5.3.2.4 Font Size and FG-/BG-Colour (Parameters 2, 3)

Font Size	Description	Width	Height
1	Small	12 px	16 px
2	Medium	24 px	32 px
3	Large	32 px	48 px

Table 5-4: Font sizes for transient OSD commands

FG-/BG-Colour	Description
0	Do not change colour
1	Transparent
2	Black
3	Red
4	Green
5	Blue
6	Yellow
7	Violett
8	Turquoise
9	Dark gray
10	Gray 2
11	Gray 3
12	Gray 4
13	Gray 5
14	Gray 6
15	Bright gray
16	White

Table 5-5: FG-/BG-Colours for transient OSD commands

5.3.3 Examples

OSD:CLR 255 1,4,6-9,12

Clears the screens that show one of the camera IDs 1,4,6-9 or 12.

OSD:TXT 255 3,5-7 "This is text"

Writes "This is a text" at the current cursor position on the screens showing camera IDs 3 and 5-7.

OSD:TXTABS 255 1-8 5 5 "12:30:00"

Displays text (time "12:30:00") at screen position x=5 and y=5 on the screens with camera IDs 1-8. Using OSD:TXT and OSD:TXTABS, the time or date can be displayed in a user defined format. A command with the new value must be sent for each update.

5.4 Permanent OSD Commands

Permanent OSD commands have following properties:

- select output by channel number: each permanent OSD command addresses one AV output card based on its channel number. The addressed output inserts information independent from its current camera ID.
- insert permanent information:
  - the information (text, date, time, or battery status) is always visible when an ouput is on. Erasing transient text, does not erase permanent information.
  - permanent information can be deactivated by setting its font size to 0.
  - configuration of permanent information is restored after restart, after it has been saved with OSD:PSTORE

- used by Camera Control Software and 3rd party software: customers typically use the Camera Control Software to configure permanent OSD information (see chapter 4.3.8.1). Once this is completed, EMC software sends only MX:TIME and MX:DATE (see table 5-6) to update time and date.

5.4.1 Description of Commands

Tables 5-6 and 5-7 show permanent OSD commands in order to display text, time, and date.

Table 5-8 shows permanent OSD commands in order to display battery status.

Whether a command is supported by a receiver, depends on its receiver type and firmware version. This dependency is described in table 5-9.

Command	Address	Parameters							Description	
		1	2	3	4	5	6	7		
OSD:PTEXT	Channel-No	0	Size	x	y	FG-Color	BG-Color	"Text"	Sets font size, position, colours, and text.	(1)
OSD:PTEXT2									PTEXT2 - PTEXT4 show additional texts. Parameters are identical to OSD:PTEXT.	(2)
OSD:PTEXT3										
OSD:PTEXT4										
OSD:PTIME								-	Sets font size, position, and colours for displaying the current time. A valid time must be set using MX:TIME.	(1)
OSD:PDATE									Sets font size, position, and colours for the displaying the current date. A valid date must be set using MX:DATE.	
OSD:PSTORE			-	-	-	Stores permanent OSD configuration, so that it is restored after restart. Storage contains all parameters from OSD:PTEXT[2,3,4], PDATE. PTIME, TFRMT, DFRMT, and PBAT[START,OK,LOW,EMPTY]. **ATTENTION:** Do not send this command frequently, as this can lead to wear out of the receiver's internal memory.				(1)
MX:TIME	250	Hour	Minute	Second	-	Sets time and date of the internal controller. Values are not stored with OSD:PSTORE, but are automatically incremented as explained in chapter 5.4.3.				
MX:DATE		Year	Month	Day	-					

Table 5-6: Permanent OSD commands for text, time, and date

Command	Address	Parameters								Description	
		1	2	3	4	5	6	7	8		
OSD:TFRMT	Channel-No	0	Clock System	Format	Sep	Format	Sep	Format	Day Period	Sets displayed time format. Clock System = **12h 24h** Format = **h hh m mm s ss** (**##** = do not show) Sep = **. , ; : - _ / |** (**#** = do not show) Day Period = **am AM pm PM** (only for 12h clock system, omit parameter to not show)	(2)
OSD:DFRMT			Format	Sep	Format	Sep	Format	-	-	Sets displayed date format. Format = **YY YYYY M MM D DD** (**##** = do not show) Sep = same as OSD:TFRMT	

Table 5-7: OSD commands for date and time format

Command	Address	Parameters				Description	
		1	2	3	4		
OSD:PBAT	Channel-No	0	Size	x	y	Sets font size and position for battery status. Set size to 0 to not show any battery status	(2)
OSD:PBATSTART			FG-Color	BG-Color	"Text"	Set colours and text of a specific battery status. There is one command for each status START, OK, LOW, or EMPTY. Use empty text "" to not show a specific battery status.	
OSD:PBATOK							
OSD:PBATLOW							
OSD:PBATEMPTY							

Table 5-8: Permanent OSD commands for battery status

Note	Receiver Type	Since Firmware Version
(1)	Tabletop/Multichannel, 19“, Matrix	v035.00
	Tabletop/Singlechannel	v045.05
(2)	Tabletop/Multichannel, 19“	v035.00_uC-07
	Matrix	v045.00
	Tabletop/Singlechannel	v045.05

Table 5-9: Permanent OSD commands supported by receiver type and firmware version

5.4.2 Description of Parameters

5.4.2.1 Address

- 250 addresses the internal controller and must not be changed.
- Channel-No. addresses an AV output card at a specific channel. This card always processes the permanent OSD command regardless of the camera ID it currently shows.

5.4.2.2 X/Y-Positions

Same as chapter 5.3.2.3.

5.4.2.3 Font Sizes and Colours

Font Size	Description	Width	Height
0	Do not show	-/-	-/-
1	Small	12 px	16 px
2	Medium	24 px	32 px
3	Large	32 px	48 px

Table 5-10: Font Sizes

FG-/BG-Colour	Description
0	Transparent
1	Black
2	Red
3	Green
4	Blue
5	Yellow
6	Violett
7	Turquoise
8	Dark gray
9	Gray 2
10	Gray 3
11	Gray 4
12	Gray 5
13	Gray 6
14	Bright gray
15	White

Table 5-11: FG-/BG-Colours

5.4.3 Synchronisation of Time and Date with External Sources

Time and date can be synchronized with an external source as follows:

- use the network time protocol (NTP). Requires optional LAN interface. Refer to chapter 4.3.9.4 how to configure this function.
- send MX:TIME and MX:DATE (see table 5-6) from an external source (such as EMC PC).

Following interval for sending MX:TIME and MX:DATE is recommended:

- Options "**real-time clock without battery**" and "**no real-time clock**": send MX:TIME and MX:DATE on each start of the receiver. After that, send MX:TIME cyclically depending on the required accuracy. Option "**real time clock"** provides an accuracy of up to 5ppm, otherwise a deviation of up to 2% can occur.
  Send MX:DATE only when you change time from one day to another.
- Option "**real-time clock with battery**": the internal controller updates time and date also when turned off.
  Send MX:TIME and MX:DATE only when receiver and external source have run out of sync.
  Recent receivers always combine option "OSD" with option "real-time clock with battery".

5.4.4 Examples

MX:TIME 250 13 5 1

Sets the time of the internal controller to **13h 5m 1s**.

OSD:PTIME 2 0 1 3 4 14 2

Displays the time of the internal controller on channel 2 with text size=1, position x=3, y=4, foreground colour=14

and background colour=2. The time value is incremented automatically every second.

OSD:TFRMT 2 0 24h hh : mm : ss

OSD:PTIME shows **13:05:01** on channel 2.

OSD:TFRMT 2 0 12h hh : mm # ## AM

OSD:PTIME shows **01:05 AM** on channel 2.

MX:DATE 250 2017 3 31

Sets the date of the internal controller to **31st March 2017**.

OSD:PDATE 2 0 1 3 5 1 2

Displays the date of the internal controller on channel 2 with text size=1, position x=3, y=5, foreground colour=1 and background colour=2. The date value is incremented automatically when time passes midnight.

OSD:DFRMT 2 0 YY / M / D

OSD:PDATE shows **17/3/31** on channel 2.

OSD:DFRMT 2 0 DD . MM . YYYY

OSD:PDATE shows **31.03.2017** on channel 2.

OSD:PBAT 2 0 3 1 2

Displays battery status of camera currently switched on channel 2 with text size=3, x=1, and y=2.

OSD:PBATOK 2 5 6 "OK"

Sets foreground colour=5, background colour=6, and text="BAT OK" for battery status OK.

5.5 Obsolete OSD Commands (Deprecated)

Obsolete OSD commands are still supported to provide backward compatibility. It is not recommended to use them when implementing new 3rd party software.

Table 5-12 shows OSD commands, which have applied to receiver type tabletop/singlechannel. This receiver type now provides the same command set as all other receiver types (see table 5-9), so that these commands are now obsolete.

Command	Address	Parameters				Description
		1	2	3	4	
OSD:DATE	255	Camera List	Year	Month	Day	Sets the date of an AV output card.
OSD:TIME			Hour	Minute	Second	Sets the time of an AV output card.
OSD:TIMERUN			Status	-	-	Switches display of time on (status = 1) or off (status = 0).
OSD:DATERUN			Status	-	-	Switches display of date on (status = 1) or off (status = 0).
OSD:DATEABS			x	y	-	Sets the position for the date to display.
OSD:TIMEABS			x	y	-	Sets the position for the time to display.

Table 5-12: Obsolete OSD commands (used only by type tabletop/singlechannel)

6 Troubleshooting

The following troubleshooting list helps you to locate and fix problems in order to reduce downtimes.

Notice!

- For problems that you cannot solve yourself, please contact mk messtechnik GmbH for further assistance.
- Only send in devices after you have contacted a representative of mk messtechnik GmbH and received an RMA number to authorise the return.

Error	Possible Cause	Solution
AV input card Receiver does not show video from AV input card at output	The AV input card cannot process the input resolution	Set a different output resolution on your video source, see chapter 2.2.2.1
	The wrong video input is set on the AV input card	Select the correct video input (DVI/HDMI, VGA or CVBS) on the AV input card, see chapter 2.2.2.1
	The video source has read the wrong EDID data	Trigger the detection of the monitor at your video source or reconnect the video source to the AV input card, see chapter 2.2.2.3
Relay card Target receiver does not display the relayed AV signal at the output	Relay card at the source receiver is not switched to the corresponding input	Correct the switching at the source receiver, see chapter 2.3
	Error in network configuration	Check and, if necessary, correct the configuration of the network, see chapter 2.3 and 4.3.9.3
	Error in wiring between source and destination receiver	Check the optical wiring. Check the connection via network. Are both receivers in the same subnet? Are the network settings correct?
	Multiple relaying of the same source to target receiver	Correct the switching at the source receiver, see chapter 2.3
	Source ID exists more than once	Check with the Camera Control Software whether all inputs have different IDs, see chapter 4.3.7.2
Optical input / AV output card	See base manual	
Optical input / AV output card VGA output shows wrong colors	Mode incorrectly set	Check the configuration (Mode and Submode) of the AV output card, see chapter 4.3.7.1

Error	Possible Cause	Solution
Camera Control Software No connection to receiver	Incorrect wiring	Check the wiring. If connected via network, check the network settings in the Camera Control Software (see chapter 4.3.9.3) and in your network. Check in particular the IP address of the receiver and whether the subnet is accessible from your PC.
	Wrong parameters	Observe the notes in chapter 4.2.2
Camera Control Software No feedback when remote controlling a camera, e.g. zoom	A camera can only be remote controlled on the Matrix receiver type if it is switched to at least one output.	Switch the camera to an output and try again.
Camera Control Software Input not available	Camera off or incorrectly configured. Battery empty.	See base manual
	Incorrect ID set on camera.	
	Camera incorrectly wired.	
	AV input card incorrectly configured or not connected.	See AV input card
On-Screen Display No text display	Error in communication	Check the communication settings according to chapter 3
	Relay card	Text is only displayed on an AV output card. If you are relaying, you have to configure the on-screen display at the target receiver.
	Wrong command	Check the syntax of the command according to chapter 5.2 and the parameters according to chapters 5.3 and 5.4.
	Wrong ID	Check whether the addressed camera ID or OSD group (see chapter5.3.2.2) is known to the receiver.