MMP40
User Manual

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Index

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Introduction
SourceCon™ media player & recorder module

The MMP40 is a professional media player & recorder featuring SourceCon™ modular technology. This unique technology guarantees true plug & play implementation to any compatible device. When inserted to a supporting slot, the module is instantly installed, discovered and ready for operation without requiring any additional internal wiring or complex configuration.

The MMP40 supports media playback and / or recordings from/to USB storage drives in a wide variation of compressed and lossless audio formats. The USB media carrier shall be inserted to the corresponding slot on the controlling main unit. Media playback is possible in MP3, OGG, AAC, FLAC, WMA and WAV filetypes, while recordings can be made in MP3, OGG and WAV filetypes.

All media information such as track, artist, playback mode, ... including even graphical album covers can be retrieved from the MMP40, allowing displaying it on the controlling device or software interface. Playback modes are selectable between single or continous play, while various repeat and random play modes are available.

Both the balanced stereo line output (playback) and the balanced stereo line input (recording) are implemented on its panel, using two 3–pin terminal block connections.

Precautions

READ FOLLOWING INSTRUCTIONS FOR YOUR OWN SAFETY

- ALWAYS KEEP THESE INSTRUCTIONS FOR FUTURE REFERENCE. NEVER THROW THEM AWAY

- ALWAYS HANDLE THIS UNIT WITH CARE

- HEED ALL WARNINGS AND FOLLOW ALL INSTRUCTIONS

- AVOID ELECTROSTATIC DISCHARGE BY TOUCHING GROUNDED POINT BEFORE REMOVING THE MODULES FROM THEIR PROTECTIVE BAG

- AVOID TOUCHING OF THE COMPONENTS ON THE CIRCUIT BOARD DIRECTLY

- NEVER EXPOSE THIS EQUIPMENT TO RAIN, MOISTURE, ANY DRIPPING OR SPLASHING LIQUID. NEVER PLACE AN OBJECT FILLED WITH LIQUID ON TOP OF THIS DEVICE

- DO NOT INSTALL THIS UNIT NEAR ANY HEAT SOURCES SUCH AS RADIATORS OR OTHER APPARATUS THAT PRODUCE HEAT

- DO NOT PLACE THIS UNIT IN ENVIRONMENTS WITH A HIGH LEVEL OF DUST, HEAT, MOISTURE OR VIBRATION

- THIS UNIT IS DEVELOPED FOR INDOOR USE ONLY. DO NOT USE IT OUTDOORS

- ONLY USE ATTACHMENTS & ACCESSORIES SPECIFIED BY THE MANUFACTURER.

- UNPLUG THIS APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF TIME

- CAREFULLY CHECK THE UNIT'S CONDITION AFTER UNPACKING. IF THERE IS ANY DAMAGE TO THE CARTON BOX OR THE UNIT ITSELF, INFORM YOUR VENDOR IMMEDIATELY.

- ONLY CONNECT THIS UNIT TO A MAINS SOCKET OUTLET WITH PROTECTIVE EARTHING CONNECTION

- THE INSTALLATION, CONNECTION AND CONFIGURATION OF THE DEVICE SHOULD BE DONE BY QUALIFIED TECHNICIANS

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	CAUTION – SERVICING
	This product contains no user serviceable parts. Refer all servicing to qualified service personnel. Do not perform any servicing (unless you are qualified to do so.)

	EC DECLARATION OF CONFORMITY
C€	This product conforms to all the essential requirements and further relevant specifications described in following directives: 2014/30/EU (EMC) and 2014/35/EU (LVD)

	WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)
	The WEEE marking indicates that this product should not be disposed with regular household waste at the end of its product life. This regulation is created to protect both the environment and human health.
	This product is developed and manufactured with high quality materials and components which can be recycled and/or reused. Please dispose of this product at your local collection point or recycling centre for electrical and electronic waste. Do this to make sure that the product is recycled in an environmental friendly way, and help to protect the environment in which we all live.

CAUTION

The symbols shown are internationally recognized symbols that warn about potentional hazards of electrical products. The lightning flash with arrowpoint in an equilateral triangle means that the unit contains dangerous voltages. The exclamation point in an equilateral triangle indicates that it is necessary for the user to refer to the users manual.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

These symbols warn that there are no user serviceable parts inside the unit. Do not open the unit. Do not attempt to service the unit yourself. Refer all servicing to qualified personnel. Opening the chassis for any reason will void the manufacturer's warranty. Do not get the unit wet. If liquid is spilled on the unit, shut it off immediately and take it to a dealer for service. Disconnect the unit during storms to prevent damage.
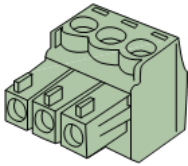
Chapter 1
Connections and connectors

CONNECTION STANDARDS

The in– and output connections for AUDAC audio equipment are performed corresponding to international wiring standards for professional audio equipment.
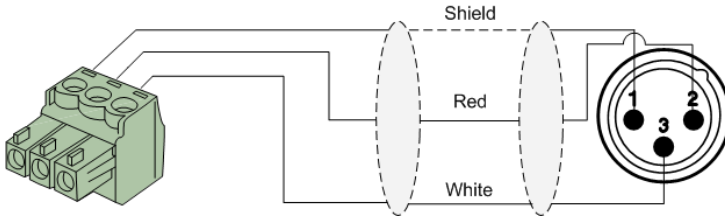
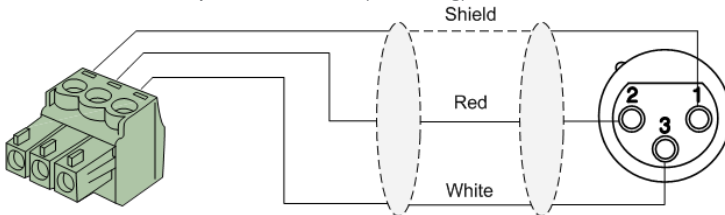### 3–Pin terminal block:
For balanced in & output connections

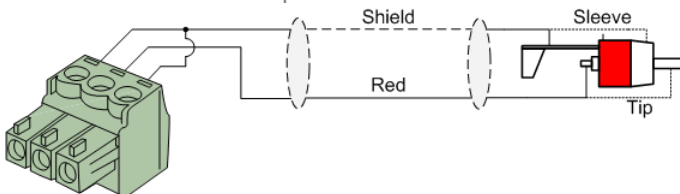|		
Left:	Signal –	(XLR Pin 3)
Center:	Signal +	(XLR Pin 2)
Right:	Ground	(XLR Pin 1)

For balanced line output connections (playback):

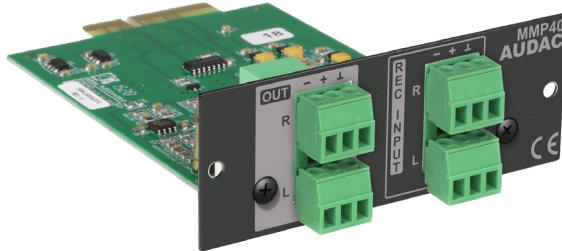For balanced line input connections (recording):

For unbalanced line in & output connections:

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Chapter 2
Overview MMP40

The MMP40 is a SourceCon™ compatible module featuring an (internal) board−edge connector which carries all signals for getting it connected to any supporting main unit.

All external in & output connections shall be made using the available connectors on the panel.

1) Balanced stereo line output:
The balanced stereo line output is implemented using two 3−pin terminal block connectors. The audio output available on this connector allows it to be fed to any amplifier or pre−amplifier.

2) Balanced stereo record input:
The balanced stereo line input (recording input) is implemented using two 3−pin terminal block connectors. The line level audio signal coming from the audio source or pre−amplifier shall be connected to this connector, allowing it being recorded.

Chapter 3
Using the MMP40

Since the MMP40 is a SourceCon™ module, it can be combined with a variation of supporting main units. The operation and configuration interface might be different of the unit where installed, however the offered functionality is identical. Some devices will support control and configuration through a front panel graphical control interface on a display, while others are also supporting web–control.

This manual describes the control configuration possibilities using front panel control. For applications where more control possibilities are offered, check the instruction manual of the used main device for more instructions.

Module screen

The module screen of the MMP40 gives an overview of the current operation mode and can be switched between media player mode and media recorder mode. In media player mode, the track position, track name and album cover (if available) will be displayed on this screen. In media recorder mode, the filesize of the recorded track and length of the recorded track are indicated.
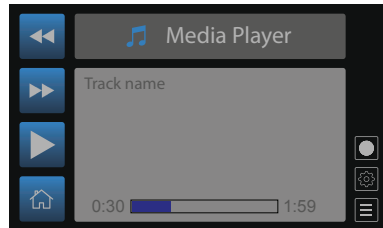

The left section of the module screen includes 4 quick buttons which can be controlled through the tactile buttons on the left screen side.

Switching between record or playback mode is done through rotating the selection dial and selecting the ▶ (switch to media player) or ◉ (switch to media recorder) icons.

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Media player mode

Track selection:
The playing track can be selected by pressing the ◄◄ (previous track) and ►► (next track) buttons. When selected, the first next supported track will be selected and start playing. When using this function, track browsing throughout the entire inserted media carrier can be done, including all sub–folders.
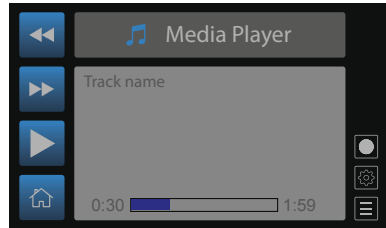
Track browsing:
Browsing through the folders of the inserted media carrier can be done by using the rotary dial and selecting the ☰ (browse) icon. The media player browsing menu will be indicated and browsing through the media files is done by turning the function dial. The currently highlighted file can be selected by pressing the selection dial.

Play / pause:
Toggling between play and pause is done by pressing the play/pause button with ► (play) or ‖ (pause) symbols. Depending of the current mode, the displayed symbol on the icon will toggle.

Home:
The ⌂ (home) button gets you back to the main screen of the device where the MMP40 is installed to.

Settings:
The ⚙ (settings) button can be selected through rotating the selection dial until the icon is highlighted and pressing it. This button gets you to the media player settings menu of the MMP40 where all configurations can be made. (it also includes various recording settings, which can only be accessed when switched to recorder mode)

Media player settings

The player settings menu for MMP40 is loaded when pressing the ⚙ (settings) button in player mode.

Output gain:
The gain can be adjusted within a range of +8 dB and −92 dB, allowing optimalization of the output level according to the input sensitivity of the connected amplifier or pre−amplifier. For adjusting the output gain, rotate the function dial until 'Gain' is highlighted and press it for proceeding to the gain settings. The level can be adjusted by rotating clockwise (volume up) or counter−clockwise (volume down). Press the rotary dial for confirming the currently set output level.

Shuffle:
Random play mode (shuffle) can be switched On and Off. When switched On, all tracks will be played in a randomized sequence. The MMP40 will select between all the tracks available on the inserted media carrier including all sub−folders.

Toggle the shuffle mode by highlighting 'Shuffle' (navigate through rotary dial) and pressing the rotary dial.

Repeat mode:
The repeat mode can be switched between '**Off**', '**Repeat all**', '**Repeat one**' and '**Repeat folder**'. When '**Repeat all**' is enabled, all tracks on the inserted media carrier will be played in sequential order and when the last track is played, it will restart automatically with the first track. When selected '**Repeat one**', the currently selected track will continuously play in an endless loop. When selected '**Repeat folder**', all tracks in the same folder of the currently playing track will be played in a sequential order and when the latest track inside this folder is played, it will automatically restart with the first track in this folder.

Toggle between the various repeat modes by highlighting 'Repeat mode' (navigate through rotary dial) and pressing the rotary dial.

AUDAC

Play mode:

The play mode can be selected between 'Single play' and 'Continuous play'. In 'Continuous play' mode, the next track will automatically start playing when the current track is finished. In 'Single play' mode, the player stops playing, waiting for a 'Play' command (press the Play button) before playing the next track.

In applications where the device is used for music playback, usually the 'Continuous play' will be used, while in other situations such as educational purposes, houses of worships or gym's the 'Single play' mode can provide great user convenience.

Media recorder mode

Start recording:

Recording of audio tracks can be started by pressing the ⦿ button. The display will indicate the filesize (in kB) and length (in minutes and seconds) of the current recording.
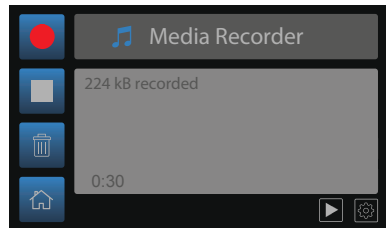
While recording, the upper button will change to ‖ (pause) allowing to pause the current recording. When resuming recording after paused (press again the ⦿ record button) the recording will continue within the same track.

Stop recording:

The recording can be stopped through pressing the ■ (stop) button. When pressed, the recording will be stopped and the file will be closed, making it unable to resume the recording within the same track.

When restarting the recording after stop, the audio recording will be stored as an individual file. When the filename is not changed in between various recordings (to be done in recording settings menu), the subsequent recordings will be indicated with a number (e.g. recording(2).mp3) in the stored filename.

Delete recording:

While recording, the current recording can be removed through pressing the 🗑 (delete) button. Note that deleted files are permanently removed and cannot be recalled afterwards.

Pre–listening recording:

Once stopped the recording, the ▶ (play) button becomes available, allowing to pre–listen the last made recording.

Media recorder settings

The recorder settings menu for MMP40 is loaded when pressing the ⚙ (settings) button in recorder mode.

Filename:
The filename of the recorded tracks can be configured in this screen. When selected, a screen with keyboard overview allows to enter the filename through using the rotary selection dial. When entered, select 'OK' to confirm the currently entered track name. 'Delete' removes the latest entered character, while 'Cancel' brings you back to the settings overview screen without any applied changes.

When making multiple recordings in a row, each audio recording will be stored as an individual file (when the recording was stopped). When the filename is not changed in between various recordings, the subsequent recordings will be indicated with a number (e.g. recording(2).mp3) in the stored filename.

Filetype:
The filetype of the recordings can be selected between MP3, OGG Vorbis and Wav. Toggle between the various recording filetypes by highlighting 'Filetype' (navigate through rotary dial) and pressing the rotary dial.

Mono/stereo:
The recording for MP3 filetypes can be switched in various types of mono / stereo modes, including '**Joint stereo**', '**Dual stereo**', '**Mono (left input)**' and '**Mono mix**'. Toggle between various recording modes by highlighting 'Mono / stereo' and (navigate through rotary dial) and pressing the rotary dial.

Using '**Joint stereo**' mode, the similarities and differences between both left and right channels are individually encoded. This improves the compression efficiency at a slight loss of separation.

Using '**Dual stereo**', both left and right channels are individually encoded as completely separate signals. Each channel uses half of the available bitrate, for example by a 128 kbit recording, each channel would take 64 kbit.

Using '**Mono (left input)**', only the signal available on the left recording input will be recorded as a single (mono) audio signal.

Using '**Mono mix'**, both left and right signal inputs will be summed to a mono signal, which will be recorded as a single (mono) audio signal.

MP3:
The MP3 recording settings can be selected between '**Variable bitrate'** and '**Constant bitrate**'. In constant bit rate mode, a fixed bitrate is used for the entire track resulting in consistent and predictable file sizes. In variable bitrate mode, the bitrate is adapted according to the complexity of the audio. For simple passages, the system automatically turns the bitrate down, saving valuable data bits while retaining audio quality. During more complex passages, the system automatically turns the bitrate up, using more databits to retain the same level of audio quality. In general, the variable bitrate gives better results in terms of audio quality, while the constant bitrate is better for compatibility (mainly with older systems).

The bitrate for the audio recording can be selected between 64 kbps, 96 kbps, 128 kbps, 192 kbps, 256 kbps and 320 kbps. A bitrate of 192 kbps is generally accepted as good−quality, while a 256 kbps recording corresponds with CD quality. For constant bitrate recordings, the selected bitrate is constant throughout the entire track, while for variable bitrate recordings the nominal bitrate is defined, which could be influenced by the complexity and detail of the audio.

OGG Vorbis:
For OGG Vorbis recordings, the quality settings can be selected by a number from '0' to '9', whereby '0' corresponds with a nominal bitrate of 64 kbps and '9' corresponds with a nominal bitrate if 320 kbps. Starting from '6' (192 kbps) the recording is generally accepted as a good−quality recording, while '8' (256 kbps) corresponds with CD quality. An OGG recording provides the same quality for a lower filesize, compared to MP3.

WAV:
For WAV recodings, the sampling rate can be selected between 8 kHz, 16 kHz, 24 kHz, 32 kHz and 48 kHz with a fixed bit depth of 16 bits per sample. Depending on the application, the suitable sample rate can be selected. For high−quality music recordings, it is recommended to always select the 48 kHz sample rate, while for voice announcements or other spoken message recordings, lower sample rates can be sufficient.

AUDAC 15

Chapter 4
Installing the MMP40

| CAUTION |
|---|
| ⚠ Before installing the MMP40 to any SourceCon™ compatible device, make sure the power is switched off. Malfunctions or electrical shocks may occur otherwise. |

Step 1:
Make sure that the slot whereto the module should be installed is open and ready for installation. Depending of the main unit, some module slots will be covered by blind panels when delivered. The corresponding blind panels should be removed by releasing the screws on both ends.

Step 2:
Before removing the modules from their protective bag, we recommend touching a grounded metal chassis (or any other grounded point) to prevent electrostatic discharges affecting the sensitive electronic components. It is recommended to always hold the module card by the metal connection panel and avoid touching of the components on the circuit board directly.

Step 3:
Align both edges of the module with the guide rails inside the slot and carefully insert the module into the slot. It should slide into the slot without any considerable resistance when well positioned into the guide rail.


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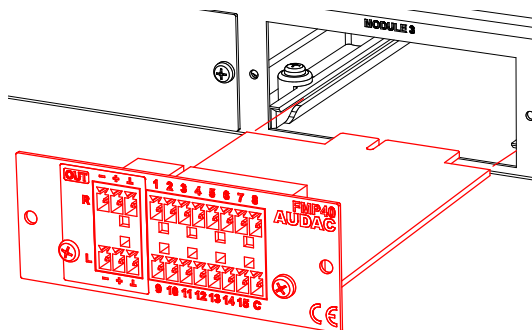
Step 4:
Some resistance might occur when the module's board edge connector reaches the connection counterpart on the main board. Gently push the module all the way into the slot to ensure that the contacts are correctly inserted. The module is well inserted when its connection panel touches the metal chassis of the main device where inserted to.
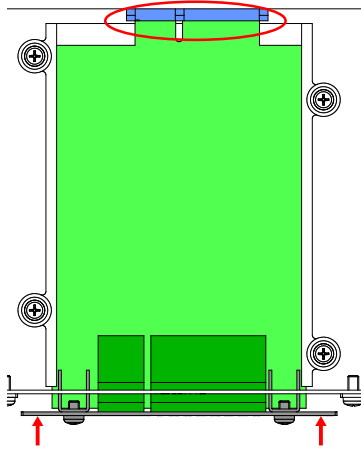
Step 5:
Fasten the module into the slot using the included screws. Be aware that damage or malfunctions may occur if the module is not correctly fastened.
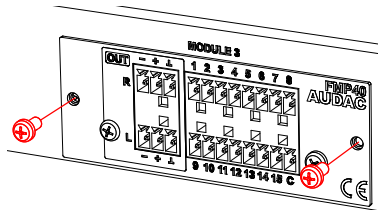
Step 6:
Once the module correctly installed, the system can be powered–on and the module functionality will be automatically discovered.

Chapter 5
Technical specifications

Connection	SourceCon™ interface card slot
Input	Balanced stereo line input (2 x 3–pin Euro Terminal Block ~ 3.81 mm)
Output	Balanced stereo line output (2 x 3–pin Euro Terminal Block ~ 3.81 mm)
Output level	+8 dB ~ −91 dB (Software configurable)
Supported filetypes playback	MP3 V1.0, V2.0, V2.5 Ogg vorbis MPEG4/2 AAC–LC+PNS HE–AAC v2 (Level 3), SBR+PS WMA 4.0/4.1/7/8/9 WAV (PCM + IMA ADPCM);
Compatible media playback	USB Flash drive / HDD (external)
Compatible filesystems	FAT16/FAT32
Supported media carrier capacity	Max 8 TB (FAT32)
Signal/noise	94 dB
THD+N	< 0.07%
Frequency response	20 Hz – 20 kHz
Crosstalk	80 dB
Power consumption	1.0 Watt
Dimensions (W x H x D)	87 x 34.5 x 114 mm
Weight	0.075 Kg
Packaging	Carton box
Shipping weight & Volume	1.08 Kg – 0.028 Cbm
Compatible devices	XMP44 Modular audio system

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Notes

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