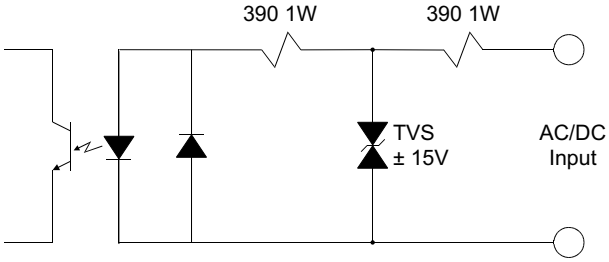
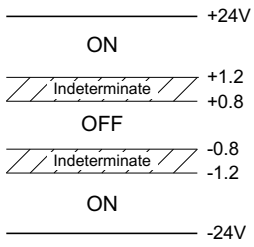
# Global Caché
## GC-SP1
## AC/DC Input Sensor

The GC-SP1 is a voltage detection sensor for DC or AC voltages within an operating range of ±24 volts. The GC-SP1 provides an ON indication when a positive or negative voltage is applied as an input. Wiring polarity is not a concern since voltage detection is symmetric, as well as, optically isolated to avoid noise and ground loops often found in installations powered by multiply sources. Transient voltage protection is provided to avoid sensor damage from voltage surges.

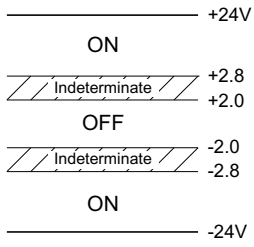



*GC-SP1 Input Circuitry*

For DC or steady-state voltage, the GC-SP1 is ON when the voltage is above +1.2V or below -1.2V and it is OFF when the voltage is between -.8V and +.8V. Below is a diagram indicating the operating range of the GC-SP1. The GC-SP1 can indicate either an ON or OFF for voltage input in an indeterminate area. AC or alternating voltage changes the GC-SP1 ON and OFF thresholds due to the alternating voltage passing through zero volts 2 * *f* times per second, where *f* is the frequency. The GC-SP1 filters out these zero voltage crossings providing a consistent ON/OFF threshold from 5Hz to 5KHz. The following AC chart is for sinusoidal waveforms with no DC offset.



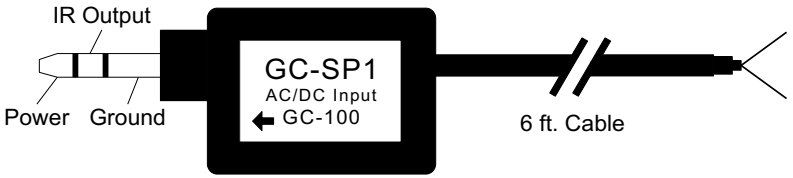

*DC voltage input*




*AC voltage p-p @ 5Hz to 5KHz*

The GC-SP1 was designed to work seamlessly with the GC-100 series of Network Adapters. Before plugging the GC-SP1 3.5mm jack into a GC-100 IR/Sensor connector, this GC-100 connector must be configured as an input. Configuration is accomplished through the GC-100 internal Web pages, by selecting the IR/Sensor connector as an input and pressing the "Apply" button. See the GC-100 manual for more details. Without anything plugged in the IR/Sensor connector, the indicator above it will be ON when properly configured as an input. This indicator will be OFF when the GC-SP1 is plugged into the GC-100 and with no voltage connected across the input. Now apply a voltage to the GC-SP1 input to change the indicator to ON. A common method to determine if a 120V, 60Hz power source is on is to use an AC or DC wall adapter to supply a low-voltage signal to the GC-SP1.

The GC-SP1 requires +5V to operate, and provides a logic level output. The pin assignments are shown below.




| **Specifications** | Minimum | Typical | Maximum |
|---|---|---|---|
| DC voltage input for ON | - | > 1.0V | > 1.2V |
| DC voltage input for OFF | < 0.8V | < 1.0V | - |
| AC voltage p-p @ 5Hz to 5KHz for ON | - | > 2.4V p-p | > 2.8V p-p |
| AC voltage p-p @ 5Hz to 5KHz for OFF | < 2.0V p-p | < 2.4V p-p | - |
| Input current (see input schematic) | 1.0mA | - | 30mA |
| Sensor output ON @100µA | Vcc – 0.1V | - | - |
| Sensor output OFF @100µA | - | - | 0.1V |
| Vcc, Supply voltage | 4.50V | - | 5.50V |
| Supply current | - | 1.0mA | 1.5mA |

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