BRUCONTROL

Process Automation Made Personal

Analog Amplifier Board: Model AA-2

Description

This board converts PWM or Analog Output signals from the interface into analog voltages to drive analog (also termed 'proportional') voltage-controlled devices such as proportional valves, variable SSRs, proportional regulators, etc. It has 4 adjustable channels with an additional adjustment to determine the outputs' states when a channel's interface output is disabled or unwired (i.e. high impedance). It takes a 5-24 VDC input and has pass-through terminals for simplified device wiring. The signal voltage to the board from the interface is 3.3 or 5V DC PWM or analog. The output range is adjustable to accommodate 0-5, 0-10, 0-12 VDC, etc. for different controlled device requirements. The maximum output drive current per channel is 45 mA. Input signal channels are labeled I1 … I4 and Output channels are labeled O1 … O4.

Installation

⚠ The order of installation must be followed below. Failing to do so could damage the Analog Amplifier or downstream devices.

1. At the top terminals, wire power and signal inputs as follows:
    a. V+ to DC power supply positive, within range of 5 – 24 VDC.
    b. G to DC power supply ground.

     c. I1 … I4 to interface PWM/Analog Out pin, either 3.3 or 5 VDC max. Check the interface's Interface Wiring Map to ensure the pin can produce a PWM/Analog output signal, denoted by the 'P' code.

2. Without wiring the bottom terminals, each output's voltage upper limit must be established. (e.g. <u>BEFORE COMPLETING THIS PHYSICAL CONNECTION TO THE PROPORTIONAL DEVICE). This is not established during board manufacture and must be performed by the installer! Note:</u> The potentiometers are delicate – do not place any stress upon them other than what is required to turn the adjustment screw.

     a. Each PWM/Analog Out pin connected via I1 … I4 is associated with a PWM/Analog Output Device Element port in BruControl. That output must be enabled and set to <u>maximum</u> voltage/value (e.g. BruControl PWM/Analog Output Device Element enabled with uncalibrated output value = 255).

     b. Using a volt-meter, measure the output (O1 … O4) associated with each PWM/Analog Out pin / analog amplifier input (I1 … I4). Turn the associated potentiometer's adjustment screw (OUT 1 … OUT 4) until the controlled device's max allowable analog input voltage is achieved. This would be 5 V for a 0 – 5 V control signal, 10 V for a 0 – 10 VDC control signal, etc. These potentiometers are 12-turn, so it may take multiple turns to achieve the desired voltage. Clockwise increases voltage while counterclockwise decreases voltage.

     c. Repeat for every channel <u>before</u> wiring to the controlled device to ensure an over-voltage is not induced. After each channel is established, the physical connection to the controlled device may be completed per below.

3. At the bottom terminals, wire:

     a. V+ to device requiring power. Voltage is the same as V+ above as this is a pass-through connection to facilitate wiring. Max current is 2A per channel.

     b. GND to device requiring power. This is the same as GND above as this is a pass-through connection to facilitate wiring.

     c. OUT 1…4 to controlled device (e.g. proportional valve) input signal.

4. Set OFF VOLT ADJ: This potentiometer determines the O1 … O4 output voltage when the I1 … I4 input impedance is high, such as when the associated BruControl PWM/Analog Device Element is disabled or the input

is unwired. Turn the potentiometer clockwise to increase the voltage, and counterclockwise to decrease it. Full counterclockwise for 0 VDC is recommended to ensure the controlled device is "off" when the Device Element is disabled. If turning clockwise, do not continue to increase the O1 … O4 output voltage above its maximum of 5, 10 etc. VDC. This potentiometer is 12-turn, so it may take multiple turns to achieve the desired voltage.

Contact BruControl at info@brucontrol.com with any questions or concerns.

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