



## MP3annunciator

### Industrial Digital Audio Player

Datasheet Rev.: 1.0.  
Date: 03.02.2007

#### Features

- Atmel **ATmega128** RISC CPU @ 6MHz
- VLSI **VS1011E** MP3/WAV Decoder
- Decodes MPEG 1 & 2 audio layer 3 (ISO 11172-3), WAV and PCM files
- Supports VBR (variable bitrate) for MP3
- High-quality stereo DAC with no phase error between channels
- Stereo earphone driver capable of driving a 300Ohm load
- **CFcard** removable storage device, on IDE bus
- **1 x RS-232** Interface
- **1 x RS-485** Interface
- Operating Voltage: 7...15VDC

#### Ordering Information

##### Art.-No. 01.0137

MP3annunciator, OEM board

##### Contact:

##### Elektronik-Atelier Kallen

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#### Specifications

##### AUDIO

Decoder Type	VLSI VS1011E
Clock	12.288 MHz
Decoded Audio Formats	MPEG 1 & 2 audio layer 3 (ISO 11172-3), WAV and PCM
DAC Resolution	16 bits
THD	0.1%
Dynamic Range	88dB
Output Voltage	1.6...2.1VPP @ 30 Ohms

##### CPU

Type	Atmel ATmega128 8-bit RISC
Clock	16 MHz

##### STORAGE DEVICE

Type	CFcard
Operating Mode	IDE

##### I/O

Serial	RS-232, RS-485
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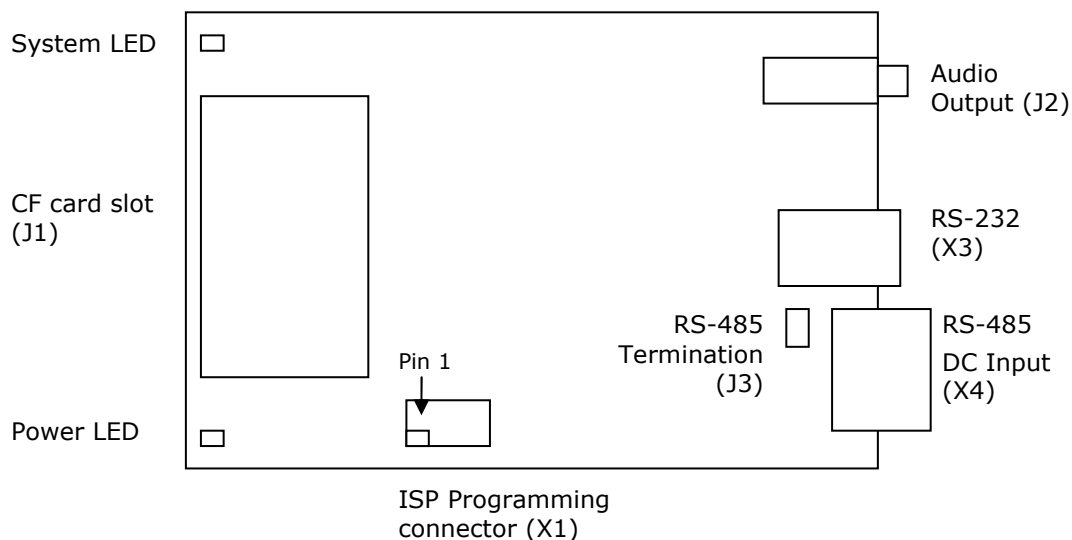
##### Power Supply

Requirement	7...15VDC, max. 140mA
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##### Mechanical

Size (L x W)	100 x 65 mm
Weight	60 g

## Connector Specifications

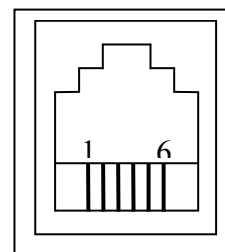


### Audio Output

Standard 3.5mm stereo jack.

### Serial Control Interface

X3: RS-232		
No.	Signal	Description
1	(N.C.)	
2	<b>TXD</b>	RS-232 Transmit Data
3	<b>RXD</b>	RS-232 Receive Data
4	(N.C.)	
5	<b>GND</b>	Signal Ground
6	(N.C.)	



### DC Input, RS-485

X4: DC Input, RS-285		
No.	Signal	Description
1	<b>+ DC IN</b>	DC Input voltage, 7...15V
2	<b>0V</b>	
3	<b>RS-485-A</b>	RS-485 Interface
4	<b>RS-485-B</b>	

### ISP Programming Interface

X1: Programming			
No.	Signal	Type	Description
1	<b>TXD</b>	OUT	UART Transmit Data
2	<b>+5V</b>	POWER	Digital power
3	<b>SCK</b>	IN	Clock
4	<b>RXD</b>	IN	UART Receive Data
5	<b>RESET</b>	IN	CPU Reset Input/Output
6	<b>GND</b>	RESET	Signal and power ground

## Device Setup

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### Power Supply

Connect a regulated DC source, capable of delivering 7...15V and min. 200mA to terminals 1 and 2 on X4.

### Serial Connection

A monitor program is active on the serial interface. It can be connected to a host PC with a terminal application. The communications parameters are:

```
19'200 bps, 8 databits, 1 stopbit, no parity
```

The available commands are described on page 3.

## Device Operation

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### Startup

After power-on, the MP3annunciator module will send initialization messages over the serial port as follows:

```
INIT: MP3annunciator V1.1  
INIT: DSP HW  
INIT: DSP SW  
INIT: IDE  
INIT: FAT  
INIT: Ready
```

After the 'Ready' message, the module is ready to receive commands over the serial interface.

#### Startup Errors

```
ERROR: IDE init failed, need Reset  
CFcard not inserted, not properly formatted or defect.
```

### Commands on the Serial Interface

<b>Command:</b>	<b>PA</b>
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Argument: (none)

Description: Plays all the \*.mp3 file in the current directory.

Response: PLAY: <filename>

Filenames can be long filenames, up to 40 characters long. Only the root directory is searched.

<b>Command:</b>	<b>PF</b>
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Argument: Filename

Description: Plays the \*.mp3 file with name given in argument.

Response: PLAY: <filename>

Filenames can be long filenames, up to 40 characters long. Only the root directory is searched.

<b>Command:</b>	<b>PN</b>
Argument:	(none)
Description:	Plays the next *.mp3 file in the current directory.
Response:	PLAY: <filename>
<b>Command:</b>	<b>SP</b>
Argument:	(none)
Description:	Stops playing of present audio file. Player will return to idle state.
Response:	ACTION: stopped.
<b>Command:</b>	<b>PS</b>
Argument:	(none)
Description:	Pauses playing of present audio file. Player will return to paused state. Audio playback may be resumed with CO command.
Response:	ACTION: paused.
<b>Command:</b>	<b>CO</b>
Argument:	(none)
Description:	Resumes playing of present audio file at file position where it has been paused. Player will return to paused state. Audio playback may be resumed with CO command.
Response:	PLAY: <filename>: <Bytes played>: <Bytes Total>.
<b>Command:</b>	<b>DI</b>
Argument:	(none)
Description:	Displays directory listing of root directory.
Response:	DIR: <filename> ...
<b>Command:</b>	<b>FI</b>
Argument:	(none)
Description:	Displays file information of currently playing *mp3 file.
Response:	FILE: <filename>>: <Bytes played>: <Bytes Total>
<b>Command:</b>	<b>VU</b>
Argument:	(none)
Description:	Increases playback volume by 2dB.
Response:	VOL: <hex value>
<b>Command:</b>	<b>VD</b>
Argument:	(none)
Description:	Decreases playback volume by 2dB.
Response:	VOL: <hex value>
<b>Command:</b>	<b>VS</b>
Argument:	Hex value
Description:	Sets playback volume level to hex value given in argument. Value 0 corresponds to maximum volume or 0dB, value BF corresponds to minimum volume, value FF switches off the audio part of the VS1011 decoder.
Response:	VOL: <hex value>

**Command: ST**

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Argument: (none)

Description: Displays player status.

Response: Idle | Playing | Paused | Error

**Command: UD**

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Argument: (none)

Description: Invokes firmware upload mode. See p. 6 for details.

Response: Confirm Firmware Upload.

Enter Y to confirm, or any other character to abort.

## Loading of New Firmware to MP3orator

### Prerequisites

1. Image file with firmware in Intel-Hex format (\*.hex)
2. Download tool for PC: `flashloader.exe`
3. Serial connection.

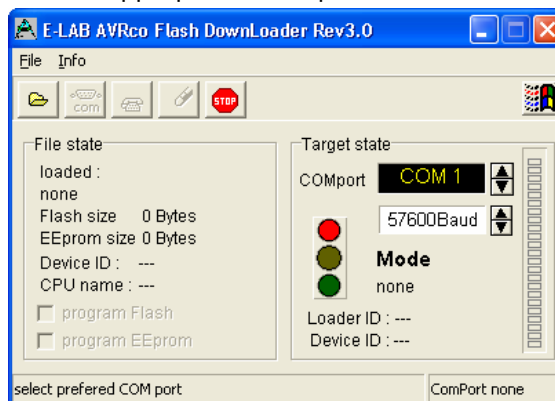
### Procedure

#### Hardware Setup

1. Connect MP3annunciator module via serial adapter to PC.
2. Apply power to the module

#### Prepare PC software

3. Download firmware file (\*.hex) from support website or receive it via email, and store it on PC.
4. Start a terminal program on the PC, set to 19'200bit/s, 8 databits, 1 stopbit, no parity.
5. Check serial connection by entering the 'ST' command.
6. Enter the command 'UD' and confirm message with 'Y' to invoke the bootloader on the MP3annunciator module.
7. Close the terminal connection in order to release the COM port.
8. Start the download tool `flashloader.exe` on the PC.
9. Set the appropriate COM port and transmission speed to 57'600 Baud:



10. Open the file selection dialog in the menu „File – Open File...“, select the firmware imagefile and select „Open“.
11. Click the button „com“. The status display on the right side should now show „Target connected“.
12. Start downloading by clicking on the “Telephone” button. The status display will now show „programming“, and the progress bar fills up. After the download is finished, the status message reads again „Target connected“.
13. Start firmware by clicking on the „Stop“ button.



#### Check for Successful Download.

4. Close the download tool
5. Open the terminal connection again and issue the 'SI' or any other command.

## Appendix

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### Notice to Users

The intended use of the MP3annunciator modules is described in this document. Other than the described uses are not permitted or only after consultation with the manufacturer.

MP3annunciator modules are not authorized for use as critical components in life-support devices or systems.

Life-support devices or systems are devices or systems intended for surgical implantation into the body or to sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling and user's manual, can be reasonably expected to result in significant injury.

No complex software or hardware system is perfect. Bugs are always present in a system of any size. In order to prevent danger to life or property, it is the responsibility of the system designer to incorporate redundant protective mechanisms appropriate to the risk involved.

All MP3annunciator modules are 100 percent functionally tested. Additional testing may include visual quality control inspections. Specifications are based on characterization of tested sample units rather than testing over temperature and voltage of each unit. MP3annunciator modules may qualify components to operate within a range of parameters that is different from the manufacturer's recommended range.

### Revision History

Rev. 1.0., Date: 03.02.2007  
Initial release.

### Contact

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