Power-Tronics, Inc. Electrical Power Control Systems

P.O. Box 291509 Kerrville, Texas USA 78029 Phone: 830.895.4700 Email: pti@power-tronics.com Web: www.power-tronics.com

EIC1020

External Interface Card

The Power-Tronics EIC1020 External Interface Card is an optional add-on module for select Power-Tronics voltage regulating systems designed to allow the voltage regulator to receive control signals from a Genset or VAR controller or other remote computerized control system.

The EIC1020 is the latest upgrade to the Power-Tronics UIC product line and replaces the EIC10V, UIC200, UIC100, and UIC100X series Optical Interface Modules. The EIC1020 is a very rugged and reliable interface module designed to last a lifetime.

The EIC1020 offers 2 different modes of operation: Fully Automatic, and Automatic/Manual selectable for the convenience of the system operator.

Compared to previous EIC and UIC products, the EIC1020 offers superior 4-20mA signal compatibility and delivers a more linear adjustment range. The EIC1020 also contains a loading resistor to better match the adjustment range of a manual potentiometer when using the Automatic/Manual wiring configuration.

The Power-Tronics EIC1020 is fully encapsulated to ensure a long service life and protect the unit from moisture or external contamination.

The EIC1020 is compatible with select Power-Tronics Universal Voltage Regulators and Static Exciters.

Specifications

Input Signal:	0-10VDC or 4-20mA
Maximum Input Burden:	20mA @ 10VDC
Input Impedance:	500Ω
Maximum Output Burden:	100mA
Output Impedance:	0-100KΩ
Adjustment Range:	±10%
Effective Control Range:	1.5-10VDC or 2-20mA
Electrical Isolation:	Optical, 3750VACrms
Physical Size:	4.05 x 2.1 x .75 in.
Weight:	2.5 oz
Fully Encapsulated:	Yes

* Can be used with +/-10VDC control signals by programming the control device to use a positive signal offset.

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Introduction and Functional Description

Caution: Read This Installation Manual Carefully and Entirely!

Warning: Do not use digital equipment to read voltage, Hz, or amperage during this installation. Use only Analog sensing equipment! Failure to do so may result in damage to equipment or in personal injury!

ALWAYS perform all setup procedures off-line
ALWAYS wear eye protection
ALWAYS strip wire insulation properly or use insulated connectors
ALWAYS use analog metering equipment when setting up the regulator
ALWAYS ensure the regulator receives ample airflow
NEVER hold the regulator in your hand when energized
NEVER install the regulator in a place it can get wet or is exposed to the elements
NEVER mount the regulator over a screw, bolt, rivet, welding seam, or other fastener
NEVER remove the regulator cover while the unit is in operation
NEVER insert a screwdriver or other object under the regulator cover
NEVER install a switch in the DC portion of the regulator's wiring
NEVER touch any exposed portion of the EIC1020 when in operation
NEVER USE A DIGITAL FREQUENCY METER (It *can give a false reading*!)

Functional Description

The Power-Tronics EIC1020 is an optional add-on module for select Power-Tronics voltage regulating systems and phase controllers designed to allow the voltage regulator (or phase controller) to be controlled by an external Genset or VAR controller.

Instead of using a manual or motorized potentiometer for control, the EIC1020 allows a completely solid-state solution for remote adjustment. The EIC1020 is capable of interpreting 0-9VDC, 0-10VDC, or 4-20mA signals with minimal adjustment. It can also interpret +/-9V and +/-10V signals by programming the issuing controller to use a positive offset signal.

Instead of linking the control signal directly to the voltage regulator's circuitry, the EIC1020 contains an optical isolation circuit, which allows the control system to be completely isolated from the voltage regulating circuitry. The EIC1020 also has a maximum current draw of 20mA to conform to industry standard PLC based controls.

Due to its reliable design and complete encapsulation, the EIC1020 is designed to provide reliable service for a lifetime when properly installed.

Fully Automatic Operation

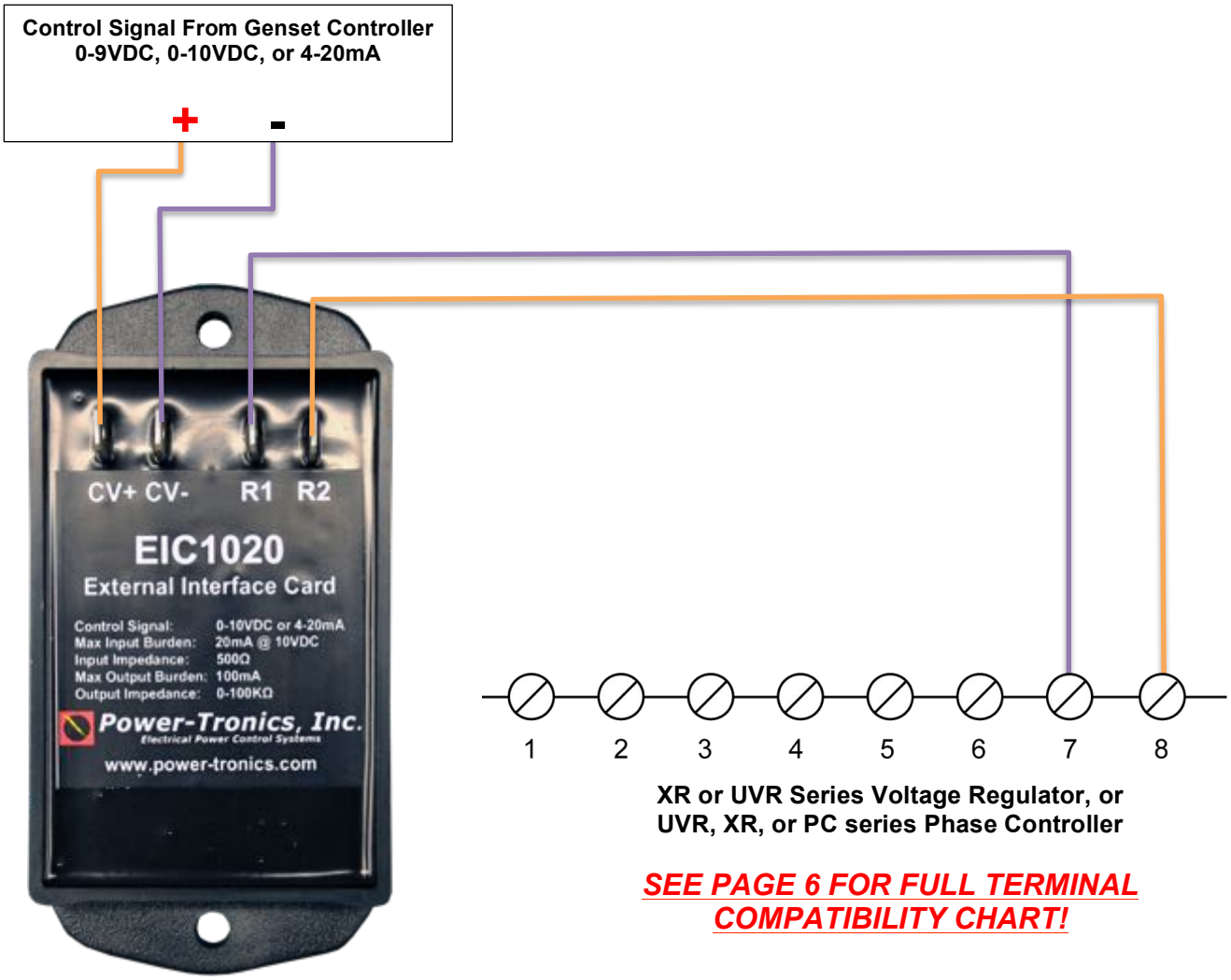
This configuration should be used if the EIC1020 is to be used in an unattended application, or if manual voltage control is not needed on your application.

NOTE: This instruction manual only contains instructions for your EIC1020's connection to the voltage regulator or phase controller. For wiring details regarding your voltage regulator or phase controller, see the instructions that came with your model.

NOTE:
For +/-9V or +/-10V Control Signals, please program your genset controller with the following positive offset values:

+/-9V or +/-10V: +6VDC

NOTE:
All wiring to and from the EIC1020 should be in shielded cable with the shield *UNGROUNDED* for best operation!

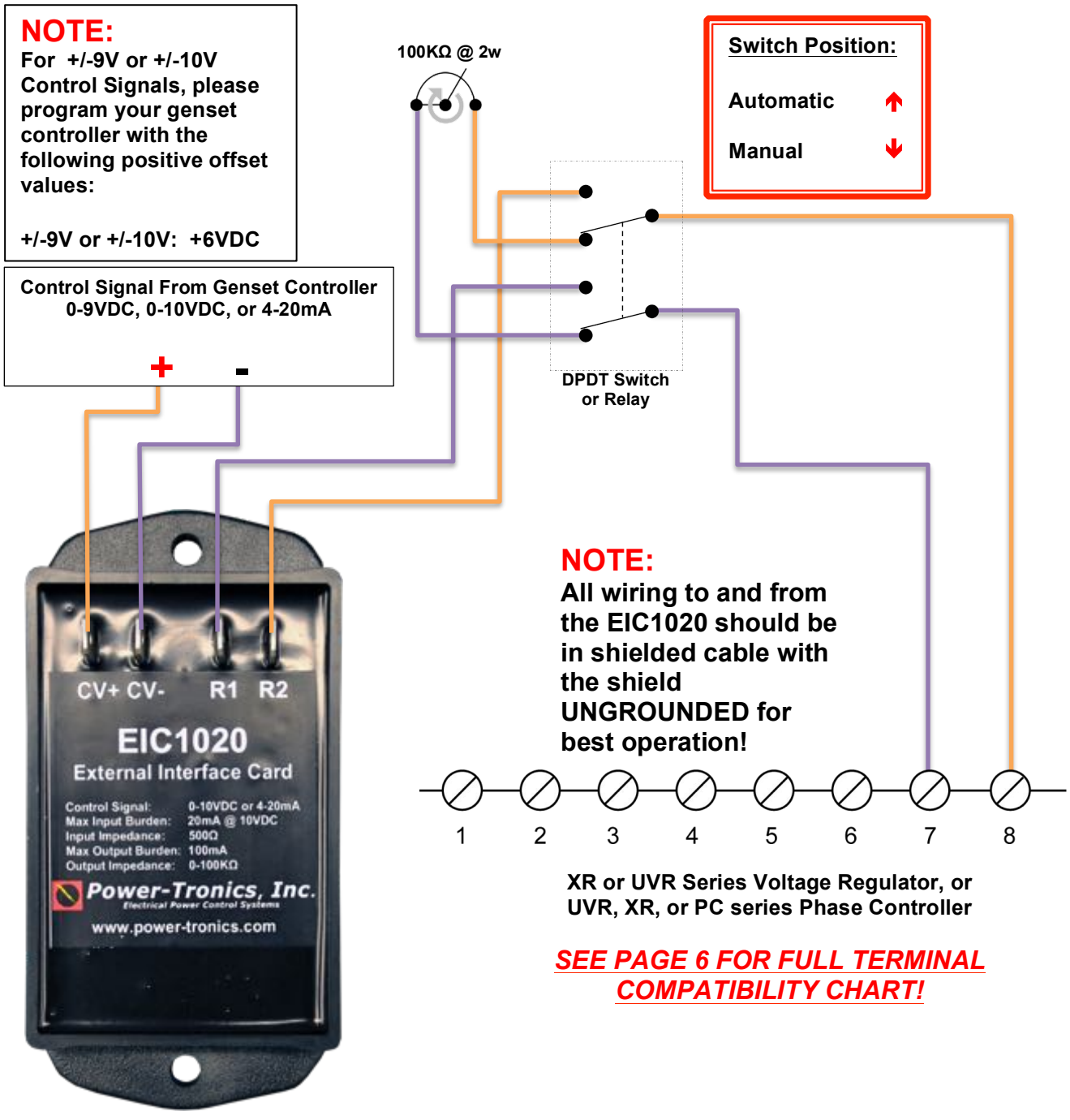


SEE PAGE 6 FOR FULL TERMINAL COMPATIBILITY CHART!

Automatic/Manual Selectable Operation

This configuration should be used if the EIC1020 is to be used in an installation where manual voltage adjustment is required or is important for redundancy.

NOTE: This instruction manual only contains instructions for your EIC1020's connection to the voltage regulator or phase controller. For wiring details regarding your voltage regulator or phase controller, see the instructions that came with your model.



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Terminal Compatibility Chart

This chart gives terminal compatibility and crossover information for all Power-Tronics voltage regulators and Static Exciters that are compatible with the EIC1020 External Interface Module

EIC1020 Terminal: R1	EIC1020 Terminal: R2
Connects To:	**Connects To:**
All UVR & XR Series Voltage Regulators:	**All UVR & XR Series Voltage Regulators:**
Terminal 7	***Terminal 8***
All SE1500 and Single-Phase SE2000AX/F, SE2000BX/F, SE3000BX, SE6000BX Static Exciters:	**All SE1500 and Single-Phase SE2000AX/F, SE2000BX/F, SE3000BX, SE6000BX Static Exciters:**
Terminal E **on TB2**	***Terminal F*** **on TB2**
All 3-Phase SE2000, SE3000, SE6000 Static Exciters WITHOUT internal UIC200 Option:	**All 3-Phase SE2000, SE3000, SE6000 Static Exciters WITHOUT internal UIC200 Option:**
Terminal F **on TB3**	***Terminal G*** **on TB3**
All Static Exciters using VRMSE series Control Module:	**All Static Exciters using VRMSE series Control Module:**
Terminal R1	***Terminal R2***
DC125i & DC250i:	**DC125i & DC250i:**
Terminal R1	***Terminal R2***

Initial Setup and Commissioning

1. Install the EIC1020 and wire up to the correct wiring diagram (Fully Automatic, or Selectable Automatic/Manual).

2. Start up the generator and bring the engine up to design speed, then manually adjust the voltage regulator to just below no-load voltage (See the manual that came with your voltage regulator for these instructions).

3. Adjust the Genset or VAR controller to provide a small positive voltage (6VDC or 12mA) at no-load.

4. Adjust the voltage regulator to rated no-load voltage using its internal controls.

5. The effective range of the EIC1020 is determined by the equipment it is connected to. Compatible Power-Tronics Products manufactured from 2017 and onwards provide a ±10% control range when using the EIC1020. Earlier products will have a reduced range, typically ±7%.

6. The EIC1020 is designed to provide a roughly linear control range across its rated input signal range. Effective control range is 1.5-10VDC or 2-20mA, this is due to the saturation voltage of the internal optical coupler circuitry. Best results are obtained from 2.5-10VDC or 4-20mA. Control output range is centered at 6VDC or 12mA. 2.5VDC or 4mA will bias the control output range to its minimum value of -10%. 10VDC or 20mA will bias the control output range to its maximum value of +10%.

7. Place the generator online and observe its operation. You should not have to readjust these settings after the initial installation.

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Installation Warranty Form

It is very important that you fill out this form completely when installing a voltage regulator. This form serves as a history record on the application. This form also contains the information needed by Power-Tronics, Inc., for repair and troubleshooting of any product you may be having problems with.

Failure to fill out this form during installation will result in a cancellation of your warranty coverage! Filling out this form takes only minutes but will save hours or days later on if your product should require service!

Product Model:	Additional Module(s) or Options:
Serial #:	
Date of Installation:	
This Section for Brushless Generators Only	
Exciter Field Voltage:	Exciter Field Resistance:
This Section for Brush-Type Generators Only	
Shunt-Field Voltage:	Shunt-Field Resistance:
Rotor Resistance @ Brush Leads:	Rotor Resistance on Slip-Rings:
Rotor Excitation Voltage:	
Generator Wiring/Usage Information	
Generator Leads (Check One:) ☐12 ☐10 ☐6 ☐4 (3ø) ☐4 (1ø) ☐3	
Generator Wiring Mode (Check One:) ☐High-Wye ☐Low-Wye ☐Series Delta ☐Zig-Zag ☐Double-Delta ☐Single-Phase ☐Other	
Terminal Voltage:	Residual AC Voltage:
Rated KW:	Rated KVA:
Primary Load (Please Explain):	
Repair/Warranty Request Information	
Company Name:	
Contact Person:	
Telephone Number:	
Email Address:	
Ship-To Address (City, State, Zip, Country):	
Problem Description/History (Please be detailed!!!):	

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PRODUCT WARRANTY

Power-Tronics, Inc., assumes no liability for damages due to incorrect voltage or other voltage related damages resulting from either output of the generator or input to the generator exciter system. These problems should be protected with external devices provided by the customer such as ***fuses, surge suppressors, over/under voltage and frequency controls.***

Power-Tronics, Inc., warranties **only parts and workmanship** of this product for a **period of 3 years from the original date of purchase from Power-Tronics, Inc.** Under warranty, Power-Tronics, Inc. will replace, exchange or repair the defective product **without labor or parts cost to the customer.** Remaining warranty of the original product will be transferred to the replaced or repaired product. To obtain warranty, a copy of the original Installation Warranty Form must be sent in with the defective product, which clearly shows the purchase date and serial number of the defective part. A repair request form must be sent in with the product before repairs will begin. You can obtain this form by contacting Power-Tronics, Inc.

Send repairs to: Power-Tronics, Inc., 2802 Cobbler Ln., Kerrville Texas USA 78028.

Send in repairs only by UPS or FedEx. **USPS will NOT deliver to our facility!**

Any *one* of the following conditions will void the warranty:

- Overheating of the power supply resistor on the printed circuit card.
- Overheating of the SCR or freewheeling diode.
- Physical damage to the printed circuit card, housing or components.
- Unauthorized repair or alteration of printed circuit card.
- Installation by anyone other than a qualified professional generator service technician.
- Conductive or corrosive contamination of the circuit card.
- Removal of our company identification from the product.
- Removal of any conformal coating of the printed circuit card or components.
- Overheating of foil on the printed circuit card.
- Inappropriate or infeasible application.
- Use with any external device other than manufactured by Power-Tronics, Inc.
- Failure to fill out the attached warranty card during installation

No other warranty is expressed or implied.