INTERFACE SERIES

Installation & Operation Instructions

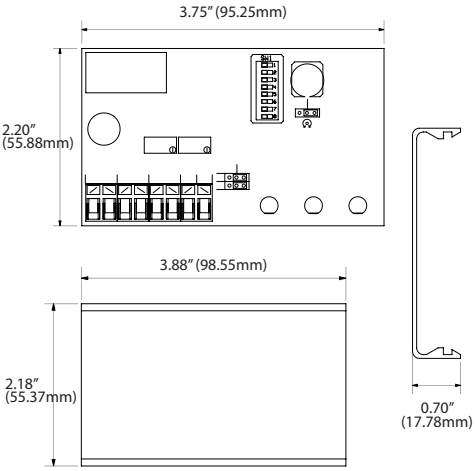
AUD

Phone: 1-888-967-5224
Website: workaci.com

GENERAL INFORMATION

The AUD converts a floating point signal into a linear analog output. There are two inputs on the AUD, one to increase the analog output and one to decrease the analog 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. The output stops ramping once the up or down input is deactivated, and will remain at that value until another up or down signal is received. If both inputs are "ON," the output will reset to the lowest value of the selected range. The output and the AUD is in the form of an analog, steady state voltage or current. This signal can be scaled to fit the needs of the application by selecting one of several preset ranges by dip switch or by adjusting the offset and the gain of the output with two potentiometers.

FIGURE 1: DIMENSIONS



MOUNTING INSTRUCTIONS

Circuit board may be mounted in any position. If circuit board slides out of snap track, a non-conductive "stop" may be required. Use only fingers to remove board from snap track. Slide out of snap track or push against side of snap track and lift that side of the circuit board to remove. **Do not flex board or use tools.**

WIRING INSTRUCTIONS

PRECAUTIONS

- **Remove power before wiring. Never connect or disconnect wiring with power applied.**
- **When using a shielded cable, ground the shield only at the controller end. Grounding both ends can cause a ground loop.**
- **It is recommended you use an isolated UL-listed class 2 transformer when powering the unit with 24 VAC. Failure to wire the devices with the correct polarity when sharing transformers may result in damage to any device powered by the shared transformer.**
- **If the 24 VDC or 24VAC power is shared with devices that have coils such as relays, solenoids, or other inductors, each coil must have an MOV, DC/AC Transorb, Transient Voltage Suppressor (ACI Part: 142583), 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. Without these snubbers, coils produce very large voltage spikes when de-energizing that can cause malfunction or destruction of electronic circuits.**
- **All wiring must comply with all local and National Electric Codes.**

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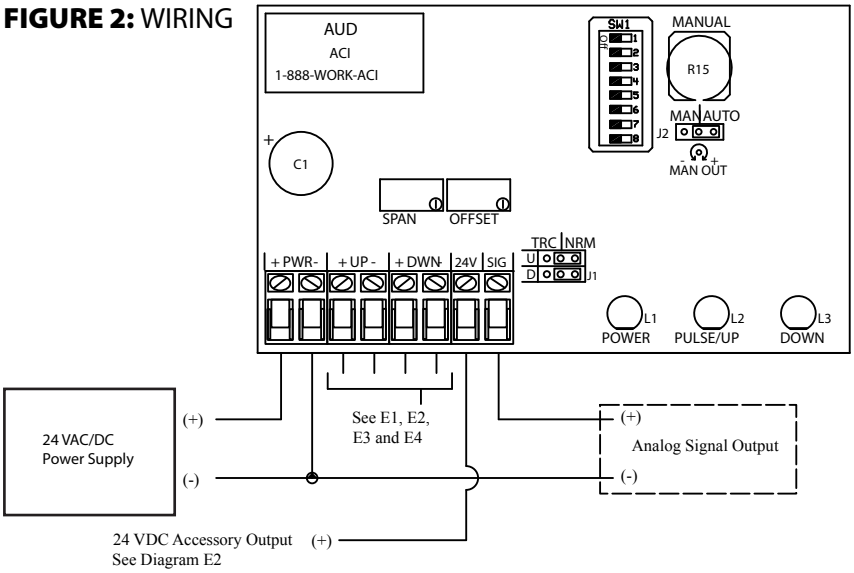
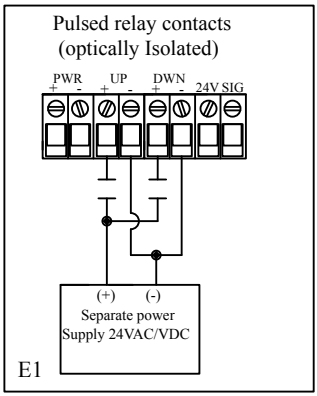
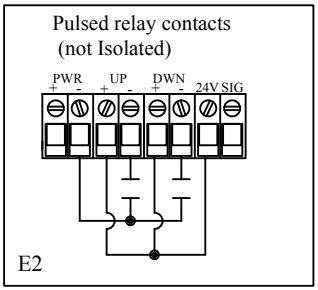
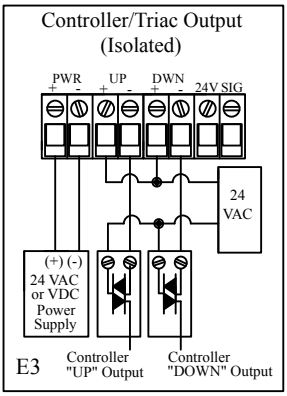
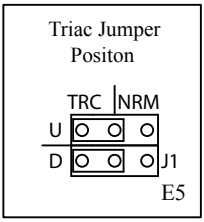
FIGURE 2: WIRING

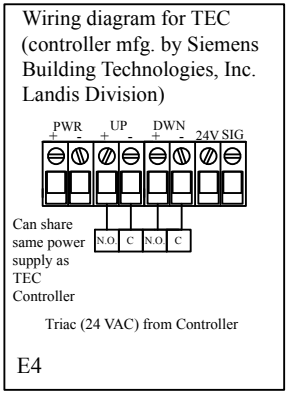












Note: If the end device has an earth ground(SCR, VFD), the ground/common must be isolated. This can be achieved by using an isolated transformer. R16 resistor will be extremely hot to the touch if there is a ground loop.

Note: If J1 jumpers are set to the NRM position, but the controller is outputting a Triac signal for UP pulse, the UP LED will be turned on and the DOWN LED will be slightly dim. This would be an indication that the jumpers need to be set for TRIAC.

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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:

Version 1: 5, 15, 30 and 90 seconds.

Version 2 & 3: 45, 60, 120, and 240 seconds (Version 3 differs in that it will reset to maximum on start-up, or if both inputs pulse 3.5 seconds).

Version 4: 5 and 360 seconds. Changing the timing range with power on will result in reset to minimum on Versions 1, 2 and 4.

Version 5: 60, 75, 120, and 150 seconds.

Verify that the chip numbers on your AUD corresponds to version ordered - See **Table 1.**

2. Select either current or voltage output with the two switches shown in Figure B (on p. 4). 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.

TABLE 1: VERSION CHART

Fig. A	Timing			
Program #	1 OFF, 2 OFF	1 ON, 2 OFF	1 OFF, 2 ON	1 ON, 2 ON
Version 1 0008Y0A.HEX	5 sec.	15 sec.	30 sec.	90 sec.
Version 2 0244Y0A.HEX	45 sec.	60 sec.	120 sec.	240 sec.
Version 3 0256Y0A.HEX	45 sec.	60 sec.	120 sec.	240 sec.
Note: Version 3 differs in that it will reset to maximum on startup, or if both inputs pulse 3.5 seconds				
Version 4 0537Y0A.HEX	5 sec.	N/A	N/A	360 sec.
Version 5 S-AUD V5.HEX	60 sec.	75 sec.	120 sec.	150 sec.

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FIGURE 3: OUTPUT DIP SWITCH SETTING

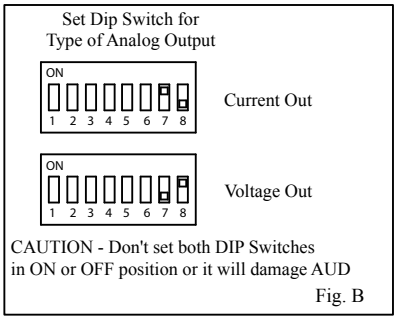

Fig. B

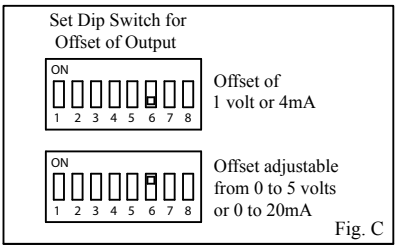

Fig. C

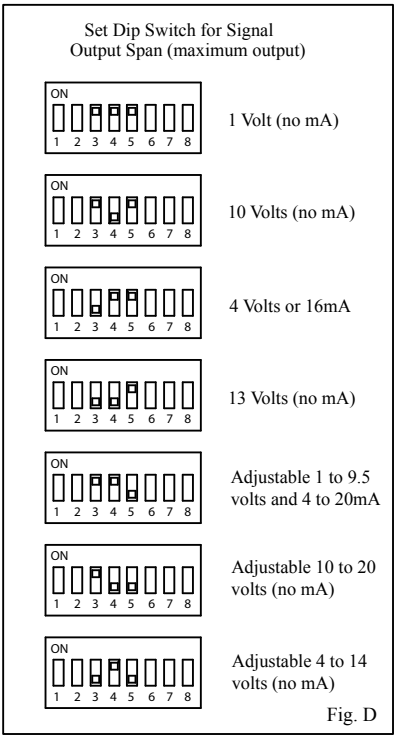

Fig. D

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

Or… 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 3**), connect multimeter to the output and turn the power on.

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.

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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 3**). 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 2** (p. 2).

Manual Override Potentiometer – If you want to manually increase and decrease the output within the selected signal span (to test the hookup to the actuator), place Jumper J2 in MAN (manual) position, and turn the manual potentiometer. Be sure to return Jumper J2 to AUTO position after testing.

TROUBLE SHOOTING 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 (see **Figure 3** (p. 4))) Should be 7 OFF & 8 ON. 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 ACI Tech Support at (888) 967-5224.

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 ACI Tech Support at (888) 967-5224.

If yes, voltage output is functioning properly.

Current Out:

Confirm DIP Switch setting for "Current Out" (See (see **Figure 3** (p. 4)). With meter only connected to the

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SIG and PWR(-) turn the manual pot full left and then full right. The output should vary from 0 to 100% of the calibrated or jumper selected range. If not, measure the voltages and turn the Manual override pot clockwise. Is voltage present? If no, contact ACI Tech Support at (888) 967-5224.

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 1VDC @ 4mA and 5VDC @ 20mA. Using the 500 ohm will give 2 VDC @ 4mA and 10VDC @ 20mA. Does the unit function as stated above?

If no, contact ACI Tech Support at (888) 967-5224.
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 ACI Tech Support at (888) 967-5224.

If yes, unit is functioning properly.

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PRODUCT SPECIFICATIONS

NON-SPECIFIC INFORMATION	
Supply Voltage:	24 VDC (24 VDC to 35 VDC) or 24 VAC (21.6 VAC to 28 VAC), 50/60 Hz.
Supply Current:	208 mA maximum
Input Signal Source:	Relay contact closure, transistor, or triac (24 VAC, 50/60 Hz)
Input Signal Trigger Level:	**Normal Mode:** 5 to 26.4 VDC, 24 to 26.4 VAC | **Triac Mode:** 24 to 26.4 VAC
Input Full Range Rates of Change:	See page #3
Output Voltage Fixed Signal Ranges:	0 to 1 VDC, 0 to 4 VDC, 0 to 10 VDC, 0 to 13 VDC, 1 to 2 VDC, 1 to 5 VDC, 1 to 11 VDC, 1 to 14 VDC
Output Voltage Adjustable Signal Ranges:	0 to 20 VDC (with adjustable offset and span)
Output Voltage Signal Load:	3300Ω minimum at 20 VDC ± 10% , 400 ohms minimum at 10 VDC ± 10% (If the voltage output is limited to 18 VDC on the high end of the output span, the DC supply limit can be 24 VDC –10% and maintain stated accuracy
Output Current Fixed Signal Ranges:	0 to 16 mA, 4 to 20 mA
Output Current Adjustable Signal Ranges:	0 to 20 mA (with adjustable offset and span)
Output Current Signal Load:	0 to 750Ω maximum (If the load is lowered to 700Ω, the DC supply can be 24 VDC –10% and maintain stated accuracy
Output Signal Accuracy (24 VAC, 60 Hz):	Absolute +/- 2% of span for adjustable ranges, 5% for preset
Output Signal Accuracy (24 VAC, 50 Hz):	Absolute +/- 3% of span for adjustable ranges, 5% for preset
Output Signal Resolution:	256 steps (all ranges)
Regulated Power Output (User):	24 VDC (+/- 10%), 48 mA maximum
Connections:	90° Pluggable Screw Terminal Blocks
Wire Size:	16 (1.31 mm²) to 26 AWG (0.129 mm²)
Terminal Block Torque Rating:	0.5 Nm (Minimum); 0.6 Nm (Maximum)
Operating Temperature Range:	35 to 120°F (1.7 to 48.9°C)
Operating Humidity Range:	10 to 95% non-condensing
Storage Temperature:	-20 to 150°F (-28.9 to 65.5°C)

WARRANTY

The AUD Series is covered by ACI's Two (2) Year Limited Warranty, which is located in the front of ACI'S SENSORS & TRANSMITTERS CATALOG or can be found on ACI's website: www.workaci.com.

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