Features

- From bulk power distribution to point-of-load in two simple steps
- Universal AC input
- Multiplicity of Point-of-Load options
- Small size, low profile, easy-to-use, highly flexible

IMPORTANT NOTICE:

Please read this user guide before operating the Vicor Development Kit. The Development Kit is for evaluation purposes only. Compliance testing on the Development Kit is not permissible.

Introduction

The AC to point-of-load Development Kit contains a front-end (FE) chassis, a hold-up bank (HUB), and a point-of-load (PoL) chassis. The front-end chassis has chassis-mount versions of the AIM™ and PFM™ in a VIA™ package that provide full-wave rectification, EMI Filtering and power factor correction that may be connected to worldwide AC mains. A HUB is included to provide proper hold up for the PFM.

The PoL chassis has an input board and three ZVS Buck Regulator evaluation boards. The input board interfaces with the front-end chassis and HUB to provide a 24V or 48V voltage rail on the PoL chassis. The included ZVS Regulators provide 3.3, 5 and 12V outputs.

Please visit www.vicorpower.com for data sheets and more information on the individual products used in the Development Kit. Part numbers can be found in the Bill of Materials on Page 5.
DANGER! HIGH VOLTAGE!  DANGER! HOT SURFACE!

The Development Kit contains exposed hazardous voltages on the Front-End Chassis. The Front-End Chassis may be operating at surface temperatures which may pose a thermal hazard to the operator. Please use caution not to touch the Front-End Chassis unless the power is disconnected and the Front-End Chassis has been given sufficient time to cool.

IMPORTANT NOTICE:

AC Input Fusing

The Vicor Development Kit is meant for bench evaluation purposes only. A power supply with an adjustable current limit must be used when powering the Development Kit.

Although a 7A input fuse is installed in the AC cord adapter, this fuse does not meet safety approvals outlined for the AIM and PFM. It is the user’s responsibility to select proper fusing at the system level to meet the desired application requirements. Please refer to the section titled Input Fuse Selection on page 16 in the PFM data sheet for guidelines on proper fuse selection.

System Overview

Front-End (FE) Chassis

Vicor AIM™ and PFM™ in a VIA™ package chassis mount modules are mounted on the Front-End Chassis of the Development Kit. The AIM interfaces directly with worldwide AC mains and provides a rectified AC input for the PFM. The AIM combines a bridge rectifier, EMI filter, and surge protection circuitry in an easy to use VIA plastic housing.

The PFM in a VIA package is a 400W power factor corrected AC-DC converter operating from a rectified universal AC input which delivers an isolated and regulated Safety Extra-Low Voltage (SELV) 24 or 48V (model dependent) secondary output.

These modules are mounted on the Front End Chassis of the Development Kit to showcase their efficient, simple, and cost effective AC-DC solution compliant to IEC 61000-3-2 Class B EMC standard. The metallic stand acts as a heat sink for the AIM and PFM. Please use caution not to touch the Front-End chassis unless the power is disconnected and the front end chassis has been given sufficient time to cool.
Hold-up Bank (HUB)
The PFM™ uses secondary-side energy storage to maintain output hold up through line dropouts and brownouts. A hold-up capacitor bank is included in the kit to achieve the required hold-up functionality. Moreover, the HUB provides a viable path for the second harmonic due to the PFM power factor correction function.

Point-of-Load (PoL) Chassis

Point-of-Load evaluation boards are on mounted on the PoL Chassis and have 3.3, 5 and 12V outputs. The Input Board, on the left side of the PoL Chassis, interfaces with the Front-End Chassis and HUB using the three black right-angle connectors. The PoL Chassis showcases Vicor high power density, flexible and high-efficiency Point-of-Load offerings.

A communications port is available on the Input Board which can be connected to the VIA module mounted on the Front-End Chassis.

Note: This feature will be available in the future.

\[\text{I}^2\text{C}\]™ communications will be available in the future for \(V_{\text{OUT}}\) margining, fault reporting, and EN pin polarity for the ZVS Regulator converters.

Set-Up Instructions

**Figure 2**
PoL chassis

**Figure 3**
Front-end chassis set up
1. Ensure the evaluation boards on the PoL Chassis are securely plugged into the white plastic board-to-board edge connectors and that all nuts on the evaluation boards are screwed down. The toggle switches on the evaluation boards control the enable for each PoL converter.

Note: Any load connected to the PoL converters should be off or disabled until the Front-End Chassis has been powered on.

2. Connect the red and black HUB cable to one of the black right angle connectors on the Input Board of the PoL Chassis. Input Board is labeled 2 in Figure 4.

3. Remove black plastic cable retainer on the Front-End Chassis, labeled 8 in Figure 3, and the plastic insert that is screwed down on the AIM™ input. The plastic insert can be discarded.

4. Insert provided AC cord into the cord retainer. The AC cord should be fed through the retainer to the location where the black insulation ends and the Line, Neutral, and Ground wires are exposed. Screw retainer back to the Front-End Chassis and screw down the Ground wire ring lug using the supplied screw that is mounted in front of the AIM in a VIA™ package as seen in Figure 3. Install the Line/Black wire to the top terminal of the AIM and install the Neutral/White wire to the bottom terminal of the AIM.

5. A cover accessory kit is included in the Development Kit box, refer to Figure 5. Place the funnel cover over the input terminals of the AIM in a VIA package and use the included screw to secure the cover. The screw hole is centered between the input terminals of the AIM on the Front End Chassis. Place the snap-on cover between the AIM and PFM™ in a VIA package. The cover should snap down securely on the metal jumpers that connect terminals of the AIM and PFM.
6. Ensure all screws are secure on the Front-End Chassis.

7. Plug in the red and black Front-End Chassis output cable, labeled 11 in Figure 3, to one of the black right angle connectors on the Input Board of the PoL Chassis.

8. Connect the outputs of the PCBs on the PoL Chassis to the desired load(s) via the large screw-down output connectors. Test points are available near the top of each PoL PCB to observe the output voltage from the Front-End chassis, and test points between the output connectors are available to observe the output voltage from the PoL converter.

9. Connect the AC cord to a bench power supply.

10. Once power has been applied to the Front-End Chassis, the load(s) connected to PoL Chassis can be enabled.

### Bill of Materials

#### Table 1
Hardware bill of materials common to all Development Kits

<table>
<thead>
<tr>
<th>Description</th>
<th>Manufacturer</th>
<th>Manufacturer Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3.5 X 14 SSTL PH PHILLIPS SCREW</td>
<td>Fastenal</td>
<td>145078</td>
</tr>
<tr>
<td>M3.5x8 SSTL PH PHILLIPS SCREW, BLACK</td>
<td>Fastenal</td>
<td>145082</td>
</tr>
<tr>
<td>CLAMP .375 PA66 BLACK .250 BUNDLE DIA</td>
<td>HellermannTyton</td>
<td>T3D02500M4</td>
</tr>
<tr>
<td>CLAMP .375 PA66 BLACK .375 BUNDLE DIA</td>
<td>HellermannTyton</td>
<td>T3D03750M4</td>
</tr>
<tr>
<td>AC LINE CORD KIT</td>
<td>Quail Electronics</td>
<td>2573.048S</td>
</tr>
<tr>
<td>UNIVERSAL AC ADAPTER TO UK</td>
<td>Quail Electronics</td>
<td>0522.8</td>
</tr>
<tr>
<td>UNIVERSAL AC ADAPTER TO EURO SCHUKO</td>
<td>Quail Electronics</td>
<td>0521.8</td>
</tr>
<tr>
<td>INTERCONNECT TO POL ASSEMBLY</td>
<td>Vicor</td>
<td>42982</td>
</tr>
<tr>
<td>TIM PAD, VIA, 4414PFM</td>
<td>Vicor</td>
<td>43151</td>
</tr>
<tr>
<td>TIM PAD, VIA, 1714</td>
<td>Vicor</td>
<td>43150</td>
</tr>
<tr>
<td>M4x12 SSTL HEX HEAD CAP SCREW</td>
<td>McMaster-Carr</td>
<td>91287A113</td>
</tr>
<tr>
<td>SPACER, 8 mm OD, 4.2 mm ID, 2.5 mm HT</td>
<td>Vicor</td>
<td>42603</td>
</tr>
<tr>
<td>M4 SSTL THIN HEX NUT</td>
<td>McMaster-Carr</td>
<td>90710A035</td>
</tr>
<tr>
<td>10 Position Open Edge Board to Board Connector</td>
<td>AVX</td>
<td>9.15901E+12</td>
</tr>
<tr>
<td>ACCESSORY COVER KIT</td>
<td>Vicor</td>
<td>43916</td>
</tr>
<tr>
<td>JUMPER TERMINAL BLOCK.413 PITCH .150 ID</td>
<td>Vicor</td>
<td>43055</td>
</tr>
</tbody>
</table>

#### Table 2
Development Kit bill of materials

<table>
<thead>
<tr>
<th>Development Kit Part Number</th>
<th>Description</th>
<th>Front-End / PoL Chassis Part Number</th>
<th>VIA Package / PoL Converter or HUB Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>DKIT-AC-24-POL-00</td>
<td>Front End Chassis</td>
<td>PFM4414EB6M24D0T00</td>
<td>AIM1714V6MC7D5T00</td>
</tr>
<tr>
<td></td>
<td>PoL Chassis</td>
<td>PI33-24-3-5-12-00</td>
<td>PI3301-00-EVAL2</td>
</tr>
<tr>
<td>DKIT-AC-48-POL-00</td>
<td>Front End Chassis</td>
<td>PFM4414EB6M48D0T00</td>
<td>AIM1714V6MC7D5T00</td>
</tr>
<tr>
<td></td>
<td>PoL Chassis</td>
<td>PI35-48-3-5-12-00</td>
<td>PI3543-00-EVAL2</td>
</tr>
</tbody>
</table>
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/TS 16949 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/termsconditions](http://www.vicorpower.com/termsconditions)

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](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](http://www.vicorpower.com)

custserv@vicorpower.com
apps@vicorpower.com

©2019 Vicor Corporation. All rights reserved. The Vicor name is a registered trademark of Vicor Corporation.

PIC™ is a trademark of NXP Semiconductor

All other trademarks, product names, logos and brands are property of their respective owners.