



Evaluation Board For Dual PLL Frequency Synthesizer

EVAL-ADF4206_7EB1

FEATURES

General Purpose PLL Evaluation Board excluding Synthesizer, VCO, Loop Filter for generating generic PLL standard

Compatible with the ADF4206BRU and ADF4207BRU Standard 0.5" x 0.5" VCO Footprint.

On-Board 10MHz Crystal

Accompanying Software allows complete control of synthesizer functions from PC

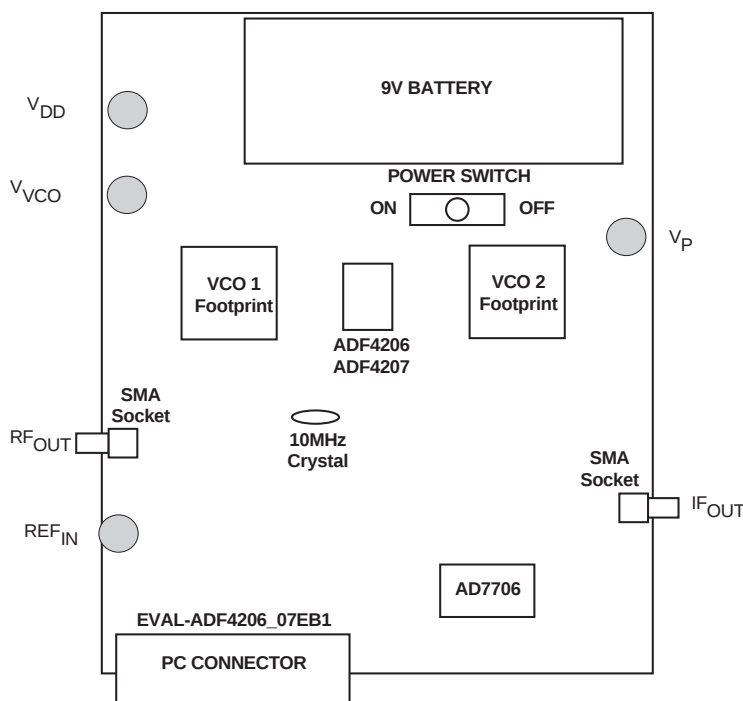
Battery Operated: Choice of 3V or 5V supplies

GENERAL DESCRIPTION

This board is designed to allow the user to evaluate the performance of the ADF4206 or the ADF4207 Frequency Synthesizers for PLL's (Phase Locked Loops). The block diagram of the board is shown below. It contains the footprint for the ADF4206 and ADF4207 synthesizers, a pc connector, SMA connector for the reference input, power supplies and RF output. There is also a footprint for the loop filters and VCO's on the board. A cable is included with the board to connect to a pc printer port.

The package also contains windows software to allow easy programming of the synthesizer.

BLOCK DIAGRAM



REV.PrA 06/00

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Hardware Description

The evaluation board comes with a cable for connecting to the printer port of a PC. The silk screen and cable diagram for the evaluation board are shown below. The board schematic is shown on pages 3 and 4.

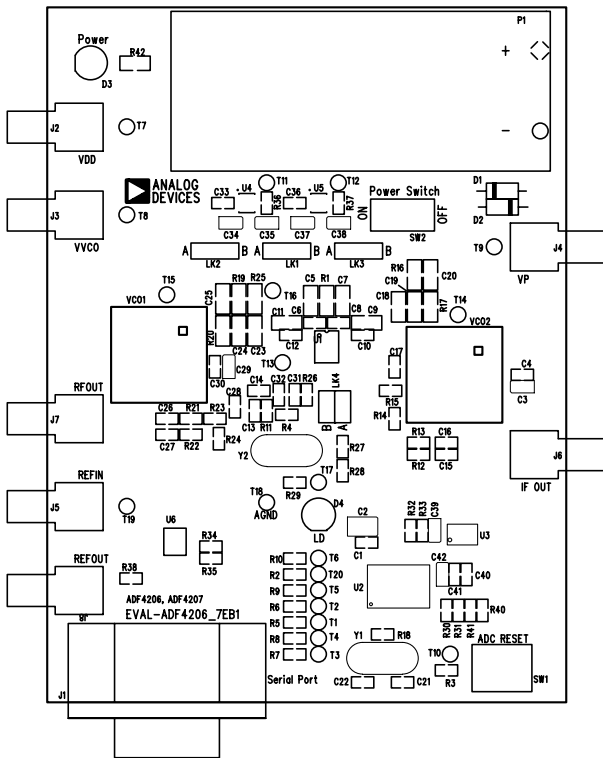


Figure 1. Evaluation Board Silkscreen

The board is powered from a single 9V battery. The power supply circuitry allows the user to choose either 3V or 5V for the ADF4206/07 V_{DD} and V_P , and for the VCO supply. The default settings are 3V for the ADF4206/07 V_{DD} supplies and 5V for the ADF4206/07 V_P and VCO supplies. **It is very important to note that the ADF4206/07 V_{DD} supplies should never exceed the ADF4206/07 V_P supplies. This can damage the device.**

All components necessary for LO generation are catered for on-board. The 10MHz crystal provides the necessary Reference Input. The PLL is made up of the ADF4206 or ADF4207, passive loop filter a VCO. The outputs are available at RF_{OUT} and IF_{OUT} through standard SMA connectors. If the user wishes they may use their own power supplies and reference input. In this case, they need to insert SMA connectors to as shown on the silkscreen and block diagram. The AD7706 A/D converter is used to monitor the power supply voltage and current consumption of the ADF4206 or the ADF4207. This helps the user pick the optimum synthesizer settings for power consumption and also provides an alert if the battery voltage is too low to sustain the required 3V or 5V for the board supply.

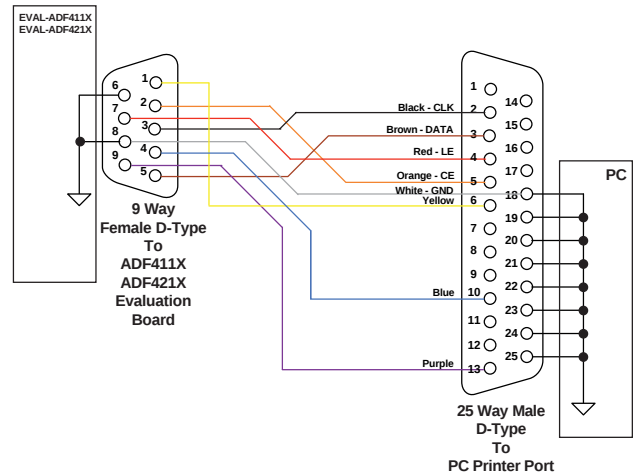


Figure 2. PC Cable Diagram

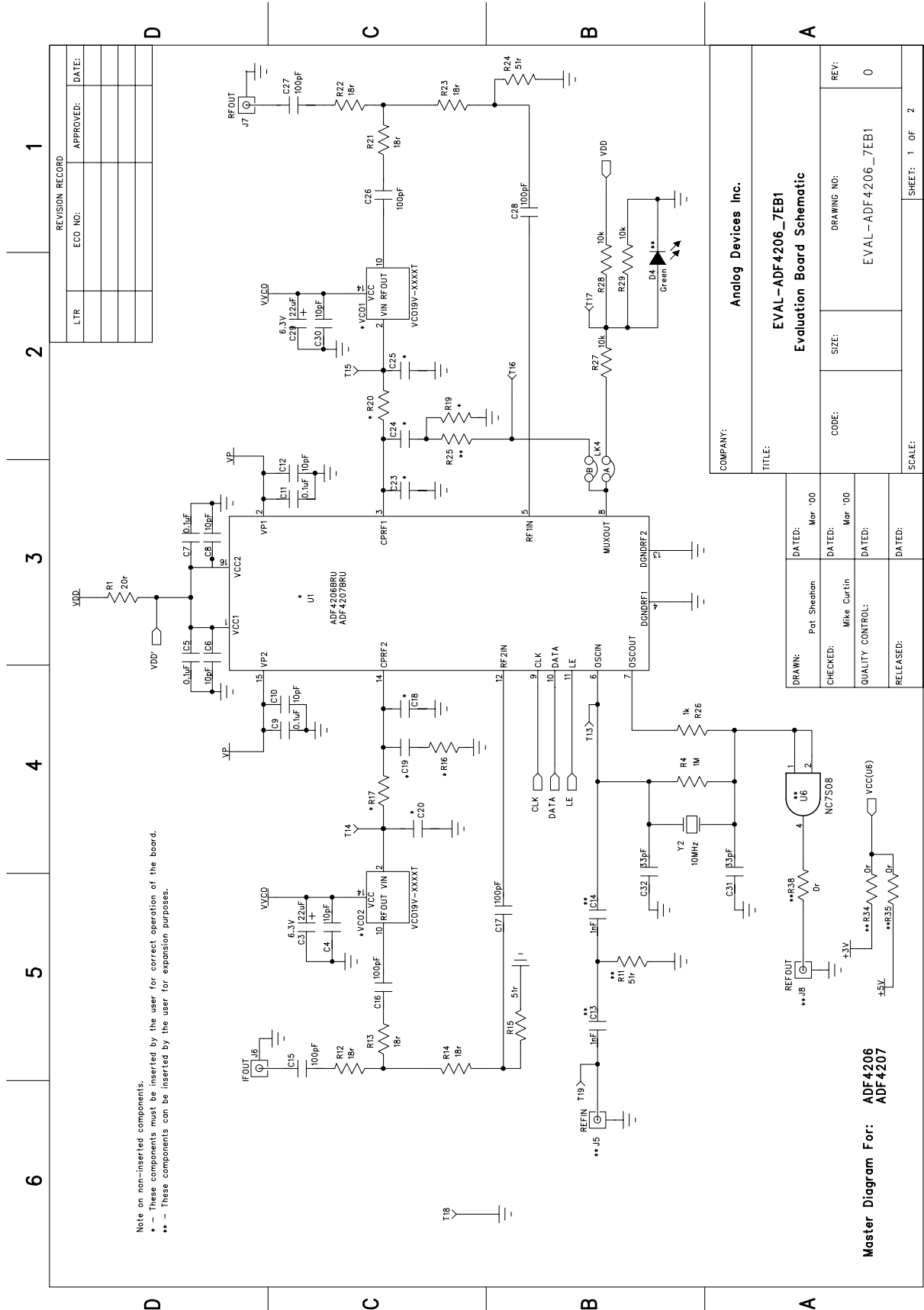


Figure 3. Evaluation Board Circuit Diagram (Page 1)

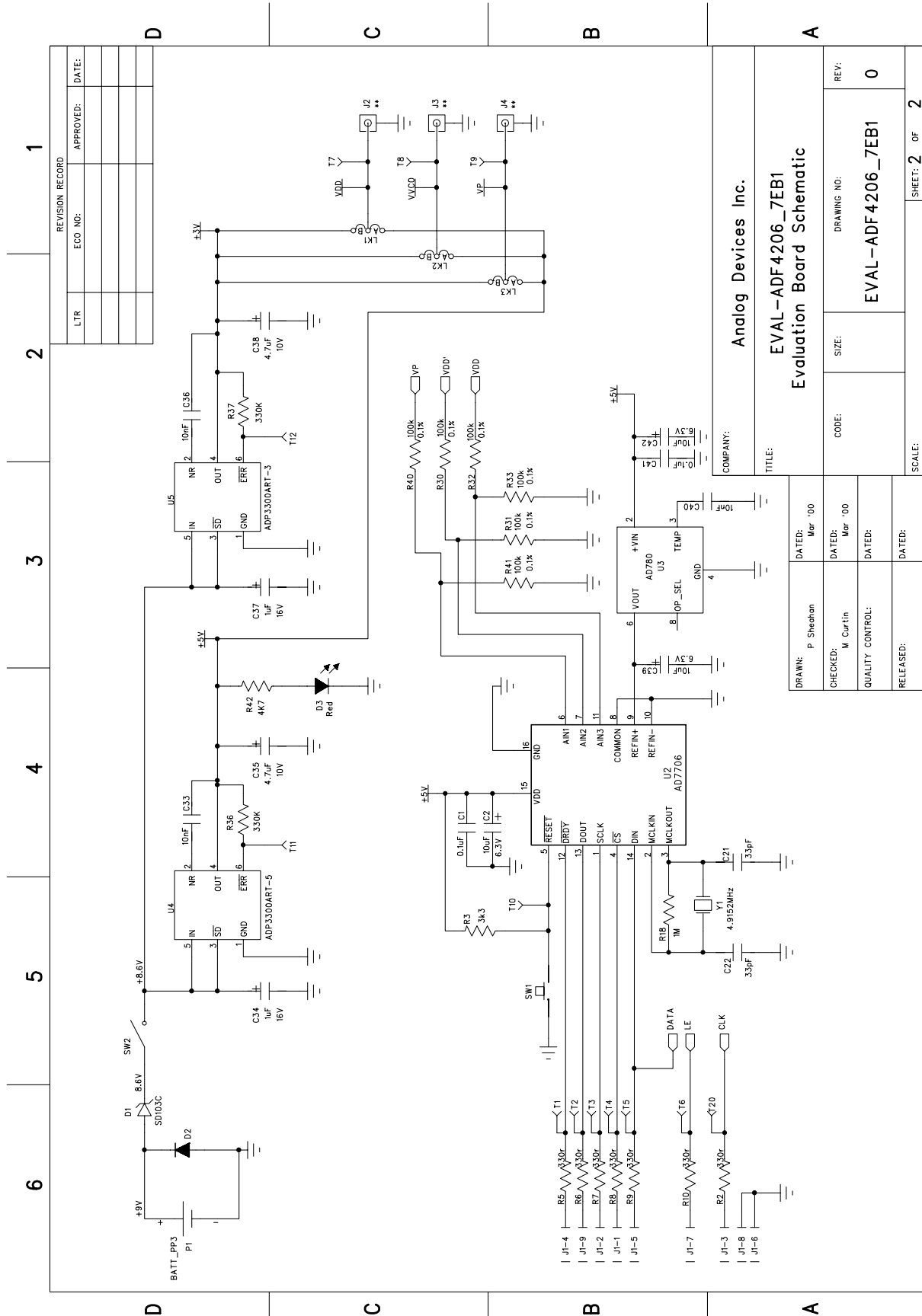


Figure 4. Evaluation Board Circuit Diagram (Page 2)

Software Description

The evaluation board software is contained on a CD-ROM which comes in the package. To load the software the user should click on "setup.exe", then the install wizard installs the software. Follow the on-screen directions. The software will be installed in a default directory called "C:/Program Files/Analog Devices". To run the software, simply go to the Start Menu and choose Program/ADF4XXX/ADF4XXX_rev0. This will open the software for the evaluation board. The user will be asked to choose which device is being evaluated. Click on the ADF4206 or ADF4207 button. Hit OK. The window shown below will now appear.

Click on "Choose Port" and the Port Connector window will appear. Choose the port that the cable is connected to on the PC and click OK. The setting here will normally be LPT1.

Click on "REFIN Frequency" and the Reference Frequency window will appear. Enter the reference frequency being used and then click OK.

Click on "RF VCO Output Frequency" and the output frequency window for RF1 will appear. Enter the output frequency desired and the PFD frequency (channel spacing), and then click OK.

Click on the RF or the IF Prescaler and the window for choosing both of these will appear. Clicking once in each box will toggle the prescaler value between 64/65 and 32/33.

Click on "IF VCO Output Frequency" and the output frequency window for RF2 will appear. Enter the output frequency desired and the PFD frequency (channel spacing), and then click OK.

The charge pump current setting for each channel can be chosen by clicking on the CP Gain Box in each window. This toggles between 1.25mA and 4.375mA.

Clicking once on the MUXOUT box brings up a window which allows the user to choose the output selected at the MUXOUT pin.

The software also allows monitoring of the device supply voltage, supply current and the charge pump voltage. Simply hit the "Update Voltage and Current Display" button to get an up-to-date reading.

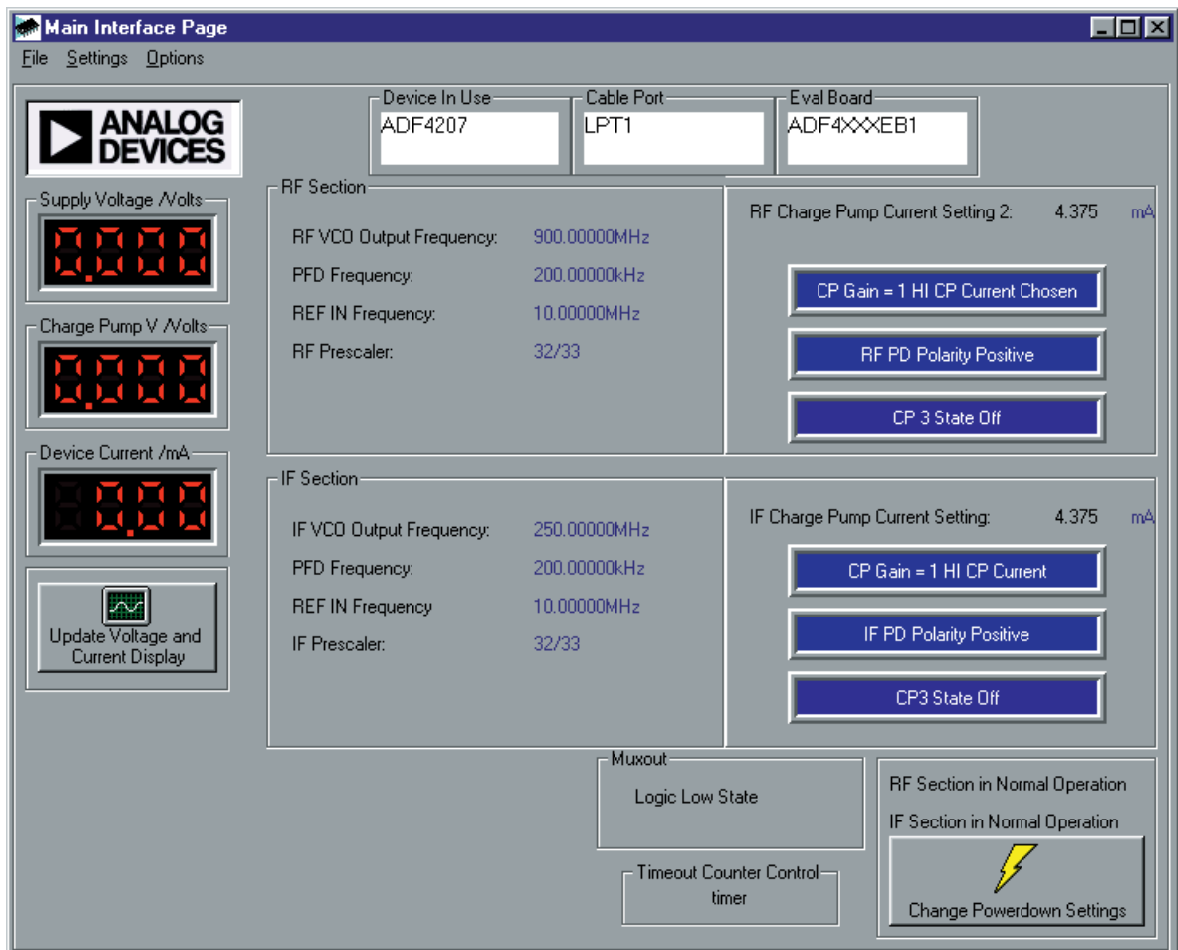


Figure 5. Software Front Panel

Table 1. Bill of Materials for the EVAL-ADF4206_7EB1

Qty	Reference	Description	Manufacturer	PCB DECAL	VALUE
1	U1	Do Not Insert	ADI	TSSOP-16	
1	U2	AD7706BR	ADI	SO16WB	AD7706BR
1	U3	AD780A	ADI	SO8NB	AD780A
1	U4	ADP3300ART-5	ADI	SOT23-6	ADP3300ART-5
1	U5	ADP3300ART-3	ADI	SOT23-6	ADP3300ART-3
1	U6	Do Not Insert	Fairchild	SOT23-5	NC7SM508
1	VCO1	Do Not Insert	Vari-L		
1	VCO2	Do Not Insert	Vari-L		
1	Y1	4.9152MHz Crystal	Vectron International	HC49 low profile	VXA4-1011
1	Y2	10MHz Crystal	Vectron International	HC49 low profile	VXA4-1B2-10M00
1	D1	SD103C Schottky Diode	General Semiconductor	DO35	SD103
1	D2	IN4001		DO35	FEC 365-117
1	D3	Red Low Power LE	Visha	LED	FEC 657-130
1	D4	Green Low Power LED (Do Not Insert)	Visha	LED	FEC 657-141
6	C1 C5 C7 C9 C11 C41	Multi Layer Ceramic Capacitor	Murata	Case 0603	0.1uF
1	C2	Tantalum Capacitor	AVX	CAP\TAJ B	10uF 6.3V
2	C3 C29	Tantalum Capacitor	AVX	CAP\TAJ A	22uF 6.3V
6	C4 C6 C8 C10 C12 C30	Multi Layer Ceramic Capacitor	Murata	Case 0603	10pF
2	C13-14	Do Not Insert	Murata	Case 0603	1nF
6	C15-17 C26-28	Multi Layer Ceramic Capacitor	Murata	Case 0603	100pF
1	C18	Do Not Insert	Murata	Case 0805	
1	C19	Do Not Insert	Murata	Case 0805	
1	C20	Do Not Insert	Murata	Case 0805	
4	C21-22 C31-32	Multi Layer Ceramic Capacitor	Murata	Case 0603	33pF
1	C23	Do Not Insert	Murata	Case 0805	
1	C24	Do Not Insert	Murata	Case 0805	
1	C25	Do Not Insert	Murata	Case 0805	
3	C33 C36 C40	Multi Layer Ceramic Capacitor	Murata	Case 0603	10nF
2	C34 C37	Tantalum Capacitor	AVX	CAP\TAJ A	1uF 16V
2	C35 C38	Tantalum Capacitor	AVX	CAP\TAJ A	4.7uF 10V
2	C39 C42	Tantalum Capacitor	AVX	CAP\TAJ A	10uF 6.3V
1	R1	Resistor (Surface Mount)	Boums	Case 0805	20r 1.0%
7	R2 R5-10	Resistor (Surface Mount)	Boums	Case 0603	330r 1.0%
1	R3	Resistor (Surface Mount)	Boums	Case 0603	3k3 1.0%
2	R4 R18	Resistor (Surface Mount)	Boums	Case 0603	1M 1.0
1	R11	Do Not Insert	Boums	Case 0603	51r 1.0%
6	R12-14 R21-23	Resistor (Surface Mount)	Boums	Case 0603	18r 1.0%
2	R15 R24	Resistor (Surface Mount)	Boums	Case 0603	51r 1.0%
1	R16	Do Not Insert		Case 0805	
1	R17	Do Not Insert		Case 0805	
1	R19	Do Not Insert		Case 0805	
1	R20	Do Not Insert		Case 0805	
1	R25	Do Not Insert		Case 0805	
1	R26	Resistor (Surface Mount)	Boums	Case 0603	1k 1.0
3	R27-29	Resistor (Surface Mount)	Boums	Case 0603	10k 1.0%
6	R30-33 R40-41	Resistor (Surface Mount)	Meggitt	Case 0603	100k 0.1%
3	R34-35 R38	Do Not Insert		Case 0603	0r 1.0%
2	R36 R37	Resistor (Surface Mount)	Boums	Case 0603	330k 1.0%
1	R42	Resistor (Surface Mount)	Boums	Case 0603	4k7 1.0%
1	SW1	Push Button Switch	Omron	SW\PB-SMALL	FEC 176-986
1	SW2	SPDT Switch - (Washable)	Apem	SW SIP-3P	FEC 150-559
20	T1-20	Red Testpoint	W Hughes	TESTPOINT	FEC-240-345
1	J1	9 PIN D-TYPE MALE (HORIZ)	McMurdo	DCON9M	FEC 150-750
5	J2 J3 J4 J5 J8	Do Not Insert		SMA	
2	J6 J7	GOLD 50Ω SMA SOCKET	Pasternack	SMA	PE4118
3	LK1 LK2 LK3	3 pin header	Harwin	SIP-3P	FEC 512-047
1	LK4	4 pin header (2x2)	Harwin		FEC 512-035
4	LK1-4	Shorting Shunt	Harwin		FEC 150-410
4	Each Corner	Rubber Stick-On Feet	3M		FEC 148-922
2	P1	Pair PCB snap-on battery connector	Keystone	BATT PP3	FEC 723-988
1	P1	9V PP3 Battery	Duracell		FEC 908-526
1	PCB	EVAL-ADF4206_7EB1			
	Parts Free issued by ADI.				
	Leave position blank - Do not insert				