# INTERFACE SERIES

***Installation & Operation Instructions***

**6N1-ISO**

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

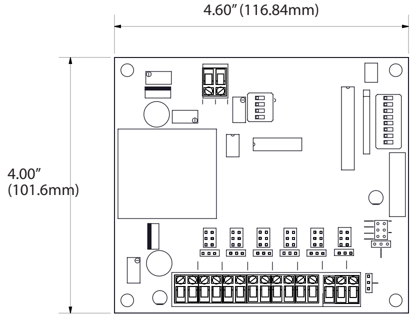
## GENERAL INFORMATION

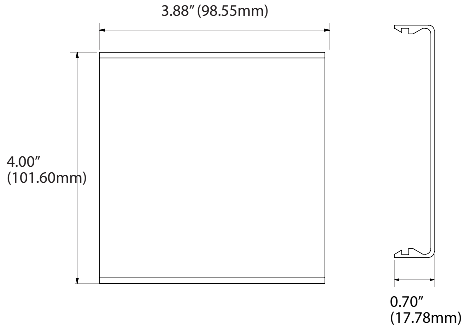
The 6N1-ISO is a microprocessor controlled interface designed to provide maximum flexibility with a minimum cost. With a variety of standard inputs, the 6N1-ISO provides the user with the ability to interface several devices to a single analog output. The 6N1-ISO can average two to six inputs, output the highest of two to six inputs, output the lowest of two to six inputs, output the sum of 2 inputs, or output the difference of two inputs. Input ranges are jumper selectable and all modes and analog outputs are DIP switch selectable. The output signal is optically isolated from the input signals. The 6N1-ISO also accepts up to 6 digital inputs (binary sequence) and outputs a proportional analog signal. The power output terminal can be used for power if the inputs are contact closures only.

## MOUNTING INSTRUCTIONS

The interface device can 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 up against side of snap track and lift that side of the circuit board to remove. **Do not flex board or use tools.**

## FIGURE 1: DIMENSIONS




## WIRING INSTRUCTIONS

**PRECAUTIONS**

- **6N1-ISO is powered by 24 VAC only.**
- **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.**
- **This device needs to have its own Isolated Transformer. This transformer cannot be connected/or shared with any other device. It is recommended you use an isolated UL-listed class 2 transformer.**
- **All wiring must comply with all local and National Electric Codes.**

**Note:** ACI recommends to remove the pluggable terminal blocks to terminate wires first. The terminal blocks can be removed using pliers. Once wired, rotate the terminal block 90 Degrees so they are facing upward, and insert onto pins. This eliminates any wires getting pinched by the snaptrack. See **Figure 4** (p.3).



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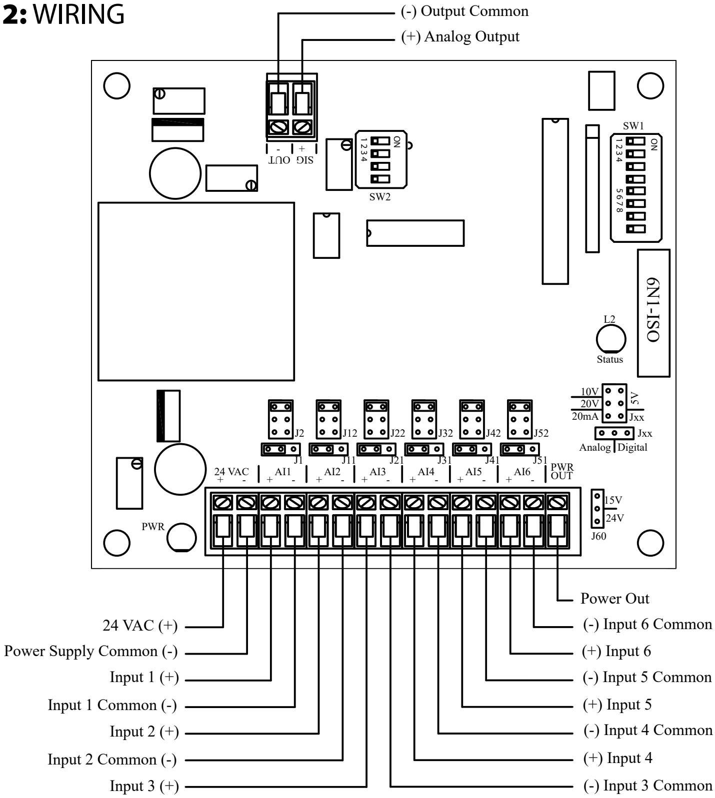
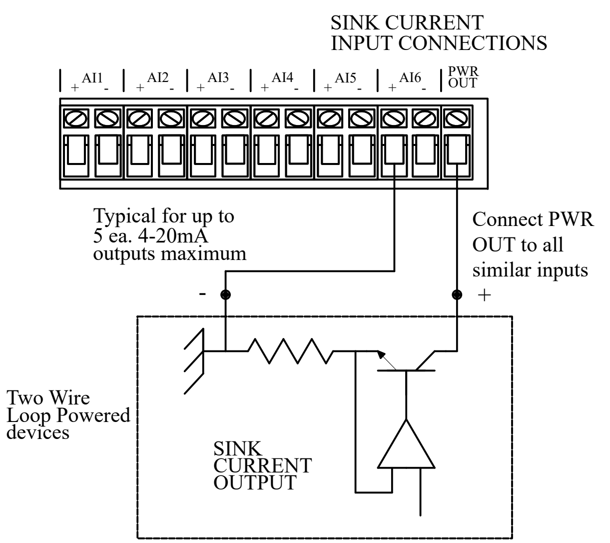
## **FIGURE 2:** WIRING



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## Operation

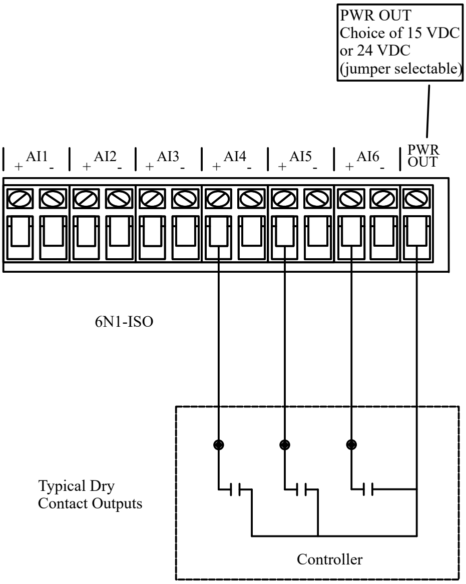
The 6N1-ISO can:

1. Read two to six analog inputs and output the average.
2. Read two to six analog inputs and output the lowest.
3. Read two to six analog inputs and output the highest
4. Read analog input One and Two and output the difference
5. Read two to six analog inputs and output the sum.
6. Read up to 6 digital inputs (binary sequence) and output a proportional signal.

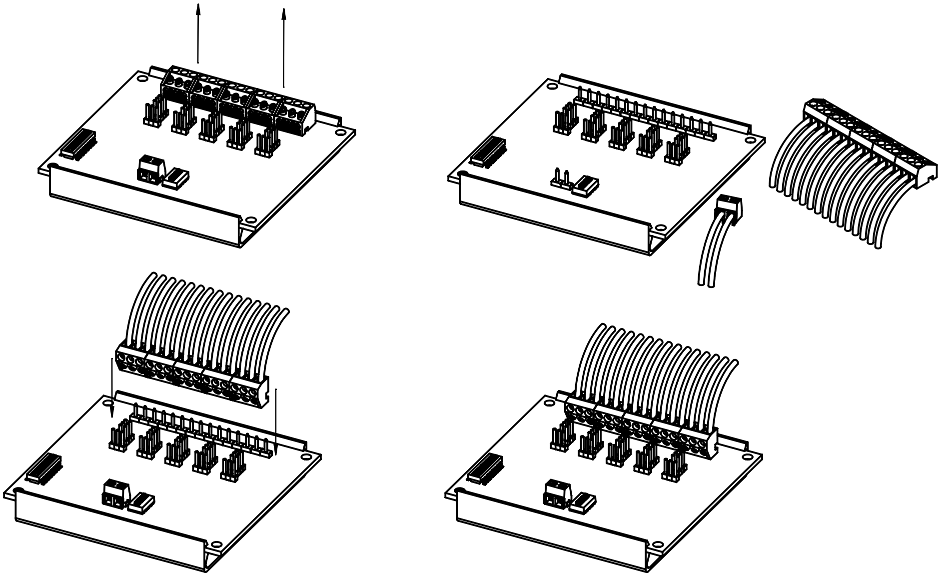
## Wiring Connections

Connect Input Signal Common (-) to terminals labeled (-) labeled AI1 thru AI6.
Connect Input Signal (+) to respective terminal (+) labeled AI1 thru AI6.
Connect controlled device to SIG OUT (+) and (-).
Connect 24 VAC to terminals marked 24 VAC (+) and (-). See **Figure 2** (p.2).

## **FIGURE 3:** TYPICAL BINARY INPUT WIRING




## **FIGURE 4:** TERMINAL BLOCK INSTALLATION





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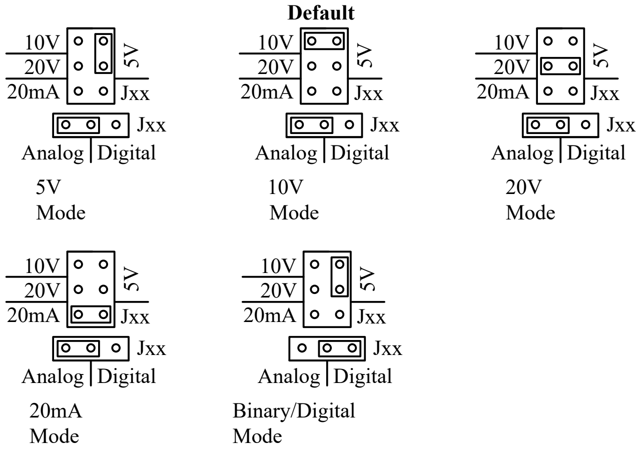
## CALIBRATION, JUMPER & DIP SWITCH SETTINGS

The 6N1-ISO output is factory calibrated in all four DIP switch selectable output ranges. Do not adjust the potentiometers on the 6N1-ISO as this may void any warranty.

## **FIGURE 5:** INDIVIDUAL INPUT JUMPER SHUNT SETTINGS



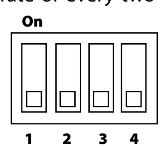

### MODE DIP SWITCH SETTINGS – BLOCK SW1: Factory Default – All Off

| MODE | DIPswx 1 | DIPswx 2 | DIPswx 3 |
|---|---|---|---|
| Average | OFF | OFF | OFF |
| High | OFF | OFF | ON |
| Low | OFF | ON | OFF |
| Difference | OFF | ON | ON |
| Binary | ON | OFF | OFF |
| Sum | ON | OFF | ON |

### INPUTS USED DIP SWITCH SETTINGS – BLOCK SW1: Factory default – All Off

| INPUTS USED | DIPswx 4 | DIPswx 5 | DIPswx 6 |
|---|---|---|---|
| 1 & 2 | OFF | OFF | OFF |
| 1 thru 3 | OFF | OFF | ON |
| 1 thru 4 | OFF | ON | OFF |
| 1 thru 5 | OFF | ON | ON |
| All | ON | OFF | OFF |

**Legend:** These switches are OFF If an invalid DIP switch selection is made, the status LED will blink at a rate of every two seconds.




### OUTPUT TYPE DIP SWITCH SETTINGS – BLOCK SW2:

Factory default is Voltage Out

| OUTPUT TYPE | DIPswx 1 | DIPswx 2 |
|---|---|---|
| Voltage Out | OFF | ON |
| Current Out | ON | OFF |

### OUTPUT RANGE DIP SWITCH SETTING – BLOCK SW2:

Factory default is 0 -10 VDC

| OUTPUT RANGE | DIPswx 3 | DIPswx 4 |
|---|---|---|
| 0-5V/0-20mA | ON | OFF |
| 0-10V | OFF | ON |
| 0-20V | OFF | OFF |

## BINARY / DIGITAL MODE OPERATION

The 6N1-ISO can have up to 6 digital inputs (binary sequence) and output a proportional analog signal. The input signal can be either a 24 VDC, 15 VDC or 24 VAC signal. If the customer only has a contact closure output, the power out terminal must be used to provide the signal to the inputs. See **Figure 3** (p.3).

1 = signal applied to input
0 = no signal applied to input

**Note:** The 6N1-ISO is not a true staging device. The inputs are based upon the Binary Output Chart. Inputs are not proportionally equal vs the output. Contact ACI Tech Support for further information.

**LEGEND FOR A SELECT FEW BINARY INPUTS**

| INPUTS | | | | | | OUTPUT |
|---|---|---|---|---|---|---|
| A6 | A5 | A4 | A3 | A2 | A1 | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0.00% |
| 0 | 0 | 0 | 1 | 1 | 0 | 9.52% |
| 0 | 0 | 1 | 1 | 0 | 1 | 20.63% |
| 0 | 1 | 0 | 0 | 1 | 1 | 30.15% |
| 0 | 1 | 1 | 0 | 0 | 1 | 39.68% |
| 0 | 1 | 1 | 1 | 1 | 1 | 49.20% |
| 1 | 0 | 0 | 1 | 0 | 1 | 58.73% |
| 1 | 0 | 1 | 1 | 0 | 0 | 69.84% |
| 1 | 1 | 0 | 0 | 1 | 0 | 79.37% |
| 1 | 1 | 1 | 0 | 0 | 0 | 88.89% |
| 1 | 1 | 1 | 1 | 1 | 1 | 100.00% |

**Note:** Only a select few Binary Inputs are shown due to the length and size of the data.

The output shown in the table is a general percentage. To get the actual output value, multiply the percent output value by the range of the output.
Range x Output Percentage = Output Value

**Example:** A 0-10 volt output range from the 6N1-ISO. The range is the maximum value; in this case it would be 10V, if your output percentage is 49.20%, your output equation would be 49.20% x 10V which equals 4.92V.
To figure out the output percentage for any given binary input, first convert your binary input number to a decimal number. Then take your decimal number and divide it by 63 (if all six inputs are set up to be used), then multiply that number by 100. The final result is your output percentage value.

**Example:** Binary Input of 1 0 1 0 1 0 when converted to a decimal number is 42. So you have 42 / 63 which has a result of 0.6667. When multiplied by 100 you get an output percentage of 66.67%.

If all six inputs are not used in the binary mode (for example, if you only have a 4 bit number you want to input) then you must first set the number of inputs used, by the appropriate DIP switch setting. To calculate the output percentage you first must calculate your maximum binary number in decimal form, in the case of a 4 bit number ( 1 1 1 1) it would be 15. You would use this number as your divisor in the equation.

**Example:** Binary input of 1 0 1 0 when converted to a decimal number is 10. So you have 10 /15 which has a result of 0.6667. When multiplied by 100 you get an output percentage of 66.67%.

## Checkout

Apply power. Power LED will light and remain ON.

### STATUS LED OPERATION

Status LED will blink at a very fast rate when 6N1-ISO is first powered up. After approximately 2 seconds the LED will blink at a rate of approximately twice per second (change of state every 200 ms) indicating microprocessor is functioning properly.

If the LED is blinking at a rate of once every two seconds (change of state twice per second) an invalid DIP switch setting is selected.



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# PRODUCT SPECIFICATIONS

| NON-SPECIFIC INFORMATION | |
|---|---|
| **Supply Voltage:** | 24 VAC (+/- 10%), 50/60 Hz |
| **Supply Current:** | 255 mA maximum |
| **Power Output:** | 24 VDC or 15 VDC (Jumper Selectable) |
| **Power Output (Supply Current):** | 100 mA maximum |
| **Input Voltage Signal Range (@ Impedance):** | 0 to 5 VDC @ 1MΩ, 0 to 10 VDC @ 20,000Ω, 0 to 20 VDC @ 10,000Ω |
| **Input Current Signal Range (@ Impedance):** | 0-20 mA @ 249Ω |
| **Binary Input Mode (@ Impendance):** | 15 VDC, 24 VDC or 24 VAC +/-10% @ 100,000Ω |
| **One Analog Signal Output (@ Impedance):** | 0-5 VDC @ 1000Ω \| 0-10 VDC @ 1000Ω \| 0-20 VDC @ 1000Ω \| 0-20 mA @ 500Ω maximum |
| **Output Signal Accuracy:** | +/- 2% of full scale |
| **Resolution (Analog/Binary):** | 64 steps of resolution |
| **Product Functions:** | Average, Highest, Lowest, Sum, Difference |
| **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 90% non-condensing |
| **Storage Temperature:** | -20 to 150°F (-28.9 to 65.5°C) |

# WARRANTY

The ACI 6N1-ISO 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.

# W.E.E.E. DIRECTIVE

At the end of their useful life the packaging and product should be disposed of via a suitable recycling centre. Do not dispose of with household waste. Do not burn.

RoHS 2 2011/65/EU



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## NOTES

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