End of Life

See UG:901 for supported adapter.

VIA™ Package
PMBus Interface and Accessories User Guide

Jon Siegers
Ankur Patel
Applications Engineering

Contents   **Page**

Introduction

The PMBus-USB Adapter (I2C-ADAPTER-A00) enables communication with the PMBus® interface of Vicor power modules in a VIA package using a Host PC. The PMBus control interface provides digital management capabilities and access to the telemetry monitoring and status reporting offered by the product.

The PMBus-USB Adapter converts the PMBus interface to a USB communication protocol using an internal isolated controller, allowing users to easily connect to a Host PC (no driver installation is required with Windows operating systems). A GUI, available for download on the Vicor website, provides a convenient means for monitoring and control of the power module.

The signal interface of a VIA™ is used for PMBus communication purposes with the provided GUI installed on the user's PC. All PMBus capabilities and features of the connected power module are available through the GUI, allowing users to read and write into the status configuration registers of the module, observe input and output telemetry, monitor faults and obtain other additional device information. The PMBus-USB Adapter enables easy evaluation of the PMBus digital interface offered on select Vicor products in a test environment.

Please note that this User Guide applies only to the operation of the I2C-ADAPTER-A00 PMBus-USB Adapter with Vicor converters in a VIA package. Support for all other Vicor products that include I^{2}C™ or PMBus communication capabilities is provided by the I2C-ADAPTER-A02 PMBus-USB Adapter (see reference document UG:901).

⚠️ **IMPORTANT NOTICE:**

**Hazardous voltages may be present on the interfaced Vicor power module.**

PERSONAL CONTACT WITH LINE VOLTAGE MAY RESULT IN SEVERE INJURY, DISABILITY, OR DEATH. IMPROPER OR UNSAFE HANDLING OF THIS ACCESSORY AND RELATED POWER MODULE(S) MAY RESULT IN SERIOUS INJURY OR DEATH

Read the precautions below entirely BEFORE using the PMBus-USB Adapter. Do not operate the PMBus-USB Adapter unless you have the appropriate precautions in place on your bench to guarantee safety.

The list below is not comprehensive and is not a substitute for common sense and good practice.

- During operation, the power devices and surrounding structures can be operated safely at high temperatures.
- Remove power from the converter and use caution when connecting and disconnecting test probes and interface lines to avoid inadvertent short circuits and contact with hot surfaces.
- Never use a jumper in place of a fuse.
- Always use approved safety glasses when testing electronic products. Follow good laboratory practice and procedures.
- Avoid creating ground loops when making measurements of the isolated input or output voltage and signals.
- Care should be taken to protect the user from accidental contact with electrical terminals when operating under power.
- Care should be taken to avoid reversing polarities if connecting to the opposite (solder) side of the board.
- The PMBus-USB Adapter described in this document is designed for general laboratory evaluation, and is not suitable for installation in end user equipment or applications.
- Refer to the specific Vicor power module data sheet of the interfaced product(s) for electrical, thermal, and mechanical product details.
- Signal cables 43503-01 and 43503-02 are rated up to five insertions and extractions into the VIA™ signal cable receptacle. Insert and extract the VIA signal connector cables by firmly grasping the connector body housing. To avoid unnecessary stress on the connector, the cable should be appropriately strain relieved.

Connector Information – PMBus-USB Adapter

Side View

```
1   VDDB
2   SDA
3   SCL
4   SGND
5   SGND

6
Chassis
GND
```

Micro-USB B Connector
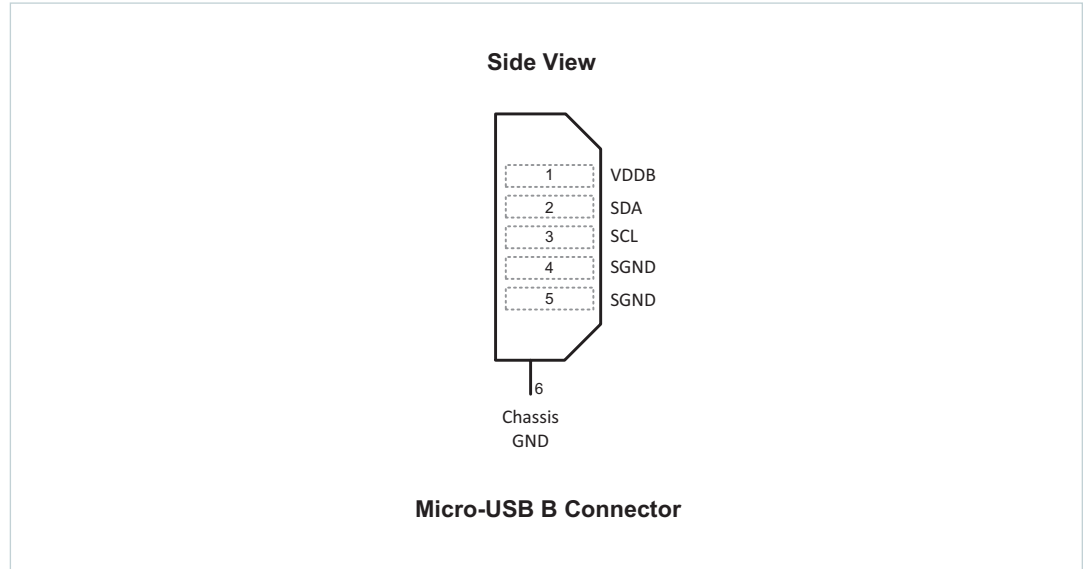
Pin Number	Signal Name	Type	Function
1	VDDB	OUTPUT	5V supply output
2	SDA	INPUT/OUTPUT	I²C™ Data PMBus® compatible
3	SCL	OUTPUT	I²C Clock PMBus compatible
4	SGND	SIGNAL RETURN	Signal ground
5	SGND	SIGNAL RETURN	Signal ground
6	Chassis GND	SHIELD	Connector housing ground

Figure 1
Host PC to VIA™ power module array connection, PMBus communication interface accessories shown as a typical application set up
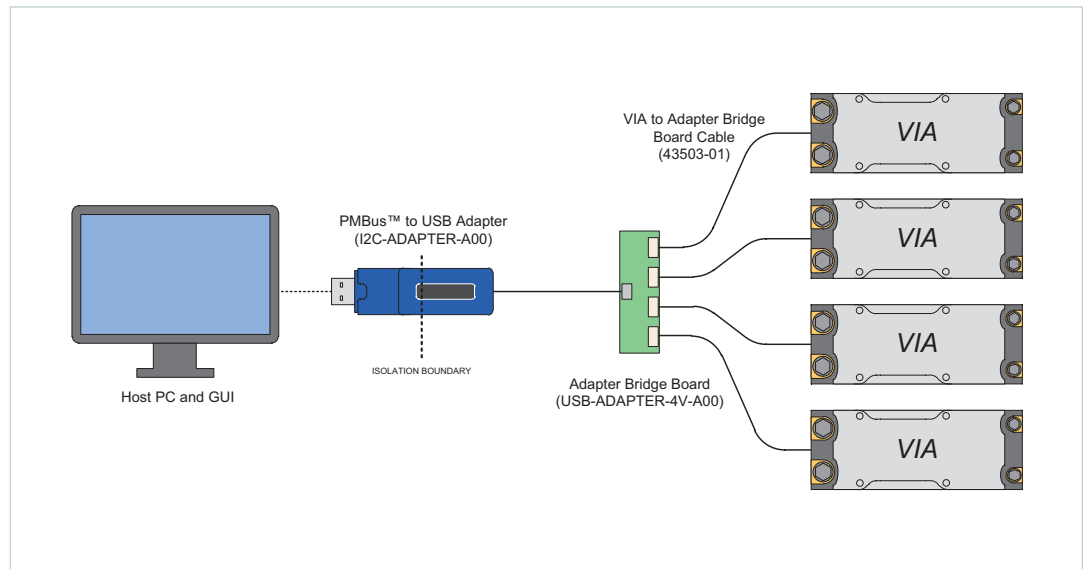
Application Details

The PMBus-USB Adapter, along with the listed companion accessories and Vicor Digital Interface Demo GUI, provides a convenient means to demonstrate the PMBus® digital interface offered on Vicor VIA™ power modules in an evaluation environment. With these tools, the user can quickly get started with evaluating the features offered by the PMBus interface and determining the needs of a final production power system.

Features

- Easily configure and monitor PMBus-enabled Vicor power modules in a VIA package
  - Vicor Digital Interface Demo Board GUI for PMBus control interface
    (available on Vicor website HV BCM family page)
- USB connection to host PC
- Provides 5V external bias (VDDB)
- Internal 10kΩ clock and data signal line (SCL and SDA) pull-up resistors to 5V VDDB
- Isolated PMBus to Host interface (4242V_{DC})
- Measurement of input and output parameters, including but not limited to:
  - Voltage
  - Current
  - Power
  - Temperature
- Fault monitoring, including but not limited to:
  - Overvoltage / Undervoltage
  - Overcurrent
  - Overtemperature
- Enable / Disable control
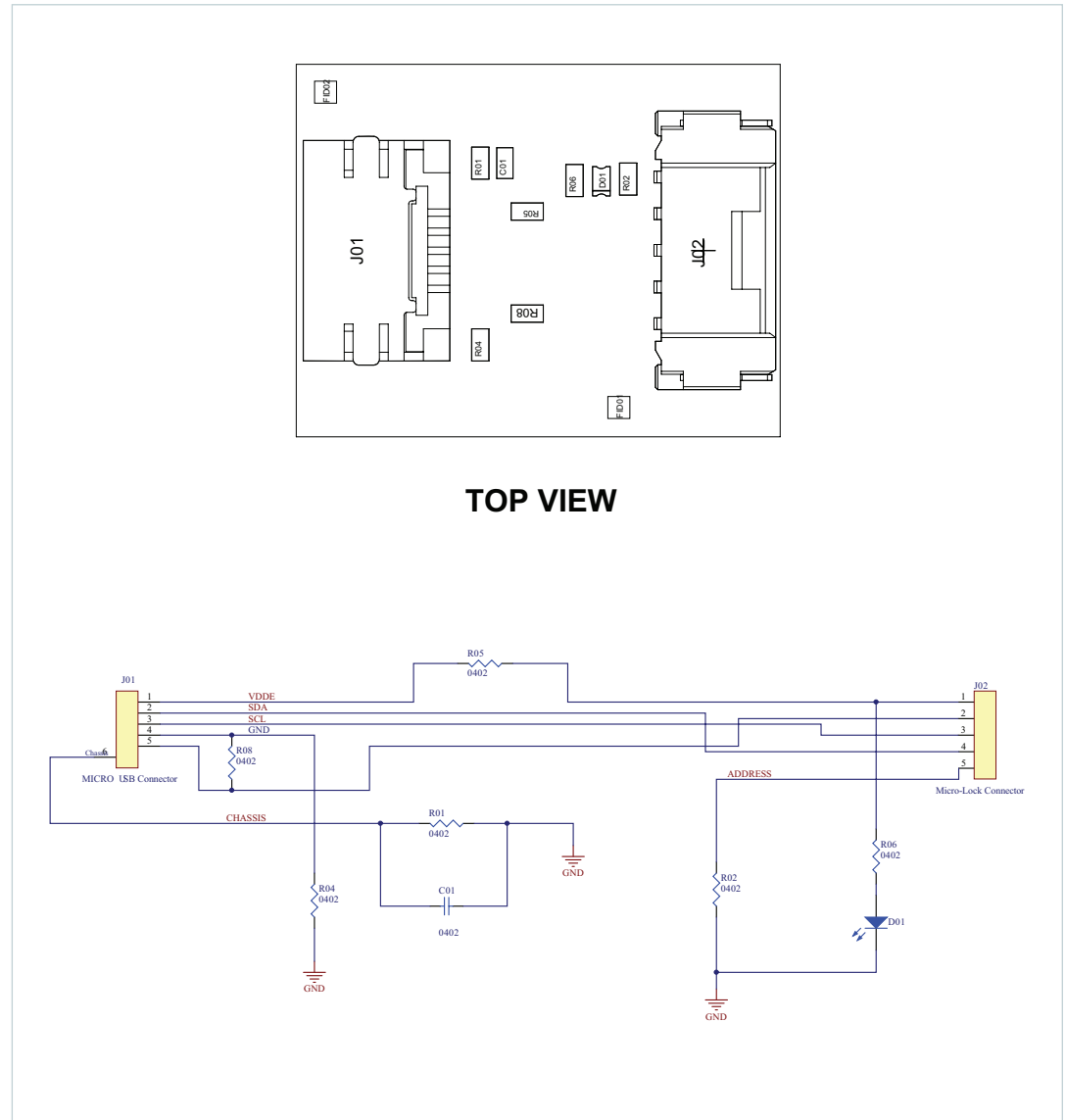
Table 1
VIA package PMBus companion accessories

Part Number	Description
USB-ADAPTER-1V-B00	Adapter bridge board, for use with single chassis-mount VIA
USB-ADAPTER-4V-A00	Adapter bridge board, for use with up to four chassis-mount VIAs
43503-01	VIA Signal Connector cable with Molex® Micro-Lock™ connector (600mm length)
43503-02	VIA Signal Connector cable with Molex® Micro-Lock™ connector (200mm length)
I2C-ADAPTER-A00	PMBus-USB Adapter
Software Interface	Vicor digital interface demo board GUI

VIA™ to Adapter Bridge Board

The Typical Application diagram in Figure 1 shows the connections required to establish PMBus® communication between PMBus-enabled VIA modules and a host PC. The setup for this configuration includes directly connecting the VIA Signal Connector cable to the PMBus signal port on the VIA. The Adapter Bridge Board, as shown in Figure 2 and Figure 3, provides the necessary connections between the VIA Signal Connector Cable and the PMBus-USB Adapter. On Adapter Bridge Board USB-ADAPTER-1V-B00, the VIA PMBus address is programmed to 51h by a pre-installed resistor R02. On the Adapter Bridge Board USB-ADAPTER-4V-A00, the four VIA PMBus addresses are programmed to 51h, 53h, 54h, 55h by pre-installed resistors R02-R05. An LED provides visual indication that VDDB (5V) is present.

Lastly, the PMBus-USB Adapter connects to the user's computer where the provided Vicor Digital Interface Demo GUI is installed.

Figure 2

USB-ADAPTER-1V-B00 Assembly Drawing and Schematic

TOP VIEW

Figure 3

*USB-ADAPTER-4V-A00
assembly drawing
and schematic*

TOP VIEW

The following is a list of all connectors and components present on the USB-ADAPTER-1V-B00 and USB-ADAPTER-4V-A00 Adapter Bridge Boards.

Table 2
USB-ADAPTER-1V-B00
components

| Reference Designator	Description	Manufacturer	Manufacturer Part Number
R04, R05, R08	RES 0Ω 1/16W 1% 0402	KOA Speer	RK73Z1ETTP
R06	RES 1kΩ 1/16W 1% 0402	KOA Speer	RK73H1ETTP1001F
R01	RES 10kΩ 1/16W 1% 0402	KOA Speer	RK73H1ETTP1002F
R02	RES 1.05kΩ 1/16W 1% 0402	KOA Speer	RK73H1ETTP1051F
C01	CAP X7R 0.1µF 10% 16V 0402	Murata	GRM155R71C104KA88D
D01	DLED RED SMD 0402	Panasonic	LNJ247W82RA
J01	CONN MICRO-B USB SMD	TE Connectivity	2174507-2
J02	CONN MICRO HDR 5POS 1.25mm SINGLE ROW RA	Molex	504195-0570

Table 3
USB-ADAPTER-4V-A00
components

Reference Designator	Description	Manufacturer	Manufacturer Part Number
R01	RES 0Ω JUMPER 1A 0603	KOA Speer	RK73Z1JTTD
R06, R09	RES 0Ω 1/16W 1% 0402	KOA Speer	RK73Z1ETTP
R08	RES 1kΩ 1/16W 1% 0402	KOA Speer	RK73H1ETTP1001F
R07	RES 10kΩ 1/16W 1% 0402	KOA Speer	RK73H1ETTP1002F
R02	RES 1.05kΩ 1/16W 1% 0402	KOA Speer	RK73H1ETTP1051F
R03	RES 2.8kΩ 1/16W 1% 0402	KOA Speer	RK73H1ETTP2801F
R04	RES 3.92kΩ 1/16W 1% 0402	KOA Speer	RK73H1ETTP3921F
R05	RES 5.23kΩ 1/16W 1% 0402	KOA Speer	RK73H1ETTP5231F
C01	CAP X7R 0.1µF 10% 16V 0402	Murata	GRM155R71C104KA88D
D01	DLED RED SMD 0402	Panasonic	LNJ247W82RA
J01	CONN MICRO-B USB SMD	TE Connectivity	2174507-2
J02, J03, J04, J05	CONN MICRO HDR 5POS 1.25mm SINGLE ROW RA	Molex	504195-0570

GUI Configuration
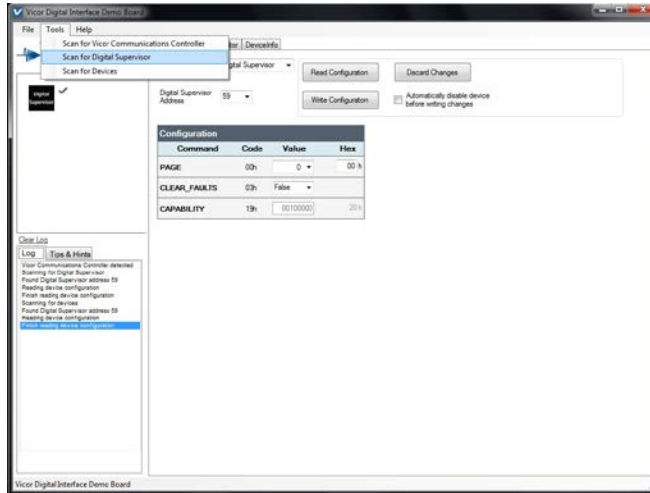
Figure 4.1
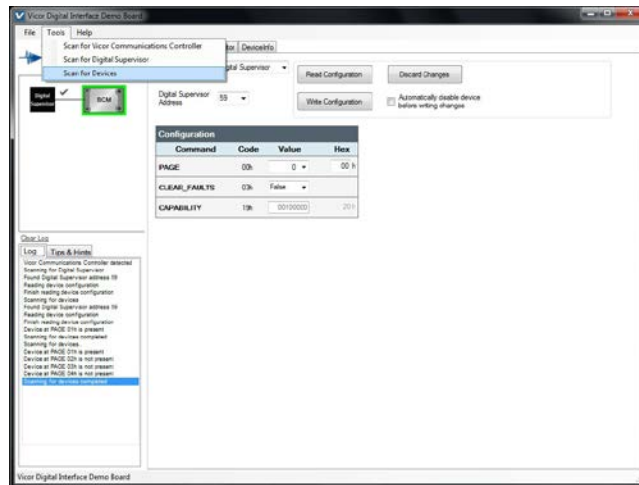
Figure 4.2

After making the necessary connections, follow the guidelines for configuring the GUI and to ensure establishment of communication between the power module and the host PC.

1. Confirm illumination of the LED on the Adapter Bridge Board as a visual indication that VDDB bias is present.

2. Power up module within the input voltage continuous operating range specified by the device data sheet.

3. Open the Vicor Digital Interface Demo Board software installed on the connected host PC.

4. Go to **Tools -> Scan for Digital Supervisor** to detect Digital Supervisor as shown in Figure 4.1.

5. Go to **Tools -> Scan for Devices** and select desired power module device as shown in Figure 4.2.

6. Verify the desired power module device is selected (highlighted in green) for communication through the GUI.

Limitation of Warranties

Information in this document is believed to be accurate and reliable. HOWEVER, THIS INFORMATION IS PROVIDED "AS IS" AND WITHOUT ANY WARRANTIES, EXPRESSED OR IMPLIED, AS TO THE ACCURACY OR COMPLETENESS OF SUCH INFORMATION. VICOR SHALL HAVE NO LIABILITY FOR THE CONSEQUENCES OF USE OF SUCH INFORMATION. IN NO EVENT SHALL VICOR BE LIABLE FOR ANY INDIRECT, INCIDENTAL, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR SAVINGS, BUSINESS INTERRUPTION, COSTS RELATED TO THE REMOVAL OR REPLACEMENT OF ANY PRODUCTS OR REWORK CHARGES).

Vicor reserves the right to make changes to information published in this document, at any time and without notice. You should verify that this document and information is current. This document supersedes and replaces all prior versions of this publication.

All guidance and content herein are for illustrative purposes only. Vicor makes no representation or warranty that the products and/or services described herein will be suitable for the specified use without further testing or modification. You are responsible for the design and operation of your applications and products using Vicor products, and Vicor accepts no liability for any assistance with applications or customer product design. It is your sole responsibility to determine whether the Vicor product is suitable and fit for your applications and products, and to implement adequate design, testing and operating safeguards for your planned application(s) and use(s).

VICOR PRODUCTS ARE NOT DESIGNED, AUTHORIZED OR WARRANTED FOR USE IN LIFE SUPPORT, LIFE-CRITICAL OR SAFETY-CRITICAL SYSTEMS OR EQUIPMENT. VICOR PRODUCTS ARE NOT CERTIFIED TO MEET ISO 13485 FOR USE IN MEDICAL EQUIPMENT NOR ISO/TS16949 FOR USE IN AUTOMOTIVE APPLICATIONS OR OTHER SIMILAR MEDICAL AND AUTOMOTIVE STANDARDS. VICOR DISCLAIMS ANY AND ALL LIABILITY FOR INCLUSION AND/OR USE OF VICOR PRODUCTS IN SUCH EQUIPMENT OR APPLICATIONS AND THEREFORE SUCH INCLUSION AND/OR USE IS AT YOUR OWN RISK.

Terms of Sale

The purchase and sale of Vicor products is subject to the Vicor Corporation Terms and Conditions of Sale which are available at: (http://www.vicorpower.com/termsconditionswarranty)

Export Control

This document as well as the item(s) described herein may be subject to export control regulations. Export may require a prior authorization from U.S. export authorities.

Contact Us: http://www.vicorpower.com/contact-us

Vicor Corporation
25 Frontage Road
Andover, MA, USA 01810
Tel: 800-735-6200
Fax: 978-475-6715
www.vicorpower.com

email
Customer Service: custserv@vicorpower.com
Technical Support: apps@vicorpower.com

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Interface Modules *category:*

Click to view products by Vicor *manufacturer:*

Other Similar products are found below :

IFD8520 cPCI-3544 422CON ATX6022/14GP7 ATX6022/8 AX93221-24/48 FC6A-EXM2 OPT8AP-AE 96RMKVM-19V1C-A 60016-011 60016-014 60006-008 60011-075 HPCI-14S12U cBP-3208 cBP-3062A FAB205-6P5 ATX6022/6 60016-012 96RMKVM-17V1C-A PCE-DP10-00A1E MOS-1120Y-0201E 96RMLCD-17V1-A 96RMKVM-17V8C-A 60004-005 60016-017 60006-009 60016-035 60016-034 60016-031 60016-030 60016-026 60016-024 60016-018 60016-007 60016-005 60007-002 60006-010 AXX10GBTWLHW3 382-BBEH 555-BDCL K6CMISZBI52 426451401-3 60011-093 MIC-3620/3-BE MPCIE-UART-KIT02-R20 RSM232 PCIE-1680-AE BB-FOSTCDRI 73-544-002