

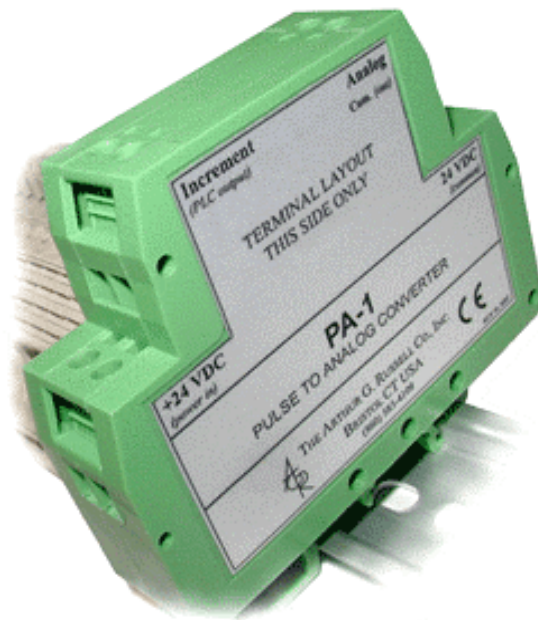


THE ARTHUR RUSSELL CO., INC.

VibroBlock® Feeder Systems Accessories

PA-1 Pulse To Analog Converter

Installation And Operation Manual



“PROVEN AUTOMATION SOLUTIONS SINCE 1945”

The Arthur G. Russell Co., Inc.

750 Clark Ave. P.O. Box 237

Bristol, Ct 06011-0237

Phone: 860.583.4109

Fax: 860.583.0686

E-Mail: agr@arthurgrussell.com

Web Site: www.arthurgrussell.com

PA-1 PULSE TO ANALOG CONVERTER INSTALLATION AND OPERATION MANUAL

DESCRIPTION:

The **PA-1** offers a unique way of adding a single channel of analog output to any PLC. Output voltage (0-5vdc or 0-10vdc) can be adjusted up or down in 1% increments by sending pulses to the **PA-1**. An Up/Down input determines direction. The **PA-1** is powered by 24VDC and provides 1000-volt isolation from input to output. This open loop design is ideal for conveyors and motorized feeders etc.

CONNECTIONS:

Connect as shown on the diagram on page 2. The supply voltage for the **PA-1** is 24 VDC plus or minus one volt. The maximum current requirement is 30ma. This supply voltage is internally isolated from all other terminals on the **PA-1**, including the connections from the PLC outputs and PLC common. Please note that the connections from PLC outputs can be either source or sink depending on the polarity of the up/down terminal. The connections on the wiring diagram on page 2 show a typical connection to a PLC with sourcing outputs.

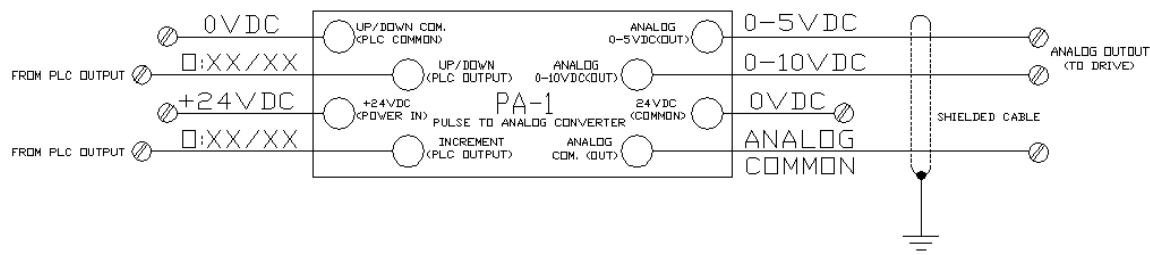
When connecting the **PA-1** to a motor drive or other load, use either the 0-5V output or the 0-10V output (depending on device requirements) and the analog common. The analog outputs are capable of 5ma continuous output.

PA-1 INSTALATION:

The **PA-1** must be installed in an enclosure approved for the location. Mount the **PA-1** on DIN rail as far as possible from sources of electrical noise. Such sources of electrical noise may include both AC and DC motor controls, switching power supplies and any high current carrying conductors. The **PA-1** should however, be mounted close to the device it is controlling. Electrical noise problems are usually indicated if the connected motor drive or other device will not maintain a steady speed or pulsates during normal operation.

OPERATION

Each pulse received by the **PA-1** will vary the analog outputs by one percent. If the **up/down** output from the PLC is **off**, the analog voltage will rise when each pulse is received. If the **up/down** output from the PLC is **on**, the analog voltage will fall when each pulse is received. The pulses must be a minimum of five milliseconds in width, with at least five milliseconds off time. When changing state of the PLC output controlling up/down, make sure that the PLC **pulse** output has been off for at least two milliseconds. This will prevent the **PA-1** from being confused as to whether a pulse should be up or down. Other devices including switches or relays can control the **PA-1**. Any device capable of supplying 24VDC signals at 10ma can be used. Care must be taken however, when using switches, relays or any hard contact devices because of contact bounce, which may record erroneous pulses. When using these devices additional filtering may be required. The full-scale range of the **PA-1** is 100 pulses. Any additional pulses received in either direction are ignored. The logic example shown on page 3 for an Allen Bradley SLC 500™, always issues a continuous stream of down pulses whenever the **PA-1** is commanded to output 0V. We recommend this approach to programming. This approach ensures that if any erroneous up pulses were received, they will be zeroed out whenever the **PA-1** is commanded to output 0V. This essentially closes the loop and prevents any long-term drift that could occur from high levels of electrical noise etc.



The latest version of this document, **pa1.pdf** is available at www.arthurgrussell.com

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SLC 500 is a trademark of Rockwell Automation

As many speeds as desired can be added. The addresss shown are examples only.

This logic can also be used with the PA-1 Pulse To Analog Converter

Your addresses could be the same or different. All addresses that are labeled as

REPLACE WITH must be replaced with your own I.O. addresses.

B3/410=RAIL HIGH LEVEL INPUT

B3/411=FEEDER OFF/ON INPUT

B3/412=FEEDER UP/DOWN SPEED SELECT OUTPUT

B3/413=FEEDER PULSE IN OUTPUT

B3/414=FEEDER OUT OF TUNE INPUT

