

# Sensor Connections

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# 1 Sensor Connections

The Sensor Connections guide lists most common Banner and non-Banner sensors and how to wire them to the DX80 devices.

This reference guide lists typical connections. If you have additional questions about a specific sensor or its connection instructions, please contact Banner Engineering or the manufacturer of the sensor you are using.

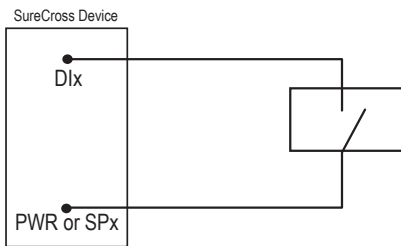
**Discrete Sensors.** Neither the inputs nor the outputs on the DX80 devices are isolated. Under certain operating conditions, externally powered sensors may need to have ground in common with the DX80 device to which they are connected. The power sources do not have to be the same.

**Analog Sensors.** For analog sensors, the ground/dc common of the sensor should be connected to the ground of the DX80 device. For best results, Banner recommends that the power source for the sensor and DX80 device is the same.

## Discrete Inputs

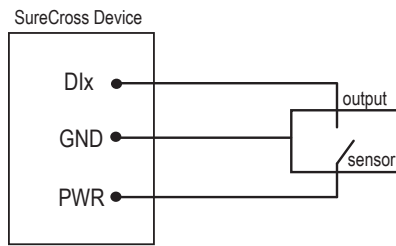
### Discrete Inputs, Sourcing, Powered using DX80 Terminals

#### Two-Wire Sensors



Wiring diagram for a sourcing (PNP), two-wire sensor powered using the DX80 device terminal block.

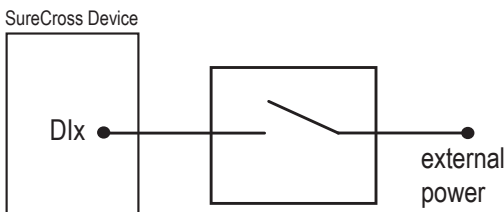
#### Three-Wire Sensors



Wiring diagram for a sourcing (PNP), three-wire sensor powered using the DX80 device terminal block.

### Discrete Inputs, Sourcing, Powered Externally

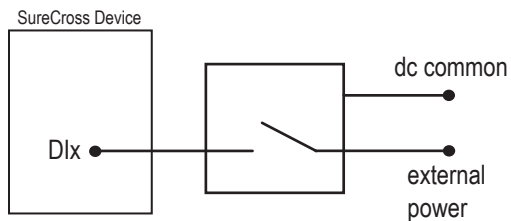
#### Two-Wire Sensors



Wiring diagram for a sourcing (PNP) two-wire sensor powered externally. Under certain conditions, the dc commons between the sensor and the DX80 might need to be connected.

The sensor's power source might need to be the same as the SureCross device power source.

#### Three-Wire Sensors

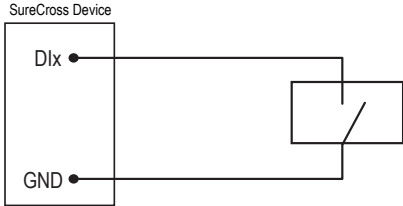


Wiring diagram for a sourcing (PNP) three-wire sensor powered externally. Under certain conditions, the dc commons between the sensor and the DX80 might need to be connected.

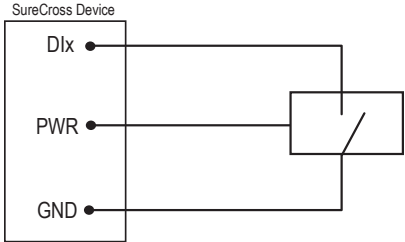
The sensor's power source might need to be the same as the SureCross device power source.

# Discrete Inputs, Sinking, Powered using DX80 Terminals

## Two-Wire Sensors      Three-Wire Sensors



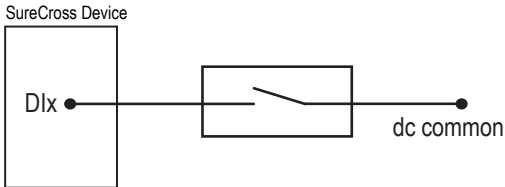
Wiring diagram for a sinking (NPN) two-wire sensor powered using the DX80 device terminal block.



Wiring diagram for a sinking (NPN) three-wire sensor powered using the DX80 device terminal block.

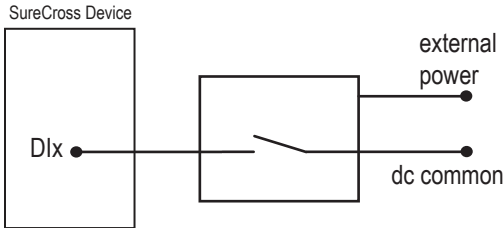
# Discrete Inputs, Sinking, Powered Externally

## Two-Wire Sensors      Three-Wire Sensors



Wiring diagram for a sinking (NPN) two-wire sensor grounded outside the DX80 device. Under certain conditions, the dc commons between the sensor and the DX80 might need to be connected.

The sensor's power source might need to be the same as the SureCross device power source.

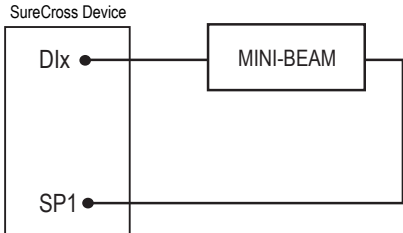


Wiring diagram for a sinking (NPN) three-wire sensor grounded outside the DX80 device. Under certain conditions, the dc commons between the sensor and the DX80 might need to be connected.

The sensor's power source might need to be the same as the SureCross device power source.

# Discrete Inputs, MINI-BEAM

## MINI-BEAM

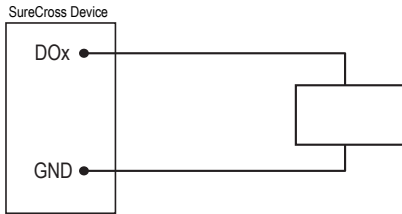


Two-wire MINI-BEAM sensor using a FlexPower™ Node and powered using the DX80's switch power.

# Discrete Outputs

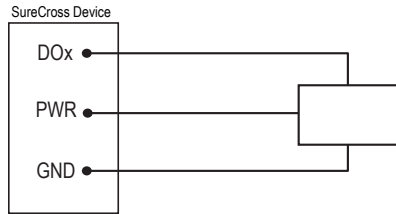
## Discrete Outputs, Sourcing, Powered using DX80 Terminals

### Two-Wire Sensors



Wiring diagram for a sourcing (PNP) two-wire output load powered using the DX80 device terminal block.

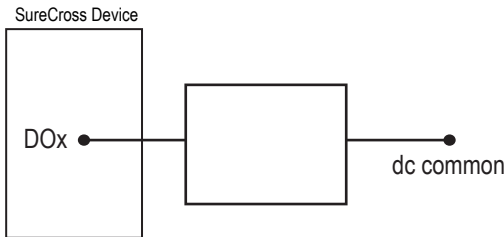
### Three-Wire Sensors



Wiring diagram for a sourcing (PNP) three-wire output load powered using the DX80 device terminal block.

## Discrete Outputs, Sourcing, Powered Externally

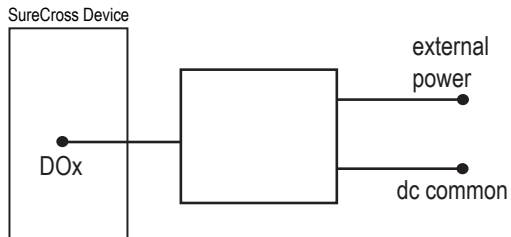
### Two-Wire Sensors



Wiring diagram for a sourcing (PNP) two-wire output load powered from outside the DX80 device. Under certain conditions, the dc commons between the sensor and the DX80 might need to be connected.

The sensor's power source might need to be the same as the SureCross device power source.

### Three-Wire Sensors

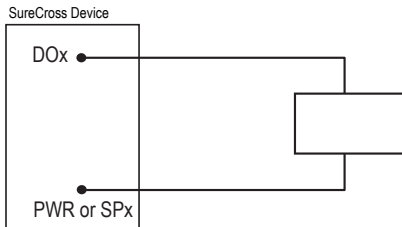


Wiring diagram for a sourcing (PNP) three-wire output load powered from outside the DX80 device. Under certain conditions, the dc commons between the sensor and the DX80 might need to be connected.

The sensor's power source might need to be the same as the SureCross device power source.

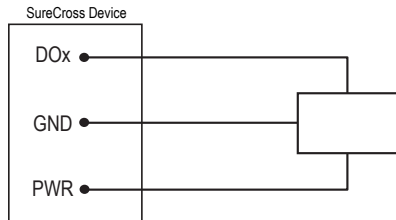
## Discrete Outputs, Sinking, Powered using DX80 Terminals

### Two-Wire Sensors



Wiring diagram for a sinking (NPN) two-wire output.

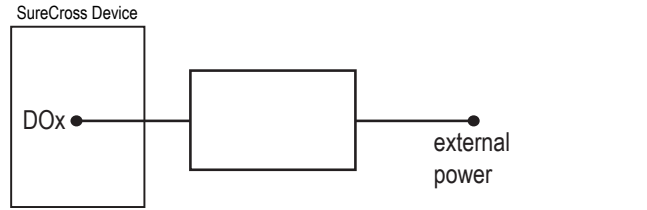
### Three-Wire Sensors



Wiring diagram for a sinking (NPN) three-wire output.

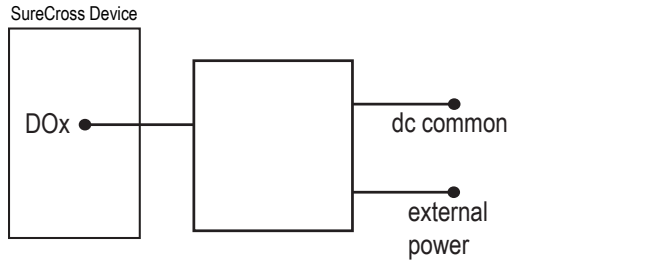
# Discrete Outputs, Sinking, Powered Externally

## Two-Wire Sensors      Three-Wire Sensors



Wiring diagram for a sinking (NPN) two-wire output. Under certain conditions, the dc commons between the sensor and the DX80 might need to be connected.

The sensor's power source might need to be the same as the SureCross device power source.



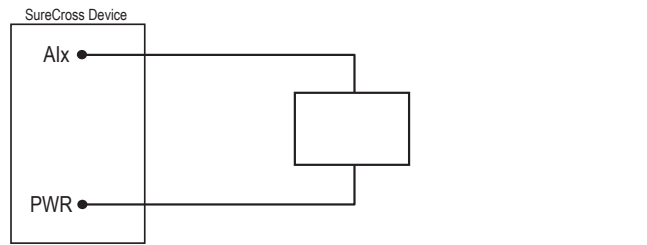
Wiring diagram for a sinking (NPN) three-wire output. Under certain conditions, the dc commons between the sensor and the DX80 might need to be connected.

The sensor's power source might need to be the same as the SureCross device power source.

# Analog Inputs

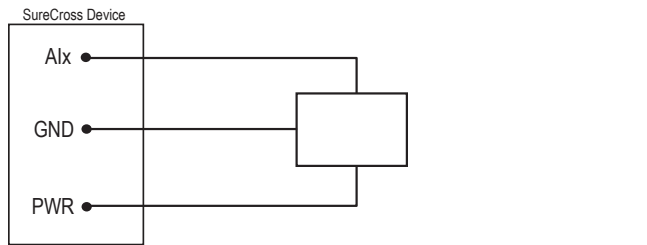
## Analog Inputs, Powered using DX80 Terminals

### Two-Wire Sensors      Three-Wire Sensors



Two-wire analog sensor powered from a 10 to 30V dc power DX80 device using the PWR terminal.

Do not exceed analog input ratings for analog inputs. Only connect sensor outputs to analog inputs.

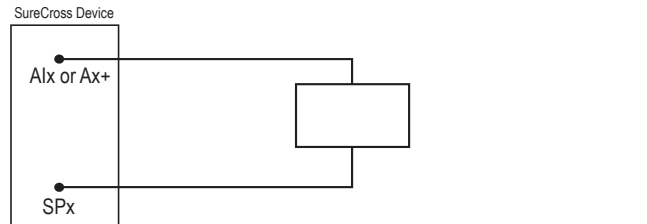


Three-wire analog sensor powered from 10 to 30V dc power DX80 device using the PWR terminal.

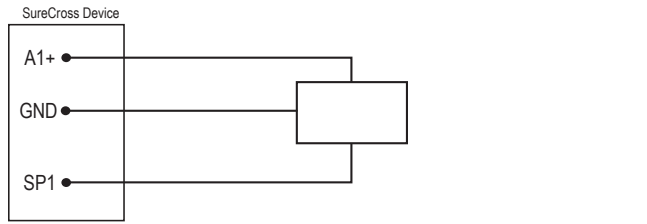
Do not exceed analog input ratings for analog inputs. Only connect sensor outputs to analog inputs.

## Analog Inputs, Powered from Switch Power

### Two-Wire Sensors      Three-Wire Sensors



Two-wire analog sensor using a FlexPower™ Node and powered using the Node's switch power.



Three-wire analog sensor using a FlexPower™ Node and powered using the Node's switch power.

**Two-Wire Sensors**

Do not exceed analog input ratings for analog inputs. Only connect sensor outputs to analog inputs.

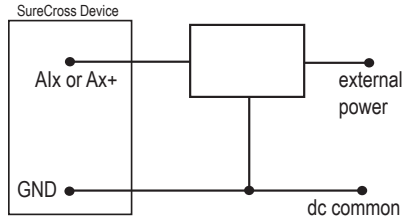
**Three-Wire Sensors**

Do not exceed analog input ratings for analog inputs. Only connect sensor outputs to analog inputs.

**Analog Inputs, Powered Externally**

**Two-Wire Sensors**

**Three-Wire Sensors**

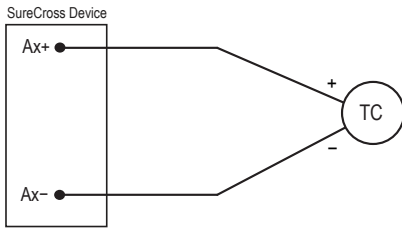


Three-wire analog sensor using a FlexPower Node but the sensor is powered externally (not from the DX80 device).

Do not exceed analog input ratings for analog inputs. Only connect sensor outputs to analog inputs.

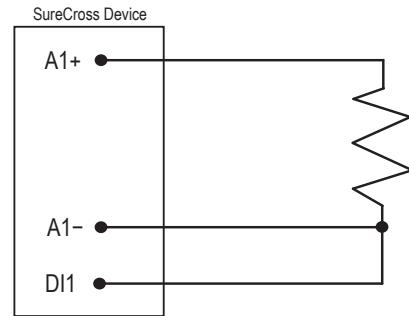
**Analog Inputs, Temperature Sensors**

**Thermocouple**



TC Type	- Wire	+ Wire
J	red	white
K	red	yellow
R	red	black

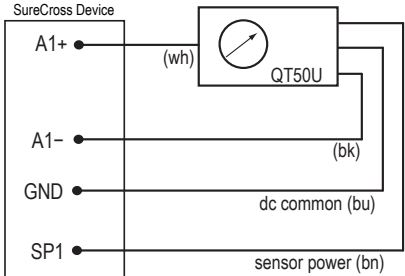
**RTD**



This wiring diagram applies to a standard three-wire RTD sensor. When using thermocouple and RTD sensors, the quality of the power supply influences the accuracy of the signal.

# Analog Inputs, QT50U Long-Range Ultrasonic Sensor

## QT50U Ultrasonic Sensor

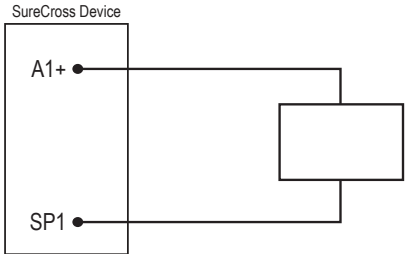


Four-wire QT50U sensor, using a FlexPower™ Node, and powered using the Node's switch power terminal. The QT50U output is set to 4–20 mA.

Do not apply power to the Ax+ connection.

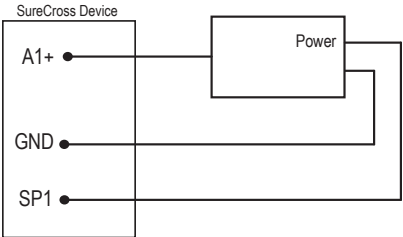
# Analog Inputs, Proximity Sensors

## Proximity Sensor, NAMUR      Proximity Sensor, Non-NAMUR



Two-wire NAMUR proximity sensor using a FlexPower™ Node and powered using the Node's switch power.

Do not apply power to the Ax+ connection.

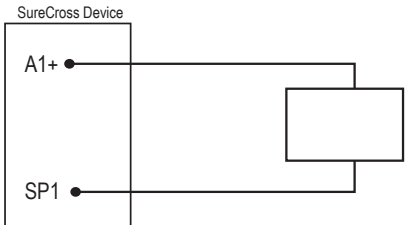


Three-wire non-NAMUR proximity sensor using a FlexPower™ Node and powered using the Node's switch power.

Do not apply power to the Ax+ connection.

# Analog Inputs, Pressure Sensors

## Pressure Sensor



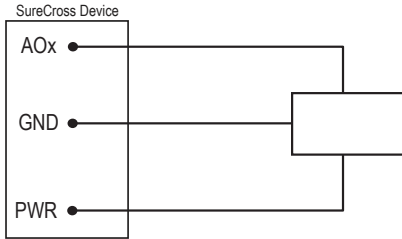
Two-wire pressure sensor using a FlexPower™ Node and powered using the Node's switch power.

Do not apply power to the Ax+ connection.

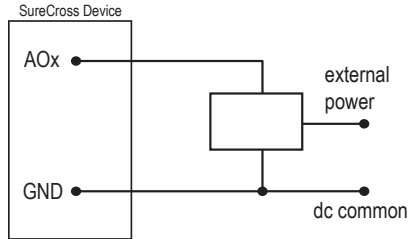
# Analog Outputs

## Analog Outputs, Three-Wire Sensors

<b>Powered from the DX80 Terminals</b>	<b>Powered Externally</b>
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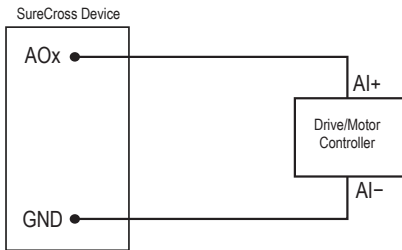
Three-wire analog output device powered off the DX80 device.



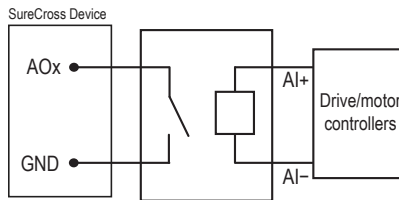
Three-wire analog output device powered externally (not from the DX80 device).

## Analog Outputs, Drive Motor Controllers

<b>AI- Referenced to Ground</b>	<b>AI- Not Referenced to Ground</b>
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When the AI- can be referenced to ground, use this wiring diagram for drive/motor controllers.



When the AI- cannot be referenced to ground, use this wiring diagram for drive/motor controllers.