

Features and Benefits

- Current or voltage output
- Relay, transistor or triac input
- DIN Rail mounting
- Manual override
- Allows conversion of non-compatible signals

Technical Overview

The IO-A-UD accepts a raise/lower relay signal (pulsed relay contact inputs, pulsed DC, or pulsed AC voltage inputs) and provides a 0-10Vdc output. Additional features include manual override jumper, LED status indication and selectable hysteresis.

Product Codes

IO-A-UD Raise/Lower to Analogue Module
45, 60, 120 or 240 seconds selectable.

Specification

Inputs:	Relay contact Transistor Triac 24Vac
Output:	
Voltage	0-10Vdc - 3.3kΩ min.
Current	4-20mA - 750Ω 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	-10 to +50°C
RH	10 to 95% non-condensing
Country of origin	USA
Conformity	EMC, CE & UKCA Marked

WEEE Directive:



At the end of the products useful life please
dispose as per the local regulations.
Do not dispose of with normal household waste.
Do not burn.



Installation



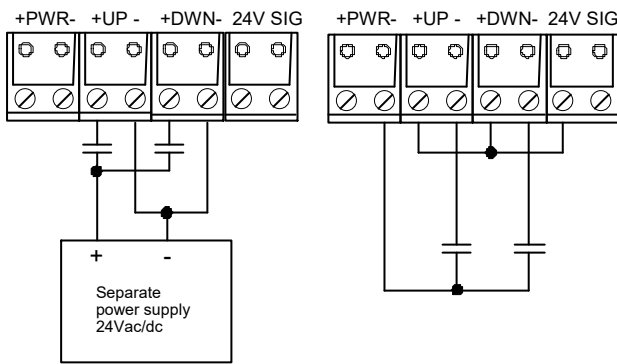
Antistatic precautions must be observed when handling these sensors. The PCB contains circuitry that can be damaged by static discharge.

1. The IO-A-RM should only be installed by a competent, suitably trained technician.
2. Ensure that all power is disconnected before carrying out any work on the IO-A-RM.
3. Maximum cable is 2.5mm², care must be taken not to over tighten terminals.
4. When mounting the IO-A-RM care should be taken not to stress the PCB when fitting to the DIN rail. If it is necessary remove the module from the DIN rail, be sure to use a flat bladed screwdriver to release the DIN clips.

Connection Examples

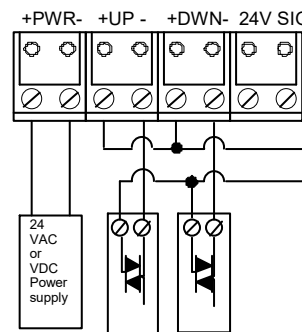
Pulsed relay contacts:

E1 (optically isolated) **E2** (not isolated)

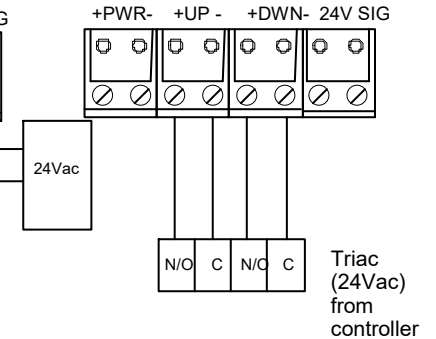


Controller/triac output:

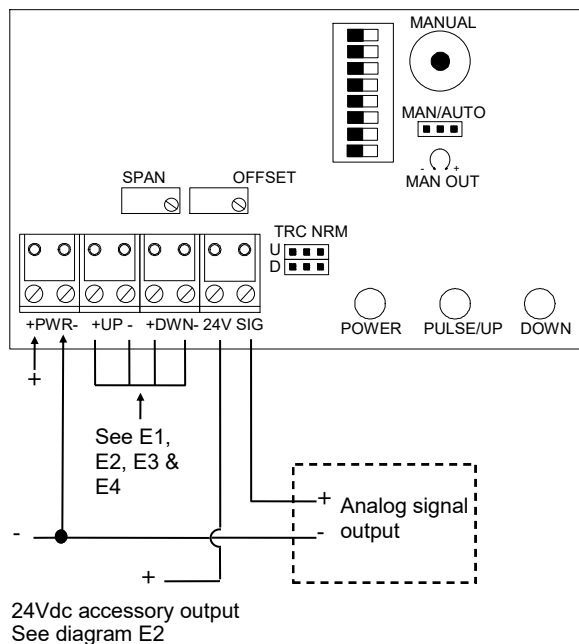
E4



Wiring for Siemens TEC controller:



Connections



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 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 & Jumpers

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

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

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

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-A-UD 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

Triac Input:

For a Triac input change jumper setting J1 to;

	TRC	NRM
U		
D		

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, Span & Manual Override

If you do not wish to use any of the pre-set selections and desire to set your own minimum and maximum output, you must make potentiometer adjustments to the IO-A-UD. The OFFSET DIP switch should be set for adjustable offset and the SPAN DIP switches 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 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-A-UD automatically resets to the minimum output signal as defined by the output DIP switch settings or the adjusted minimum.

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

Apply 24Vac or 24Vdc to "PWR" terminal, confirm power LED is on and measure voltage to confirm proper voltage.

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.

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?

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 500Ω resistor will also work to test the output. Connect the resistor to the SIG and PWR (-) terminal. With 250Ω on the output the voltage from one side of the resistor to the other will be 1Vdc @ 4mA and 5Vdc @ 20mA. Using the 500Ω will give 2Vdc @ 4mA and 10Vdc @ 20mA. Does the unit function as stated above?

- If yes, current output is functioning properly.

Troubleshooting & Testing (continued)

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-A-UD 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.