

# UG229: Si51211/Si51218 Evaluation Board User's Guide

The Si51211/Si51218 evaluation boards (the Si5121x-EVB) can be used to emulate custom Si5121x part numbers as below:

Base Part Number	EVB
Si51210/14	Si51211 EVB
Si51211	
Si51218	Si51218 EVB

The Si5121x-EVB has an on-board programmable Si514 that generates the input clock frequency and can demonstrate function of up to two dc input pins and one output clock or up to three output clocks from the Si5121x part, depending on the part emulated and the frequency plan.

#### EVB FEATURES

- Powered from USB port
- Onboard Si514 to generate any input clock based on the frequency plan
- CBPro<sup>™</sup> GUI programmable V<sub>DD</sub> supply allows device at 3.3 V or 2.5 V



#### 1. Identifying the EVB Part

Look for the "check" on one of the two boxes for either the Si51211-EVB or the Si51218-EVB as shown in Figure 1.1 Si5121x-EVB Identification on page 1. Other than this check box selection (and the Si5121x device used in the EVB), the EVBs are both identical by design. Therefore, the user guide to the EVBs is a common document. CBPro<sup>TM</sup> also has the ability to identify the EVBs and displays the EVB type as shown in Figure 1.2 Si5121x-EVB Identification by CBPro on page 1.



Figure 1.1. Si5121x-EVB Identification



Figure 1.2. Si5121x-EVB Identification by CBPro

#### 2. Functional Block Diagram



Figure 2.1. Si5121x- CEVB Functional Block Diagram

The C8051F380 MCU is used to control the Si514, Si5121x devices, and the voltage regulators and implement the plans created on CBPro.

### 3. Installing ClockBuilderPro (CBPro) Desktop Software

To install the CBPro software on any Windows 7 or above PC, go to www.silabs.com/CBPro and download the CBPro software. Installation instructions and a User's Guide for CBPro can be found at the download link shown above. Follow the instructions as indicated.

### 4. Using the Si5121x EVB

#### 4.1 Connecting to a Si5121x EVB using CBPro

Once CBPro software is installed, connect to the EVB with a USB cable as shown in the figure below:



Figure 4.1. Connecting to Si5121x EVB via CBPro

#### 4.2 Programing the Si5121x EVB using CBPro

There are three ways to select (or arrive at) a frequency plan on the CBProsoftware. They are as follows:

- 1. Selecting a "default plan" from CBPro.
- 2. Creating a plan using the CBPro wizard.
- 3. Opening an existing plan stored as a CBPro project file.

At the end of any of these three steps, the starting point to programming the EVB will be as shown in the following figures:

B Si51218_LowBW_3MHz_Output_41_41_21_5_MHz - ClockBuilder Pro	
ClockBuilder Pro v2.5.7 🍫 (4 setting overrides)	SILICON LABS
Design Dashboard 🔻	Configuring Si51218
Loaded Si51218 design from C:\Temp\planner\Si51218_LowBW_3MH	z_Output_41_41_21_5_MHz.slabtimeproj.
Edit Configuration with Wizard <u>Desian Notes · Block Diagram &amp; Supply Voltages</u> · <u>Jitter Criteria</u> · <u>Pins &amp; Clocks</u>	Evaluation Board Detected Si51218 EVB S/N00-00-17-6F-83-C1 Write Design to EVB
Save Design to Project File Your configuration is stored to a project file, which can be opened in ClockBuilder Pro at a later time.	Export Feature not available. The Si51218 does not support in- system programming.
Design Report & Datasheet Addendum You can view a <u>design report (text)</u> or create a <u>draft datasheet addendum (PDF)</u> for your design.	Documentation <u>Si51218 Datasheet</u> <u>Si51218 EVB User's Guide</u>
For Content of the services of	Ask for Help Have a question about your design? Click here to get assistance.
🕒 Frequency Plan Valid 🕢 Design OK	Home Close

Figure 4.2. Starting Screen for EVB Write

1	CB Write Design to Evaluation I	Board - ClockBuilder	Pro			
	Programming Overview	Set Jumper to DUT Program Mode	Se	t Jumper to DUT Run Mode	Fi Prog	nished tramming DUT
	This wizard will step you thr the EVB. You will be asked to the jumper back to standard	ough writing your ( o move a jumper to I run mode when p	CBPro configur ready the dev rogramming is	ration to the Si52 vice for programi s complete.	1xx device pre ming and then	esent on switch
	Click Next > to begin.					
				< Back	Next >	Cancel

Figure 4.3. Step 1 of 4 in EVB Write

Click "Next" to get to the next window.



Figure 4.4. Step 2 of 4 in EVB Write

Now, ensure that the jumper JP3 is shorted and jumper JP4 is open. Then click "Next" to get to the window in Figure 4.5 Step 3 of 4 in EVB Write on page 7.



Figure 4.5. Step 3 of 4 in EVB Write

Next, ensure that the jumper JP4 is shorted and jumper JP3 is open. Then click "Next" to get to the window in Figure 4.6 Step 4 of 4 in EVB Write on page 7.

CB Write Design to E	B Write Design to Evaluation Board - ClockBuilder Pro					X
Programming Overview	-	et Jumper to OUT Program Mode		Set Jumper to DUT Run Mode	Finished Programmi DUT	ng
Success! Your desi should now be op	ign has been erational.	programmed t	to the EVB's	s DUT. Your progr	ammed output clock(s)	
					Clo	ose

Figure 4.6. Step 4 of 4 in EVB Write

This step completes the programming. The plan can be evaluated now.

#### 5. Controlling Input Pins

The input pin (IN1 or IN2) will be:

- High when the pin is left open, such as the IN2 setting in the figure below, or
- Low when the pin is shorted using an INx\_CTRL jumper, such as the IN1 setting in the figure below.



Figure 5.1. Input Pin Control

#### 6. Bill of Materials (BOM), Layout, and Schematic

The Si5121x EVB Bill of Materials (BOM), Layout, and Schematic design files can be found online at: http://www.silabs.com/si512xx.

Note: Please be aware the Si5121x EVB schematic is in OrCad Capture hierarchical format and not in a typical "flat" schematic format.

## 7. Revision History

#### 7.1 Revision 1.0

April 20, 2016

· Initial release.

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Телефон: 8 (812) 309-75-97 (многоканальный) Факс: 8 (812) 320-03-32 Электронная почта: ocean@oceanchips.ru Web: http://oceanchips.ru/ Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А