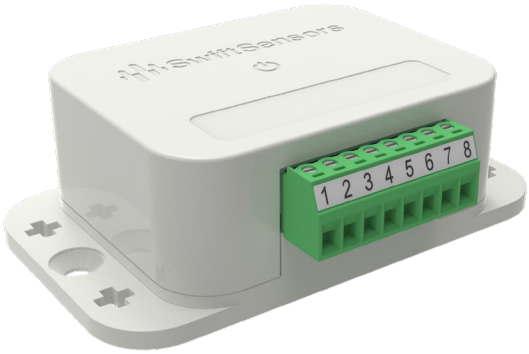
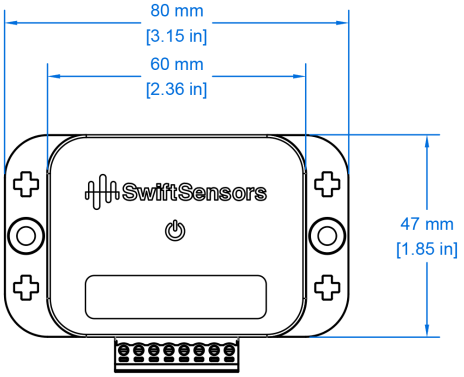
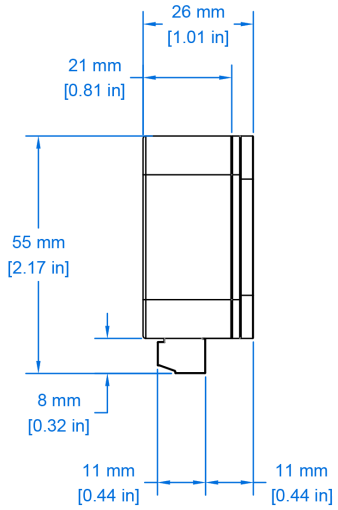
SwiftSensors







Wireless Universal Analog Sensor Adapter - 615

Part Number: SS3-615

Overview

With the SS3-615, you can address the wide range of available measurement types, operating ranges, and physical form factors by combining existing traditional analog sensors with the SS3-615 to gain access to any measurement across industrial, residential, or corporate facilities or plants. Many of the measurements available include (but are not limited to):

• Temperature (thermocouples, RTDs • Power, Voltage, Current • Flow Rate • Pressure • Level
• Proximity/Distance • And more

As you consider different traditional sensors for use with the SS3-615, the Swift Sensors team is available for consultation and support to help you select and configure the best option for your measurement needs.

Onboard Simple Control Loop

Using the onboard control loop, users can monitor a sensor measurement and enable alarms or equipment when the measured value exceeds set limits. The control loop runs onboard the sensor firmware, enabling you to monitor and react with control loops up to once per second. Measurement values are transmitted to the Swift Sensors Console on the internet without interfering with or slowing down the control loop operating on board the sensor circuitry.

Oversampling and Averaging

The SS3-615 sensor oversamples measurement acquisitions at a frequency of up to once per second (as described above relating to the onboard control loop). The sensor transmits the data to the gateway at the configured update rate of up to once per minute. You can configure what data is transmitted to be either the latest data point acquired or an average (FIR Filter) of the oversampled data points acquired within the update rate window.

Designed for Global Use

The SS3-615 Wireless Universal Analog Sensor Adapter's "universal" nature simplifies your decision and inventory issues because it can be configured to work with any analog sensor, whether it outputs voltage, current, or resistance. In addition, like all Swift Sensors wireless sensors, the SS3-615 uses Bluetooth (BLE5) for its communication technology and has been certified for use around the world with both radio frequency and CE certification.

Rev: March 14th, 2022

Operational Specifications:

Power Type	5-24Vdc Power Terminals or 1.8-3.6Vdc from AAA Batteries
Battery Type	AAA x2 Replaceable “L92” Lithium Polymer, 1300mAh avg.
Operating Voltage + Power	3.0Vdc, 0.06mW average (Battery Operation), 0.6mW (Ext.)
Avg. Current Consumption (Battery Power)	18-20uA (Active), 500uA (Command ACK), <5uA (Sleep), 6uA Drain (When 5-24V Ext. Power is used).
Avg. Current Consumption (5-24Vdc)	200uA (active, 680uA (Command ACK), 170uA (Sleep).
Operating Temperature	Battery Installed: -40°C to +60°C (-40°F to +140°F) Battered Removed: -40°C to +80°C (-40°F to +176°F)
Sensor Lifetime	Battery: 6 - 8 Years; External Power: Up to 20 years.
Communication Protocol	BLE/BT5 2.4Ghz
BLE Chipset	nRF52840
TX Strength	Default +8dBm
Range	250m - 300m (270ft - 300ft+) Line-of-Sight 30m - 50m (100ft - 150ft+) Non Line-of-Sight
Encryption	128-Bit AES Encryption
Button Press	Click to turn on. Press and Hold 2 sec to put in sleep mode
LED	Green LED: 2 sec. blinking when turning on Green LED: 2 sec. solid when entering sleep mode
Find My Sensor	Command from Console to blink sensor LED
Weight	56g (2 oz)
Dimensions	80mm x 59.5mm x 46.25mm (2.343in. x 1.82in. x 1.004in.)
Input Connector	8-Position Screw Terminal Connector (3.5mm Pitch)
Enclosure Material	ABS PA-765+
Certifications FC Industry Canada CE RoHS	FCC ID: X8WBT840F IC ID: 4100A-BT840F CE Compliance 2014/30/EU, 2014/53/EU
EMC Compliance	FCC Part 15 Class B

Operational Specifications Cont.:	
Flammability Rating	UL94-0V
Warranty	2-years.

Measurement Specifications:	
Voltage Measurement (0 - 10V Industrial)	
Connector Pin Vdc+	3
Voltage Range	0 - 10 VDC
Accuracy	15mV
Precision	10mV
Resolution	14-bit (0.806mV/Step)
Impedance	49.9kohms
Inspection Rate	1 - 30 Minutes (Default 1 Minute)
Current Measurement (0 - 20mA, 4 - 20mA Industrial)	
Connector Pin (Current/Loop +)	5
Range	0 - 20mA
Accuracy	15uA
Precision	1uA
Resolution	14-bit (Current: 1.44uA/Step)
Impedance	51 Ohm
Inspection Rate	1 - 30 Minutes (Default 1 Minute)

Resistance Measurement (NTC/PTC/RTD Devices or any Generic Measurement)	
Connector	4
Range	0-3MΩ with defined accuracy Supported, No guarantee for Measurements >3MΩ to 6MΩ
Mechanism	Adaptive Auto-Ranging with Hysteresis: Pull-up Branch resistance changes from R1-R4 to optimize Range Accuracy and Resolution
Adaptive Resistance Ranges	**R4**: 0-1kΩ, **R3**: 1k-10kΩ, **R2**: 10k-80kΩ, **R1**: 80k-3MΩ+ (Highest possible resistance value = 6MΩ)
Hysteresis	**R4**: 0-1kΩ, **R3**: 500-10kΩ, **R2**: 5k-80kΩ, **R1**: 40k-3MΩ, Maximum Hysteresis for Adaptive Switching is 50%
Open Circuit Impedance(s)	**R1**: 101kΩ, **R2**: 11kΩ, **R3**: 2k, **R4**: 1.1k
Accuracy	<(+/-1%) from 50-1MΩ, < (+/-2%) from 2-3MΩ, Accuracy within 0.5-1Ω Below 50Ω. No gauranteed accuracy >3MΩ
Precision	1mΩ
Resolution/Steps	14-bit, 128mΩ (0-1kΩ), 1.3Ω (1k-10kΩ), 10.6Ω (10k-80kΩ), 339Ω (80k-3MΩ)
Inspection Rate	1 - 30 Minutes (Default 5 Minutes)
Digital Out (General Purpose Output Trigger)	
Voltage Rating	0-24V
Current Rating	0.25A average, 0.375A Peak
Switch Type	Open-Drain Output Switch with Fuse + Diode Protection.
Switching Conditions	User-Configurable, Based on Measurement Context.

Measurement Specifications Continued:	
Resistance Measurement (NTC/PTC/RTD or any Other Resistive Device 0-3Mohm)	
Pin 1	5-24V Input for External Power
Pin 2	GND
Pin 3	Vin
Pin 4	Rin
Pin 5	Iin
Pin 6	GND
Pin 7	DOUT
Pin 8	GND

Swift Sensors Gateway

The Swift Sensors Gateway collects encrypted data from sensors located within the specified communication range (< 90m/300ft) and then transmits the sensor data to the Swift Sensors Cloud through either Ethernet, Wi-Fi, or cellular. The gateway auto-detects all sensors within range and will immediately establish secure communication without any user configuration or setup. Each gateway can support up to 150 Series 3 sensors.

Swift Sensors Console

All sensor data is logged and stored in the Swift Sensors Cloud. The Swift Sensors Console is configured to monitor and track all sensor data in the cloud. Multiple thresholds and alerts can be set separately for each sensor to supply notification via SMS text, email, or phone call. The console can be viewed in a web browser on a computer, tablet, or smartphone.

No programming is required to configure the console. An API to the Swift Sensors Platform allows integration with other data sources and 3rd-party data analytics tools.

SS3-615 Typical Connection Diagrams

Powering SS3-615 Externally

Any DC Voltage source 5-24VDC, Consumes 0.2mA (200uA)

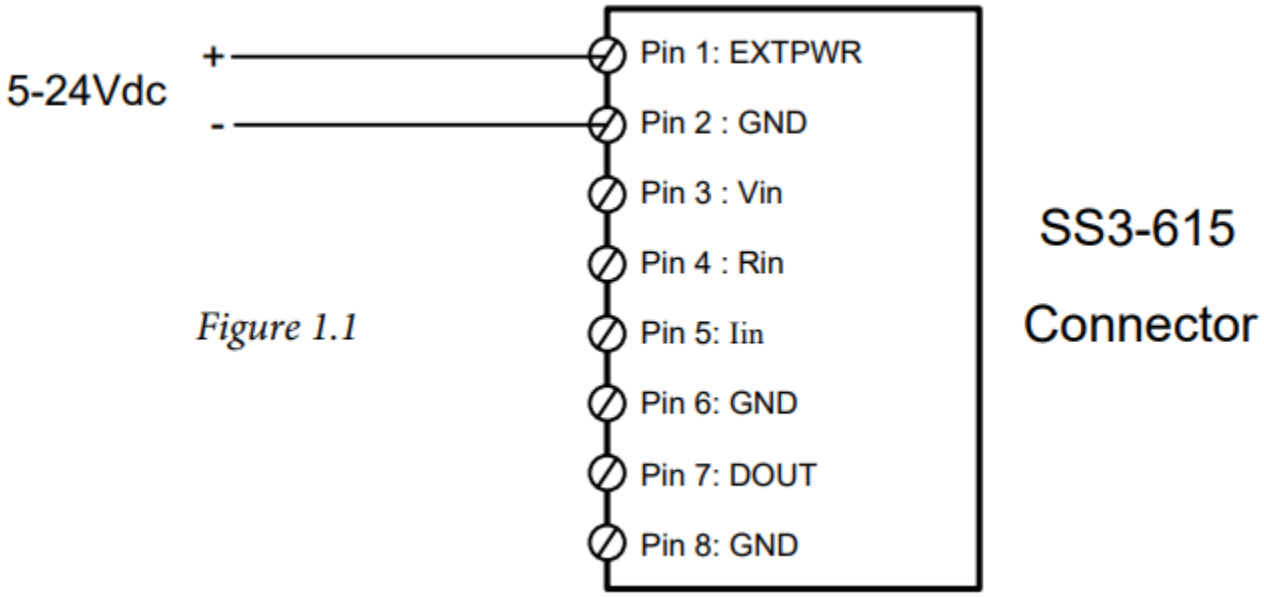


Figure 1.1

Self-Powered Transducers with Linear Output

Voltage Output Shown in Figure 1.2

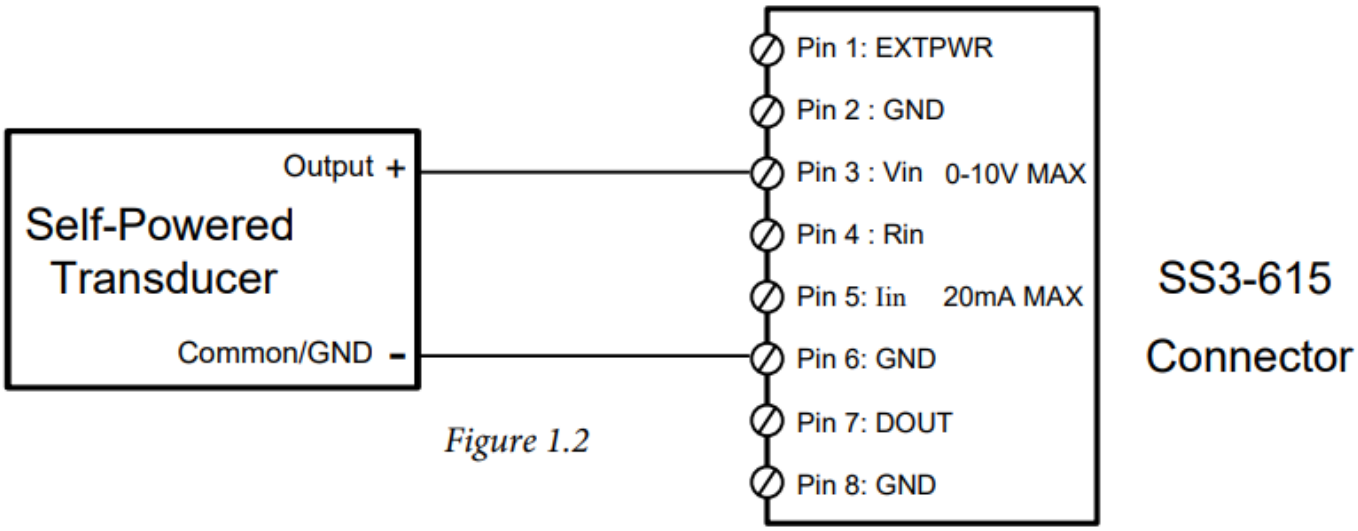


Figure 1.2

Notes on Self-Powered Transducers with Linear Output

1. Self-Powered Linear Current Output (up to 20mA) Shall use Pin 5 for (+) Terminal.
2. Self-Power may come from Transducer Input or Internal Transducer Battery Power.

SS3-615 Typical Connection Diagrams Cont.

DC-Powered Transducers with Linear Output

Voltage Output Shown in Figure 1.3

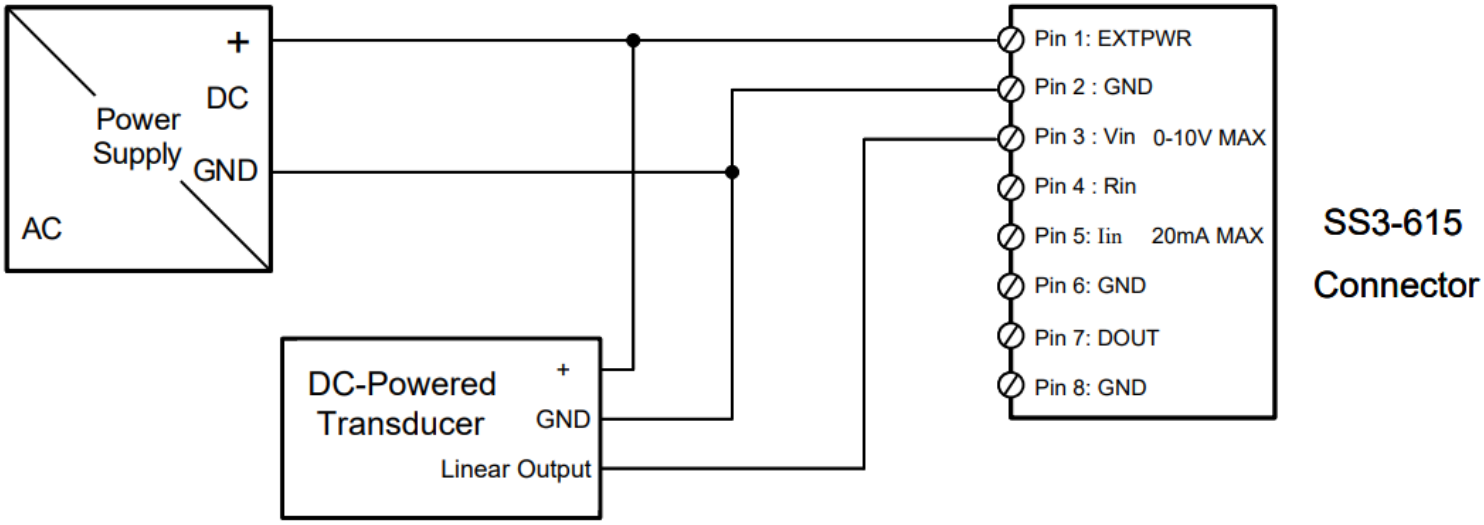


Figure 1.3

Notes on Self-Powered Transducers with Linear Output

1. *DC-Powered Linear Output Current Output Transducers (up to 20mA) Shall use Pin 5 for (+) Terminal.*

Loop-Powered Transducers with 4-20mA Output

Standard 4-20mA Loop shown in Figure 1.4 with Loop-powered Transducer

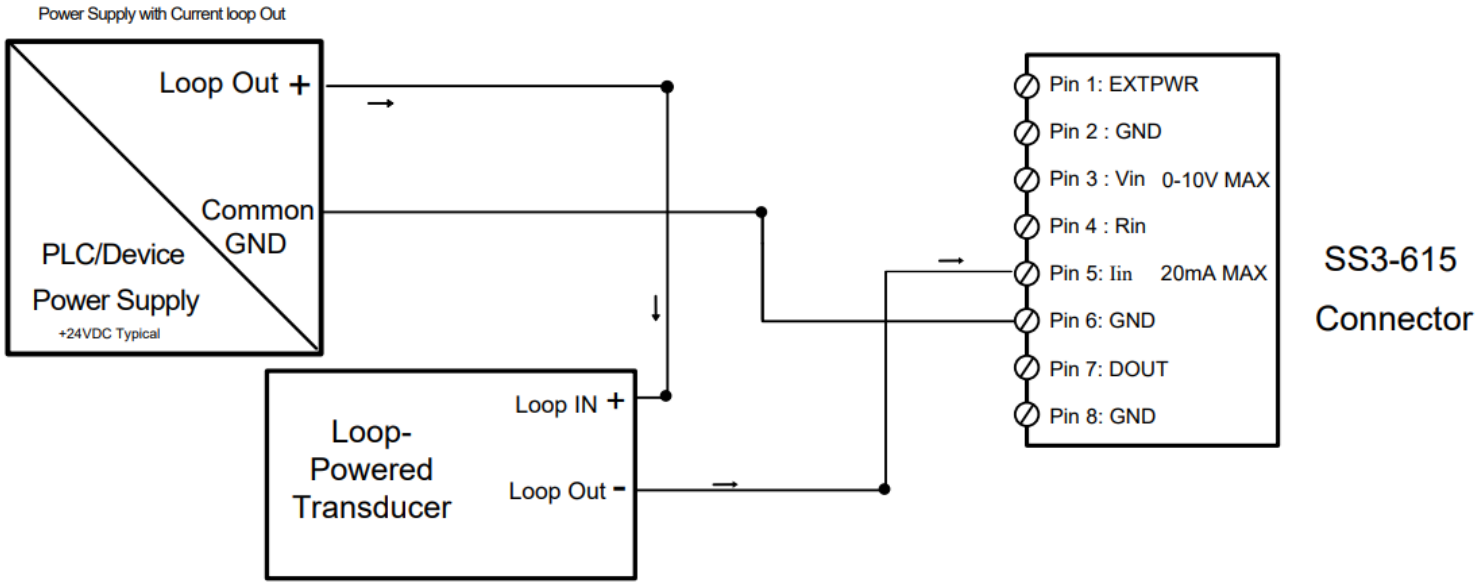


Figure 1.4

Adding SS3-615 External Power from the Current Loop

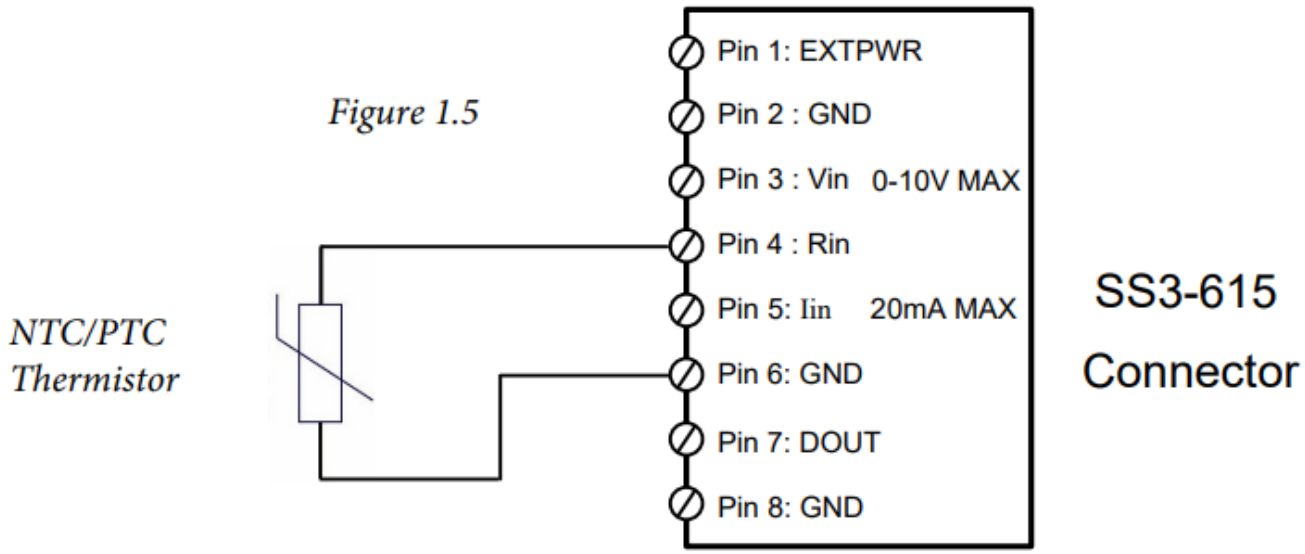
Connecting Pin 1 to "Loop Out +" may be done, but will consume 0.2mA (200uA) Battery power operation recommended as Lifetime is Typically 8yrs.

SS3-615 Typical Connection Diagrams Cont.

Resistance Measurements with SS3-615

Thermistor Example Below in Figure 1.5. Any 2-wire General Resistive Measurement can be made 0-3Mohm

Figure 1.5



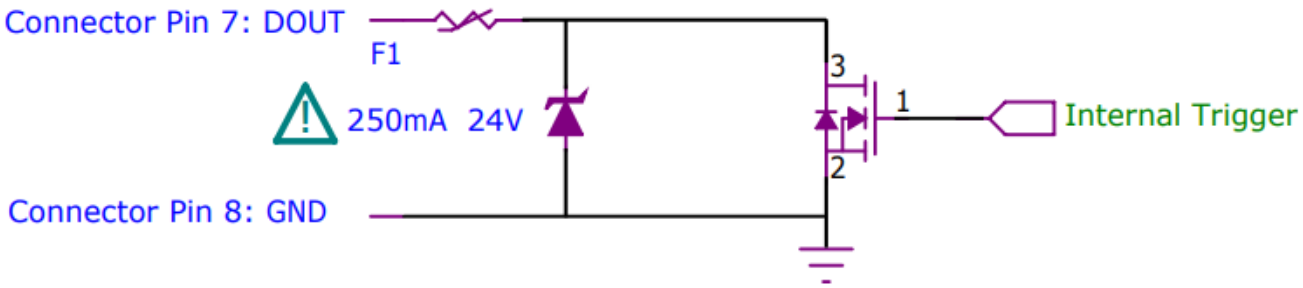
Notes on Resistive Measurements

1. Reference the Datasheet Resistance Measurement Ranges before attaching a resistive device/load.
2. Low-Z loads do not increase average sensor current consumption.
3. 2-wire Measurements supported only.

Connection + Use of Digital Output Trigger (DOUT)

DOUT Diagram shown in Figure 1.6; DOUT Trigger is a configurable Open-Drain Output

Figure 1.6



Notes on using DOUT

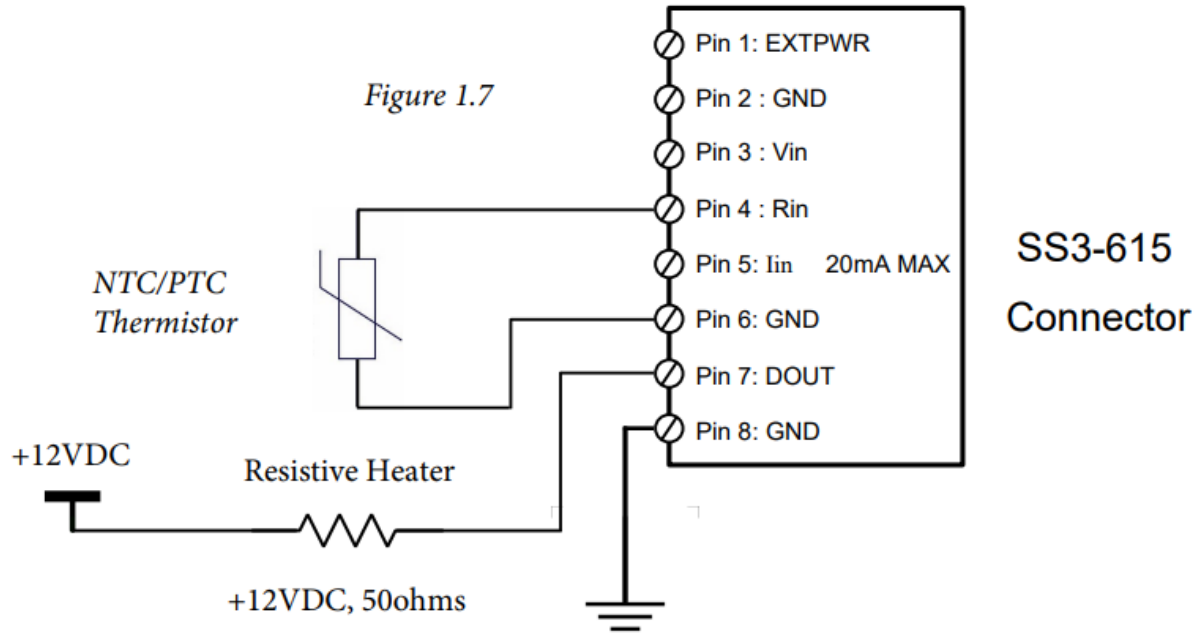
1. DOUT Trigger effectively completes a circuit to ground, similar to a relay.
2. DOUT may be set into 4 different modes in the Swift Sensors console: Disable, Always On, Always Off, and Automatic.
3. Automatic mode offers Control Loops that may be set in the Swift Sensors Console to set Trigger Switch Limits and behavior. Please refer to the manual for information on Setting DOUT Parameters.

SS3-615 Typical Connection Diagrams Cont.

DOUT Use Case Example: Heater Temperature Control

Operation of Use Case: Heating to 40C +/- 0.1C

Swift Sensors Console has DOUT configured in Automatic mode, with the heater triggering ON when the NTC reads a temperature of 39.90C, and Triggering OFF when the temperature reads 40.10C. The control Rate isset to 1s. This means a measurement is made every 1s and the Switch is triggered in "real-time" on the hardware, ensuring the most robust control.



Notes on using DOUT

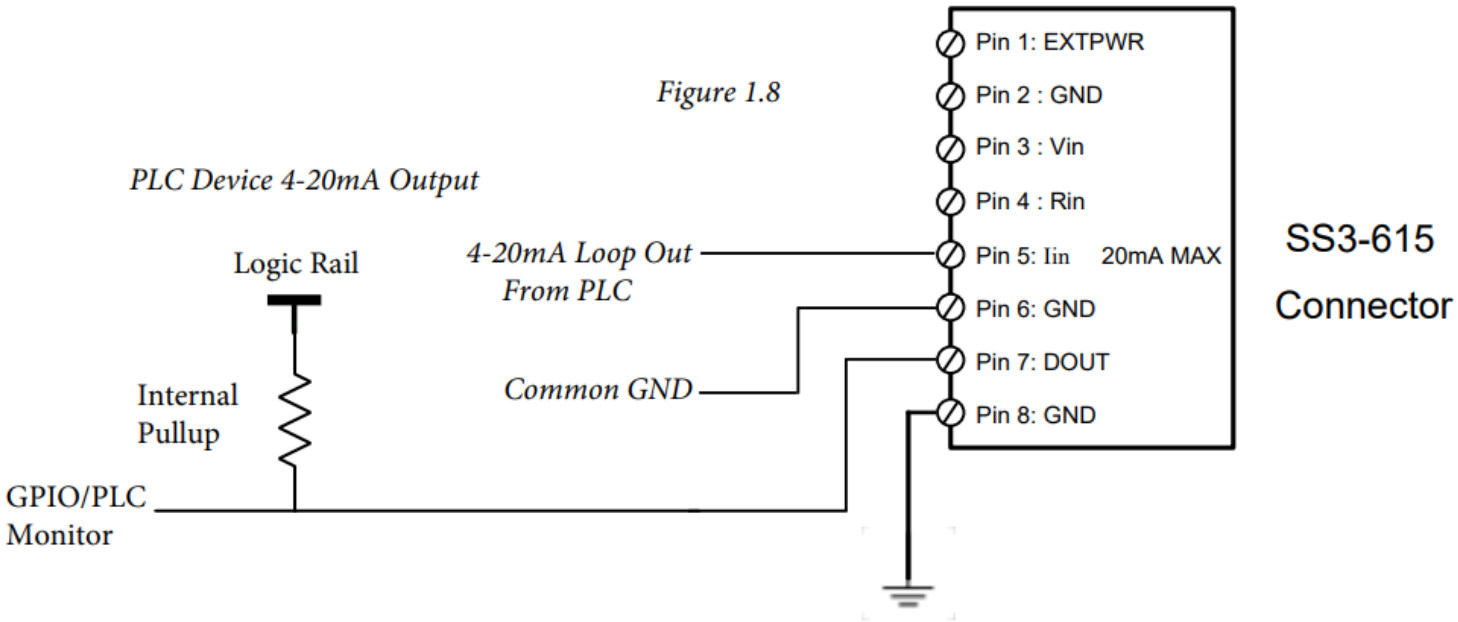
1. No matter the Load Device (Alarm/Light/Heater/etc), it's always recommended to connect the load output to Pin 7, as shown in figure 1.7. This way, the sensor merely completes the GND of the Load circuit, similar to a Relay. Power Dissipation happens across the load and not inside the sensor.
2. Another benefit of always using DOUT to complete ground is the ability to also externally power the sensor with the same supply the load is drawing from is desired.
3. Please avoid connecting any powered load to Pin 8, even when the sensor is battery-powered with a floating GND.

SS3-615 Typical Connection Diagrams Cont.

DOUT Use Case Example: Logic Control

Operation of Use Case: Logic Control

DOUT Trigger may be used to control Logic Level signals (up to +24vdc)



Notes on Logic Control

1. .Please avoid connecting any Voltage to Pin 8. Although Battery power gives the sensor a floating GND, connecting Voltage to Pin 8 may cause unexpected behavior and is not receommended.