

## Interfacing DVSI's AMBE-2000™ and AMBE-2020™ Vocoder Chips with the Analog Devices AD73311 Codec

The Analog Devices AD73311 codec chip presents a simple low cost solution for use with DVSI's AMBE-2000™ or AMBE-2020™ vocoder chips. This application note provides information on alternative methods of interfacing these components.

### AD73311AR codec (using a 5 volt supply)

The block diagram in Figure 1 shows a sample interface between the AD73311 codec and DVSI's AMBE-2000™ vocoder chip. When the AMBE-2000™ or AMBE-2020™ CODEC\_SEL bits (see AMBE-2000™ or AMBE-2020™ users manual) are set for the AD73311, the vocoder chip sends configuration words to the codec and no other configuration actions required by the user. Configuration words are listed in Table 1.

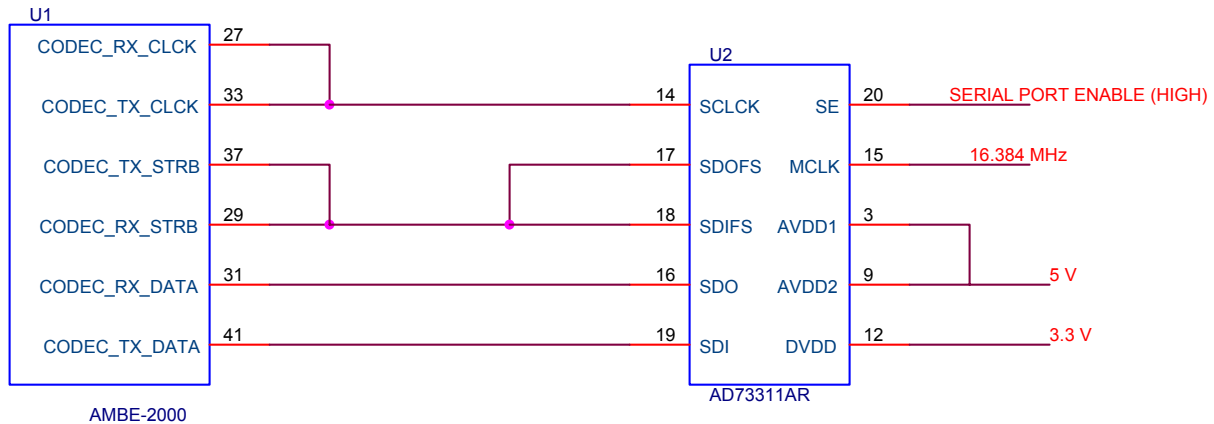


Figure 1: The AMBE-2000™ Vocoder with the AD73311 CODEC

Register Address (D10-D8)	Configuration Data (D7-D0)	Notes:
0x1 CRB	0x13	MCD = 1 Sets DMCLK=MCLK/2 SCD = 0 Sets SCLK=DMCLK/8
0x2 CRC	0xF9	D7 = 1 5V EN On D6 = 1 Reference Out Enabled D5 = 1 Reference Power On D4 = 1 DAC Power On D3 = 1 ADC Power On D0 = 1 Power On
0x3 CRD	0x00	Gain set to 0
0x0 CRA	0x01	D0 = 1 Puts CODEC in Data Mode

Table 1: Configuration Data Sent to the AD73311 from the AMBE-2000 when CODEC\_SEL [1-0]=01,b

## AD7331AR codec (using a 3 volt supply)

It may be desirable for the AD73311 AD/DA converter to be configured for a 3-volt supply voltage instead of a 5-volt supply voltage. The diagram and configuration procedure below outline the details necessary in order to send alternate configuration words to the CODEC.

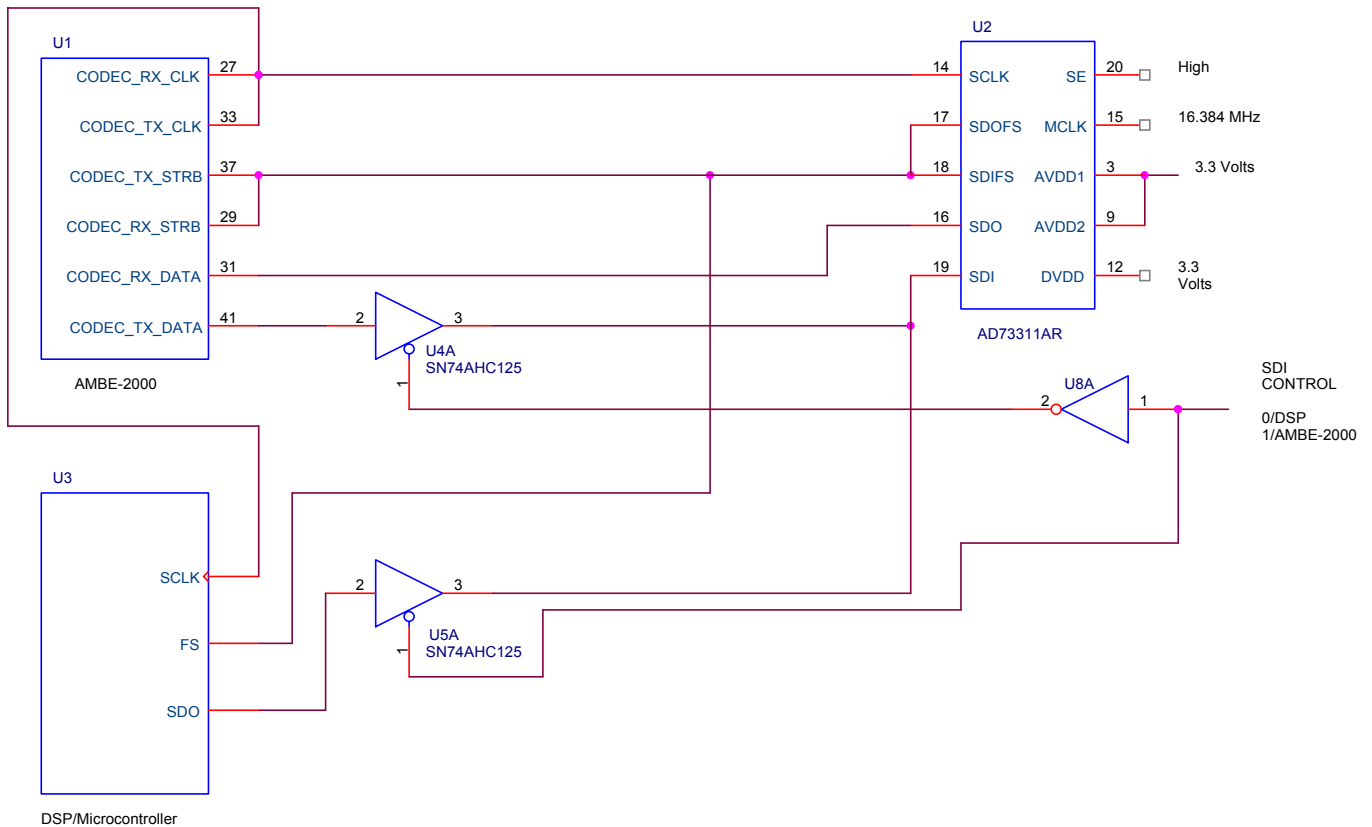


Figure 2: The AMBE-2000™ or AMBE-2020™ Vocoder with the AD73311 Configured for 3-volt operation.

The objective of this circuit is to tri-state the output of the AMBE-2000 CODEC\_TX\_DATA. This allows the DSP or Microcontroller to communicate with the AD73311 to send it the desired configuration.

1. Configure the AMBE-2000 for operation with the AD73311 Codec. Set the CODEC\_SEL pins as shown.  
CODEC\_SEL [1-0] (pins 85,84) = 01,b
2. Hold the CODEC\_TX\_DATA lines on the AMBE-2000 in tri-state (in the circuit set the SDI bit to 0,b) during power up.
3. While the AMBE-2000 lines are in tri-state, send the desired configuration words from the DSP/Microcontroller/logic to the AD73311 (Reset timing constraints for the AD73311 must be met).
4. After sending the configuration words set the SDI Control bit to 1,b (SEE NOTE). This sets the CODEC SDI line for normal operation with the AMBE-2000.

**NOTE:** The SDI Control bit must be set to 0 for approximately 365 msec following a hardware reset.

Register Address (D10-D8)	Configuration Data (D7-D0)	Notes:
CRB 0x1	0x13	MCD = 1 Sets DMCLK=MCLK/2 SCD = 0 Sets SCLK=DMCLK/8
CRC 0x2	0x79	D6 = 1 Reference Out Enabled D5 = 1 Reference Power On D4 = 1 DAC Power On D3 = 1 ADC Power On D0 = 1 Power On
CRD 0x3	0x00	Gain set to 0
CRA 0x0	0x01	D0 = 1 Puts CODEC in Data Mode

Table 2: Alternate Configuration Data for the AD73311

### **AD73311L codec (3 volt supply)**

The Analog Devices AD73311L is a low power 3 volt version of the AD73311. It is possible to use this part with the AMBE-2000™ or AMBE-2020™ vocoder chip utilizing the method described above for sending alternate configuration words to the AD73311 CODEC. Table 3 lists alternate control words for configuring the AD73311L for use with the AMBE-2000™ or AMBE-2020™.

Register Address (D10-D8)	Configuration Data (D7-D0)	Notes:
0x1 CRB	0x13	MCD = 1 Sets DMCLK=MCLK/2 SCD = 0 Sets SCLK=DMCLK/8
0x2 CRC	0x79	D6 = 1 Reference Out Enabled D5 = 1 Reference Power On D4 = 1 DAC Power On D3 = 1 ADC Power On D0 = 1 Power On
0x3 CRD	0x00	Gain set to 0
0x0 CRA	0x01	D0 = 1 Puts CODEC in Data Mode

Table 3: Configuration Data for the AD73311L

### **Additional Reference Material**

AMBE-2000™ or AMBE-2020™ vocoder chip Users Manual

<http://www.dvsinc.com/literature.htm>

Application Report – Understanding Data Converters:

<http://www-s.ti.com/sc/psheets/slaa013/slaa013.pdf>

AD73311 - Data Sheet

[http://www.analog.com/productSelection/pdf/AD73311\\_b.pdf](http://www.analog.com/productSelection/pdf/AD73311_b.pdf)

AD73311L - Data Sheet

[http://www.analog.com/productSelection/pdf/AD73311L\\_a.pdf](http://www.analog.com/productSelection/pdf/AD73311L_a.pdf)