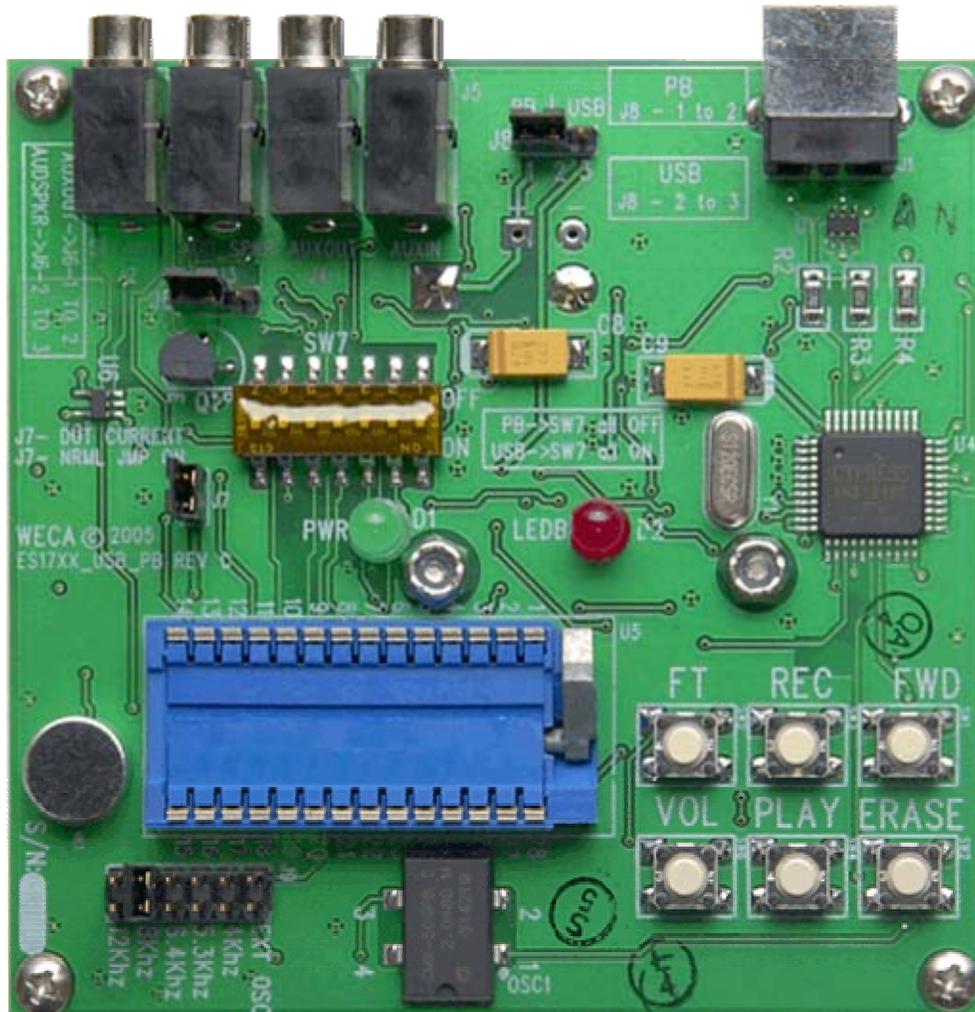


Winbond ChipCorder[®] 17xxx Family Evaluation System User Guide ES-17xx-USB



DESCRIPTION:

This demo board allows the complete operation of the Winbond I17xx ChipCorder[®] IC controlled through the USB port of a PC. All the functions of the chip may be selected in real time to allow complete evaluation of this chip for an end application. The PC connects to the demo board using a standard USB cable. (Not included in the package)

The demo board also works in stand alone mode (Push Button Mode).

DEVICE SUPPORTED:

Product supported	Ordering Code
ISD1730	ES-17xx-USB
ISD1740	
ISD1750	
ISD1760	
ISD1790	
ISD17120	
ISD17150	
ISD17180	
ISD17210	
ISD17240	

SYSTEMS REQUIREMENTS:

The demo board must be connected to a USB port on a PC running Windows 2000 or higher that supports Microsoft's .NET framework v1.1 or higher. Please down load the latest .NET framework from www.microsoft.com go to Microsoft .NET Framework Version 1.1 Redistributable Package. **Please also install the SP1 service pack.**

CONTENTS OF KIT:

- One Sample ISD17150
- CD (with Applications Software and User's guide with demo boards schematics)
- Three AA batteries
- An Eight Ohm Speaker

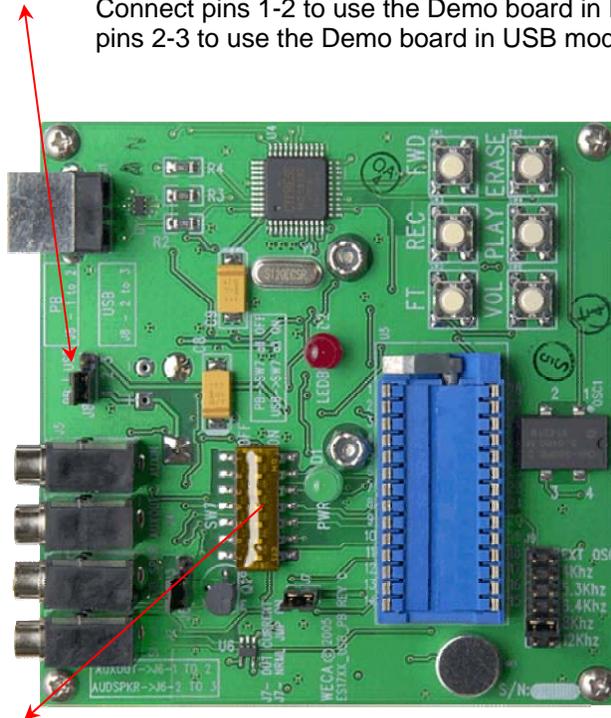
INSTRUCTIONS:

This demo board allows the complete operation of the Winbond I17xx ChipCorder[®] IC controlled through the USB port of a PC. All the functions of the chip may be selected in real time to allow complete evaluation of this chip for an end application. The PC connects to the demo board using a standard USB cable. (Not included in the package)

The demo board also works in stand alone mode (Push Button Mode). To use it as stand alone Push-Button Mode change the following jumpers and switches. Please make sure to install 3 AA batteries.

J8: Power Settings

Connect pins 1-2 to use the Demo board in Push Button mode, powered by batteries. Connect pins 2-3 to use the Demo board in USB mode, powered by the USB port.



S7: Control Settings

All switches **ON** enables USB mode.
All switches **OFF** disables USB control

Please print the user's guide from the enclosed CD for detailed instructions.

HARDWARE / SOFTWARE REQUIREMENTS:

The demo board must be connected to a USB port on a PC running Windows 2000 or higher that supports Microsoft's .NET framework v1.1 or higher. Please download the latest .NET framework from www.microsoft.com go to Microsoft .NET Framework Version 1.1 Redistributable Package. **Please also install the SP1 service pack.**

Software Installation

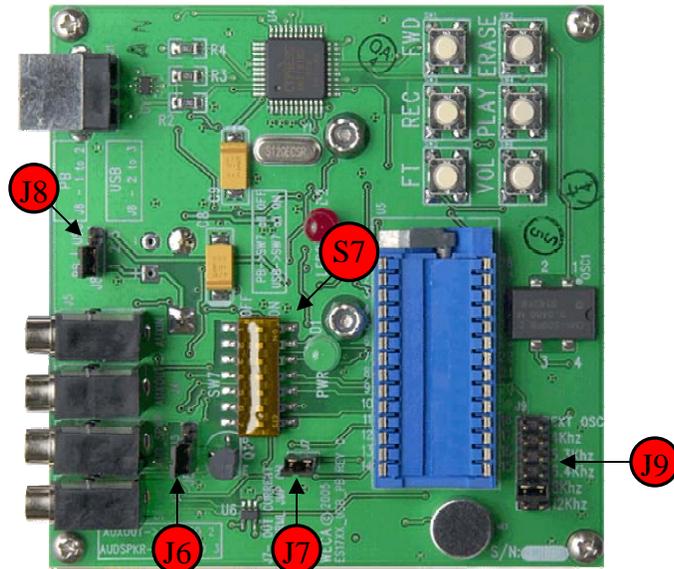
If necessary (no access to internet), install .NET frameworks, which is included on the CD. Insert the CD. The installation should start automatically, if it does not, run setup.msi from the CD. It is

recommended to use the default installation options during setup. After the installation is completed, the 17xx Demo application program can be started from the Start Menu. The demo board should be connected to the USB port prior to running the application.

HARDWARE INSTALLATION:

The first time the ES-17xx-USB board is plugged into the USB port, Windows will begin a search for an appropriate driver for: “Cypress EZ-USB...”. Let the wizard search for compatible drivers automatically. If the wizard finds multiple compatible drivers, use “ezusbw2k.inf” found in the “..\windows\system32\drivers” directory. Additionally, the first time the ES-17xx-USB application is run, Windows will report that new hardware is found for “%USB\VID_0547...”. Search for drivers automatically, and if multiple drivers are found, use “ttsbench.inf” found in the “..\windows\system32\drivers” directory.

Jumper and Switch Settings:



J6: Output Selection

Connect pins 1-2 to route current driver output on AUXOUT
 Connect pins 2-3 to use current driver to drive speaker output on AUD_SPKR

J7: Device Current

This provides a way to measure operating current. Just remove the jumper and connect an Ammeter across these two pins.

J8: Power Settings

Connect pins 1-2 to use the Demo board in Push Button mode, powered by batteries. Connect pins 2-3 to use the Demo board in USB mode, powered by the USB port.

J9: Sample Rate Selection

This jumper selects the Sample rate for recording.
Available options are: 4 KHz, 5.3 KHz, 6.4 KHz, 8 KHz and 12 KHz.

The EXT_OSC selection can only be used in USB mode and should only be set after checking the EXT_OSC box on the main panel. ⑩

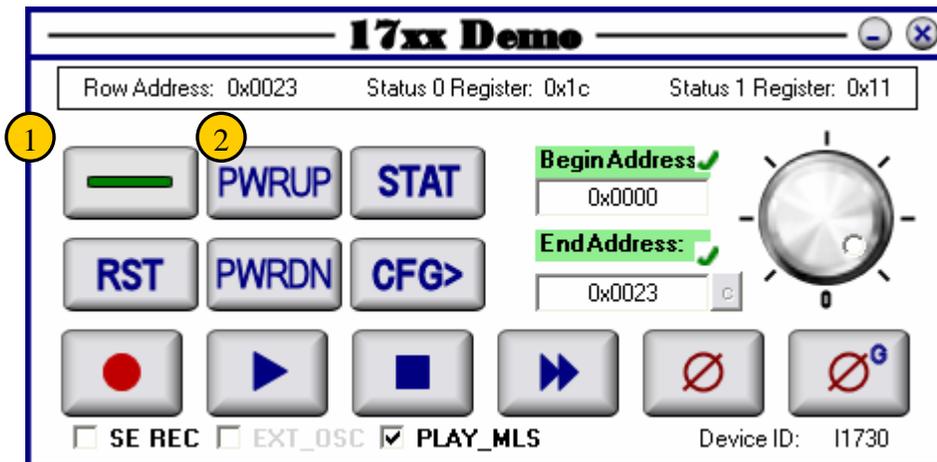
S7: Control Settings

This switch enables the USB control for the Demo Board.
All switches on enables USB mode.
All switches off disables USB control and is used for push button mode.

CHIPCORDER® ES-17XX-USB DEMO SOFTWARE OPERATION:

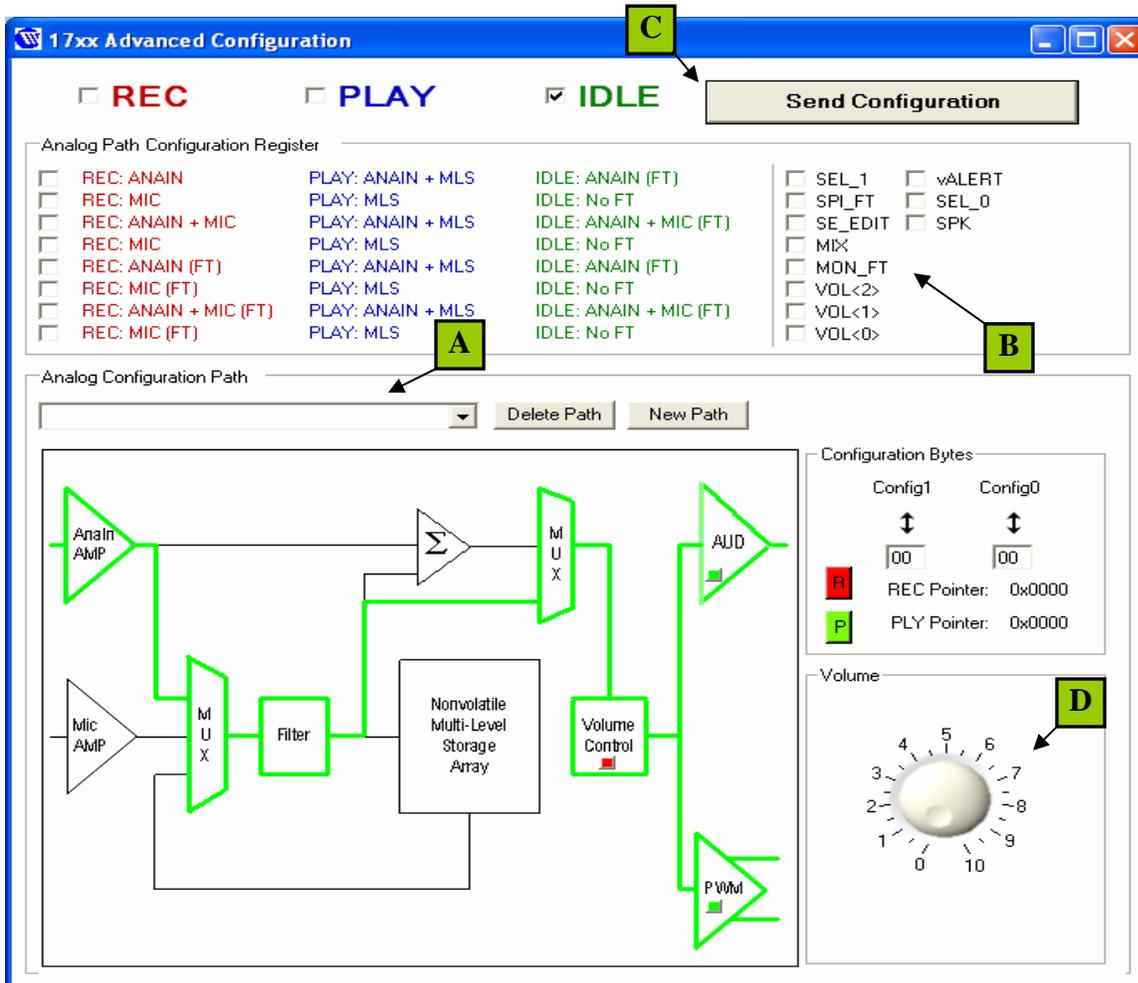
Before starting the 17xx Demo software application, make sure that the evaluation board is plugged into one of the PC's USB ports and properly installed. Once the software starts, it will attempt to download firmware onto the evaluation board, but if no board is detected, an error message will be displayed. If so, it will be necessary to restart the software.

Once the software is running, the main control panel will appear. To begin evaluating the ChipCorder® part, first apply power to the chip by pressing the power toggle button ①, then press the PWRUP button ② to send a SPI power up command. This evaluation system uses the ChipCorder®'s SPI interface, and the last step starts the chip's power up sequence and resets the chip to its IDLE state.



Pressing the PWRDN button sends an SPI power down command to the chip, and places the part in power-down mode. Pressing the RST button has the same effect as a reset on the hardware reset pin of the ChipCorder®, and places the part in power-down mode. To check the status of the part, press the STAT button and the row address, status 0 register, and status 1 register fields at the top of the panel will be updated. Use the mouse to hover over the register values to activate tool-tips which explain the register values. All other commands require the chip be in powered-up mode.

Note that the standard audio record, play, and stop operations will have different effects depending on the configuration settings. To modify the configuration, press the CFG> button to open up the configuration panel. The ChipCorder® 17xx family allows for two different modes of configuration, through the SPI configuration register or the analog path configuration register. The SPI configuration register consists of 11 bits which determines the record, play, and idle behavior. Selecting one of the eight possible behaviors of the left side of the panel will automatically update the actual register bits that are displayed on the right side of the panel. It is also possible to set the register bits directly.



To send the current SPI configuration register settings, ensure that the “SPI Configuration” check box is selected at the top of the panel and press the “Send Configuration” button.

Alternatively, configuration with the analog path configuration register provides more flexibility, but requires greater knowledge of the ChipCorder® architecture. However, there are several pre-defined settings that are selectable in the path diagram drop down combo box that automatically configure the four analog path configuration bytes. **A**

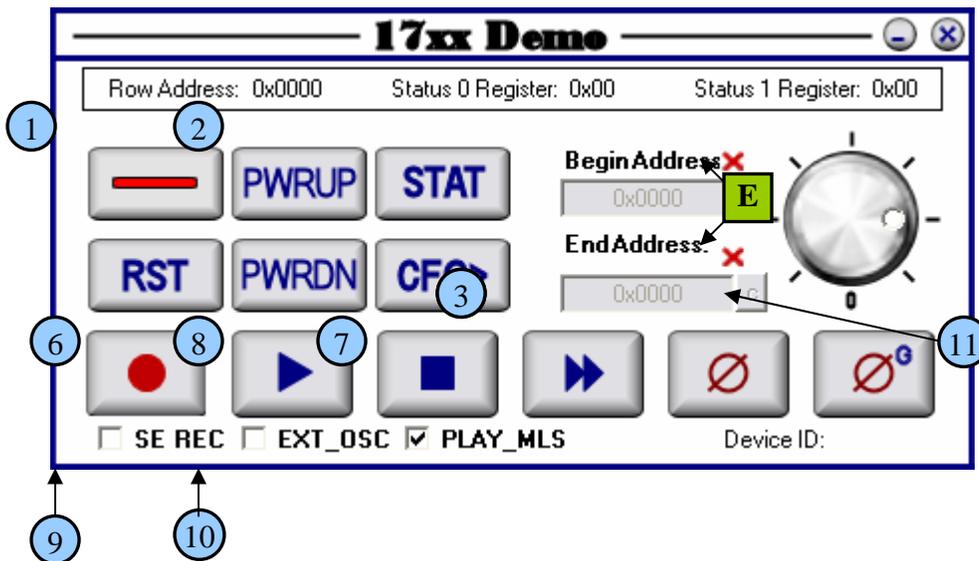
It is also possible to directly configure the configuration bytes or customize the analog path through the drop down combo boxes in the path diagram. Note that APC (config3.0) must be set in order for the

ChipCorder[®] to use the analog path configuration register settings. Corollary, the APC bit must be cleared to use the SPI configuration register settings. **B** To send the current analog path configuration register settings, ensure that the “Analog Path Configuration” check box is selected at the top of the panel and press the “Send Configuration” button. **C**

There are two different options for configuring the sampling rate. The internal Oscillator can be setup by selecting the appropriate frequency at J9. Simply select the desired R_{osc} value and connect the jumper. An External Oscillator can also be used. To do this you must first check the Ext_OSC box located on at the bottom of the main panel and then set the jumper at J9 for the Ext_OSC input. **10** This sends a command to the ChipCorder[®] to use an external oscillator also enables the oscillator on the Demo board. For specific R_{osc} to sample rate conversion, please refer to the ChipCorder[®] 17xx reference manual.

From the main panel, in addition to the standard audio operations, the user can also erase the current message, perform a global erase, and set the playback volume. If the analog path configuration register is used, the volume can be adjusted with the volume knob on the configuration panel. **D**

The final features are the set commands that allow recording, playing, and erasing at specific row addresses. To use this feature, click the cross **E** beside the “begin / end” address text fields to enable editing of the fields. To disable address setting and use the default ChipCorder[®] built-in begin / end of message markers, simply click on the check beside the begin / end address fields to disable editing and the set address feature.



EXAMPLE 1: RECORDING THE ANAIN PORT, AND PLAYING BACK ON THE SPK PORT

- 1.) Apply power up to the ChipCorder[®] part by pressing the power toggle button. **1**
- 2.) Send a SPI power-up command to place the part in IDLE mode. **2**
- 3.) Press the CFG> button to open up the configuration panel. **3**
- 4.) Select the first setting (REC: ANAIN, PLAY: ANAIN + MLS, IDLE: ANAIN) on the Analog Path Configuration Register panel. **4**
- 5.) Ensure that “SPI Configuration” check box is selected (by default) and press the “Send Configuration” button. Close the configuration panel. **5**
- 6.) Plug in an audio source to the ANAIN port and press the REC button on the main panel. **6**

- 7.) Press STOP when desired and unplug the audio source from the ANAIN port. ⑦
- 8.) Attach speakers to the SPK port, and press PLAY. ⑧ The part will play the recently recorded message and stop when an end of message marker is reached or if STOP is pressed.



Alternatively, the user can record to a specific memory range by enabling the set address feature as outlined above or by using delayed record feature. ⑨

Pre-Programming a Wave File

Another option for set recording is the Delayed Record feature. **The wave file format has to be 16bit PCM mono (8KHZ to 44 KHz sampling rate).** Checking the SE_REC ⑨ box, puts the ChipCorder® into a mode that will wait for a signal at ANAIN before recording. Once checked, the set address feature is enabled and the device path is setup for ANAIN (FT) record. At this point the user is prompted to select an audio file. The address range can be manually entered or the software can calculate the necessary range to record the entire audio file by pressing ⑩. Pressing records begins playback of the specified file and the record session is triggered automatically.

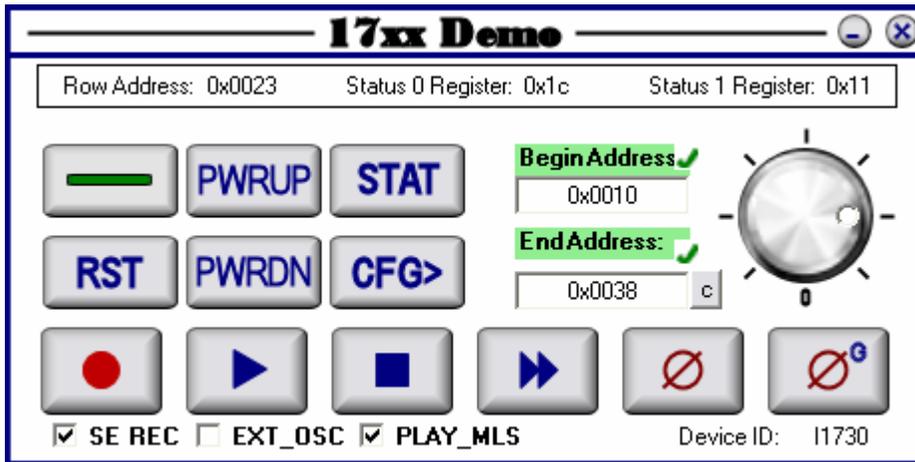
This requires the following hardware connections:

- USB connection from the PC to the demo board.
- An Audio connection from the PC to ANAIN on the demo board. (Usually the Headphone Jack)
Note: Be sure that the volume is turned up all the way.
- Speaker connection to the Demo Board

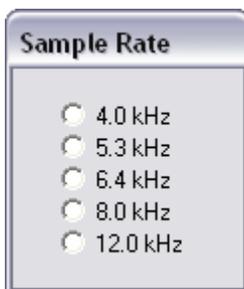
EXAMPLE 2: PRE-PROGRAMMING A WAVE FILE FROM ADDRESS 0X10 TO 0X40

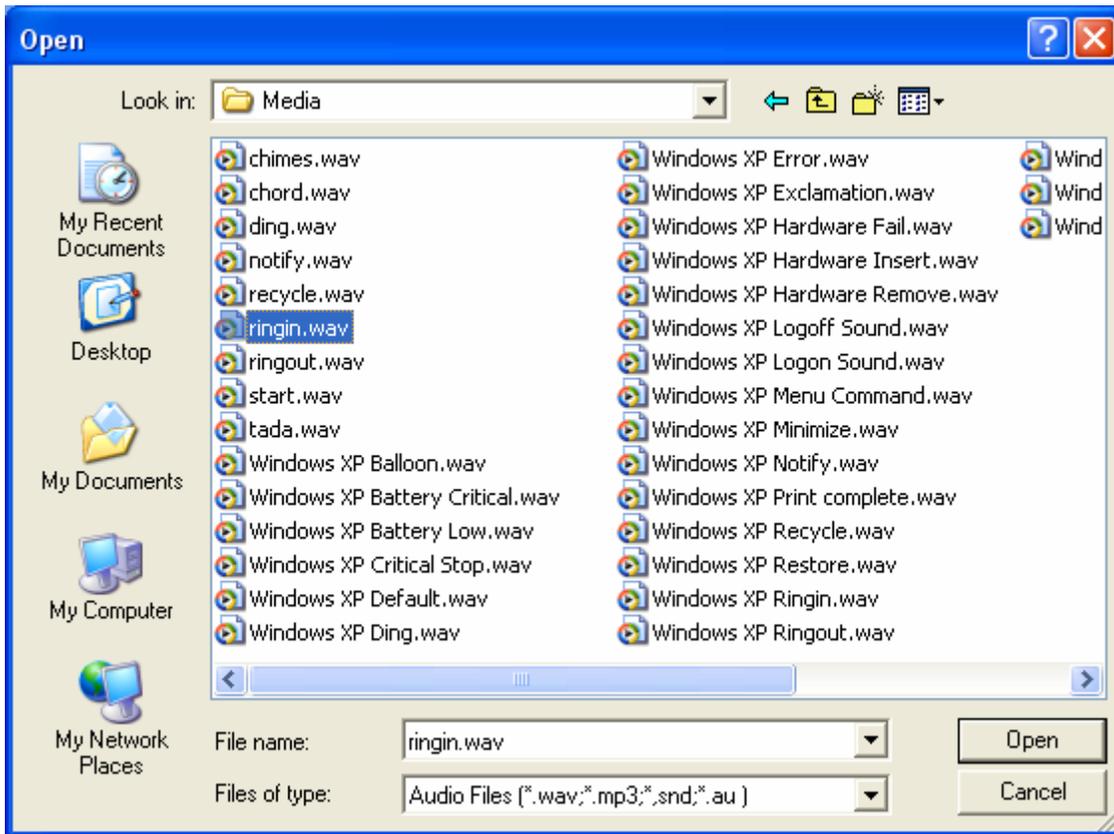
- 1.) Apply power up to the ChipCorder® by pressing the power toggle button. ①
- 2.) Send a SPI power-up command to place the part in IDLE mode. ②
- 3.) Check the SE REC check box and you will be prompted to select an audio file. ⑨

- 4.) The Begin/End address field should be enabled. You can manually select the address range (ie. 0x10 & 0x40 respectively ) or have the software calculate the appropriate address range. Enter 0x0010 in the begin address box, and then press the C button. . You will be prompted to select the current record sample rate if the external oscillator is not enabled.

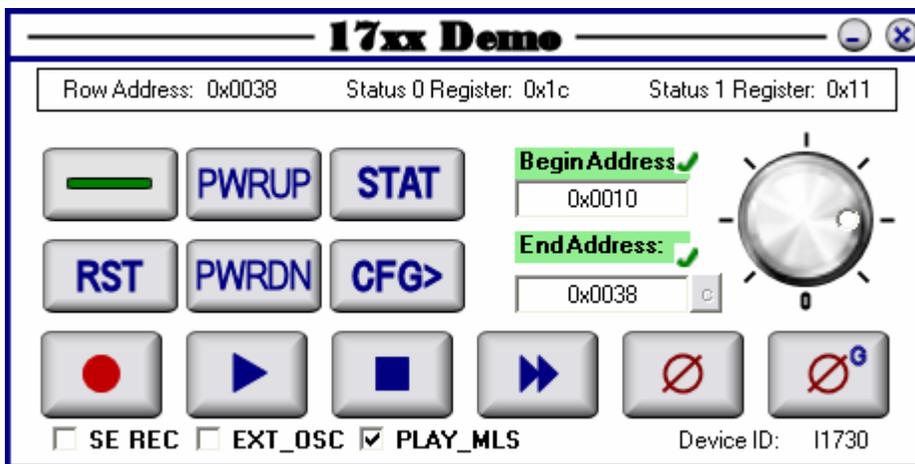


- 5.) Next press the record button. 
- 6.) Once selected, the file will play automatically and the record session will begin when there is signal at ANAIN.





7.) When complete, the SE REC box will be unchecked as shown below:



8.) Press Play to hear the recorded Wave file. ⑧

CHIPCORDER® ES-17XXX-USB DEMO SCHEMATICS:

