User Guide

MP8847 Evaluation Kit (EVKT-8847)

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Overview

Introduction

The EVKT-8847 is an evaluation kit for MP8847.The MP8847 is a highly integrated, high-frequency, synchronous, step-down switcher with an I²C control interface. The MP8847 can support up to 6A of current from a wide 2.7Vto 6V range with excellent load and line regulation. This kit allows for quick evaluation of the MP8847. By using the I²C, users can set the switching frequency, slew rate, work mode, and the output voltage.

Kit Content

EVKT-8847 kit contents: (items below can be ordered separately).

#	Part Number	Item	Quantity
1	EV8847-D-00A	MP8847GD evaluation board	1
2	EVKT-USBI2C-02	Includes one USB to I²C communication interface, one USB cable, one ribbon cable	1

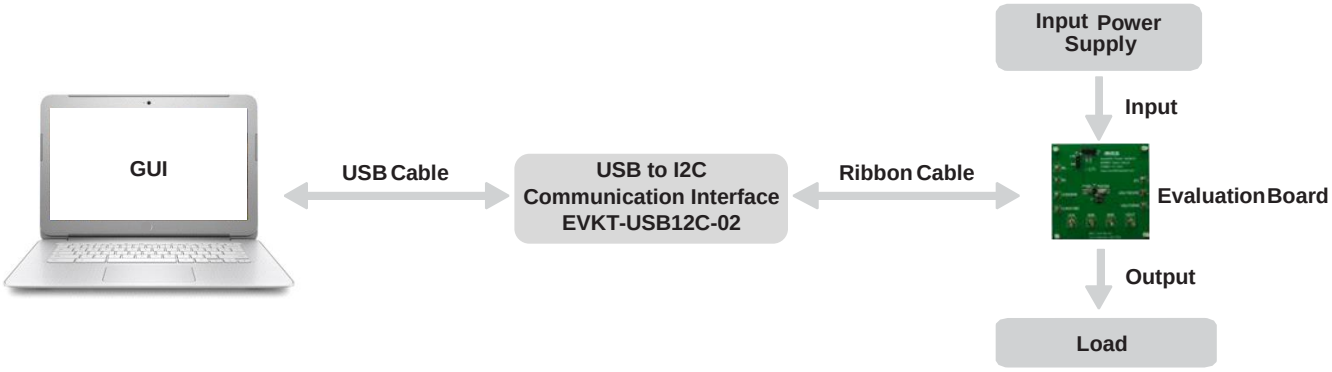

Figure 1: EVKT-8847 Evaluation Kit Set-Up

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Features and Benefits

The MP8847 is highly customizable. Users can program the IC via the MPS I²C GUI.

⚠ *All changes made in I²C mode will NOT be retained once the EVB is powered down.*

Features adjustable under each method are outlined below.

I2C

- Selectable the output voltage
- Selectable transition response
- Selectable slew rate
- Selectable switching frequency
- Selectable output discharge
- Selectable VIN_OVP
- Selectable PG function
- Selectable mode (PFM & CCM)
- System enable
- Status indication: ILIM, UVLO, VIN & Vout OVP, Vout UVP, PG, OTW

Kit Specifications

Feature	Specification
Supply for Board	2.7V - 6V
Operating Input Voltage	2.7V - 6V
Operating Systems Supported	Windows XP, 7, and later
System Requirements	Minimum 22.2MB free
GUI Software	3 Register Controls: VSEL, System 1, System 2
EVB Size (L x W)	6.3 cm x 6.3 cm

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Section 1. Hardware Specifications

1.1 Personal Computer Requirements

The following must be minimally met to use the EVKT-8847.

- Operating System of Windows XP, 7, or later
- Net Framework 4.0
- PC with a minimum of one available USB port
- At least 22.2 MB of free space

1.2 EV8847-D-00A Specifications

The EV8847-D-00A is an evaluation board for the MP8847GD. For more information, please refer to the EV8847-D-00Adatasheet.

Figure 2:EV8847-D-00A Evaluation Board

Feature	Specification
Supply for Board	2.7V - 6V
Operating Input Voltage	2.7V - 6V
EVB Size (L x W)	6.3 cm x 6.3 cm

1.3 EVKT-USBI2C-02 Specifications

The EVKT-USBI2C-02 refers to the communication interface, which connects the EVB, the PC, and its supporting accessories. It provides I^2C and PMBus capabilities. Together with MPS Virtual Bench Pro and GUI tools, it provides a quick and easy way to evaluate the performance of MPS digital products. For more details, refer to the EVKT-USBI2C-02 datasheet.

Figure 3: EVKT-USBI2C-02 Communication Interface

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Section 2. Software Requirements

2.1 Software Installation Procedure

Programming occurs through the MPS I²C GUI. Follow the instructions below to install the software.

Note: This software can be downloaded directly from the MPS website.

1. Visit the MP88xx I2C GUI page at https://www.monolithicpower.com/en/i2c-tool.html.
2. Click the “Download” button in the upper right-hand corner.
3. Once the download has completed, double-click the .exe file to open the set-up guide (see Figure 4). If a protection window comes up, click “More info,” then click “Run anyway.”
4. Follow the prompts in the set-up guide.
5. Wait for status screen to verify that installation is complete (see Figure 5).

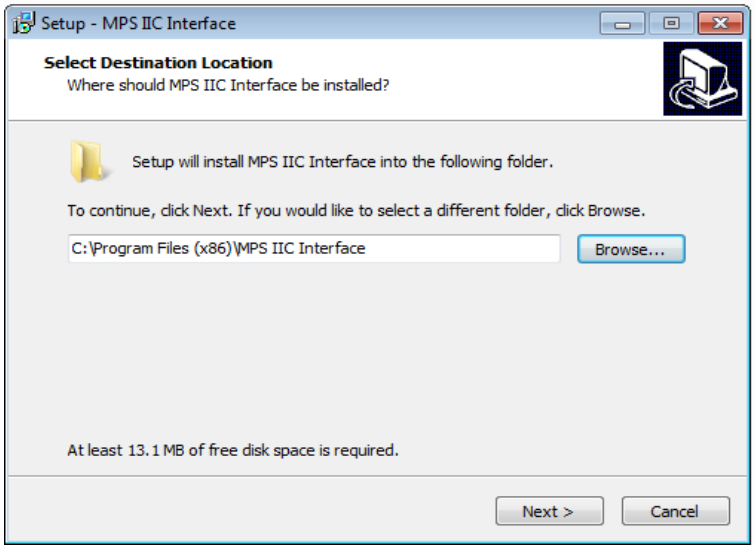

Figure 4: MPS I²C GUI Set-Up Guide

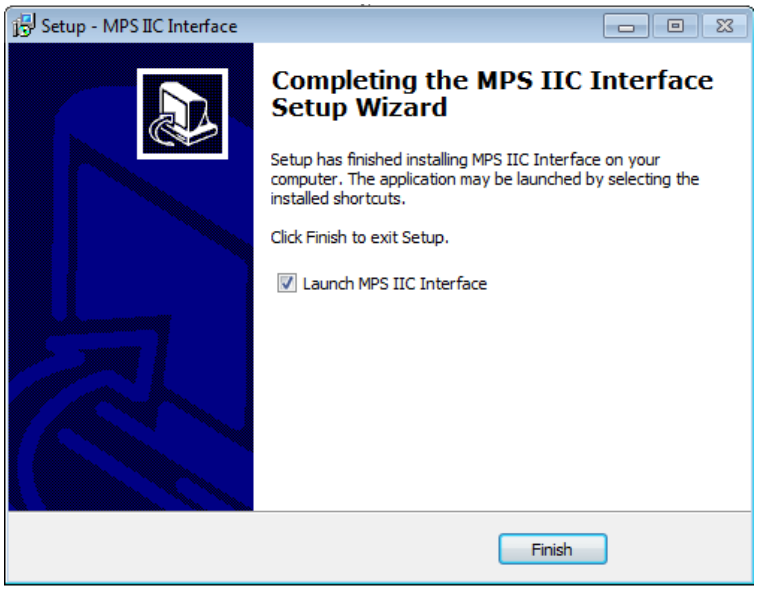

Figure 5: MPS I²C Set-Up Success

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Section 3. Evaluation Kit Test Set-Up

3.1 Hardware Set-Up

The hardware must be properly configured prior to use. Use the USB cable to connect the EVKT-USBI2C-02 communication interface to the PC, and follow the instructions below to set up the EVB.

1. Locate the proper wires to connect the EVB to the EVKT-USBI2C-02 communication interface.
2. Connect SCL, SDA, and GND (see Figure 6). If needed, refer to the datasheet for further clarification.

Figure 6: EVB to MPS I²C Communication Interface Wire Connection

3.2 Powering up the EVB

1. Connect the positive and negative terminals of the load to the VOUT and GND pins, respectively.
2. Preset the power supply output to between 2.7V and 6V, and then turn off the power supply.
3. Connect the positive and negative terminals of the power supply output to the VIN and GND pins, respectively.
4. Turn the power supply on and make the EN voltage more than the threshold. The IC will enter the power-on sequence automatically.

3.3 Software Set-Up

After connecting the hardware according to the steps above, follow the steps below to use the GUI software.

1. Start the software. It will automatically check the EVB connection.
   - If connection is successful, the address will be listed in the “Slave Address” (see Figure 7).

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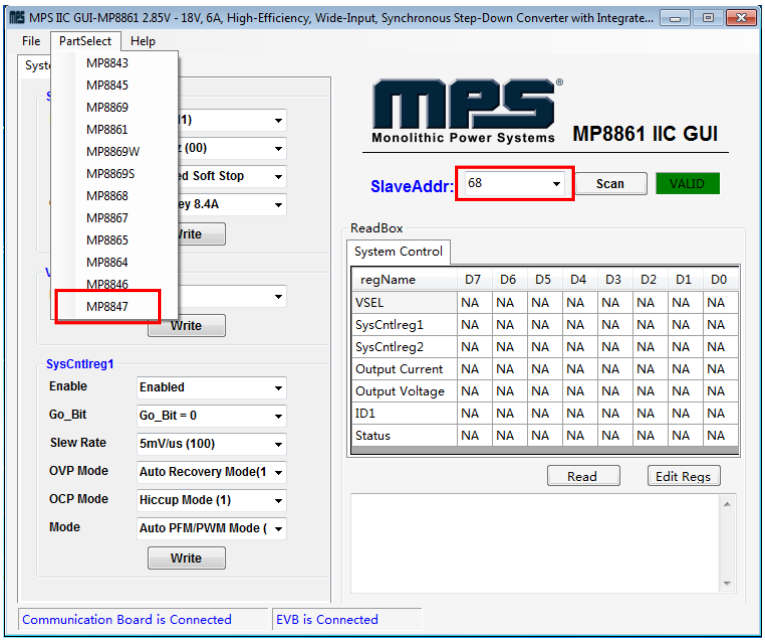

Figure 7: Appearance of Address Shows Successful Connection

- If the connection is not successful, a warning will appear at the bottom. There are two warnings a user can expect (see Figure 8). Each of the warnings mean an invalid connection.

  1) "EVB is Disconnected!" This means that the evaluation board is not connected.
  2) "Communication Board is Disconnected!" This means that the USB I^2C communication interface is not connected.

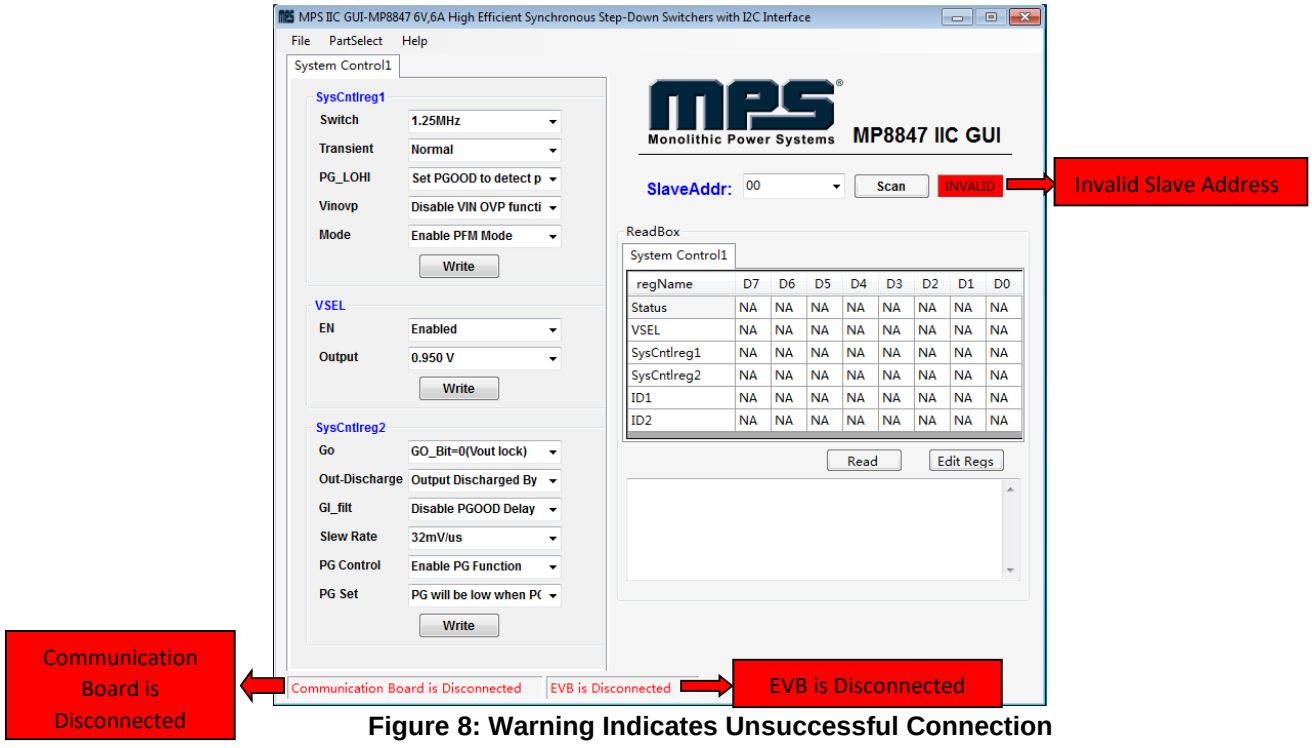

Figure 8: Warning Indicates Unsuccessful Connection

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2. If connection is successful, proceed to Step 3. Otherwise, check connections between the EVB, communication interface, and PC. Re-plug the USB into the computer and restart the GUI.
3. Click the **PartSelect** button to select the MP8867 (see Figure 7) (The default GUI window is for the MP8861). The Register Control menu will appear on the left side. The I²C register values will be read and displayed on the right side after clicking the **Read** button (see Figure 9).

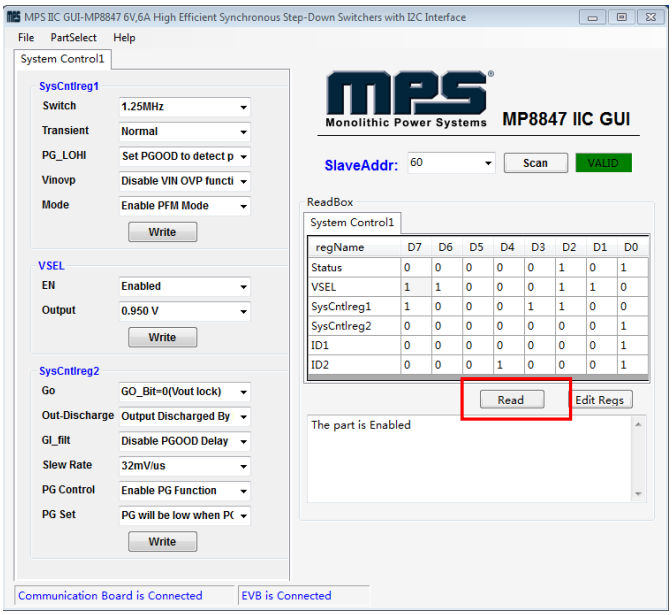

Figure 9: Values from I²C Shown in Table

4. Find the item you want to change and select the desired value from the drop-down menu.
5. Click the **Read** button to update the values. The changed information of the item will appear on the right side (see Figure 10).

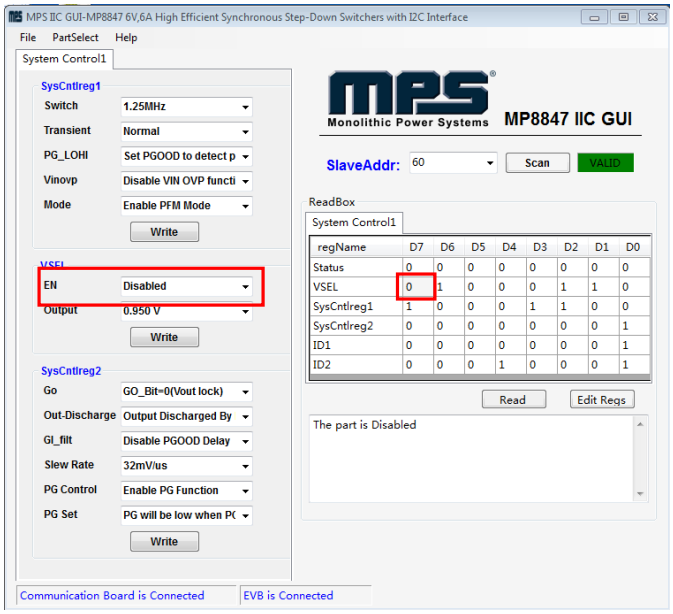

Figure 10: Refer to Datasheet to Translate 0's and 1's

⚠ *All changes made via I²C will be restored to default values once the EVB is powered down.*

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3.4 Troubleshooting Tips

Note: USBI2C-02 and USBI2C-01 drivers are not compatible. USBI2C-02 uses USBXpress and USBI2C-01 uses Cyusb3. USBI2C-02 is the recommended device for the MPS PMBus and I²C.

EVKT-USBI2C-01

In case the USBI2C-01 driver is not properly installed, manual installation is required. Follow the steps below:

1. Open the Device Manager and select update driver software (see Figure 11).
2. Click "Browse my computer for driver software."

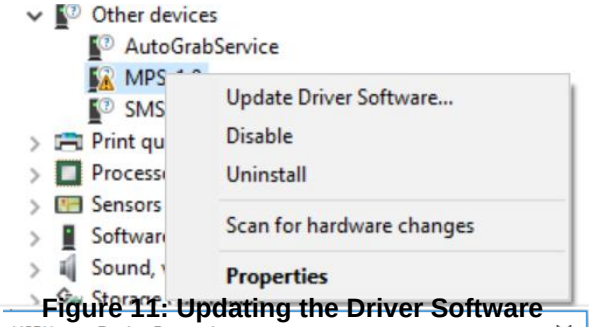
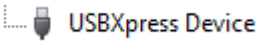


Figure 11: Updating the Driver Software

EVKT-USBI2C-02

In case the USBI2C-02 driver is not properly installed, manual installation is required. Follow the steps below:

Note: Check driver version. Find "USBXpress" Device in the Device Manager under USB controllers.



Right click and view properties. Check to make sure the driver version matches the newest version (see Figure 12).

1. Install the correct USBXpress ".exe" file.
   Choose either the 32 bit or 64 bit operating system:
   32-bit: USBXpressInstaller_x86.exe
   64-bit: USBXpressInstaller_x64.exe
2. Connect the EVKT-USBI2C-02 communication interface to the PC with the USB cable.

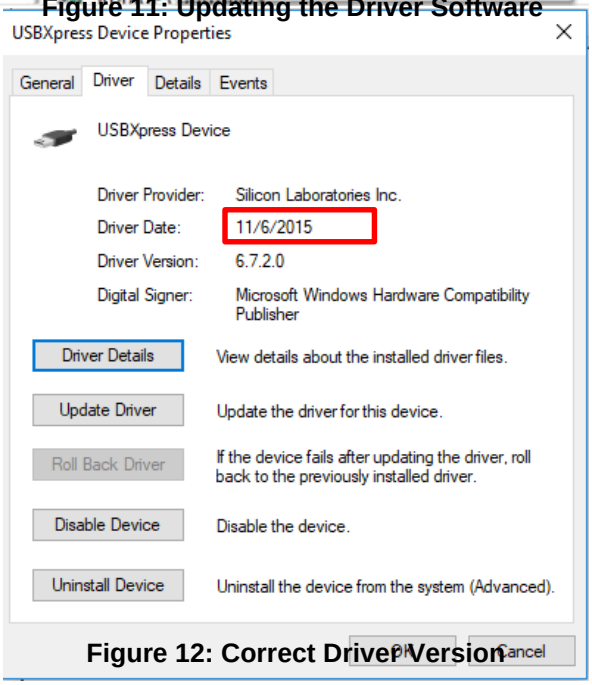


Figure 12: Correct Driver Version

- **No Supply**

The MP8847's input pin has an under-voltage lockout (UVLO) detection circuit. If the input voltage (AVIN) is lower than the UVLO rising threshold, the MP8847's functions are disabled.

- **Shutdown Event**

If the MP8847 detects that the input voltage is lower than the UVLO falling threshold (it enters a no supply state) or over-temperature protection is triggered (it enters a power-off state), the MP8847 switches to no supply state or power-off state, regardless of the current state.

- **Thermal Recovery**

If the MP8847 is in a power-off state due to the die temperature exceeding the thermal protection threshold, the MP8847 enters a power-on sequence when the die's temperature decreases.

- **Shutdown Sequence**

When the input voltage is lower than the UVLO falling threshold, or the IC is over-temperature, the MP8847 enters the shutdown sequence directly.

Section 4. Ordering Information

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The components of the evaluation kit can be purchased separately depending on user needs.

Part Number	Description
EVKT-8847	Complete evaluation kit
Contents of EVKT-8847	
EV8847-D-00A	MP8847GD evaluation board
EVKT-USBI2C-02	Includes one USB to I^2C communication interface, one USB cable, one ribbon cable

Order directly from MonolithicPower.com or our distributors.

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