



## USB DEBUG ADAPTER USER'S GUIDE

### 1. Contents

The USB Debug Adapter package contains the following items:

- USB Debug Adapter (USB to Debug Interface) with attached 7" Ribbon Cable

### 2. USB Debug Adapter Specifications

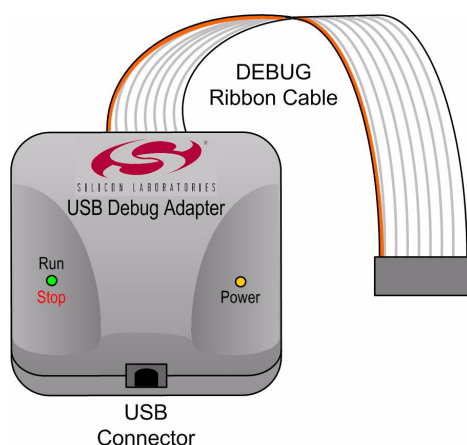
The USB Debug Adapter provides the interface between the PC's USB port and the target device's in-system debug/programming circuitry. The attached 10-pin DEBUG ribbon cable connects the adapter to the target board and the target device's debug interface. The USB Debug Adapter supports both Silicon Laboratories JTAG and C2 debug interfaces. Power is provided to the adapter from the USB connection to the PC. The USB Debug Adapter is capable of providing power to a circuit board via pin 10 of the DEBUG connector. See the Kit User's Guide for instructions on powering a target board from this source. Table 1 shows the pin definitions for the DEBUG ribbon cable connector.

**Notes:**

- The USB Debug Adapter requires a target system clock of 32 KHz or greater.
- With the default settings, the USB Debug Adapter can supply up to 100 mA to a target system.

**Table 1. USB Debug Adapter DEBUG Connector Pin Descriptions**

| Pin # | Description   |
|-------|---------------|
| 1,8   | Not Connected |
| 2,3,9 | GND (Ground)  |
| 4     | TCK (C2D)     |
| 5     | TMS           |
| 6     | TDO           |
| 7     | TDI (C2CK)    |
| 10    | USB Power     |



**Figure 1. USB Debug Adapter**

# USB Debug Adapter

## 3. Hardware Setup using a USB Debug Adapter

Connect a target board to a PC running the Silicon Laboratories IDE via the USB Debug Adapter as shown in Figure 2.

1. Connect the USB Debug Adapter to the JTAG or DEBUG connector on a target board with the 10-pin ribbon cable.
2. Connect one end of the USB cable to the USB connector on the USB Debug Adapter.
3. Connect the other end of the USB cable to a USB Port on the PC.
4. Connect the AC/DC power adapter to the power jack on the target board, or configure the board to receive power from the USB Debug Adapter (see Kit User's Guide for configuration options).

### Notes:

- Use the **Reset** button in the IDE to reset the target when connected using a USB Debug Adapter.
- Remove power from the target board and the USB Debug Adapter before connecting or disconnecting the ribbon cable from the target board. Connecting or disconnecting the cable when the devices have power can damage the device and/or the USB Debug Adapter.
- A USB cable is necessary when using the USB Debug Adapter. USB cables are included with the purchase of microcontroller development kits that include a USB Debug Adapter. However, a USB cable is not included when purchasing the USB Debug Adapter separately.

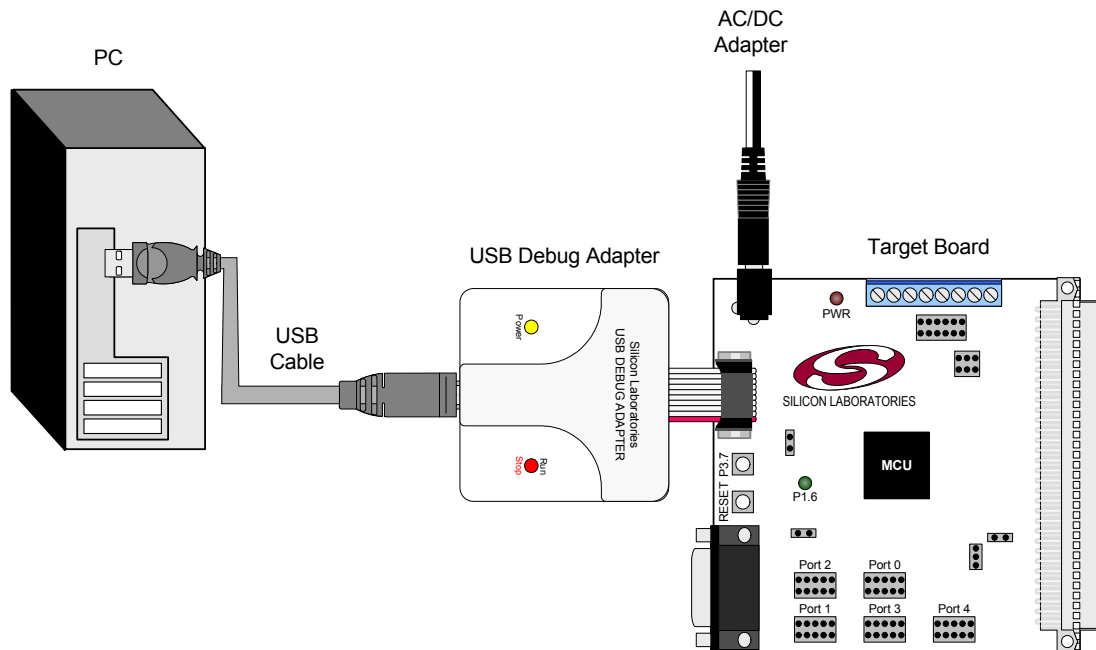


Figure 2. Hardware Setup using a USB Debug Adapter

## 4. Software Setup using a USB Debug Adapter

The Silicon Laboratories Integrated Development Environment (IDE) along with other software tools are provided for device development and debugging. The IDE is available for download from the Silicon Laboratories website and is also available on microcontroller development kit CD-ROMs. Once the IDE has been installed and the hardware has been connected as shown in Section 3, follow the steps below to build a project, connect and download to a target board using the USB Debug Adapter.

1. Select **Project**→**Open Project...** to open a previously saved project.
2. Before connecting to the target device, several connection options may need to be set. Open the **Connection Options** window (shown in Figure 3) by selecting **Options**→**Connection Options...** in the IDE menu.
3. Select USB Debug Adapter in the “Serial Adapter” section.
4. If more than one adapter is connected, choose the appropriate serial number from the drop-down list.
5. Check the “Power target after disconnect” if the target board is currently being powered by the USB Debug Adapter. The board will remain powered after a software disconnect by the IDE.
6. Next, the correct “Debug Interface” must be selected. Check the Debug Interface corresponding to the Silicon Laboratories device on the target board.
7. Once all the selections are made, click the OK button to close the window.
8. Click the **Connect** button in the toolbar or select **Debug**→**Connect** from the menu to connect to the device.
9. Download the project to the target by clicking the **Download Code** button in the toolbar.
10. Save the project when finished with the debug session to preserve the current target build configuration, editor settings and the location of all open debug views. To save the project, select **Project**→**Save Project As...** from the menu. Create a new name for the project and click on **Save**.

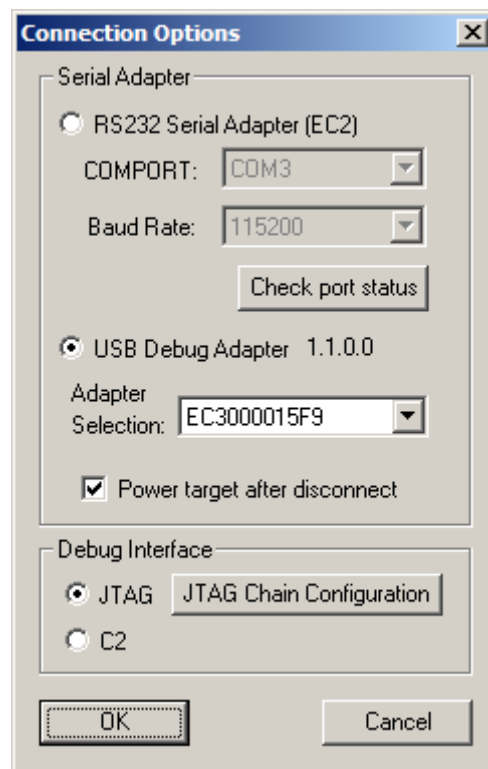


Figure 3. Connection Options

# USB Debug Adapter

## 5. Schematics

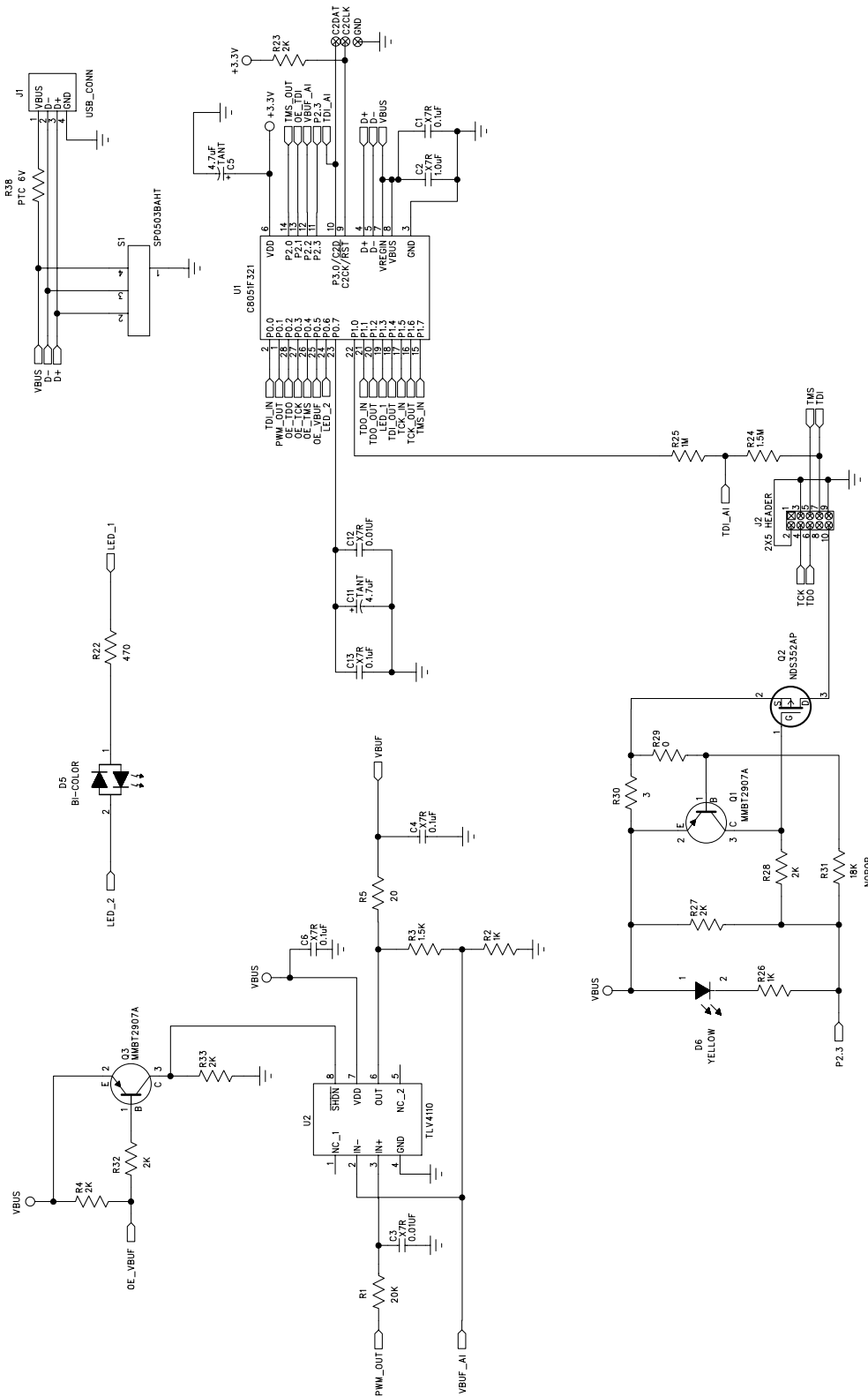


Figure 4. USB Debug Adapter Schematic (page 1)

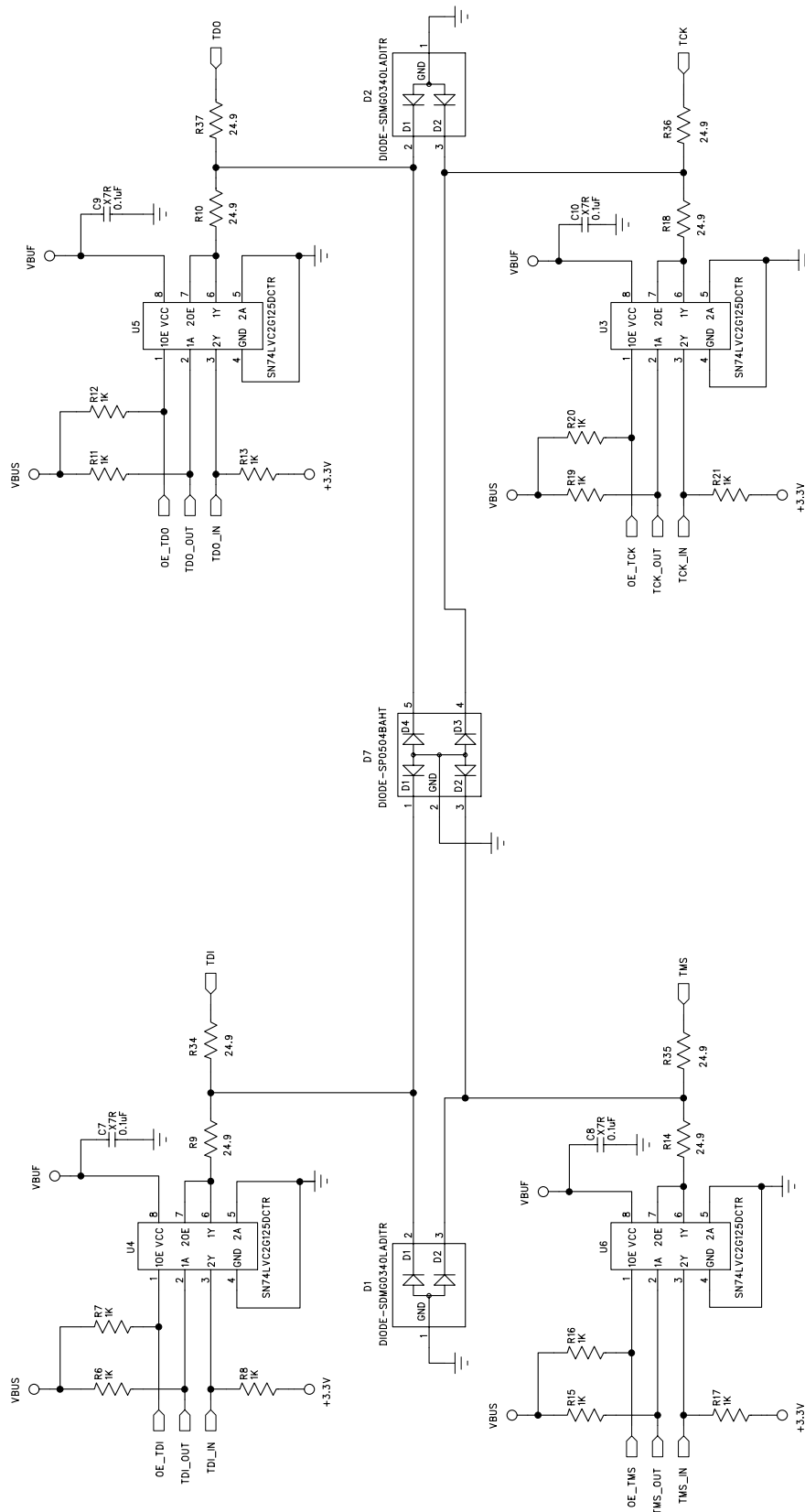


Figure 5. USB Debug Adapter Schematic (page 2)

# USB Debug Adapter

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## CONTACT INFORMATION

Silicon Laboratories Inc.  
4635 Boston Lane  
Austin, TX 78735  
Tel: 1+(512) 416-8500  
Fax: 1+(512) 416-9669  
Toll Free: 1+(877) 444-3032  
Email: [MCUinfo@silabs.com](mailto:MCUinfo@silabs.com)  
Internet: [www.silabs.com](http://www.silabs.com)

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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А