



LMV1088RL Evaluation Kit Manual

LMV1088RL Demonstration Kit Manual

I. Overview

This kit is used for the evaluation and demonstration of the LMV1088RL Far Field noise suppression amplifier. The Evaluation Kit consists of (6) components:

- LMV1088RL Demonstration Board
- USB to I²C Adapter (Aardvark module)
- Control Software
- Calibrated Microphone board
- Microphone cable
- I²C cable

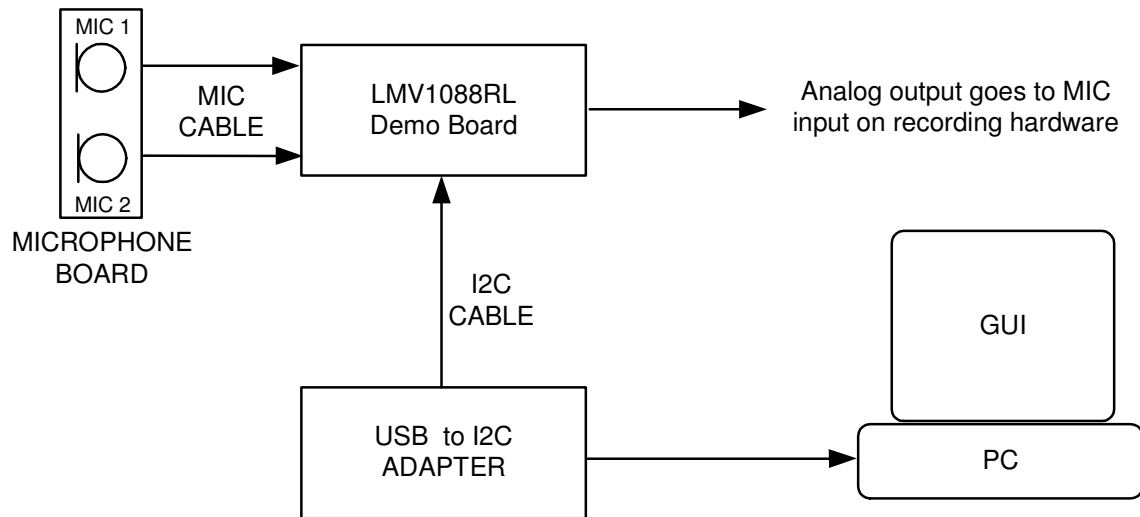


Figure 1: Basic Evaluation System

LMV1088 DEMO BOARD

The LMV1088RL Demonstration Board (Figure 2) takes analog inputs from two microphones and performs the Far Field noise cancellation process. It outputs a processed or unprocessed analog signal depending upon the operation mode used. This output can be connected to a recording device, such as a personal computer sound card through its LINE IN/MIC IN input or a mobile phone through its MIC IN input, for evaluation purposes.

The LMV1088RL contains programmable pre and post gain amplifiers, which can be adjusted through I²C commands and the software GUI.

The LMV1088RL has been pre-programmed with the proper coefficients to compensate for the mismatch of the microphones on the microphone board included in the evaluation kit. Connect the calibrated microphone board to the LMV1088RL Demonstration board with the provided microphone cable.

The LMV1088RL has four (4) operating modes:

- Noise Cancellation (default)
- Mic1 Pass Through
- Mic2 Pass Through
- Mic1, Mic2 Average

The LMV1088RL Demonstration Board can be either powered by battery (3.0V), an external power supply (3.0V or 5.0V), or by USB (5.0V). For the LMV1088RL Evaluation Kit, the demo board is powered through USB using the Aardvark module.

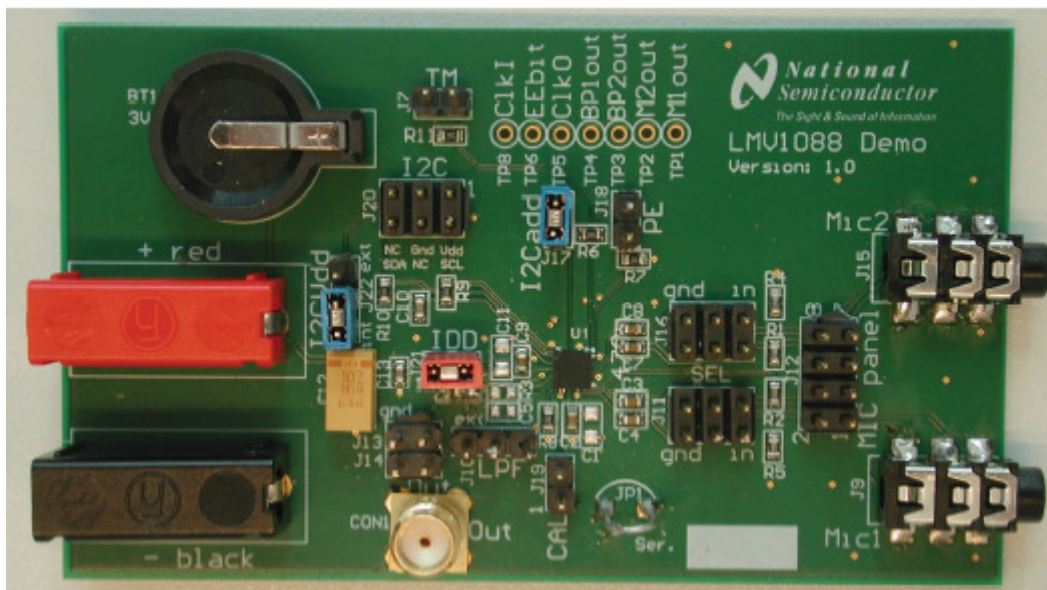


Figure 2. LMV1088RL Demo Board

The functions that are controlled by the jumpers on the LMV1088RL Demonstration Board are labeled on the PCB silkscreen as shown in Figure 2.

Table 1: Description of Headers/Connectors on LMV1088 Demo Board

Header/Connector	Indication/Function	comments
CON1	Coaxial output for connection to high impedance test equipment	
J7	(TM)	Used for manual calibration
J9, J15	(Mic1, Mic2) Microphone input jacks	Stereo 3.5mm jack with ground connection. Tip = Mic+ 1 st ring = mic-
J10	(LPF) Low pass filter selection	Pin 1+2 to connect an external LPF capacitor. Pin 2+3 select the on board LPF capacitor C5
J11	(SEL) Connection for input of electrical test signals or	Pin 3+4 differential input with ground at Pin 5+6
	activation of Microphone input connectors J12/J9	Header between Pin 1+3 and 2+4
J12	(J12) or connection a Microphone panel with 2 microphones	Mic1 between Pin 1+2 Mic2 between Pin 7+8 Ground is at pin 3+5
J13+J14	(OUT) Output monitoring	Measure output
J16	(SEL) Connection for input of electrical test signals or	Pin 3+4 differential input with ground at Pin 5+6
	Activation of Microphone input connectors J12/J15	Header between pin 1+3 and 2+4
J17	(I ² Cadd) I ² C address selection	Open: (0CE Hex) Close: (0CC Hex)
J18	(PE) Enable Programming of the EEPROM	Close: enable
J19	(CAL) Start calibration of the two microphones	Close: calibrate
J20	(I ² C) I ² C interface connector	
J21	(IDD) Supply current measurement	
J22	(I ² CVDD) Selection of the I ² C VDD	Short pin 1+2=I ² C VDD from I ² C interface Short pin 2+3= I ² C VDD=Vdd LMV1088. Short pins 1+2+3 = I ² C VDD = VDD LMV1088 = 5V from Ardvardk
+red	+VDD	Power Supply connection
-black	-VDD	Power Supply Connection
BT1	3V Lithium battery holder	CR21220 or equivalent
JP1	Ground connection for probes	

NOTE: Please note that there is a series resistor on the Demonstration Board between the output of the LMV1088RL and the signal outputs on CON1, J13, and J14. The input of the test equipment connected to these outputs should have an input impedance $\geq 100k\Omega$.

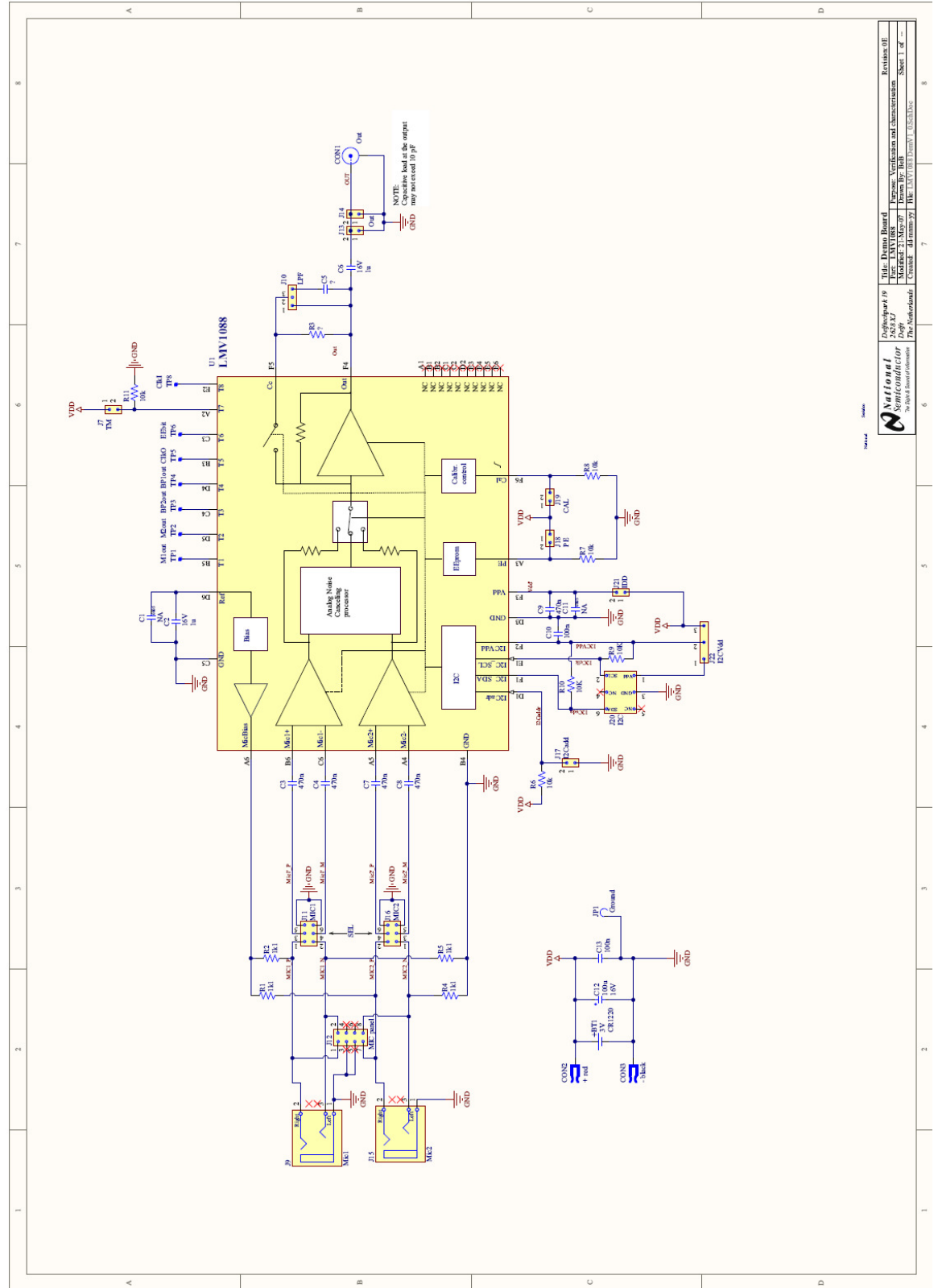


Figure 3: Demo Board Schematic

USB ADAPTER

The USB adapter expands the I/O of a PC with a USB to I²C interface. This interface can be used to configure the demo board or read back its status via a PC. The adapter used in the system is from Aardvark as shown in Figure 4.



Figure 4. Aardvark

HARDWARE/SOFTWARE INSTALLATION

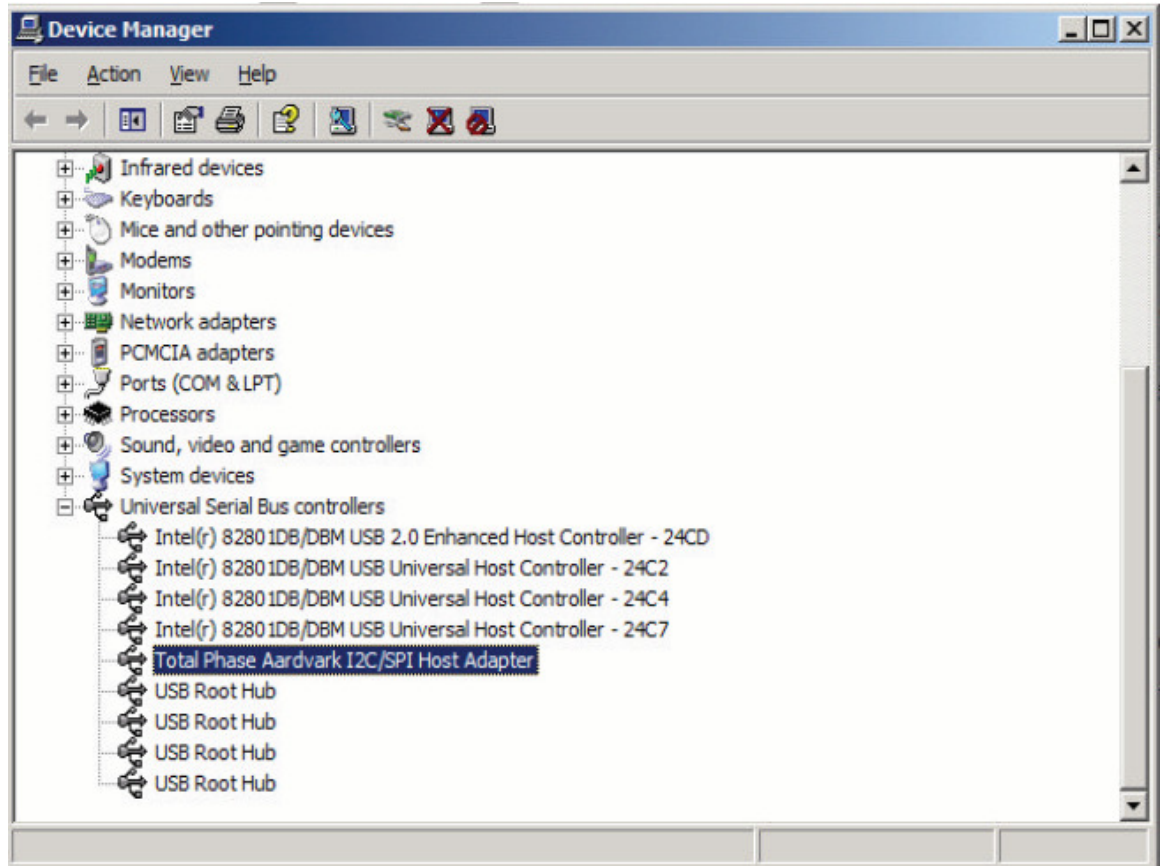
A. Hardware Installation

Connect the Aardvark I²C/SPI module ribbon cable connector to LMV1088RL Demonstration Board connector J20 with the provided I²C cable.

B. Software Installation

Unzip the file "LMV1088.zip" into the local drive on the laptop computer. For example, extract the zipped files to c:\LMV1088.

1. Connect the Aardvark I²C/SPI adapter to the laptop computer USB port.
2. If the driver has not been installed before, a pop-up window of "Found New Hardware Wizard" will be displayed. Point the installation directory to c:\LMV1088\driver\. If a pop-up box appears saying the driver does not pass the Windows logo test, click 'continue anyway'. Once the driver is installed correctly, it will show the device manager as follows:



CONTROL SOFTWARE

The Control Software is a Windows XP2000 application. The graphic user interface (GUI) is shown in Figure 5.

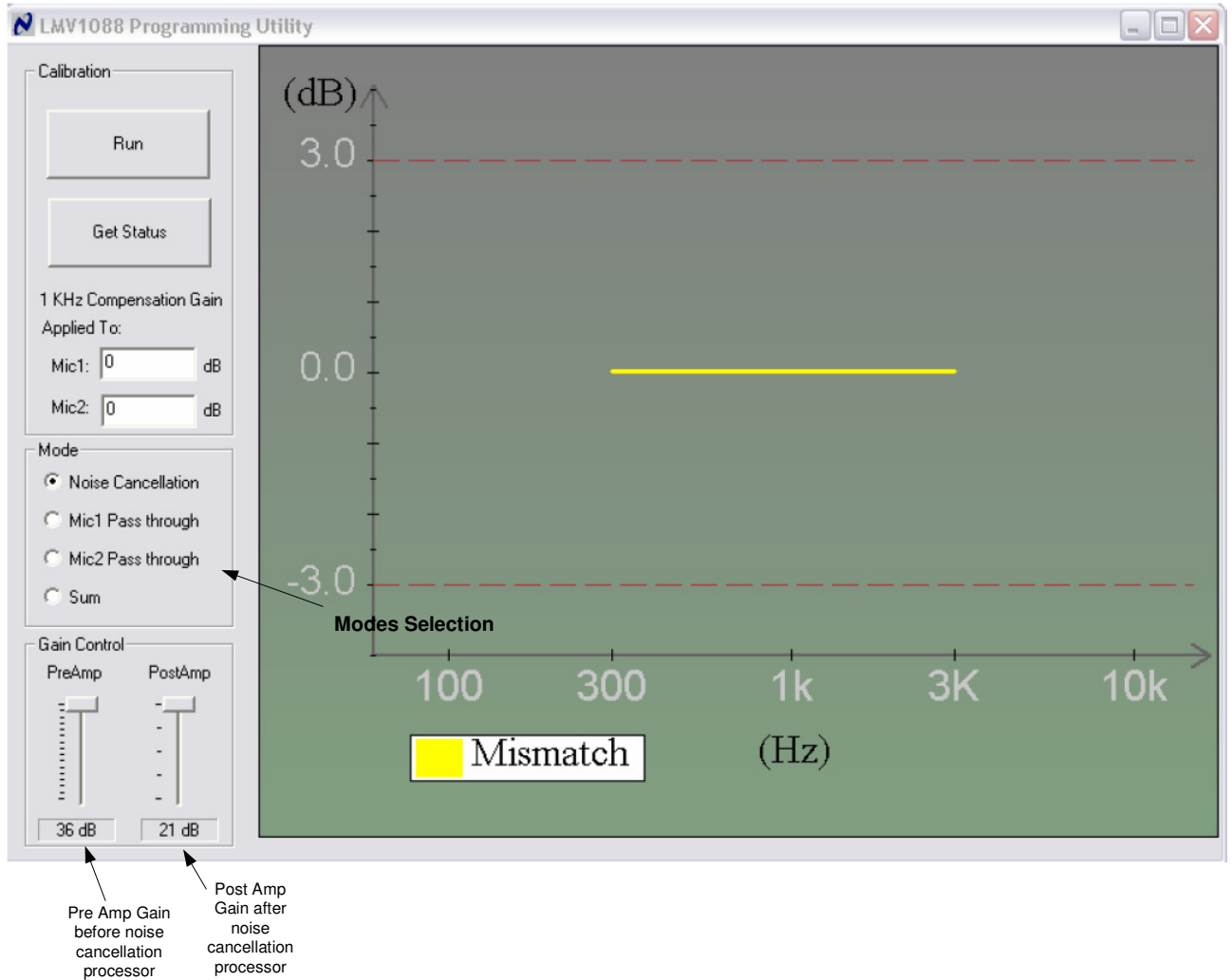


Figure 5. Software GUI

Modes:

To select a mode, just click the corresponding button in the Mode box.

- Noise Cancellation
- Mic 1 Pass Through
- Mic 2 Pass Through
- Mic1, Mic2 average

Gain Control:

Two sliding bars are provided to adjust overall gain. There are two variable gain amplifiers used in the LMV1088RL pre-amplifier and post-amplifier which control gain before and after the noise cancellation processor respectively.