

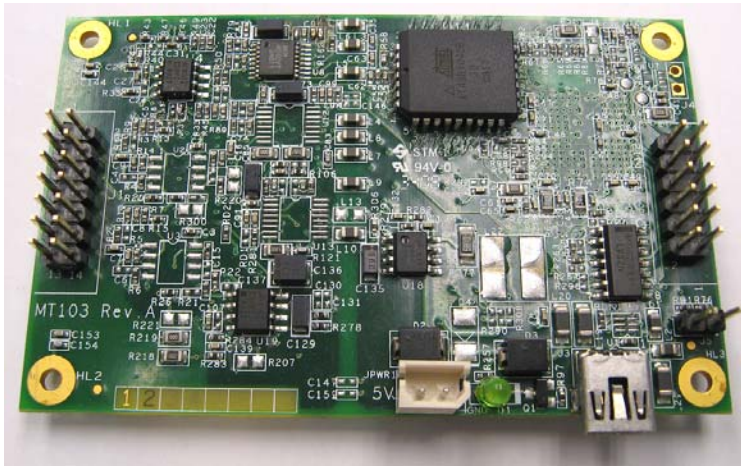


MT103

An OEM solution with extended capabilities

The MT103 is an OEM daughter board the size of a business card. It includes a powerful DSP and an extended number of I/O ports. It also includes a USB interface that offers audio communication with a computer, uploading programs, and controlling DSP parameters.

The MT103 is available in two configurations: Standard (MT103S) and Turbo (MT103T).



The MT103S offers:

- Two audio input channels with option to select them for Line Input or Mic Input (3V phantom). Each input has four selectable gain levels.
- Two audio output channels
- 108MHz DSP with top 216 MIPS

The MT103T offers:

- Six audio input channels with option to select them for Line Input or Mic Input (3V phantom).
- Two of the inputs have four selectable gain levels.
- Four audio output channels.
- 192MHz DSP with top 384 MIPS

In addition both MT103 configurations offer:

- Five input control pins
- Three output flags
- Reset
- Shut Down
- Serial Interface (I2C)
- Two analog inputs that are sampled with low frequency and low resolution and can be used as input control



MT103 Use Guide

Design and Business Concept

The MT103 is an OEM solution that will allow you to run your application and interface with your hardware elements (microphone, speaker and controls).

The board was design for maximum flexibility, powerful processor, large number of I/O and large number of controls (input and output).

Phoenix offers two methods to “get” your system on the board:

- 1) You can work with the Phoenix team to specify the algorithm, parameters, inputs, outputs and controls. At the end of the process Phoenix will deliver a “setup” file that you will be able to upload and “burn” on the board.
- 2) Phoenix offers a System Development Kit that includes a library with a limited number of algorithms with predefined parameter and pre-designated I/O ports. This SDK allows you to:
 - a. Select and algorithm from a list.
 - b. Setup this algorithm’s parameters.
 - c. Emulate the hardware and software by injecting signals from your PC to the board and by recording or monitoring signals (outputs and inputs) from the board.
 - d. Note: When designing your system with the SDK – the software will indicate the pre-assigned pin numbers**

The SDK is the tool with which you can design and tune your algorithm, but it is also the tool through which Phoenix will deliver a tailored algorithm and/or setup and with which you will load and burn this setup on the board.

SDK availability

- The SDK is available for free as an offline tool (offline means that it is not communicating with the board).
- It is available for free as a loading and burning tool
- The SDK is available for free as an on-line tool for 30 days (beginning from the first time the unit is connected and communicates with the SDK), allowing you to design, tune and emulate your setup.
- Beyond the 30 days free availability, Phoenix offers an annual membership that will “open” the SDK for one year at a time. This membership will also include free software upgrades, including new algorithms that may be added to the library down the road.

It is recommended that the user start using the SDK off-line first, and move to on-line phase once he feels comfortable enough. This will allow a more efficient usage of the 30 days of free on-line use.

The user will be able to keep using the SDK to load existing setups (tailored or setups created by the user itself) and burn them on the MT103 boards.



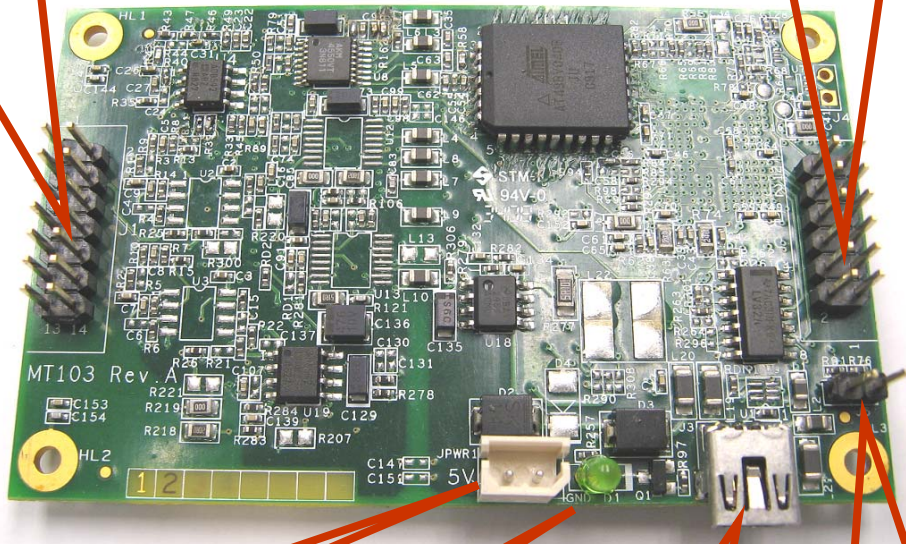
MT103 Connections

Analog connector

- 4 audio outputs
- 6 audio inputs
- 2 sampled (10 bit A/D) inputs
- 3.3v out
- AGND

Digital connector

- 3 output flags
- 5 input control pins (Pulled Up)
- Reset
- Shut Down
- I2C serial link



Power
Vcc 5V
DGND

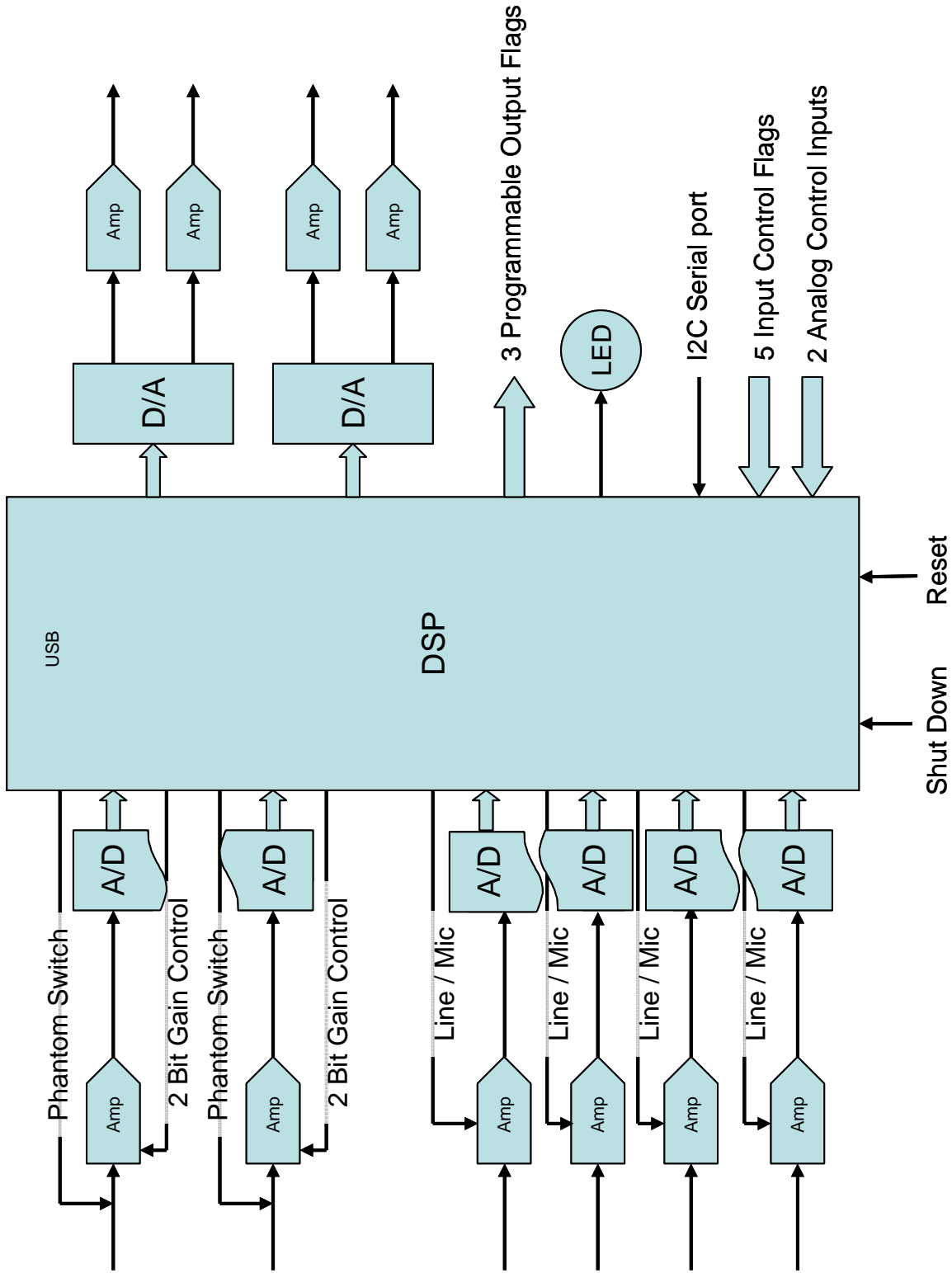
LED

USB Connector

Backup
Reboot pins



MT103 Block Diagram





Input Output Options

The analog I/O channels are sampled by 16 bit Codecs with an analog swing of 2 volts peak to peak.

The MT103 offers two different ways to control the input sensitivity (input gain) and output swing (output gain).

- 1) Controlling the input amplifier so that the analog gain is modified. This option is available on some of the input/output channels but not all. This option will offer two or four gain levels
- 2) Controlling the input/output gain by digital means inside the DSP. This option offers continuous control of levels but it is not a “true” gain (as option 1) since the input/output swing of the A/D D/A is fixed.

In addition, an optional phantom power supply is provided on each of the microphone input channels.

Control pins

The MT103 has several programmable pins that can be used to control the software flow and parameters:

- 1) 5 Digital input pins. Each can be controlled to flag the software to perform a task or select different set of parameters (like turn off an algorithm or select a different level of aggressiveness)
- 2) 3 programmable output flags that can be programmed to indicate an internal event to the outer world.
- 3) 2 analog inputs, each sampled with low rate low resolution A/D (10 bit). These inputs can be used for continuous control of a parameter. For example you can sample an input voltage to control the output gain of the system (functionality of a volume control knob).

USB communication port can be used for several functions:

- 1) Transferring parameters between the PC and the board.
- 2) Programming of the software on the board's memory
- 3) Audio data I/O. One can use the board as a USB I/O device, in addition or instead of the analog I/O. The board also offers a 3-way configuration in which data from the PC is shared with the data from the analog I/O.



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Analog Connector (J1) Pin Definition

Pin	Function	MT103S	MT103T	Rating
1	IN1	Mic/Line	Mic/Line	Mic = 150mV ptp Phantom 1K 2.8V Line = 2V ptp Input Impedance 24K AC Coupled Max Rating 3Vptp
2	IN2	Mic/Line	Mic/Line	
3	IN3	NC	Mic/Line	
4	IN4	NC	Mic/Line	
5	IN5	NC	Mic/Line	
6	IN6	NC	Mic/Line	
7	3.3V	OUT	OUT	
8	AGND	AGND	AGND	
9	AD0	AD0	AD0	Input level 0V-3V Maximum Rating 0-5V
10	AD1	AD1	AD1	
11	OUT1	Line	Line	2V ptp Impedance 50 Ohm Max Current 50mAmp (total for all utilized outputs)
12	OUT2	Line	Line	
13	OUT3	NC	Line	
14	OUT4	NC	Line	

Digital Connector (J2) Pin Definition

Pin	Function	Notes	Nominal Rating	Max Rating
1	Control In 1	Pulled Up – 100K	Vin Low<0.8V Vin High>2V	0V – 4.5V
2	Control In 2	Pulled Up – 100K		
3	Control In 3	Pulled Up – 100K		
4	Control In 4	Pulled Up – 100K		
5	Control In 5	Pulled Up – 100K		
6	I2C Data	Pulled Up – 5K	VIn Low<1.0V Vin High>2.3V	0V – 4.5V
7	I2C Clock			
8	Shut Down	Active High, Pulled Down	VIn Low<0.7V Vin High>2.0V	0V – 5.0V
9	Output Flag 1		Vout Low <0.4 Vout High >2.5	I Out Max 4mA
10	Output Flag 2			
11	Output Flag 3			
12	Reset	Active Low, Pulled up 100K	VIn Low<0.7V Vin High>2.0V	

Power Connector Specifications:

Nominal voltage: 4.25V < VPower < 5.25V

Current consumption: 100mAmp

Maximum absolute rating: 0V-7V



SDK Quick Start Guide

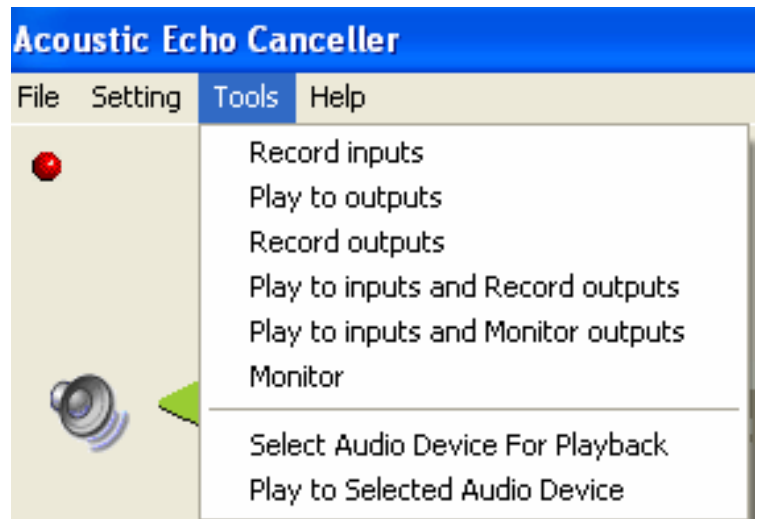
- 1) Install the SDK
- 2) Run it without connecting the MT103 board
- 3) Select “Start a New Setup”
- 4) Click Next
- 5) Select one of the algorithms.
- 6) Move the cursors above the different graphic elements, read the “hints” and get familiar with the tool.

Design your own application

- 1) Select “Start a New Setup”
- 2) Click Next
- 3) Select the algorithm you wish to run (if your board is connected it will determine the type of DSP you use).
- 4) Select the type of board you have (MT103T or MT103S)., the number of channels, the frequency response.
- 5) Click Next
- 6) Check / Uncheck the elements in the algorithm, setup the input levels
- 7) When you place the cursor on the I/O element the SDK will indicate the pin number you need to use
- 8) Save your setup with your unique name. If your board is connected the parameters will be saved on the board as well.

Emulating the board performance and connectivity

- 1) In the application page (where the algorithm graphics is displayed) select tools
- 2) Select from one of the options in the pull-down menu:
 - a. Record Inputs – will record the microphone inputs that you connected (test microphone connection)
 - b. Play to Outputs: will play a selected file into your output pins (test loudspeaker connection)
 - c. Record Outputs: will record a selected output pins (test input and output connections)
 - d. Play to Inputs and Record Outputs: will emulate a selected file into the input and record the output.





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- e. Play to Inputs and Monitor Outputs: will emulate a selected file into the input and play the output through the selected audio device.
 - f. Monitor: will play a test point into the selected audio device
 - g. Select Audio Device: will select the monitoring device (sound card).
- 3) Red / Green dots will appear on the screen denoting the relevant test points. You can click on these points to select / deselect them
 - 4) Follow the software instructions (browse for files, define storage location and so on)

Loading your application on the board

- 1) When you are ready and completed the setup of the algorithms and parameters connect your board
 - 2) Save your setup.
- Or
- 3) Connect the board first
 - 4) Run the SDK
 - 5) Wait for the green light on the SDK to turn on
 - 6) Select Load Setup and Continue
 - 7) Select your setup file
 - 8) Wait until the board finished loading



Continue / modify existing setup

- 1) Select Continue from Existing Setup. The SDK will load the setup the resides on your board and will bring you to the application screen
- 2) If your board is not connected the SDK will bring up the last setup you were working on.