

Raise/Lower to Analogue Module

Features



- Current or Voltage Output
- Relay, Transistor, or Triac Input
- 255 Step Resolution

Specification

Inputs:	Relay contact Transistor Triac 24Vac
Output:	
Voltage	0-10Vdc - 3.3kohms min.
Current	4-20mA - 750ohms max.
Resolution	255 steps
Power supply	24 to 35Vdc 21.6 to 28Vac @ 50/60Hz
Power consumption	208mA max.
Connections	Screw terminals for 0.5-2.5mm ² cable
Dimensions	96 x 58 x 30mm
Ambient range:	
Temperature	0°C to +50°C
RH	10 to 95% non-condensing
Country of origin	U.S.A.

Product Codes

IO-AUD

Raise/Lower to Analogue Module 45, 60, 120 or 240 seconds selectable

Technical Overview

The IO-AUD accepts a raise/lower relay signal and provides a 0-10Vdc output. Additional features include manual over-ride jumper, LED status indication and selectable hysteresis.

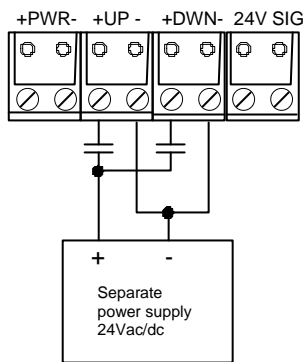
Signal Inputs

The IO-AUD accepts either pulsed relay contact inputs, pulsed DC, or pulsed AC voltage inputs.

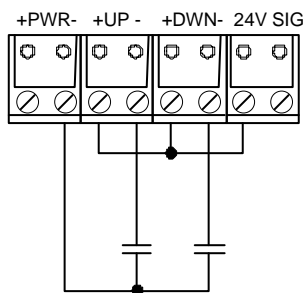
Connection Examples

Pulsed relay contacts:

E1 (optically isolated)

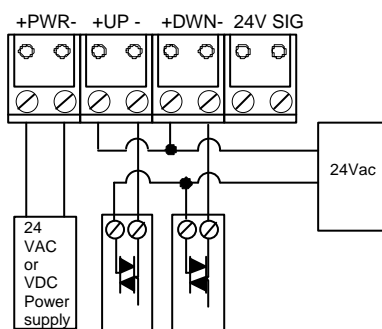


E2 (not isolated)



Controller/triac output:

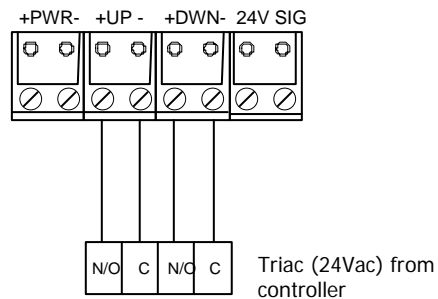
E3



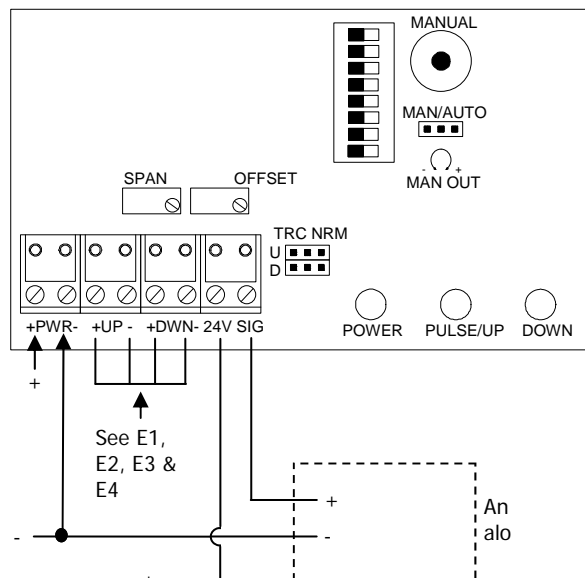
Connection Examples (continued)

Wiring for Siemens TEC controller:

E4



Connections



24Vdc accessory output
See diagram E2

Power Supply

DC Power - Refer to wiring diagram for connection information.

If the 24Vdc power is shared with devices that have coils such as relays, solenoids, or other inductors, each coil must have an MOV, DC Transorb, or diode placed across the coil or inductor. The cathode, or banded side of the DC Transorb or diode, connects to the positive side of the power supply.

AC Power - Refer to wiring diagram for connection information.

Check the wiring configuration of any other loads that may be connected to this transformer. If required by BAS or

Power Supply (continued)

controller specification, the 24Vac neutral can be earth grounded at the transformer. Analog input, digital input, and analog output circuits should not be earth grounded at two points. Any field device connected to this transformer must use the same common. If you are not sure of other field device configuration, use separate transformers for isolation. If the 24Vac power is shared with devices that have coils such as relays, solenoids, or other inductors, each coil must have an MOV, AC Transorb, or other spike snubbing device across each of the shared coils. Without these snubbers, coils produce very large voltage spikes when de-energizing that can cause malfunction or destruction of electronic circuits. Refer to wiring diagram for connection information.

You should measure the actual voltage output of the secondary. If the output is not fully loaded you may read a higher voltage than the circuit board can handle.

Dip Switch Settings

MAKE DIP SWITCH SETTINGS WITH POWER OFF

Setting output rate of change (Timing):

Select the rate of change by setting the DIP switch as shown. The rate of change is the time it takes for the analog output to go from minimum to maximum. Changing the timing range with power on will result in reset to minimum.

	Dip-Switch	
	1	2
45 Sec.	Off	Off
60 Sec.	On	Off
120 Sec.	Off	On
240 Sec.	On	On

Output Type:

Select either current or voltage output with the two switches shown.

NEVER have both switches on or off at the same time while powered, or chip failure may occur.

	Dip-Switch	
	7	8
Voltage	Off	On
Current	On	Off

Dip Switch Settings (continued)

Offset:

Select offset of 1Vdc / 4mA or adjustable offset by switch 6 as shown in. With the adjustable offset setting, you can adjust the "OFFSET" trim pot as desired.

	Dip-Switch
	6
1Vdc or 4mA	Off
Adjust. Between 1 & 5V or 0 to 20mA	On

Span:

Select the desired span by setting the three switches as shown. If you chose an adjustable span, you can adjust the "SPAN" trim pot, as necessary. After all connections have been made, activate the power source. The "POWER" LED should light. The "UP" and "DOWN" LED's will light when the IO-AUD is receiving input signals.

Fixed

	Dip-Switch		
	3	4	5
1Vdc (no mA)	On	On	On
10Vdc (no mA)	On	On	Off
5Vdc or 16mA	Off	On	On
13Vdc (no mA)	Off	Off	On

Adjustable

	Dip-Switch		
	3	4	5
1 to 9.5Vdc & 4 to 20mA	On	On	Off
10 to 20Vdc (no mA)	On	Off	Off
4 to 14Vdc (no mA)	On	Off	Off

ADJUSTABLE OFFSET AND SPAN.

If you do not wish to use any of the preset selections and desire to set your own minimum and maximum output, you must make potentiometer adjustments to the IO-AUD. The OFFSET DIP switch should be set for adjustable offset and the SPAN DIP switches should be set for the span desired.

Dip Switch Settings (continued)

The minimum output signal will be equal to the offset. The maximum output signal will be equal to the offset plus the span.

Examples:

If the Span is set at 4Vdc and the Offset is set at 0Vdc
Minimum Output will be 0Vdc, Maximum Output will be 4Vdc
If the Span is set at 16mA and the Offset is set at 4mA
Minimum Output will be 4mA, Maximum Output will be 20mA

To Set an Adjustable Offset:

1. Turn power OFF, set DIP switch 6 for adjustable offset, connect multi-meter to the output and turn on power.
2. Place Man/Auto jumper in the Manual position.
3. Turn the Manual Override potentiometer counter clockwise until it stops. It is a 3/4 turn pot.
4. Offset Pot turns counter clockwise to Decrease and clockwise to Increase.
5. Turn the Offset potentiometer until the desired minimum output is read on meter

To Set an Adjustable Span:

1. Turn the power OFF, set DIP switches 3, 4 and 5 for one of the 3 desired adjustable ranges, Connect multi-meter to the output and turn power ON.
2. Place (or leave) the Man/Auto jumper in the manual position.
3. Turn the override potentiometer clockwise until it stops.
4. Turn the Span potentiometer until the desired maximum output is read on meter (turn counter clockwise to increase and clockwise to decrease).
5. Check full range and repeat if needed. (Note: If powered when making DIP switch settings, power must be reset to allow DIP switch settings to be recognized.

When power is first applied or restored after power interruption, the IO-AUD automatically resets to the minimum output signal as defined by the output DIP switch settings or the adjusted minimum.

Triac Input

For a Triac input change jumper setting J1 to:

	TRC	NRM
U	■	○
D	■	○

Manual Override

If you want to manually increase and decrease the output (to test the hook up to the actuator) within the selected signal span, place Jumper J2 in MAN (manual) position, and turn the manual potentiometer.

Be sure to return Jumper J2 to AUTO position after testing.

Troubleshooting & Testing

1. Apply 24Vac or 24Vdc to "PWR" terminal, confirm power LED is on and measure voltage to confirm proper voltage.
2. Check the DIP settings. Depressing the switch closest to the MAN/AUTO pot selects the ON position. You must reset power if switch changes are made with power on or they will not be recognized.
3. **Testing the output.** Connect power. Place MAN /AUTO jumper to Manual.

Voltage out:

Confirm DIP switch setting for "Voltage Out". With meter only connected to the SIG and PWR (-), turn the manual pot full left and then full right. The output should vary from 0 to 100 % of calibrated or jumper selected range.

If yes, connect load/device and meter to SIG and PWR (-) terminals. Turn override pot and measure voltage. Do the readings match the no load test?

If no, check load impedance mismatch or a possible ground loop problem.

If yes, voltage output is functioning properly.

Current out:

Confirm DIP Switch setting for "Current Out". With meter only connected to the SIG and PWR (-) turn the manual pot full left and then full right. The output should vary from 0 to 100 % of calibrated or jumper selected range. If no, measure the **voltage** and turn the Manual override pot clockwise. Is voltage present?

Troubleshooting & Testing (continued)

A voltage between 15-39Vdc indicates the IO-AUD is attempting to generate the desired mA. Load or meter may have an open, blown fuse or connected improperly. A 250 or 500 ohm resistor will also work to test the output. Connect the resistor to the SIG and PWR (-) terminal. With 250 ohms on the output the voltage from one side of the resistor to the other will be 1Vdc @ 4mA and 5Vdc @ 20mA. Using the 500 ohm will give 2Vdc @ 4mA and 10Vdc @ 20mA. Does the unit function as stated above?

If yes, current output is functioning properly.

Testing the input. To manually test the input.

Apply 24Vac or 24Vdc to the PWR terminal. Connect your meter to the SIG and PWR (-) terminal. Set meter to match output DIP switch settings. Place MAN/AUTO jumper to AUTO. Connect a jumper wire from UP + to the PWR (+). Connect a jumper wire to the PWR (-) only. You are now ready to simulate an input pulse signal.

For testing purposes, select the 45 second range (DIP switch 1 OFF, DIP switch 2 OFF). Be sure to reset power to allow the IO-AUD to recognize new settings.

Take the free end of the jumper wire from "PWR" (-) and connect by holding wire to the "UP" (-) terminal. Verify the pulse LED indication. Read output. Has the output changed? The output should be increasing and stop when maximum span is reached.

Placing the wires on the DWN + and - terminals should decrease the output signal. If no, change the TRC/NRM to the opposite setting and repeat test. Has the output changed?

If yes, unit is functioning properly.