



# Raise/Lower to Analogue Module AUD

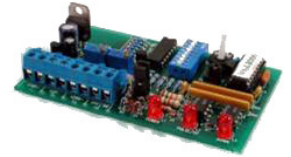
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## Description

The AUD converts a floating point signal into a linear analogue output. There are two inputs on the AUD, one to increase the analogue output and one to decrease the analogue output. The output of the AUD is stable when the inputs are both off. A contact closure or voltage signal to either input will cause the output of the AUD to begin to ramp either up or down depending on which input was activated. If both inputs are "ON" the output will reset to the lowest value of the selected range

## Features

- Field Selectable Rate of Change
- Field Adjustable Output with Manual Override Potentiometer
- 255 Step Resolution
- Current or Voltage Output
- LED Status Indicators
- No Wrap Around
- Relay, Transistor, or Triac Input



## Technical Specification

<b>Supply Voltage:</b>	24...35Vdc or 21.6...28Vac 50/60 Hz.
<b>Supply Current:</b>	208 mA max
<b>Signal Source:</b>	Relay contact closure, transistor, or triac
<b>Signal Trigger Level:</b>	Normal Mode: 5 to 26.4 VDC 24 to 26.4 VAC Triac Mode: 24 to 26.4 VAC
<b>Range Rates of Change:</b>	45, 60, 120, 240 seconds
<b>Voltage Preset Ranges:</b>	Dip Switch Selectable: 0...1Vdc, 1...2Vdc 0...4Vdc, 1...5Vdc, 0...10Vdc, 1...11Vdc, 0...13Vdc, 1...14Vdc
<b>Voltage Ranges:</b>	Adjustable 0...20Vdc
<b>Voltage Output Load:</b>	3300 ohms minimum at 20 Volts $\pm$ 10% 400 ohms minimum at 10 Volts $\pm$ 10%
<b>Current Preset Ranges:</b>	Dip Switch Selectable: 0...16mA, 4...20mA
<b>Current Ranges:</b>	Adjustable 0...20mA
<b>Current Output Load:</b>	0 to 750 ohms maximum.
<b>Accuracy:</b>	+/- 3% of span for adjustable ranges
<b>Resolution:</b>	256 steps (all ranges)
<b>Power Output (for user):</b>	24 VDC (+/- 10%), 48mA maximum
<b>Dimensions:</b>	3.75" L x 2.25" W x 1.15" H
<b>Weight:</b>	1.5 oz.
<b>Mounting:</b>	DIN rail mounted
<b>Operating Temperature:</b>	0...70°C
<b>Storage Temperature:</b>	-20...80°C
<b>Operating Humidity:</b>	10% to 95% non-condensing

## Calibration and Checkout

Signal Inputs: See figures E1, E2, E3, and E4 for wiring details. The AUD accepts pulsed relay contact inputs, pulsed DC, or pulsed AC voltage inputs (see E5 for triac jumper position)

## DIP Switch Programming

1. Select the rate of change by setting the DIP switch as shown in figure A. The rate of change is the time it takes for the analog output to go from minimum to maximum. Rate of change selections are as follows: 45, 60, 120, and 240 seconds
2. Select either current or voltage output with the two switches shown in Figure B. **NEVER have both switches on or off at the same time while powered, or chip failure may occur.**
3. Select offset of 1 volt / 4 mA or adjustable offset by switch 6 as shown in Figure C. With the adjustable offset setting, you can adjust the "OFFSET" trim pot as desired. For offset higher than 5 volts contact customer service.
4. Select the desired span by setting the three switches as shown in Figure D. 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 AUD is receiving input signals.

## Order Code

AUD Raise/Lower to Analogue Module

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## 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 AUD. The OFFSET DIP switch (shown in Figure C) should be set for adjustable offset and the SPAN DIP switches (shown in Figure D) should be set for the span desired. 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 4 VDC and the Offset is set at 0 VDC  
Minimum Output will be 0 VDC, Maximum Output will be 4 VDC

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

### To Set an Adjustable Offset:

Turn power OFF, set DIP switch 6 for adjustable offset (see figure C, page 1), connect multimeter to the output and turn on power.

Place Man/Auto jumper in the Manual position. Turn the Manual Override potentiometer counter clockwise until it stops. It is a 3/4 turn pot.

Offset Pot turns counter clockwise to Decrease and clockwise to Increase. Turn the Offset potentiometer until the desired minimum output is read on meter

### To Set an Adjustable Span:

Turn the power OFF, set DIP switches 3, 4 and 5 for one of the 3 desired adjustable ranges (see figure D, page 1). Connect multimeter to the output and turn power ON. Place (or leave) the Man/Auto jumper in the manual position. Turn the override potentiometer clockwise until it stops. Turn the Span potentiometer until the desired maximum output is read on meter (turn counter clockwise to increase and clockwise to decrease). 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 AUD automatically resets to the minimum output signal as defined by the output DIP switch settings or the adjusted minimum.

**Triac input** – Follow wiring example in Figure E3 or E4, page 1.

**Manual Override Potentiometer** – If you want to manually increase and decrease the output (to test the hookup 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 and Testing

1. Apply 24 VAC or 24 VDC 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” (See Figure B). 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 change is seen, contact Tech Support.

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 and/or call Tech Support.

If yes, voltage output is functioning properly.

### Current out:

Confirm DIP Switch setting for “Current Out” (See Figure B). 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? If no, contact Tech Support.

A voltage between 15-39 VDC indicates the 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 1 V @ 4 mA and 5 VDC @ 20 mA. Using the 500 ohm will give 2 VDC @ 4 mA and 10 VDC @20 mA. Does the unit function as stated above? If no, contact Tech Support.

If yes, current output is functioning properly.

4. **Testing the input** – To manually test the input. Apply 24 VAC or 24 VDC 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 15 second range (DIP switch 1 ON, DIP switch 2 OFF). Be sure to reset power to allow the 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?

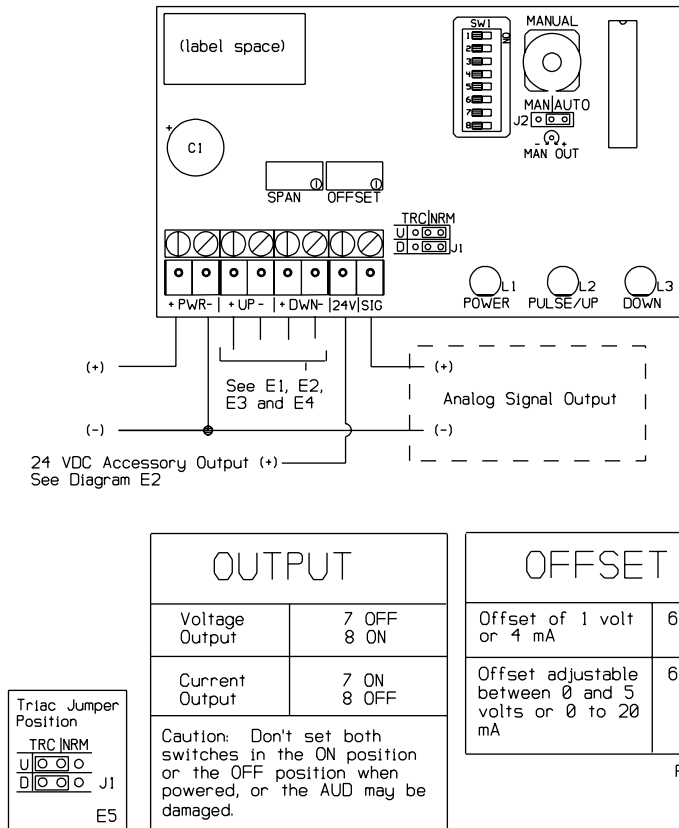
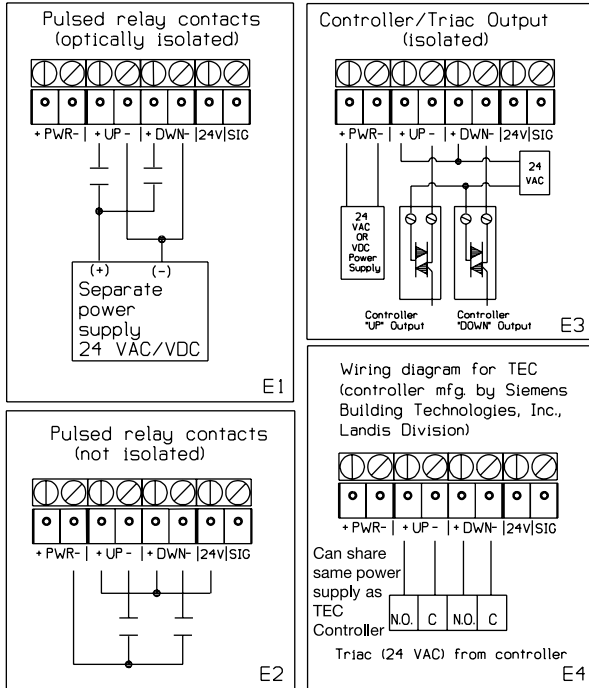
If no, contact Tech Support. If yes, unit is functioning properly.

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## Wiring & Jumper Settings



TIMING				
Program #	1 OFF 2 OFF	1 ON 2 OFF	1 OFF 2 ON	1 ON 2 ON
Ver. 1 0008Y0A.HEX	5 sec.	15 sec.	30 sec.	90 sec.
Ver. 2 0244Y0A.HEX	45 sec.	60 sec.	120 sec.	240 sec.
Ver. 3 0256Y0A.HEX	30 sec.	60 sec.	120 sec.	240 sec.
Ver. 4 0537Y0A.HEX	5 sec.	n/a	n/a	360 sec.

Fig. A

SPAN			
Signal Span Output	Switch Positions	Signal Span Output	Switch Positions
1 volt (no mA)	3, 4 & 5 ON	Adjustable 1 to 9.5 volts & 4 to 20 mA	3 & 4 ON, 5 OFF
10 volts (no mA)	3 & 5 ON, 4 OFF	Adjustable 10 to 20 volts (no mA)	3 ON, 4 & 5 OFF
4 volts or 16 mA	3 OFF, 4 & 5 ON	Adjustable 4 to 14 volts (no mA)	4 ON, 3 & 5 OFF
13 volts (no mA)	3 & 4 OFF, 5 ON		

Fig. D

MAKE DIP SWITCH SETTINGS WITH POWER OFF

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