

User Guide

MP8869W Evaluation Kit (EVKT-8869W)



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Overview

Introduction

The EVKT-8869W is an evaluation kit for the MP8869W. The MP8869W is a highly integrated, highfrequency, synchronous, step-down switcher with an I2C control interface. The MP8869W is optimized to support up to 12A continuous/15A peak output current over an input supply range from 3V to 18V with excellent load and line regulation. By using the I2C, users can set the current limit, slew rate, enable, power saving mode, and output voltage. This device also features telemetry, which provides output voltage and output current monitoring via I2C.

Kit Contents

EVKT-8869W kit contents: (items below can be ordered separately).

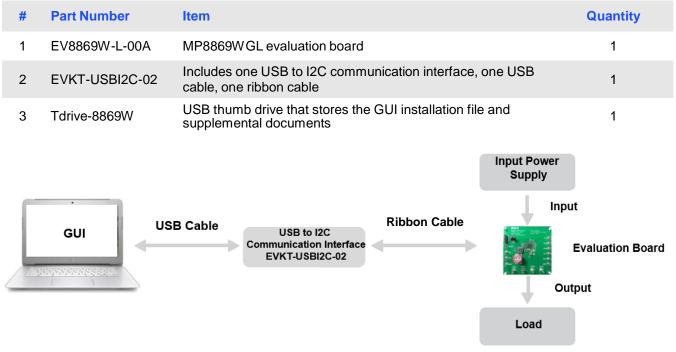


Figure 1: EVKT-8869W Evaluation Kit Set-Up



Features and Benefits

The MP8869W is highly customizable. Users can program the MP8869W via the MPS I2C GUI.

 \triangle 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

- Adjustable output
- Adjustable slew rate
- Selectable OVP, OCP mode
- Selectable PFM mode
- PG deglitch time
- Selectable frequency
- Soft stop
- Adjustable current limit
- Output current monitor
- System enable (EN bit)
- Status indication: OC, OTEW, OT, PG

Kit Specifications

Features	Specification
Supply for Board	3V - 18V
Operating Input Voltage	3V - 18V
Output Voltage (Vout)	1V
Continuous Output Current (IOUT)	12A
Peak Output Current (Iout)	15A
Operating Systems Supported	Windows XP, 7, or later
System Requirements	Minimum 22.2MB free
GUI Software	3 Register Controls: VSEL, System1, System2
EVB Size (L x W)	8.5cm x 8.5cm



Section 1. Hardware Specifications

1.1 Personal Computer Requirements

The following must be minimally met to use the EVKT-8869W .

- 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 EV8869W-L-00A Specifications

The EV8869W-L-00A is an evaluation board for the MP8869WGL. For more information, please refer to the EV8869W-L-00A datasheet.



Feature	Specification
Supply for Evaluation Board	3V - 18V
Operating Input Voltage	3V - 18V
Output Voltage (Vour)	1V
Continuous Output Current (IOUT)	12A
Peak Output Current (IOUT)	15A
EVB Size (L x W)	8.5cm x 8.5cm

Figure 2: EV8869W -L-00A Evaluation Board

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 I2C 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



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: In the near future, this software can be downloaded from the MPS website. For now, it is provided on a USB thumb drive.

- 1. Plug the thumb drive into the computer using any available USB port.
- 2. Locate the folder containing the thumb drive contents.
- 3. Double click the .exe file to open the set-up guide (see Figure 4).
- 4. Follow the prompts in the set-up guide.
- 5. Wait for the status screen to verify that installation is complete (see Figure 5).

📴 Setup - MPS IIC Interface	- • •
Select Destination Location Where should MPS IIC Interface be installed?	
Setup will install MPS IIC Interface into the following folder.	
To continue, click Next. If you would like to select a different folder, clic	k Browse.
C:\Program Files (x86)\MPS IIC Interface	Browse
At least 13.1 MB of free disk space is required.	
Next >	Cancel

Figure 4: MPS I²C GUI Set-Up Guide



Figure 5: MPS I²C GUI Set-Up Success

Section 3. Evaluation Kit Test Set-Up

3.1 Hardware Set-Up

The hardware must be configured properly 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.

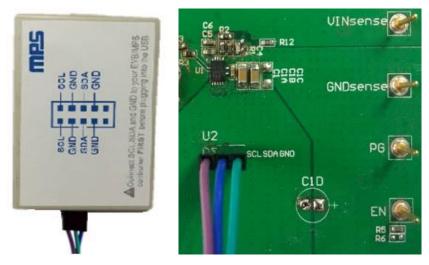


Figure 6: EVB to MPS I²C Communication Interface Wire Connection

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 between 3V to 18V, 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. The MP8869W will enter the power-on sequence automatically.

3.3 Software Set-Up

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

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



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SysCntreg1 Output Current NA <	_		Write		· · ·								
Enable Enabled Output Voltage NA NA	Sve	Cotirog1				-							
Go_Bit Go_Bit = 0 • Slew Rate 5mV/us (100) • OVP Mode Auto Recovery Mode(1 • • OCP Mode Hiccup Mode (1) • Mode Auto PFM/PWW Mode (• •	-		Enabled			-							
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OCP Mode Hiccup Mode (1) Mode Auto PFM/PWM Mode (Sle	ew Rate	5mV/us (100)	•	Status	NA	NA	NA	NA	NA	NA	NA	NA
Mode Auto PFM/PWM Mode (-	ov	/P Mode	Auto Recovery Mod	le(1 -					Read	4	E	dit Re	gs
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Write	Мо	de	Auto PFM/PWM Mo	de (👻									
· · · · · · · · · · · · · · · · · · ·			Write										
													-

Figure 7: Appearance of Address Shows Successful Connection

- If not, a warning will appear at the bottom. There are two warnings users can expect.
 - 1) "EVB is disconnected!" This means that the evaluation board is not connected (see Figure 8).
 - 2) "Communication Board is disconnected!" This means that the USB I2C communication interface is not connected.

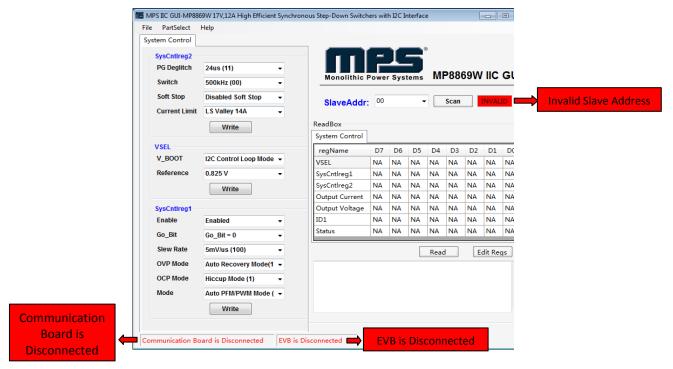


Figure 8: Warning Indicates Unsuccessful Connection – Evaluation Board not Connected



- 2. If the 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.
- Click the **PartSelect** button to select the MP8869W (see Figure 7) (The default GUI window is for the MP8861). The Register Control menu will appear on the left side. I2C register values will be read and displayed on the right side after clicking the **Read** button (see Figure 9).

stem Control										
SysCntlreg2 PG Deglitch Switch	30us (11) → 500kHz (00) →	Monolithic	Powe	r Sys	tems	M	P88	69W	IIC	GU
Soft Stop Current Limit	Disabled Soft Stop LS Valley 14A	SlaveAddr	: 64		•		Scan		VALI)
	Write	ReadBox System Control								
VSEL		regName	D7	D6	D5	D4	D3	D2	D1	D0
V_BOOT	I2C Control Loop Mode 👻	VSEL	1	0	0	1	1	1	1	0
Reference	0.825 V 👻	SysCntlreg1	1	0	1	0	0	1	1	0
	Write	SysCntlreg2	1	1	0	0	0	0	0	1
		Output Current	0	0	0	0	0	0	0	0
SysCntireg1		Output Voltage	0	0	0	0	0	0	0	0
Enable	Enabled -	ID1	1	0	0	0	0	0	1	1
Go_Bit	Go_Bit = 0 -	Status	0	0	0	0	0	0	0	1
Slew Rate	5mV/us (100) 👻					Read	i)	E	dit Re	qs]
OVP Mode	Auto Recovery Mode(1 -									^
OCP Mode	Hiccup Mode (1) 👻									
Mode	Auto PFM/PWM Mode (👻									
	Write									Ŧ

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 All** button to update values. The changed information of the item will appear on the right side (see Figure 10).

e PartSelect I	Help										
		_				_	Ð				
SysCntireg2			1 🗖 📗								
PG Deglitch	30us (11) 🔹						M	2880	69W		GU
Switch	500kHz (00) 🗸	Mon	nolithic Po	wer	Syst	ems	1411	000	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
Soft Stop	Disabled Soft Stop 🗸	Slav	veAddr:	64		•		Scan		VALIE	5
Current Limit	LS Valley 14A 🔹						_				
	Write	ReadBo	x								
		System	Control								
VSEL		regNa	me	D7	D6	D5	D4	D3	D2	D1	D0
V_BOOT	I2C Control Loop Mode 👻	VSEL		1	0	0	1	1	1	1	0
Reference	0.825 V 👻	SysCntl	reg1 (0	0	1	0	0	1	1	0
	Write	SysCntl	reg2	1	1	0	0	0	0	0	1
	vvine	Output	Current (0	0	0	0	0	0	0	0
SysCntireg1		Output	Voltage (0	0	0	0	0	0	0	0
Enable	Disabled 🗸	ID1	1	1	0	0	0	0	0	1	1
Go Bit	Go Bit=0	Status	0	0	0	0	0	0	0	0	0
Slew Rate	5mV/us (100) -						-	_	-	l'a n	_
							Read		E	dit Reg	gs j
OVP Mode	Auto Recovery Mode(1 👻										^
OCP Mode	Hiccup Mode (1) 🔹										
Mode	Auto PFM/PWM Mode (👻										
	Write										-

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.



3.4 Troubleshooting Tips

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

EVKT-USBI2C-01

In case that 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", find the driver located on thumb drive and install.

EVKT-USBI2C-02

In the case that 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.

🛄 🏺 USBXpress Device

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

- 1. Browse the thumb drive contents and open the driver's folder.
- 2. Install the correct USBXpress ".exe" file.

Choose either 32 bit or 64 bit operating system.

32-bit: USBXpressInstaller_x86.exe 64-bit: USBXpressInstaller_x64.exe

 Connect the EVKT-USBI2C-02 Dongle to the PC with the USB cable.

No Supply

The MP8869W's input pin has an under-voltage lockout

(UVLO) detection circuit. If the input voltage (AVIN) is lower than the UVLO rising threshold, the MP8869W's functions are disabled.

Shutdown Event

If the MP8869W detects that the input voltage is lower than the UVLO falling threshold (enter no supply state) or over-temperature protection is triggered (enter power-off state), the MP8869W switches to no supply state or power-off state, regardless of the current state.

Thermal Recovery

If the MP8869W is in a power-off state due to the die temperature exceeding the thermal protection threshold, the MP8869W 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 MP8869W enters the shutdown sequence directly.

✓ ↓ Other device	es
AutoGr	abService
MPS SMS	Update Driver Software
> 🚍 Print qu	Disable
> D Process	Uninstall
> 🔚 Sensors > 📔 Software	Scan for hardware changes
> Sound,	Properties

Figure 11: Updating the Driver Software

USBXpress D	evice Propert	ies				×
General Dr	iver Details	Events				
e U	SBXpress Dev	ice				
D	river Provider:	Silicor	n Laborato	ies Inc.		
D	river Date:	11/6/	2015	_		
D	river Version:	6.7.2.	0			
D	igital Signer:	Micro: Publis		ws Hardware Co	mpatibility	
Driver	Details	View det	ails about t	he installed drive	er files.	
Update	Driver	Update t	he driver fo	or this device.		
Roll Bac	k Driver			ter updating the Isly installed drive		
Disable	Device	Disable t	he device.			
Uninstall	Device	Uninstall	the device	from the system	(Advanced).
				ОК	Cancel	

Figure 12: Correct Driver Version



Section 4. Ordering Information

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

Part Number	Description
EVKT-8869W	Complete evaluation kit
Contents of EVKT-8869W	
EV8869W-L-00A	MP8869WGL evaluation board
EVKT-USBI2C-02	Includes one USB to I2C communication interface, one USB cable, one ribbon cable
Tdrive-8869W	USB thumb drive that stores the GUI installation file and supplemental documents

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