

User Manual

OCTO Digital signal processor



Safety instructions

When using this electronic device, basic precautions should always be taken, including the following:

- 1 Read all instructions before using the product.
- 2 Do not use this product near water (e.g., near a bathtub, washbowl, kitchen sink, in a wet basement or near a swimming pool etc).
- 3 Use this device when you are sure that DSP has a stable base and it is fixed securely.
- 4 This product, in combination with loudspeakers and amplifier may be capable of producing sound levels that could cause permanent hearing loss. Do not operate for a long period of time at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult with otorhinolaryngologists.
- 5 The product should be located away from heat sources such as radiators, heat vents, or other devices that produce heat.
- 6 The product should be connected to a power supply that is described in the operating instructions or are marked on the product.
- 7 Before the wiring always unplug equipment's from main power supply.
- 8 The power supply should be undamaged and never share an outlet or extension cord with other devices. Never leave device plugged in the outlet when it is not being used for a long period of time.
- 9 Care should be taken that objects do not fall into liquids and liquids would not be spilled on the device.
- 10 The product should be serviced by qualified service personnel if:
 - The power supply or the plug has been damaged.
 - Objects have fallen into or liquid has been spilled on the product.
 - The product has been exposed to rain.
 - The product has been dropped or the enclosure damaged.
- 11 There are some areas with high voltage inside, to reduce the risk of electric shock do not remove cover of the microphone receiver or power supply. The cover should be removed by the qualified personnel only.


 CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN	To reduce the risk of electric shock, do not remove screws. No user-serviceable parts inside. Refer servicing to qualified service personnel. To reduce the risk of fire, electric shock or product damage, do not expose this apparatus to rain, moisture, dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.
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Before you start

OCTO - 8 input and 8 output full matrix DSP platform for microphone and line level audio processing. High performance 24 bit AD/DA converters. Processor configuration can be done in real time with computer via Ethernet. All inputs have compressors, equalizer, gate and auto gain functions and are designed for both line and mic level audio signals. Phantom power, sine wave, pink and white noise generators, auto mixer, priority control. Automatically adjust output level according ambient noise microphone measurements. Limiter and EQ designed for all outputs. GPIO programmable inputs and outputs. User friendly and intuitive operation software.

FEATURES

- Digital signal processor 8 x 8
- Compressor, limiter, gate, parametric equalizer
- Ambient noise compensation
- Auto mixer
- Auto gain
- Test tone generator
- Balanced Line/Mic inputs
- Input priority selection
- Phantom power
- Ethernet control port
- GPIO inputs/outputs
- Video camera voice tracking
- RS232 and RS485 camera control
- VISCA and PELCOL D video camera control
- RS232 interface to control mute, matrix function and audio level.

Operation

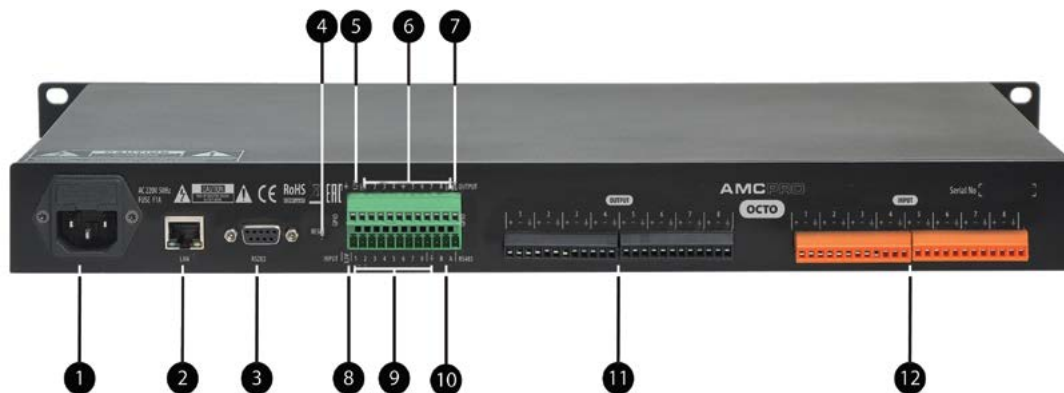
Front Panel



1. Power on indicator | 2. Main power switch

Operation

Rear Panel

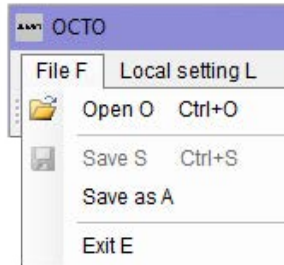


1. Main power connector and fuse | 2. Ethernet interface | 3. RS232 serial interface for video camera control | 4. Reset | 5. DC output 12V | 6. GPIO outputs | 7. DC output 12V | 8. DC output 3,3V | 9. GPIO inputs | 10. RS485 serial interface | 11. Balanced audio outputs | 12. Balanced audio inputs

Software interface

MENU BAR


File menu



OPEN

Opens and load previously saved DSP presets from AMC/OCTO/file catalog located, in computer's memory. The new DSP configuration will be loaded to currently selected preset. Open function also can be enabled by using  icon located in main software window.

SAVE

This function saves DSP configuration to currently selected preset to AMC/OCTO/file catalog. The analogue way to use save function is click  icon on main software window.

SAVE AS

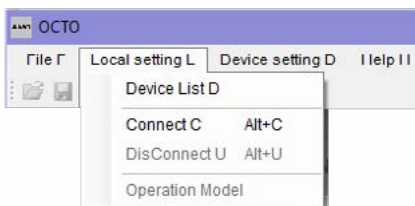
Enables save DSP configuration with availability to choose file location and name.

EXIT

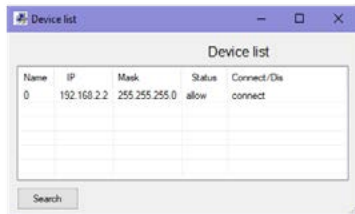
Close program window.

Software interface

Local setting menu




DEVICE LIST



Connection to DSP must be started by choosing the device from device list. If device is not listed, press "Search" button to get a list of all OCTO IP addresses which are available in local network. Before searching make sure that computer

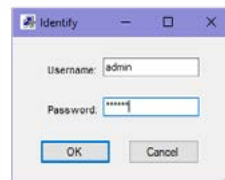
and OCTO are located in the same network segment. Default OCTO IP address is 192.168.1.10 Sub net mask: 255.255.255.0 Gate way: 192.168.1.1. This address can be changed after you connect to DSP first time by using default IP. Pay attention: The only one user can be connected at the same time.

CONNECT

Click connect in local setting menu to establish communication between OCTO software and DSP. The same function can be done by using double click on the IP address in device list window or by using  icon in the main program's window. If OCTO software can't find IP automatically, instead of login window will be displayed device list. After IP selection connection procedure will be continued.

Local setting menu


LOGIN WINDOW



User name and password must be added to "identify" window in order get access to OCTO user interface.

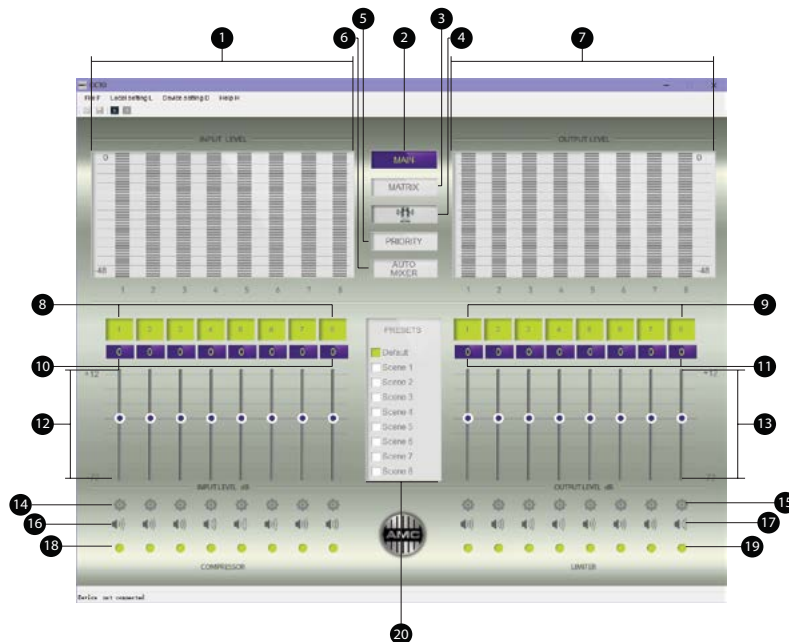
Default user name: admin
Default password: 123456

DISCONNECT

This button stops communication between DSP and OCTO software without the closing program window. The analogue function can be enabled by using  icon in the main program's window.

Software interface

MAIN WINDOW



1. Input level meter | 2. Return to main | 3. Matrix settings | 4. Ambient noise compensation (ANC) module | 5. Input priority settings | 6. Auto mixer settings | 7. Output level meter | 8. Input name | 9. Output name | 10. Input level value | 11. Output level value | 12. Input level fader | 13. Output level fader | 14. Input settings | 15. Output settings | 16. Input mute | 17. Output mute | 18. Input compressor indication | 19. Output limiter indication | 20. Presets

Software interface

Input/output level meter - level meter shows audio level in the input or output, it indicates amplitude of an audio signal.

Main - button allows return to main OCTO window.

Matrix - configuration window which allow audio routing in 8x8 matrix and also indicates already occupied inputs and outputs. More info in pages 9-10.

Ambient noise compensation - opens ANC setup window in order to setup automatic audio level controlling according ambient noise level. More info in pages 15-17.

Priority - input priority configuration window to select and setup priority audio input. More info in pages 11-12.

Auto mixer - opens auto mixer setup window. More info in pages 13-14.

Input / output name - all OCTO audio inputs and outputs can be renamed by user. The maximum name length is 8 symbols including letters and numbers. Name can be changed in any menu there name window is displaying, by mouse click.

Input / output level value - it's a numerical values which shows what audio level is set with fader. There is possibility to set audio level directly by adding values to these windows.

Input / output level fader - designed to adjust audio level. Audio level can be

adjusted by dragging the fader with mouse pointer or by clicking mouse in any area near the fader in order to force slider jump near the pointer. In order to adjust level gradually also can be used keyboard navigation buttons "up" and "down".

Input / output settings - There are located basic setting for all inputs and outputs. Input gain (mic/line) selector, phantom power, test tone generator, compressor and gate settings, limiter, auto gain, EQ and phase inverter are located under input / output settings button. More info in pages 18-25.

Mute. Turns on/off the input and output signal.

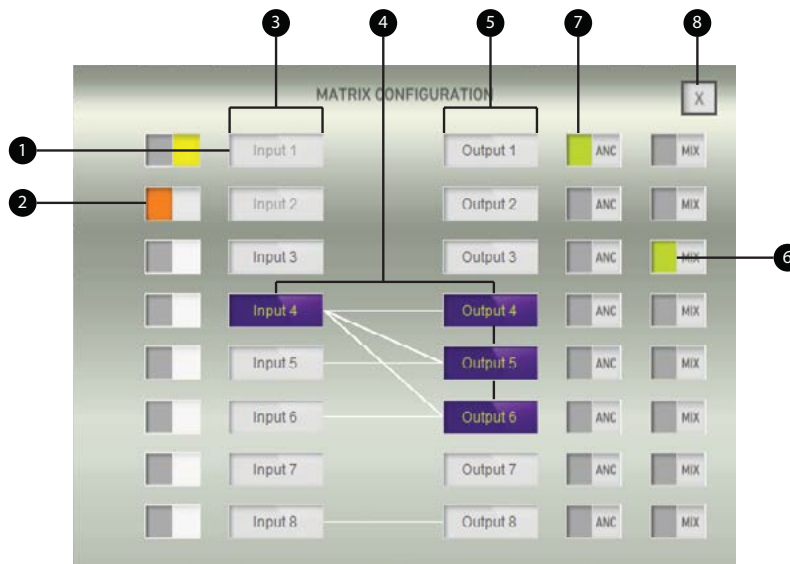
Input compressor indication - indicates when input audio signal became compressed according audio compressor module settings. Indicator became green when audio signal is compressed, otherwise it is grey.

Output limiter indication - indicates when input audio signal amplitude became limited according limiter settings. Active limiter indicates in green color.

Presets - OCTO DSP can save eight audio presets displayed in preset window. The current preset is marked by green color near the preset name. All names can be changed by user, except the default preset which parameters and name can't be changed. There are two ways how the presets can be operated: double click on the preset name which allows load selected preset. Meantime OCTO settings will be saved automatically to current present before loading new preset. Other place to load the presets is "Scene Manager" menu. More about "Scene Manager" in page 27.

Software interface

MATRIX



1. Occupied input | 2. Input user indication | 3. Input button | 4. Selected group |
5. Output button | 6. Auto mixer indication | 7. ANC indication | 8. Exit button |

Software interface

Matrix setup allow to link any audio inputs to any outputs, also display occupied audio inputs and indicates active DSP modules linked to audio outputs.

Linking inputs and outputs - in order to link audio channels, please select required inputs and outputs. Lines between audio channels indicates audio links. All linked channels became purple color after selection.

Create input link to several outputs - please select required input first and then select necessary outputs which must have audio signal from selected input. Additional click on already linked audio channel will interrupt connection. The audio linking process can be ended by mouse click on free space at matrix area or by closing matrix window.

Output link to input process is the same, just in this case first should be selected output and then all inputs from which audio must be taken. Second click on already selected output brakes connection with linked inputs.

Occupied input - Ambient noise compensation module and priority module have it's own audio mixers. Audio from this mixer can be routed to outputs inside these modules setting. There is no possibility use the same input in the matrix if the input is already used in ANC or priority module because of DSP architecture. Input selection in matrix module is disabled, if inputs are already occupied by ANC or priority module.

Input user indication - this indication show the reason why input is disabled and can't be used in matrix module. Orange color indicates that input is occupied by ANC module, yellow - priority module use this input. Grey color indicates that input is free to use.

Input button - click this button in order to link audio from this input. Selected button change it's color to purple. In order to skip selection or finish routing, click on free matrix window's area or use exit button to close the window.

Selected group - if already routed input will be clicked, all group with linked outputs change color to purple. Second click on selected input will automatically unlinks all outputs linked to it. Selected group outputs can be unlinked and one by one with mouse click on wanted unlink output. In order to add more links click on grey color outputs.

Output button - click this button in order to link audio to this output. Selected button change it's color to purple. In order to skip selection or finish routing click on free matrix window's area or use exit button to close window.

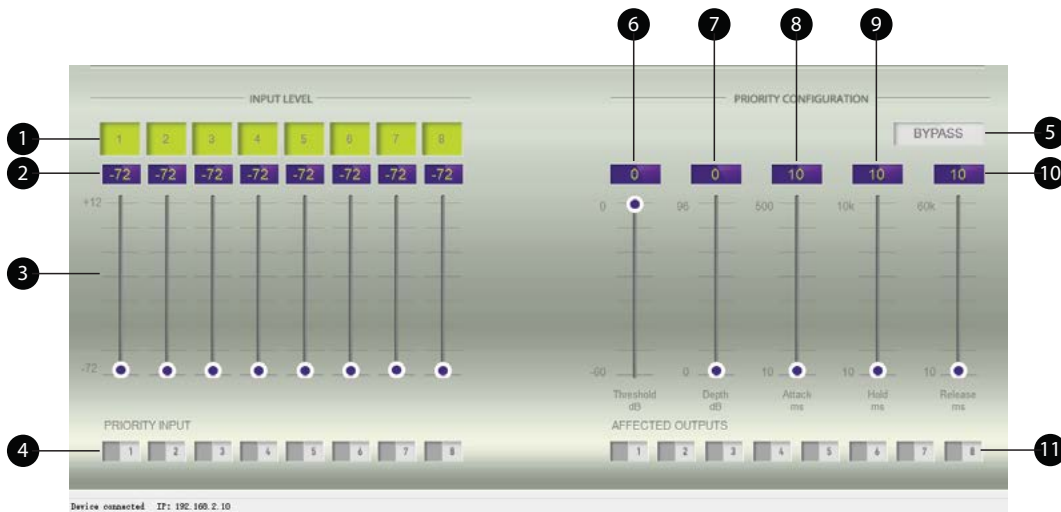
Auto mixer indication - it shows that marked output is routed from auto mixer module.

ANC indication - indicates that in this output is routed audio from mixer in ambient noise compensation module.

Exit button - close matrix window.

Software interface

PRIORITY



1. Input name | 2. Input level value | 3. Input level fader | 4. Priority input selector | 5. By pass button | 6. Threshold fader | 7. Depth level | 8. Attack time | 9. Hold time | 10. Release time | 11. Output selector

Software interface

Priority module gives a choice to reduce or even mute audio in case if signal is detected in priority audio input. Module have it's own audio mixer dedicated to adjust audio levels which will be sent to OCTO outputs and which will be muted or reduced by priority input. Audio inputs used in priority mixer became occupied and can't be used in matrix module for future routing. These occupied inputs are disabled in matrix module and marked by yellow indication.

Input name - all OCTO audio inputs and outputs can be renamed by user. The maximum name length is 8 symbols including letters and numbers. Name can be changed in any menu there name window is displaying, by mouse click and keyboard.

Input level value - it's a numerical value which shows what audio level is set with fader. There is possibility to set audio level directly by adding values to these windows.

Input level fader - Designed to adjust audio level. Audio level can adjusted by dragging the fader with mouse pointer or by clicking mouse in any area near the fader in order to force slider jump near the pointer. In order to adjust level gradually also can be used keyboard navigation buttons "up" and "down".

Attention: If audio level in Priority mixer is set higher than -72dB, input automatically became disabled and can't be used in matrix module. Please ensure that all not used mixer inputs is set to -72dB.

Priority input selector - selector designed to set priority input according it's audio priority mixer signal will be muted. OCTO DSP can support one priority

input. Selected input will be disabled, also audio from this input will not be routed to OCTO output. If necessary to have priority audio in output, link must be made in matrix module.

Bypass - enables and disables priority module. This function can't recover disabled inputs in matrix module even if bypass is set in priority module. In order to make occupied inputs active in matrix module, occupied inputs level must be set to -72 dB manually.

Threshold - gives possibility to set an audio limit beyond which module starts mute signal from priority mixer.

Depth level - specifies how much mixer volume will be reduced in case of priority activation. Max depth level mutes audio totally.

Attack time - allows to set time period through which audio level will be reduced from unaffected level till specified in "Depth level" setting.

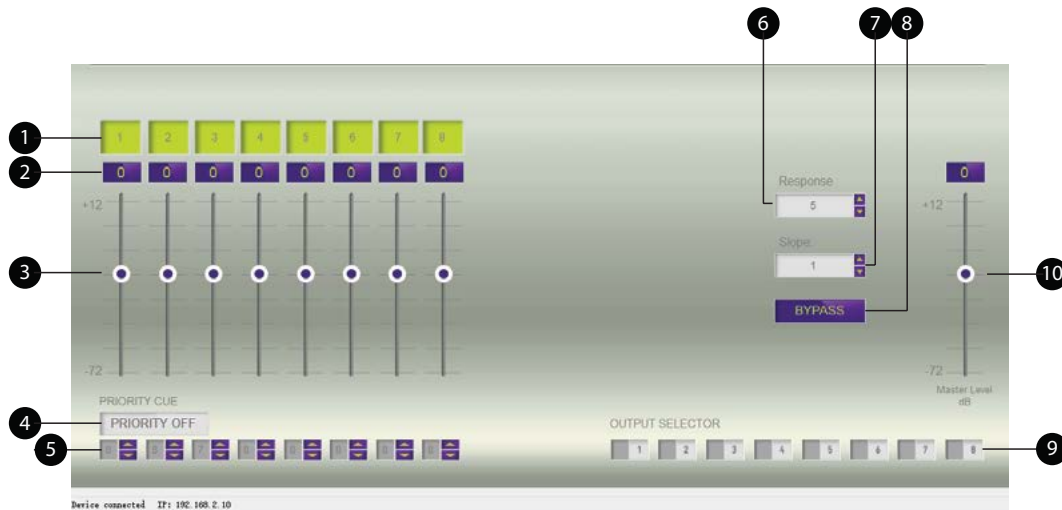
Hold time - time interval of reduced or muted audio level.

Release time - allows set time period through which audio level will be increased from level specified in "Depth level" setting till unaffected, normal level.

Output selector - designed to select OCTO outputs to which signal from priority mixer will be linked.

Software interface

AUTO MIXER



1. Input name | 2. Input level value | 3. Input level fader | 4. Priority off button | 5. Priority level selector and input enable switch | 6. Response time | 7. Slope level | 8. Bypass button | 9. Output selector | 10. Master level

Software interface

Automatic mixer module allow to use up to eight microphones in audio systems and control it's gain automatically. Auto mixer reduce non used inputs gain and increase gain in currently used microphone input in order to reduce microphones feedback, background noise and other extra noises influenced by simultaneously used microphones. OCTO auto mixer offers a choice to set priority levels for all inputs in order to have possibility set different gain adjustment for different priority. Level one, highest priority microphone will get more gain compared with lowest, eight level microphone. It helps precisely adjust automatic mixer in any situation.

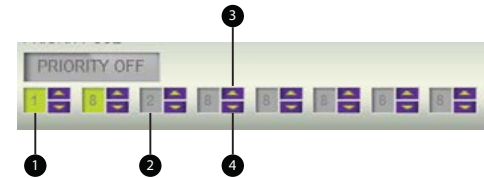
Input name - all OCTO audio inputs and outputs can be renamed by user. The maximum name length is 8 symbols including letters and numbers. Name can be changed in any menu there name window is displaying.

Input level value - it's a numerical value which shows what audio level is set with fader. There is possibility to set audio level directly by adding values to these windows.

Input level fader - Designed to adjust audio level. Audio level can adjusted by dragging the fader with mouse pointer or by clicking mouse in any area near the fader in order to force slider jump near the pointer. In order to adjust level gradually also can be used keyboard navigation buttons "up" and "down".

Priority off button - Priority off button allow reset priority cue in order to set the same priority level to each microphone. After reset highest priority level will be set to all inputs, slope value will be reset too.

Priority level selector and input enable switch - this is multipurpose button designed to enable/disable audio input in auto mixer and set it's priority level cue. Enabled input is displayed in green color while disabled in grey. In order to enable audio signal please click on the window there priority level is indicated, purple color buttons allows control priority level.



1. Enabled input | 2. Disabled input | 3. Priority level increase button | 4. Priority level decrease button

Response time - is a time when auto mixer start to response. The value can be entered in very small steps by using up and down buttons located near the value window. Value can be entered directly by keyboard or "up" and "down" navigation buttons. Before the entering value with keyboard please click on the "Response time" window.

Slope - parameter describing how much input gain and other auto mixer parameters will affected during auto adjustment. The value can be entered in the same way as in "Response time" window.

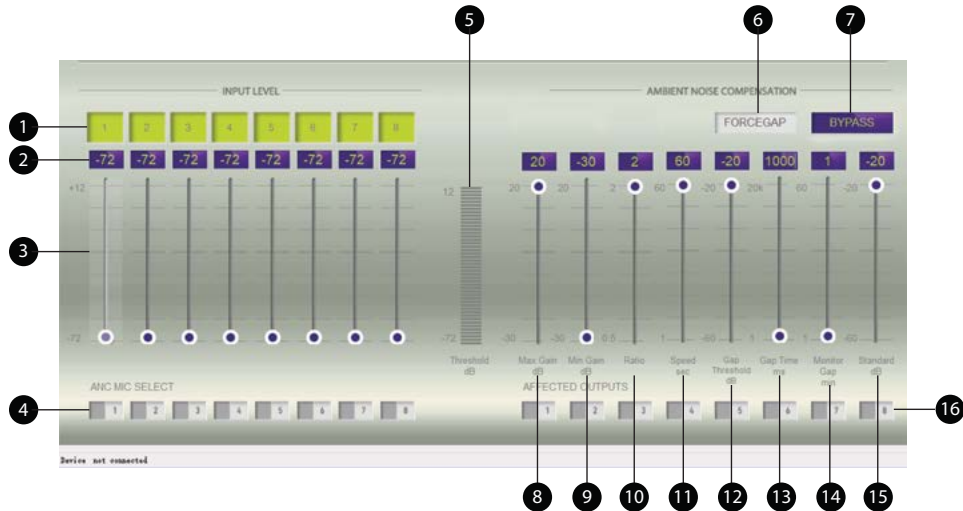
Bypass - designed to enable or disable auto mixer module.

Output selector - designed to select OCTO outputs to which signal from auto mixer will be linked.

Master level - give a choice to adjust a volume of all summed audio signals from auto mixer.

Software interface

AMBIENT NOISE COMPENSATION



1. Input name | 2. Input level value | 3. Input level fader | 4. ANC microphone selector | 5. ANC Threshold indication | 6. Force gap button | 7. Bypass button | 8. Max. gain selector | 9. Min. gain selector | 10. Ratio selector | 11. Speed selector | 12. Gap threshold selector | 13. Gap time selector | 14. Monitor gap | 15. Standard level selector | 16. Output selector

Software interface

ANC module allows automatically adjust output audio level according ambient noise microphone. Module gives a possibility to adjust background music or public address announcements volume depending on background noise in public areas. It ensures that public announcements will be audible clearly all the time.

Input name - all OCTO audio inputs and outputs can be renamed by user. The maximum name length is 8 symbols including letters and numbers. Name can be changed in any menu there name window is displaying.

Input level value - it's a numerical value which shows what audio level is set with fader. There is possibility to set audio level directly by adding values to these windows.

Input level fader - Designed to adjust audio level. Audio level can be adjusted by dragging the fader with mouse pointer or by clicking mouse in any area near the fader in order to force slider jump near the pointer. In order to adjust level gradually also can be used keyboard navigation buttons "up" and "down".

Attention: If audio level in ANC mixer is set higher then -72dB input automatically became disabled and can't be used in matrix module. Please ensure that all not used mixer inputs are set to -72dB.

ANC microphone selector – selector designed to set one audio input which will be used to connect microphone for background noise measuring. Selected input will be disabled and audio from this input will be not routed to OCTO output in ANC module. In case if you need to have audio signal from noise measurement microphone, it can be linked to output in matrix module.

ANC Threshold indication – indicates ANC microphones audio level taken through noise measurement gaps. The level will be displayed until next measurement.

Force gap button – allows to make a gap in order to measure background noise manually. It mutes ANC outputs in order to prevent pick up the audio from the speakers together with background noise. Muting duration can be set in "Gap time" selector. It's highly recommended to press "Force gap button" every time after new adjustments are made in order to update ANC module status immediately.

Software interface

Bypass - enables and disables priority module. This function can't recover disabled inputs in matrix module even if bypass is set in priority module. In order to make occupied inputs active in matrix module, occupied inputs level must be set to -72 dB manually.

Max. gain selector – designed to set maximum audio level increase in ANC module when background noise level is very high.

Min. gain selector – designed to set lowest audio level decrease in ANC module when background noise level is very low. It's default audio level.

Ratio – this parameter describes how much sound will be increased then ANC module starts adjusting volume.

Speed - it's a time period in which ANC module increase or reduce audio level. Higher level will makes audio level adjustment smoother and less noticeable. Highly recommended set lowest level in order to notice sound level changes more quickly during ANC configuration.

Gap threshold – ANC module starts ignore Gap timing and starts measure and adjust output volume continuously when OCTO input level is lower than Gap threshold. If output signal became higher than set in Gap thresholds, ANC module makes noise measurements according to Gap timing settings – Mutes audio signal in order to measure background noise.

Gap time – determinates how long the audio signal will be muted. ANC module mutes audio for specified time in order to measure the background noise. It helps to ensure that background music and public announcement will not be measured as noise.

Monitor gap – it's a time period between the gaps.

Standard level - designed to set background noise value from which ANC module will starts adjust audio level.

Output selector - designed to select OCTO outputs to which signal from priority ANC module will be linked.

Software interface

INPUT SETTINGS



1. Input level value | 2. Input level fader | 3. Gain selector | 4. Phantom power switch | 5. Test tone generator | 6. Audio compressor | 7. Gate setting | 8. Auto gain | 9. Phase inverter | 10. Input name | 11. Input selector | 12. Bypass button | 13. Parameter equalizer | 14. Center frequency indicator | 15. Amplitude indicator | 16. Bandwidth indicator

Software interface

Input settings includes all features necessary for audio inputs configuration. It's allows to set input gain level, parametric EQ, compressor and gate setting, also enable phantom power or set auto gain function.

Input level value - it's a numerical value which shows what audio level is set with fader. There is possibility to set audio level directly by adding values to these windows.

Input level fader - Designed to adjust audio level. Audio level can adjusted by dragging the fader with mouse pointer or by clicking mouse in any area near the fader in order to force slider jump near the pointer. In order to adjust level gradually also can be used keyboard navigation buttons "up" and "down".

Gain selector - designed to adjust input gain. "MIC" setting boost input gain by +20 dB in order to make DSP balanced input suitable for mic level audio signal. "LINE" decrease input gain by -20 dB in order to set input for live level audio signals. Input gain in this case is -4dB.

Phantom power - enables 48V DC voltage on input to supply condenser microphones. Phantom power can be enabled only if MIC gain level is select to input gain selector.

Test tone - It's signal generator for audio testing and adjusting. There are available: sine wave, pink and white noise signal modules. Test tone generator automatically set input gain to line level.

Compressor - allow to compress audio signal dynamic range according to threshold, ratio and attack/ realize settings.

Gate - noise gate allows to prevent any signal that is below selected threshold. It helps to prevent background noise in idle moments especially using with microphones.

Phase inverter - invert audio signal phase by 180 degree.

Auto gain - module designed to increase input gain if audio level is lower than specified in settings. Auto gain settings allow to set maximum signal level, ratio, threshold and timing. It's great tool to balance audio from microphones.

Input name - all OCTO audio inputs and outputs can be renamed by user. The maximum name length is 8 symbols including letters and numbers. Name can be changed in any menu there name window is displaying.

Input selector - added to change the input channel without returning to main window.

Software interface

Bypass - enables and disables parametric equalizer without losing it's settings.

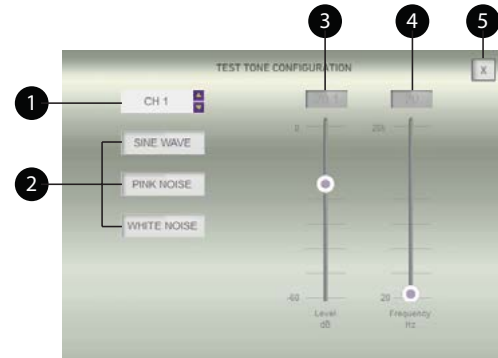
Parametric equalizer - OCTO parametric equalizer has 5 bands in 20Hz to 20kHz frequency range. All EQ points represented graphically on EQ window in different color. Centre frequency point have two smaller dots with the same color as centre frequency designed for bandwidth adjustment. Amplitude can be adjusted by lifting of rising center frequency point. All parameters are displaying below the EQ window in the analogical colored window.

Center frequency indicator - displays the numerical value of parametric equalizer adjusting point. Value can be adjusted by dragging EQ point with the mouse to left and right.

Amplitude indicator - show the level of adjusted EQ point in dB. Value can be adjusted by dragging center frequency point up and down.

Bandwidth indicator - Indicates width of effected frequency range in octaves. Value can be adjusted by dragging one of smaller center frequency dots with the mouse left and right.

TEST TONE

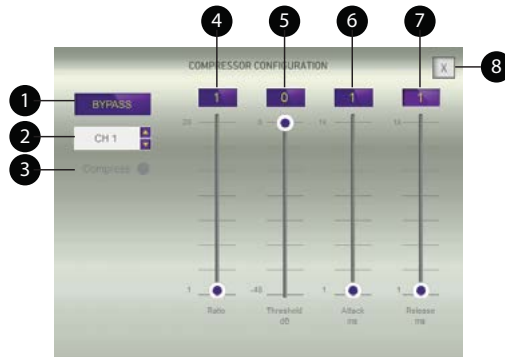


1. Input selector | 2. Type of test signal | 3. Test tone level fader | 4. Frequency fader | 5. Close window

Signal generator produce audio signal in selected input. There are three types of ready to generate audio signals. Sine wave with possibility to choose frequency from 20 Hz to 20 kHz in 1Hz step, pink noise and white noise. Sine wave and signal level can be adjusted by dragging the fader with mouse pointer or by clicking mouse in any area near the fader in order to force slider jump near the pointer. In order to adjust level gradually also can be used keyboard navigation buttons "up" and "down". There is input selector to change the input channel.

Software interface

COMPRESSOR



1. Bypass button | 2. Input selector | 3. Compressor indicator | 4. Ratio selector | 5. Threshold fader | 6. Attack time | 7. Release time | 8. Close window

This DSP module designed to compress input audio signal dynamic range. How much audio will be compressed depends on Ratio settings.

Input selector- change the input channel for compressor configuration.

Threshold settings give a possibility to set an audio limit when module starts compress audio in selected input.

Attack time - to set time period in which audio level will be compressed.

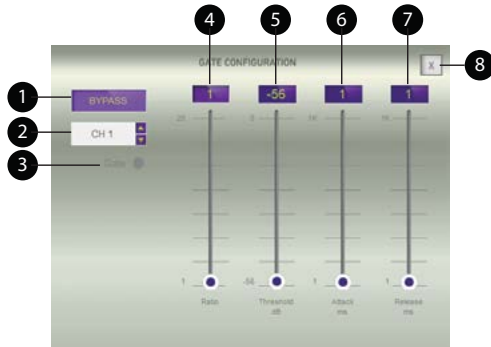
Release time - allows set a time period in which audio dynamic range will be restored.

Bypass designed to turn on or turn off compressor.

Compressor indicator - indicates when input audio signal became compressed according audio compressor module settings. Indicator became green when audio signal is compressed, otherwise it is grey. The same indicator is located in the main window also.

Software interface

GATE



1. Bypass button | 2. Input selector | 3. Gate indicator | 4. Ratio selector | 5. Threshold fader | 6. Attack time | 7. Release time | 8. Close window

GATE module designed to reduce input gain at the moments than audio signal is weak or input is not used at all. How much input gain will be reduced depends on Ratio settings. Module has input selector to change the input channel directly in compressor window.

Threshold settings give a possibility to set audio limit when module reduce input gain in order to prevent background noise.

Attack time - to set time period in which gain will be reduced.

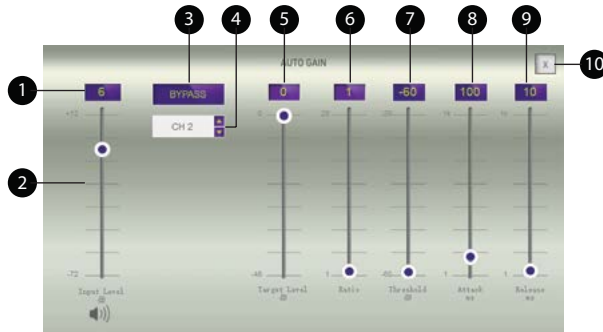
Release - time period in which gain will be restored.

Bypass designed to enable or disable module

Gate Indicator - indicates when input audio signal became compressed according audio compressor module settings. Indicator became green when audio signal is compressed, otherwise it is grey.

Software interface

AUTO GAIN



1. Input level value | 2. Input level fader | 3. Bypass button | 4. Input selector | 5. Target level | 6. Ratio selector | 7. Threshold fader | 8. Attack time | 9. Release time | 10. Close window

This DSP module automatically adjusts input gain if audio level is lower than value set in threshold parameter. In order to prevent unlimited gain growing, target level setting should be set. Value should be in save area in order prevent feedback loop. How much input gain will be increased depends on Ratio settings.

Attack and Release time specify how fast auto gain module starts and stops respond.

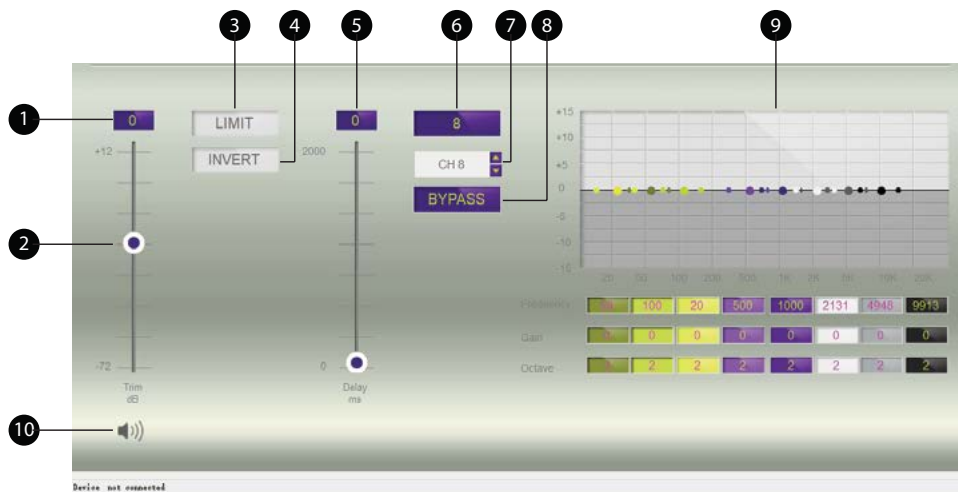
Bypass designed to enable or disable module.

Input level fader - designed to adjust audio level by dragging the fader with mouse pointer or by keyboard.

Input level value - it's a numerical value which shows what audio level is set with fader. There is possibility to set audio level directly by adding values to these windows.

Software interface

OUTPUT SETTINGS



1. Output level value | 2. Output level fader | 3. Limiter | 4. Phase invert | 5. Signal delay | 6. Output name | 7. Output selector | 8. Bypass | 9. EQ | 10. Mute

Software interface

Output settings have following features: signal limiter, phase inverter, delay and 8 point parameters equalizer.

Output level value - Input level value - it's a numerical value which shows what audio level is set with fader. There is possibility to set audio level directly by adding values to these windows.

Output level fader - Designed to adjust audio level. Audio level can be adjusted by dragging the fader with mouse pointer or by clicking mouse in any area near the fader in order to force slider jump near the pointer. In order to adjust level gradually also can be used keyboard navigation buttons "up" and "down".

Output name - All OCTO outputs can be renamed by user. The maximum name length is 8 symbols including letters and numbers. Name can be changed in any menu there name window is displaying, by mouse click and keyboard.

Limiter - allows limit audio signal amplitude according threshold settings. Its helps to prevent audio amplifier's overloading and signal clipping.

Phase inverter - invert audio signal phase by 180 degree.

Signal delay - designed to add a time delay in audio signal.

Output selector - designed to change output channel.

Bypass - enables and disables parametric equalizer without losing it's settings.

Parametric equalizer – OCTO output parametric equalizer has 8 bands in 20Hz to 20kHz frequency range. All EQ points are represented graphically on EQ window in different color. Center frequency point has two smaller dots with the same color as center frequency designed for bandwidth adjustment. Amplitude can be adjusted by lifting of rising center frequency point. All parameters are displaying below the EQ window in the analogical colored window.

Center frequency indicator - Displays the numerical value of parametric equalizer adjusting point. Value can be adjusted by dragging EQ point with the mouse to left and right.

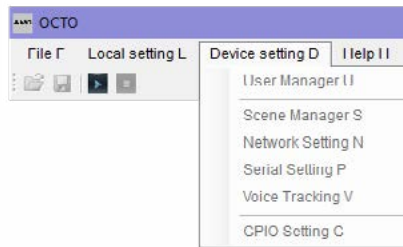
Amplitude indicator - show the level of adjusted EQ point in dB. Value can be adjusted by dragging center frequency point up and down.

Mute – turns on/off audio signal in the output.

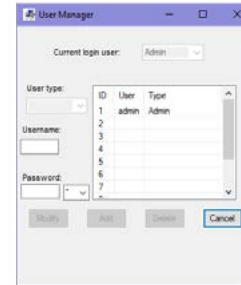
Software interface

OTHER MENU BAR SETTINGS

Device setting menu



USER MANAGER



OCTO software allows two types of access: admin and user. Admin has full access to all controls of OCTO including permission to add or remove new accounts on User manager. User has full access to all controls of OCTO except to control user manager functions. Adding the new user requires to fill both username and password windows. Press "add" button to save changes.

User without the password cannot be added.

User can be deleted from list by using "delete" button. Please pay attention, this button affects users only, administrator can't be deleted.

User manager offers two passwords methods, which can be set to window near the password place:

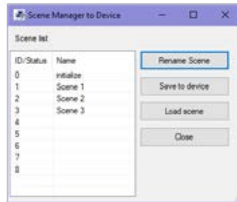
* - passwords will be hiding in user manager window

pw - password will be displayed, in reason to add or modify it more comfortable.

Administrator password is hiding all the time.

Software interface

SCENE MANAGER



OCTO DSP has option to save 9 presets with system settings. First of these presets is the default and can't be changed. Others 8 scenes are free to rename or change. Presets are stored to computer's system disk in catalog: Program Files (x86)\AMC\OCTO\file. All files can be copied or moved to another PC in order to share or backup DSP setting. A preset file includes all audio information, but don't include input, output and scenes names as well as GPIO and voice tracking.

RENAME SCENE



Before the changing name, select name which you wish to change and click on "rename scene" button. In opened window type new name and click OK.

SAVE TO DEVICE

In order to save scene, select the preset which will be assigned to all the current OCTO settings and press "Save to device" button. If "Save to device" button will be pressed without the choosing preset, all settings will be saved to current active scene.

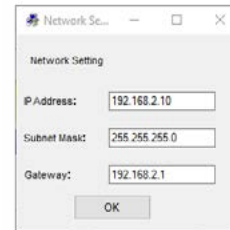
LOAD SCENE

Select one of eighth already created presets and click "Load scene" button to load the settings from the preset memory to OCTO.

CLOSE

"Close" and exit from scene manager window.

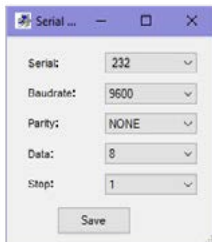
NETWORK SETTING



Set IP address, subnet mask and gateway. Default IP address is 192.168.1.10. You may need change it according your existing Ethernet network in case to prevent IP conflict or guaranty connection between OCTO software and device. Please give attention to subnet, it must be the same on computer and OCTO DSP.

Software interface

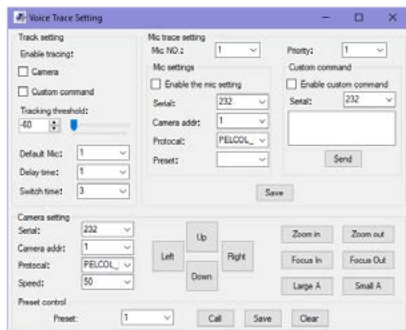
SERIAL SETTING



RS232 and RS485 serial communication interface designed to control conference video cameras. All interface parameters should be set according cameras type. Please check video cameras user manual and set appropriate settings before the start.

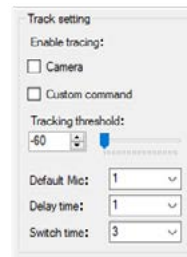
Voice tracing support PELCO and VISCA protocols as well custom control commands can be send to video cameras or other devices. After finish voice tracing configuration create a new scene preset and save it to the device in "Scene manager" settings in order to keep your configuration after power reboot.

VOICE TRACING



AMC OCTO can control video cameras or other devices via RS232 and RS485 interface. This feature is perfect for video conference systems. It automatically adjust video camera position according preprogrammed presets. All camera positions are programmable and activated automatically when DSP indicates audio to programmed microphone inputs.

TRACK SETTINGS



In this parts of settings must be set voice tracking method and timing parameters to default camera preset. There is a possibility to control video cameras directly by using standards PELCO or VISCA protocols via RS232 or RS485 interfaces or send custom command via the same interfaces as well.

Depending on how this module will be used "Camera" or "Custom command" must be selected.

Tracking threshold gives possibility to set an audio limit beyond which system will starts sending commands to video camera or other device.

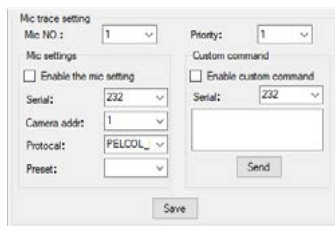
Default Mic is a default tracing input, in case if tracing module cant' identify any audio it will initiate a default scenario to which is the same to "Default Mic" preset. It's a default video camera position.

Delay time allows add a time lag between the audio detection and time when the control command or new preset will be send to video camera.

Switch time - a pause between the camera presets and default camera position. When video camera reach position programed in the preset it stops for the time which is set in this menu before returning to default. There is a choice to set 3 – 15 seconds pause.

Software interface

MIC TRACE SETTING



In this settings must be assigned one of 32 presets with camera position to individual audio input. Before the starting configuration "Enable the mic setting" must be selected to control video cameras by standard PELCO and VISCA protocols, for expanded control features tick "Enable custom command".

In order to save configuration to OCTO press "Save" button every time before selecting new audio input in "Mic NO:" window, otherwise all current settings will be set to default without the saving.

Mic NO voice tracing settings and video camera position will be assigned to audio input selected in this window. Control command will be transmitted to video cameras or other device if voice tracing module detects audio in the selected input.

Priority allow set a rule in case if more than one input receives audio signal at the same time. The biggest value means lower priority level, so in a conflict situation tracing module transmit camera position preset of highest priority level audio input.

Serial dedicated to set control interface. There are two options of interfaces to choose: RS232 and RS485. Please be sure to set the same interface in your camera and OCTO software.

Camera addr all cameras must be assigned with different addresses in order to send control commands exactly to needful camera. Please check video cameras user manual to learn how to set up addresses.

During the voice tracing configuration camera address must be specify to "Camera addr" window.

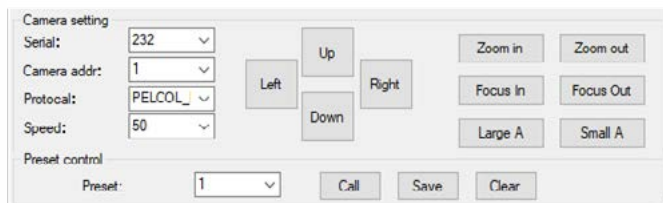
Protocol It's a window for video camera control protocol setting. There are availability to use PELCO and VISCA protocols.

Preset selector allows choose a camera position preset which will be activated by audio in assigned input. Presets can be created and modified in "Camera setting" module, in the "Voice trace setting" window.

Custom command setting allows send your own command string to video camera or other device. To enable this function "Enable custom command" must be selected in "Mic trace setting" and "Track setting" windows areas. RS232 or RS485 interface must be selected before saving mic trace setting. Command should be added in HEX system. Carriage Return & Line Feed are not send automatically, if needed these characters must be add to command line. All letters should be added in lower case.

Software interface

CAMERA SETTING



It's a tool to create video camera position presets. There is a possibility to create 32 presets with different video camera positions. These presets will be assigned to audio inputs in "Mic trace settings". Before the made preset, main camera settings: serial interface, camera address, and protocol must be set according your video cameras. Camera movement speed can be selected in "Speed" selector. This speed setting is designed to use in preset configuration moment only. Camera speed parameter will not be added to preset. In order to create a preset, camera positions must be set by using "Up", "Down", "Left" and "Right" navigation keys and after selecting preset number in the "preset" window saved by pressing "Save" button.

Serial dedicated to set control interface. There are two choices RS232 and RS485. Please sure to set the same interface as your camera is connected to OCTO.

Camera addr all cameras must be assigned with different addresses in order to send control commands exactly to needful camera. Please check video cameras user manual to learn how to set up addresses.

During the voice tracing configuration camera address must be specify to "Camera addr" window.

Protocol It's a window for video camera control protocol setting. There are availability to use PELCO and VISCA protocols.

Speed – video camera movement speed. Lower speed helps to set camera position more precisely. Camera speed parameter will not be added to preset, so camera will use default speed when voice tracing operates in automatic mode.

Up, Down, Left, Right - navigation buttons to set video camera position.

Zoom in, Zoom out – buttons to control camera zoom function.

Focus in, Focus out - buttons to control camera focus if video camera doesn't have auto focus or this function is disabled.

Large A, Small A – It's camera aperture control. Useful if video camera doesn't have auto aperture.

Call – allow to call and test already saved preset. Preset number must be selected before the call function activation.

Save – Saves camera position in to preset which number is set to "Preset" selector.

Clear – Designed to delete preset settings.

Please note: Save tracking configuration to the device in "Scene manager" settings in order to keep your configuration after power reboot.

Software interface

GPIO SETTINGS

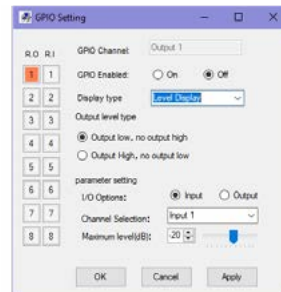


OCTO DSP has integrated general purpose input/output interface, which features can be programmed in GPIO settings menu. There are 8 inputs with 3,3V voltage formed by pull-up resistors inside DSP and 8 outputs which can supply 3,3V at high level stage. Maximum GPIO outputs current is 10mA. Programed GPIO channels are displayed in orange color inside settings window while current selected channel is marked with blue edges.

In order to activate GPIO input or output “GPIO Enabled” setting should be set to “On” position. These settings should be done for each input and output. In order to save settings “Apply” button must be pressed before the going to configure another GPIO channel, otherwise current settings will be lost. For finally saving press “OK” before the leaving GPIO setting menu.

In main GPIO Settings window all the time are displaying two columns. “R.O” column designed for setup GPIO outputs, “R.I” – for setup GPIO inputs.

GPIO OUTPUT SETTINGS R.O



In case if GPIO outputs are not programed or programed conditions do not match current DSP situation GPIO output level is in low stage (output voltage - 0V). In case if conditions match the programed settings output level became high (output voltage - 3,3V). “Output level type” allows invert output stage. OCTO have choices to control GPIO outputs by following DSP parameters: Loaded scene, Input/output audio level, Individual Input/output, mute status and by the whole system mute status.

All these choices can be selectable in “Display Type” window. Before the starting configuration one of the 8 GPIO outputs must be selected in R.O column. Below is listed common parameters for GPIO output settings.

GPIO Channel – displays selected GPIO output.

GPIO Enabled - Allows enable or disable GPIO function in selected GPIO output.

Display Type – GPIO control scenario, the reason for which GPIO outputs will be triggered.

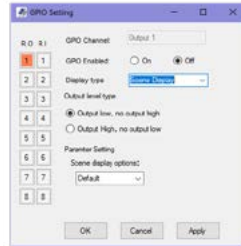
Out level type – Inverts GPIO output. “Output low, no output high” is inverter output, If output is triggered output voltage – 0V.

“Output High, no output low” is not inverter output, If output is triggered output voltage – 3,3V .

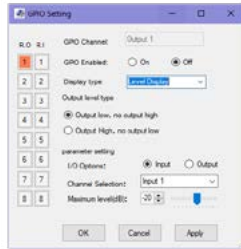
Software interface

GPIO OUTPUT FUNCTIONS

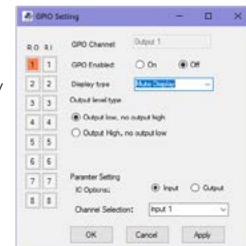
Scene Display - Controls GPIO output according which one Scene are loaded in DSP. Scene which is selected in "Scene display option" will trigger GPIO output.



Level display - Allow to trigger GPIO output if level in the audio input or output became higher than specified. "Channel selection" determines in which audio input/output audio level will be measured. "Maximum level" is audio level limit beyond which GPIO output will be activated. "I/O options" allows choose audio input or output according which GPIO will be triggered.



Mute display -allows to trigger GPIO output if audio input or output became mute. "Channel selection" determines audio input/output which mute status will be tracked. "I/O options" allows choose audio input or output according which GPIO will be triggered.



System mute - allow to trigger GPIO output if all outputs became muted.



Software interface

GPIO INPUTS SETTINGS R.I

These logical inputs allow control some DSP features by closing GPIO contacts in rear OCTO panel. All logical inputs have 3,3V voltage formed by internal pull up resistors. In order to activate programmed function GPIO input should be connected to GND pin. GPIO inputs can control following OCTO features: Scene preset, matrix, volume setting and mute. Also available send serial command via RS232 or RS485 interface. All listed choices can be selected in "Display Type" window.



Before the starting configuration one of the 8 GPIO outputs must be selected in R.I column.

Below are listed common parameters for GPIO output settings.

GPIO Channel – displays selected GPIO input.

GPIO Enabled - Allows enable or disable GPIO function in selected GPIO input.

Control Type – Allow select which function will be controlled by GPIO input.

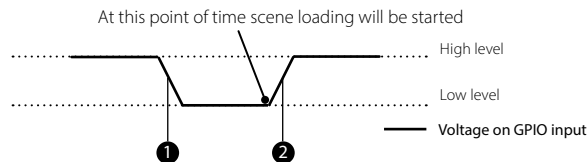
GPIO INPUTS FUNCTIONS

Scene Setting – allows load any of eight scene presets including default preset to OCTO DSP. Which one preset will be loaded should be set in "Set the scene select" window. "Trigger type" allows set at which moment OCTO starts load preset. "Rising edge" parameter specifies that preset will be loaded at the moment when logic input and GND connection will be broken and voltage on the input pin starts rise.



"Falling edge" parameter specifies that preset will be loaded at once when logic input and GND will be connected together. Take attention: During preset loading the current settings in previously preset will not be saved.

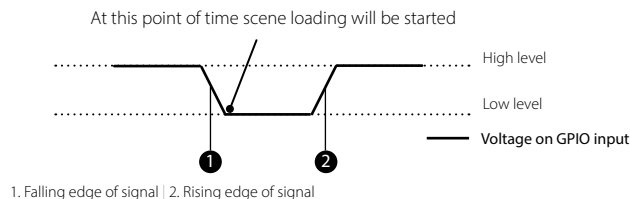
Raising edge:



1. Falling edge of signal | 2. Rising edge of signal

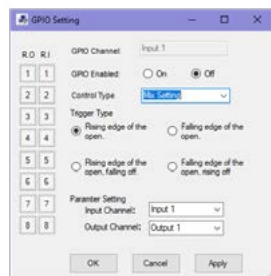
Software interface

Falling edge:



Mix settings - mix control allows to link one audio input to one audio output. It's a simplified matrix control. There are four types of trigger:

"Falling edge of the open" - connects input to output at once when logic input and GND will be connected together. Audio input and output will be linked as long as will be unlinked manually in matrix module.



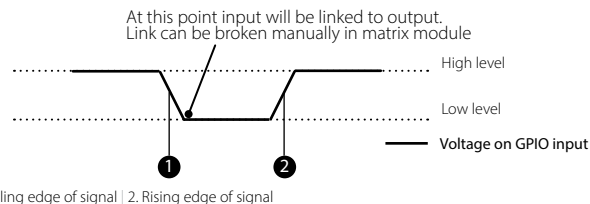
"Falling edge of the open, falling off" - keeps inputs connected to output till GPIO input is connected to GND. Input will be disconnected from output if GPIO PIN and GND connection will be lost.

"Rising edge of the open" - audio input and output will be linked at the moment when logic input and GND connection broken - down and voltage on the input pin starts rise. Audio input and output will be linked as long as will be unlinked manually in matrix module.

"Rising edge of the open, rising off" - audio input and output will be linked at the moment when logic input and GND connection interrupts and voltage on the input pin starts rise. Audio input and output will be linked as long as GPIO input have high level. If GPIO input and GND will be connected together audio link will be broken.

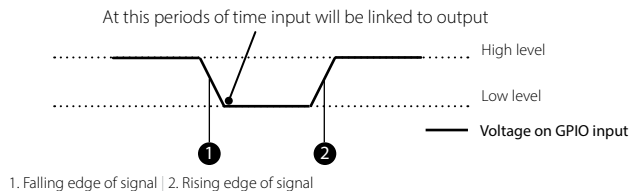
"Parameter Setting" - designed to select which input and output will be linked by using GPIO input.

Falling edge of the open:

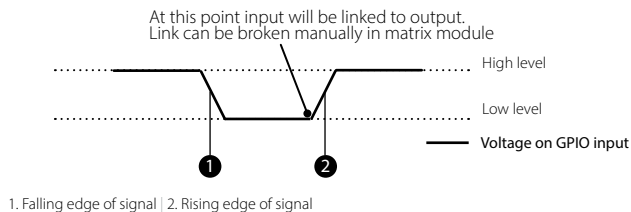


Software interface

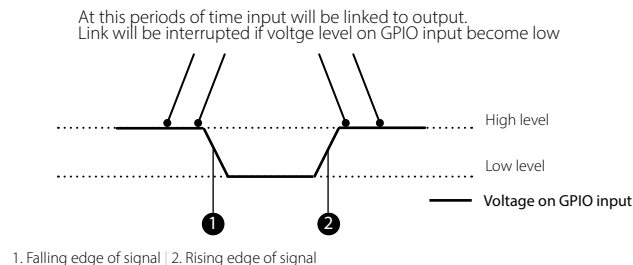
Falling edge of the open, falling off:



Rising edge of the open:



Rising edge of the open, rising off:



Volume settings – offer a choice to control audio volume by using GPIO inputs. Both inputs and outputs volume can be controlled by 1 – 12dB steps depending on GPIO setup. “Trigger type” allows set at which moment OCTO starts adjusting volume. “Rising edge” parameter specifies that volume will be adjusted by step at the moment when logic input and GND connection will be broken and voltage on the input pin starts rise.

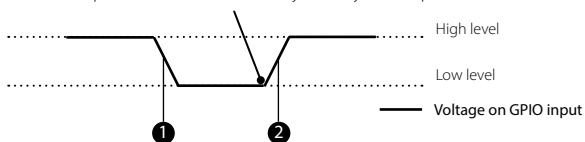


Software interface

"Falling edge" parameter specifies that volume will be adjusted by step once when logic input and GND will be connected together. "I/O Options" designed to select for which audio inputs or outputs will be enabled volume control with GPIO. "Channel selection" allow select audio channel in order to control its volume. "Gain Step" specifies a size in dB of audio volume adjusting step. There is a possibility to adjust step size precisely by selector, or just dragging fader with mouse. "Effect" specify GPIO input function to increase or decrease volume.

Rising edge:

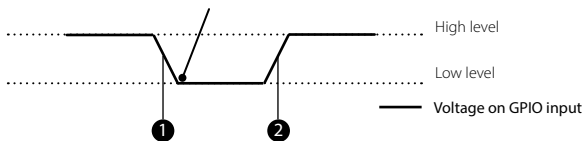
At this point audio level will be adjusted by one step



1. Falling edge of signal | 2. Rising edge of signal

Falling edge:

At this point audio level will be adjusted by one step



1. Falling edge of signal | 2. Rising edge of signal

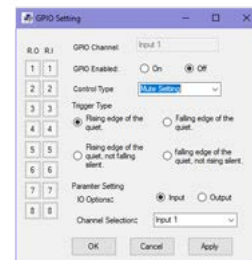
Mute settings – designed to control audio mute function by using external logic inputs. It offers a choice to control each audio input and output separately. There are four type of trigger: "Falling edge of the quiet" - mute input or output at once when logic input and GND will be connected together. Audio input and output will be muted as long as will be unmuted manually in main window. "Falling edge of the quiet, not rising silent" - keeps inputs or output muted till GPIO input is connected to GND. Audio will be unmuted if GPIO PIN and GND connection will be lost.

"Rising edge of the quiet" - audio will be muted at the moment when logic input and GND connection interrupt and voltage on the GPIO input pin starts rise. Audio input and output will be muted as long as will be unmuted manually in main window.

"Rising edge of the quiet, not falling silent" – audio will be muted as long as GPIO input keeps high level. If GPIO input and GND will be connected together audio will be unmuted. It's inverted mode of "Rising edge of the open"

"IO Options"- designed to set which ones, audio inputs or outputs will be muted with GPIO.

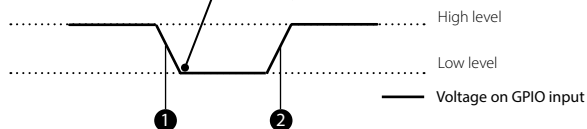
"Channel selection" allow select audio channel in order to mute it with logic input.



Software interface

Falling edge of the quiet:

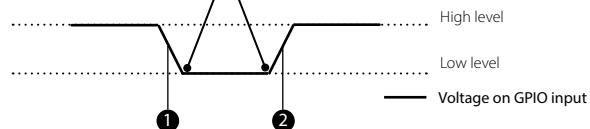
At this point audio level will be muted as long as will be unmuted manually in main window



1. Falling edge of signal | 2. Rising edge of signal

Falling edge of the quiet, not rising silent:

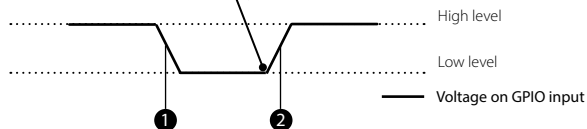
At this period of time audio will be muted



1. Falling edge of signal | 2. Rising edge of signal

Rising edge of the quiet:

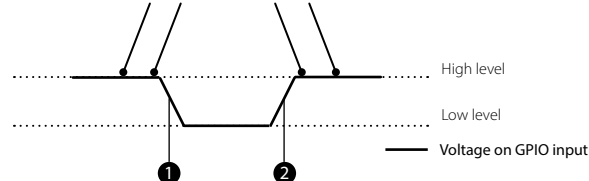
At this point audio level will be muted as long as will be unmuted manually in main window



1. Falling edge of signal | 2. Rising edge of signal

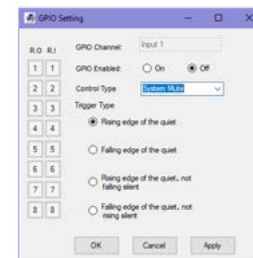
Rising edge of the quiet, not falling silent:

At these periods of time audio will be muted



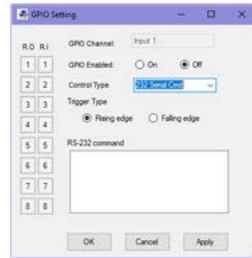
1. Falling edge of signal | 2. Rising edge of signal

System mute - mutes audio in all outputs by using external logic inputs. "System mute" set all outputs to mute mode at once. "Mute setting" allows to select which audio channel will be muted.

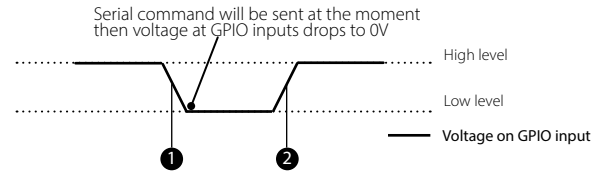


Software interface

232 serial cmd – this feature allow to send your own command string via RS232 interface. Command should be added in HEX system. Carriage Return & Line Feed are not send automatically. These characters must be added to command line if needed. All letters should be added in lower case. "Trigger type" allows set at which moment OCTO sends command string. "Rising edge" parameter specifies that serial command will be send at the moment when logic input and GND connection will be broken and voltage on the input pin starts rise. "Falling edge" parameter specifies that serial command will be send at once when logic input and GND will be connected together.

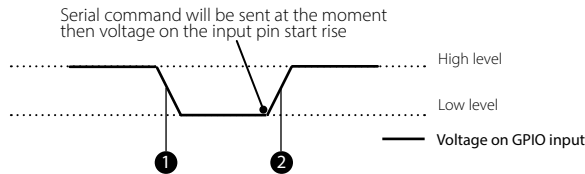


Falling edge:



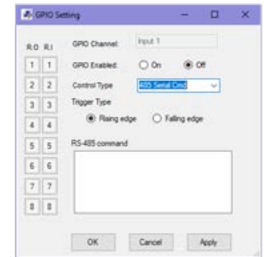
1. Falling edge of signal | 2. Rising edge of signal

Rising edge:



1. Falling edge of signal | 2. Rising edge of signal

485 serial cmd – this feature allow to send custom serial command via RS485 interface. All features and settings are the same as "232 serial cmd".



Software interface

MAIN PROGRAM WINDOW

SHORTCUTS

Main controllers and indications which give intuitive and quick access to DSP setup and status view is in the main software window. Same of DSP menu and sub menu functions can be reachable by shortcuts listed below:

Alt + F = File menu
Alt + L = Local menu
Alt + D = Device menu
Alt + H = Help menu

All OCTO menu item have it's own sub menu shortcuts. Shortcuts combination and meaning listed below:

File menu:
Ctrl + O = Open file
Ctrl + S = save
A = Save as
E = exit

Local setting:
D = Device list
Alt + C = Connect to device
Alt + U Disconnect from device

Device setting:
U = User manager
S = Scene manager
N = Network setting
P = Serial setting
V = Voice tracking
G = GPIO setting

Help:
C = Content

RS232 protocol

Octo offers a possibility to control some of DSP futures via RS232 serial interface. There is available to mute input/output, control matrix function and control input/output audio level by steps.

RS232 command structure in HEX system

Lead code	Control code			Check sum
	Section	Operation	Setting/value	
2 Bytes	1 Byte	1 Byte	3 Bytes	1 Byte
A5AB	XX	XX	XX XX XX	XX

Lead code A5 AB must be added in the front of control command every time.
A5 AB XX XX XX XX XX XX

Function byte specifies which OCTO section will be controlled by serial command.
A5 AB XX XX XX XX XX XX

Byte for control audio input control: 02
Audio output control: 03
DSP matrix: 04

Operation byte specifies action taken by serial command.
A5 AB XX XX XX XX XX XX

Mute command: 31
Unmute: 32
Volume increasing by one step: 33
Volume decreasing by one step: 34
Matrix link enable: 35
Matrix link disable: 36

Setting/value bytes of RS232 command allows add values and sets other parameters needful to perform function specified by operation byte. Structure of this part depends on selected operation. In next page is listed examples and detailed "Setting/value" structure for each operation.
A5 AB XX XX XX XX XX XX

Check sum It's a HEX sum of control code, sum of section, operation and settings/value bytes.
A5 AB XX XX XX XX XX XX
Checksum8 Modulo 256 method should be used for calculations.

OCTO RS232 feedback

OCTO generates answer every time after all 8 bytes of command are received. OCTO transmits ASCII message: "success!" if RS232 command match check sum and "fail!" If command don't match check sum byte.

RS232 protocol

Detailed Setting/value bytes

RS232 command input mute

Lead Code	Section	Operation	First input	Last input	Reserved Byte	Check Sum
A5 AB	02	31	XX	XX	XX	XX

First input - first mute input should be added to this byte in order to mute several inputs at ones. Value range 01... 08
 Last input - last mute input should be added to this byte in order to mute several inputs at ones. Value range 01... 08. First and last inputs must be the same in order to mute juts one input.
 Reserved byte - all the time 00
 Check sum - HEX sum of section, operation, first input, last input and reserved byte.

Example:

RS232 command to mute inputs from input 4 till input 7

Lead Code	Section	Operation	First input	Last input	Reserved Byte	Check Sum
A5 AB	02	31	04	07	00	3E

Check sum HEX $\Sigma 02\ 31\ 04\ 07\ 00 = 3E$
 RS232 command: A5 AB 02 31 04 07 00 3E

RS232 command to mute only input 2

Lead Code	Section	Operation	First input	Last input	Reserved Byte	Check Sum
A5 AB	02	31	02	02	00	37

Check sum HEX $\Sigma 02\ 31\ 02\ 02\ 00 = 37$
 RS232 command: A5 AB 02 31 02 02 00 37

Operation - mute outputs

Lead Code	Section	Operation	First output	Last output	Reserved Byte	Check Sum
A5 AB	03	31	XX	XX	XX	XX

First output - first mute output should be added to this byte in order to mute several outputs at ones. Value range 01... 08
 Last output - last mute output should be added to this byte in order to mute several outputs at ones. Value range 01... 08. First and last output must be the same in order to mute juts one output.
 Reserved byte - all the time 00
 Check sum - HEX sum of function, operation, first output, last output and reserved byte.

RS232 protocol

Example:

RS232 command to mute two outputs from output 2 till output 3

Lead Code	Section	Operation	First output	Last output	Reserved Byte	Check Sum
A5 AB	03	31	02	03	00	39

Check sum HEX $\Sigma 03\ 31\ 02\ 03\ 00 = 39$

RS232 command: A5 AB 03 31 02 03 00 39

Operation - unmute inputs

Lead Code	Section	Operation	First input	Last input	Reserved Byte	Check Sum
A5 AB	02	32	XX	XX	XX	XX

First input - first unmute input should be added to this byte in order to unmute several inputs at ones. Value range 01... 08

Last input - last unmute input should be added to this byte in order to unmute several inputs at ones. Value range 01... 08. First and last inputs must be the same in order to unmute just one input.

Reserved byte - all the time 00

Check sum - HEX sum of section, operation, first input, last input and reserved byte.

Example:

RS232 command to unmute all inputs from input 1 till input 8

Lead Code	Section	Operation	First input	Last input	Reserved Byte	Check Sum
A5 AB	02	32	01	08	00	3D

Check sum HEX $\Sigma 2\ 32\ 01\ 08\ 00 = 3D$

RS232 command: A5 AB 02 32 01 08 00 3D

Operation - unmute outputs

Lead Code	Section	Operation	First output	Last output	Reserved Byte	Check Sum
A5 AB	03	32	XX	XX	XX	XX

First output - first unmute output should be added to this byte in order to unmute several outputs at ones. Value range 01... 08

Last output - last unmute output should be added to this byte in order to unmute several outputs at ones. Value range 01... 08. First and last output must be the same in order to unmute just one output.

Reserved byte - all the time 00

Check sum - HEX sum of section, operation, first output, last output and reserved byte..

RS232 protocol

Example:

RS232 command to unmute three outputs from input 5 till input 8

Lead Code	Section	Operation	First output	Last output	Reserved Byte	Check Sum
A5 AB	03	32	05	08	00	42

Check sum HEX Σ 03 32 05 08 00 = 42

RS232 command: A5 AB 03 32 05 08 00 42

RS232 command to unmute output 1

Lead Code	Section	Operation	First output	Last output	Reserved Byte	Check Sum
A5 AB	03	32	01	01	00	37

Check sum HEX Σ 03 32 01 01 00 = 37

RS232 command: A5 AB 03 32 01 01 00 37

Operation - to increase input volume by step

Lead Code	Section	Operation	First input	Last input	Step Size	Check Sum
A5 AB	02	33	XX	XX	XX	XX

First input - first input for which volume will be increased by RS232 command. Value range 01 ... 08

Last input - last input for which volume will be increased by RS232 command. Value range 01 ... 08 First and last inputs must be the same in order to adjust volume just for one input.

Step size - This is a step in dB how much volume will effected. Recommended value 1 ... 12

Check sum - HEX sum of section, operation, first input, last input and reserved byte.

Example:

RS232 command to increase all inputs volume in 1 dB step

Lead Code	Section	Operation	First input	Last input	Step Size	Check Sum
A5 AB	02	33	01	08	01	3F

Check sum HEX Σ 02 33 01 08 01 = 3F

RS232 command: A5 AB 02 33 01 08 01 3F

RS232 protocol

RS232 command to increase inputs 2 volume in 3 dB step

Lead Code	Section	Operation	First input	Last input	Step Size	Check Sum
A5 AB	02	33	02	02	03	3C

Check sum HEX Σ 02 33 02 02 03 = 3C

RS232 command: A5 AB 02 33 02 02 03 3C

Operation - to increase output volume by step

Lead Code	Section	Operation	First output	Last output	Step Size	Check Sum
A5 AB	03	33	XX	XX	XX	XX

First output - first output for which volume level will be increased by RS232 command. Value range 01... 08

Last output - last output for which volume level will be increased by RS232 command. Value range 01... 08 First and last output must be the same in order to adjust volume juts for one output.

Step size - This is a step in dB how much volume will effected 1... 12

Check sum - HEX sum of section, operation, first output, last output and reserved byte.

Example:

RS232 command to increase volume in 6 dB step to outputs 1 and 2

Lead Code	Section	Operation	First output	Last output	Step Size	Check Sum
A5 AB	03	33	01	02	06	3F

Check sum HEX Σ 03 33 01 02 06 = 3F

RS232 command: A5 AB 03 33 01 02 06 3F

RS232 command to increase output 7 volume in 2 dB step

Lead Code	Section	Operation	First output	Last output	Step Size	Check Sum
A5 AB	03	33	07	07	02	46

Check sum HEX Σ 03 33 07 07 02 = 46

RS232 command: A5 AB 03 33 07 07 02 46

Operation - to decrease input volume by step

Lead Code	Section	Operation	First input	Last input	Step Size	Check Sum
A5 AB	02	34	XX	XX	XX	XX

RS232 protocol

First input- first input for which volume level will be decrease by RS232 command. Value range 01... 08

Last input- last input for which volume level will be decrease by RS232 command. Value range 01... 08 First and last inputs must be the same in order to adjust volume juts for one input.

Step size - This is a step in dB how much volume will effected. Recommended value 1... 12

Check sum - HEX sum of section, operation, first input, last input and reserved byte.

Example:

RS232 command to decrease input 2 and input 3 volume in 3 dB step

Lead Code	Section	Operation	First input	Last input	Step Size	Check Sum
A5 AB	02	34	02	03	02	3D

Check sum HEX Σ 02 34 02 03 02 = 3D

RS232 command: A5 AB 02 34 02 03 02 3D

RS232 command to decrease inputs 7 volume in 1 dB step

Lead Code	Section	Operation	First input	Last input	Step Size	Check Sum
A5 AB	02	34	07	07	01	45

RS232 command to decrease inputs 7 volume in 1 dB step

Check sum HEX Σ 02 34 07 07 01 = 45

RS232 command: A5 AB 02 34 07 07 01 45

Operation - to decrease output volume by step

Lead Code	Section	Operation	First output	Last output	Step Size	Check Sum
A5 AB	04	35	XX	XX	XX	XX

First output - first output for which volume level will be decrease by RS232 command. Value range 01... 08

Last output- last output for which volume level will be decrease by RS232 command. Value range 01... 08 First and last output must be the same in order to adjust volume juts for one output.

Step size - This is a step in dB how much volume will effected 1... 12

Check sum - HEX sum of section, operation, first output, last output and reserved byte.

Example:

RS232 command to decrease volume in 3 dB step to all outputs

Lead Code	Section	Operation	First output	Last output	Step Size	Check Sum
A5 AB	03	34	01	08	03	43

Check sum HEX Σ 03 34 01 08 03 = 43

RS232 command: A5 AB 03 34 01 08 03 43

RS232 protocol

Operation - matrix control, link enable.

Lead Code	Section	Operation	Input	Output	Reserved Byte	Check Sum
A5 AB	04	35	XX	XX	XX	XX

Input - audio input which will be link to specified output. Value range 01... 08
 Output - output to which signal from input will be linked. Value range 01... 08
 Reserved byte - all the time 00
 Check sum - HEX sum of section, operation, input, output and reserved byte.

Example:

Lead Code	Section	Operation	Input	Output	Reserved Byte	Check Sum
A5 AB	04	35	02	07	00	42

RS232 command to link input 2 to output 7
 Check sum HEX Σ 04 35 02 07 00 = 42
 RS232 command: A5 AB 04 35 02 07 00 42

Operation - matrix control, link disable.

Lead Code	Section	Operation	Input	Output	Reserved Byte	Check Sum
A5 AB	04	36	XX	XX	XX	XX

Input - audio input of disabled link. Value range 01... 08
 Output - audio output of disabled link. Value range 01... 08
 Reserved byte - all the time 00
 Check sum - HEX sum of section, operation, input, output and reserved byte.

Example:

Lead Code	Section	Operation	Input	Output	Reserved Byte	Check Sum
A5 AB	04	36	08	01	00	43

RS232 command to broke link between input 8 and output 1
 Check sum HEX Σ 04 36 08 01 00 = 43
 RS232 command: A5 AB 04 36 08 01 00 43

Factory reset

To reset device to its default settings, follow these steps:

1. Turn device off;
2. Press and hold reset button on the back panel;
3. While holding reset button, turn device on;
4. Hold reset button for few more seconds after device turns on.

Please note:

After factory-resetting device, its IP address is set to 192.168.10.10

General Specifications

OCTO

Power supply	~110-230 V / 50-60 Hz
Power consumption	44 W
Input type	Balanced
Phantom power	+48 V
Input impedance	2 k Ω
Output impedance	100 Ω
Maximum level	+20 dBu
Maximum gain	-24 dBu
Frequency response	20 Hz - 20 kHz
THD	0,005 %

Connectors	Inputs & outputs - Phoenix connectors, RS 232 - D-SUB9, RS 485 - Phoenix, Ethernet - RJ 45
Sampling rate	48 kHz
AD/DA converters	24 bit
Channel isolation	100 dBu
Dynamic range	110 dBu
Dimensions	483 mm x 304 mm x 44 mm
Weight	4,6 kg

The specifications are correct at the time of printing this manual.
For improvement purposes, all specifications for this unit, including design and appearance, are subject to change without prior notice.