PE4 - Pulse Extender, 4 Output (ETA Module)

Installation and Operation Instructions

35826_ins_PE4.pdf rev. 11/21/19

Overview

The PE4 takes up to four input pulses to the board and extends the outputs to a controller or monitor. The pulses can be extended two different ways, split or divided.

Extender Option 1:
Extends the pulse to 100ms. This is the basic pulse meter isolation mode.

Extender Option 2:
Extends the pulse to 10 seconds. This can be used as a time delay signal, but generally it converts a pulsing status signal to a solid closed contact.

Split:
Takes one input and then produces two isolated output pulses. Note that only inputs 1 and 3 can be split; input 1 triggers outputs 1 and 2, input 3 triggers outputs 3 and 4.

Divider:
Takes the input pulse and divides it by 2, 4, 8 or 16 to create an output pulse with lower frequency.

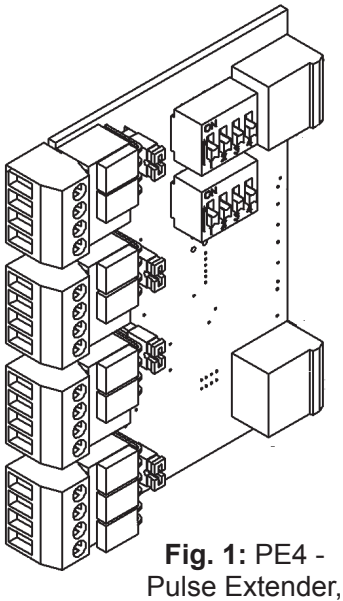

Fig. 1: PE4 - Pulse Extender, 4 Output

Mounting

The PE4 - Pulse Extender Module plugs into either a BP2, BP4 or BP8 Backplane or BP4V Vertical Backplane as shown in Fig. 2.

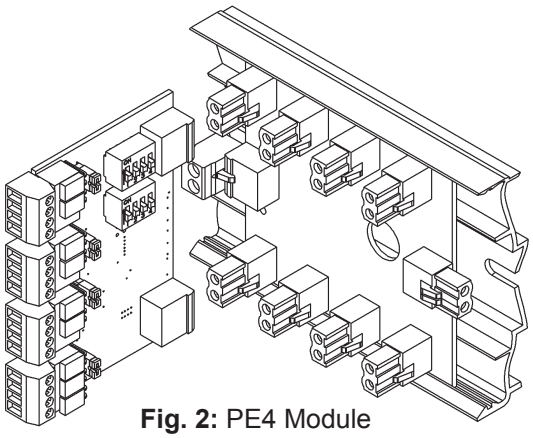

Fig. 2: PE4 Module plugging into a BP4 Backplane

Specifications

Power Voltage: 18 to 34 VDC or 20 to 24 VAC

Power Current: 125 mA Maximum

Input Pulse Sensing Voltage: 5 VDC

Output Pulse: Opto-isolated open collector (proper polarity is requred)

Building Automation Products, Inc., 750 North Royal Avenue, Gays Mills, WI 54631 USA
Tel:+1-608-735-4800 • Fax+1-608-735-4804 • E-mail:sales@bapihvac.com • Web:www.bapihvac.com

Termination

Configure the PE4 as shown in the table below. Note that “SW1, SW2, SW3, SW4” refer to the 4 switches on each DIP switch, from left to right. The upper switch is used to set the options for circuits 1 and 2, the lower switch sets the options for circuits 3 and 4.

Table 1: PE4 Settings and Outputs		
Operating Mode		
SW1	**SW2**	**Description**
ON	ON	Extend Pulse to 100ms
ON	OFF	Extend Pulse to 10 Seconds
OFF	ON	Pulse Splitter
OFF	OFF	Pulse Divider
For Pulse Splitter Mode Only		
INPUT 1	Pulse = 100ms Pulse on "OUT 1" and "OUT 2"	
INPUT 2	Not Used	
INPUT 3	Pulse = 100ms Pulse "OUT 3" and "OUT 4"	
INPUT 4	Not Used	
For Pulse Divider Mode Only (Switches SW3 and SW4 on the upper and lower DIP Switches are only used if that circuit is set to Pulse Divider mode.)		
SW3	**SW4**	**Description**
ON	ON	Divide by 2
ON	OFF	Divide by 4
OFF	ON	Divide by 8
OFF	OFF	Divide by 16

SW1, SW2, SW3, SW4 refer to the 4 switches on each DIP switch, from left to right.

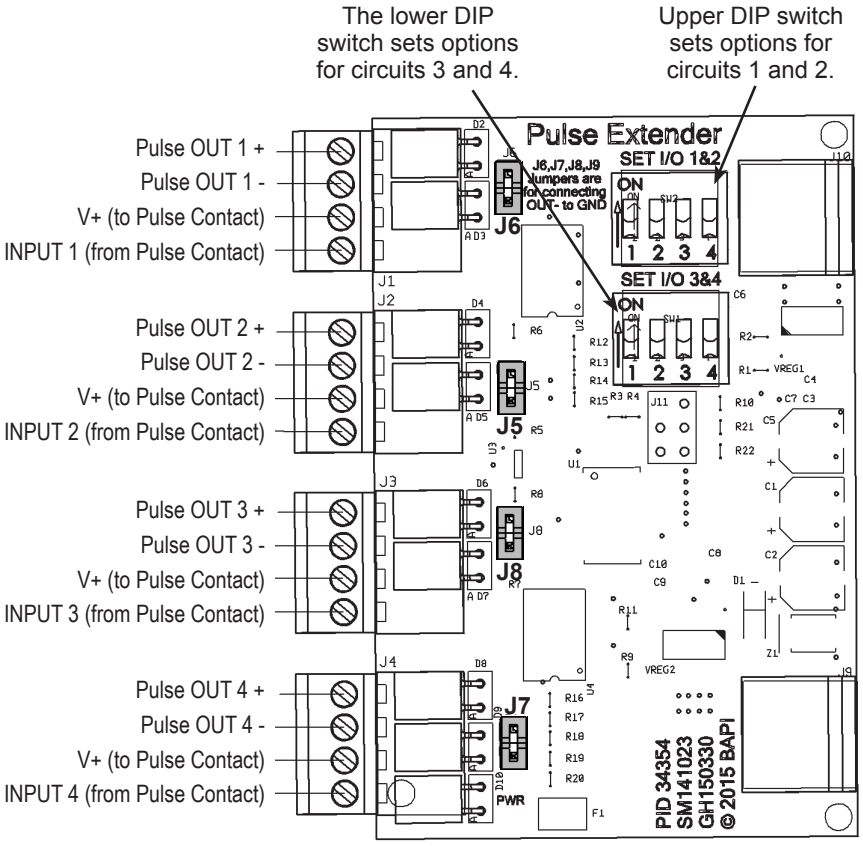

Fig. 3: PE4 Module Component Locator

Pulse Splitter Mode

In “Pulse Splitter” mode, an input pulse on INPUT 1 will produce 100ms output pulses on OUT 1 and OUT 2. An input pulse on INPUT 3 will produce 100ms output pulses on OUT3 and OUT4. INPUT 2 and INPUT 4 are not used in “Pulse Splitter” mode.

Pulse Splitter and Pulse Divider

The module cannot be used as both a “Pulse Splitter” and “Pulse Divider” for two separate pulse inputs; however, it can used as both for a single pulse input. If the application requires both dividing and splitting of a single input pulse, set circuits 1 and 2 for “Pulse Divider” on the upper DIP switch, then wire the output from circuit 1 or 2 to INPUT 3. Set circuits 3 and 4 for “Pulse Splitter” on the lower DIP switch, then connect OUT 3 and OUT 4 to the two separate systems.

Note on PE4 Circuit Boards:

The text printed on the PE4 circuit board incorrectly states that “J6, J7, J8, J9 jumpers are for connecting OUT- to GND”. It is actually jumpers J5, J6, J7 and J8 that are used for this.

- J6 is connected to “OUT 1 -”
- J5 is connected to “OUT 2 -”
- J8 is connected to “OUT 3 -”
- J7 is connected to “OUT 4 -”

Jumpers J5 through J8

Jumpers J5 - J8 are used to connect the “OUT -” pins to GND if needed. This is useful in applications where the controller senses the pulse by sensing current flow out on the “+” terminal rather than sensing a return voltage on the “-” terminal. Connecting the “OUT -” pins to GND in this situation can minimize wiring requirements. Place the jumper across the two pins to connect the “OUT -” pin to GND for that circuit. Leave the jumper across only one pin or remove it to disconnect the “OUT -” pin from GND.

Red LEDs

Terminals J1-J4 each have two red LEDs. The “lower” LED flashes when the pulse input contact closes for that circuit. The “upper” LED flashes when the pulse output contact closes for that circuit.

Specifications subject to change without notice.

Applications

PULSE EXTENDER

The basic function of the PE4 is to extend the length of flow meter pulses to be long enough for a controller to read them. This can be required when the flow meter output pulses are very short. For instance, some flow meters have pulse durations of only 15 to 30ms while some controllers require pulse durations of 50 to 100ms in order to be counted.

PULSE DIVIDER

Another function of the PE4 is a pulse divider. Some flow meters, such as natural gas meters, output a pulse with each rotation of the turbine wheel in the meter. During times of high consumption, these rotations can be extremely fast. Controllers will generally have a limitation on how many pulses per second can be read. If the meter is pulsing faster than the maximum rate that the controller can read, some pulses will be missed. The PE4 module can solve this problem by dividing the rate of incoming pulses by 2, 4, 8, or 16. Within the controller, the user then increases the flow multiplier by the same factor of 2, 4, 8, or 16.

PULSE SPLITTER

Yet another function of the PE4 is a pulse splitter. This can be useful in applications where two separate systems must connect to the same pulse output. This could be the BMS and a utility monitoring system, or a local control system and the overall BMS of the facility. The PE4 can split the single pulse output into two isolated outputs, which is considerably less expensive than installing two separate meters.

PULSE SPLITTER AND DIVIDER

By combining inputs and outputs on the module, the user can achieve the combination of both pulse divider and pulse splitter with one module if necessary.

PULSE INPUT TO SOLID OUTPUT CONTACT CONVERTER

A final application could be called a “pulse input to solid output contact converter”. Although not very common, there are applications where a device provides a pulsing status signal, but the controller wants a solid “ON” contact. An example would be monitoring the status of an injector pump using a current-sensing relay. It would be easy to monitor the control relay or contactor, but positive verification requires a current-sensing relay. However, chemical injector pumps used in water treatment systems for pools or cooling towers typically pulse on and off. If the control system needs to see the status of such a pump, the PE4 set for “Extend Pulse to 10s” will accomplish this. The pulsing input will become a solid output contact. Note that if the pulses are more than 10s apart, there will still be gaps in the output pulse.

Diagnostics

PROBLEMS	**SOLUTIONS**
Green Power LED doesn’t light	- Check to see if the PE4 is firmly inserted into the Backplane - Check the power cable to the Backplane - Check the power to the PS17 (or other external power supply that is supplying power to the Backplane) to see that it is supplying proper power.
Red LEDs do not light	- Check to see if jumpers are correctly configured - Check configuration of switches SW1 through SW4 - Check that the input contact is actually closing properly. - If the meter output is actually an open collector or other electronic “contact”, verify the polarity is correct.

Building Automation Products, Inc., 750 North Royal Avenue, Gays Mills, WI 54631 USA
Tel:+1-608-735-4800 • Fax+1-608-735-4804 • E-mail:sales@bapihvac.com • Web:www.bapihvac.com