Converting Analog Input or Output Units

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Technical Note

Converting Analog Input Units

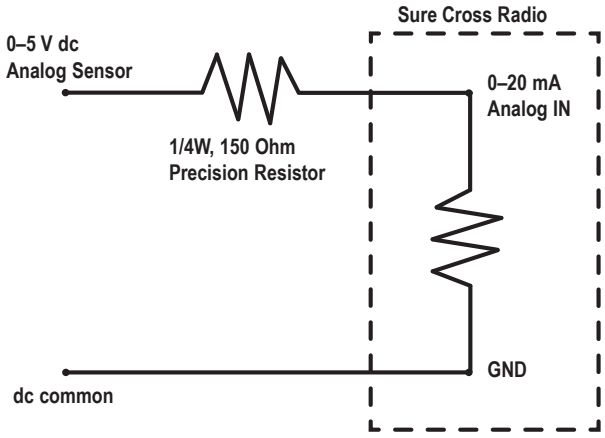
To convert a dc voltage analog output sensor to a 0–20 mA signal input on a Sure Cross Radio, install a resistor between the analog output of the sensor and the analog input of the Sure Cross radio.

Use the following equation to determine the resistor needed:

`(Analog voltage range ÷ 0.020 A) – measured existing resistance = Additional resistance to convert from Vdc to mA`

Dividing the analog voltage range by 20 mA results in the total resistance needed for the conversion. All Sure Cross analog inputs have an existing resistance from a current sensing resistor installed between analog input and ground.

To determine this value, use an Ohm meter to measure the resistance between the analog input terminal and the ground terminal. The existing resistance used in Sure Cross radios will be either 20, 22, 56, 100, or 220 Ohms, depending on the model you are testing. Subtract this already-installed resistance value from the total needed to calculate the value of the resistor that must be added to the system.



Example 1 - **Converting** a 0–5 V dc sensor output

To convert a 0–5 V dc analog output sensor to the 0–20 mA signal input on a Sure Cross radio that has a 100 Ohm current sensing resistor, follow these steps:

1. Calculate the value of the needed resistor: `5 V dc ÷ 0.020 A – 100 Ohms = 150 Ohms`
2. Connect a ¼ watt 150 ohm precision resistor in line between the sensor's analog output and the Sure Cross radio's analog input point.
3. Connect the Ground of the Sure Cross device to the Ground connection of the sensor that is providing the 0–5 V analog value.

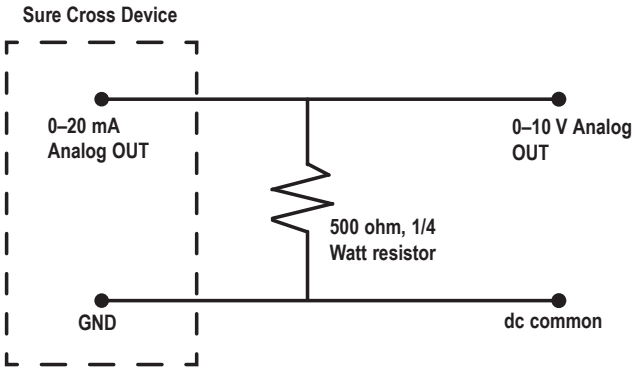
Example 2 - **Converting** a 0–10 V dc sensor output

To connect a 0–10 V sensor analog output to a 0–20 mA input on the same Sure Cross Radio, the formula calculates that you need to add a 400 Ohm resistor: `10 Volts ÷ 0.020 A – 100 Ohms = 400 Ohms`

Converting Analog Output Units

To convert a 0 to 20 mA analog outputs to a 0 to 10 V output, follow these instructions.

1. Install a 500 Ohm precision, 1/4 Watt resistor across the Analog OUT and GND (dc comon/ground) connections in the terminal block.



2. Connect to the same Analog OUT and GND (dc common/ground) connections in the terminal block.
   The instrument input tied across the 500 ohm resistor must be a high impedance input. The lower the instrument input impedance, the more offset error will be introduced.