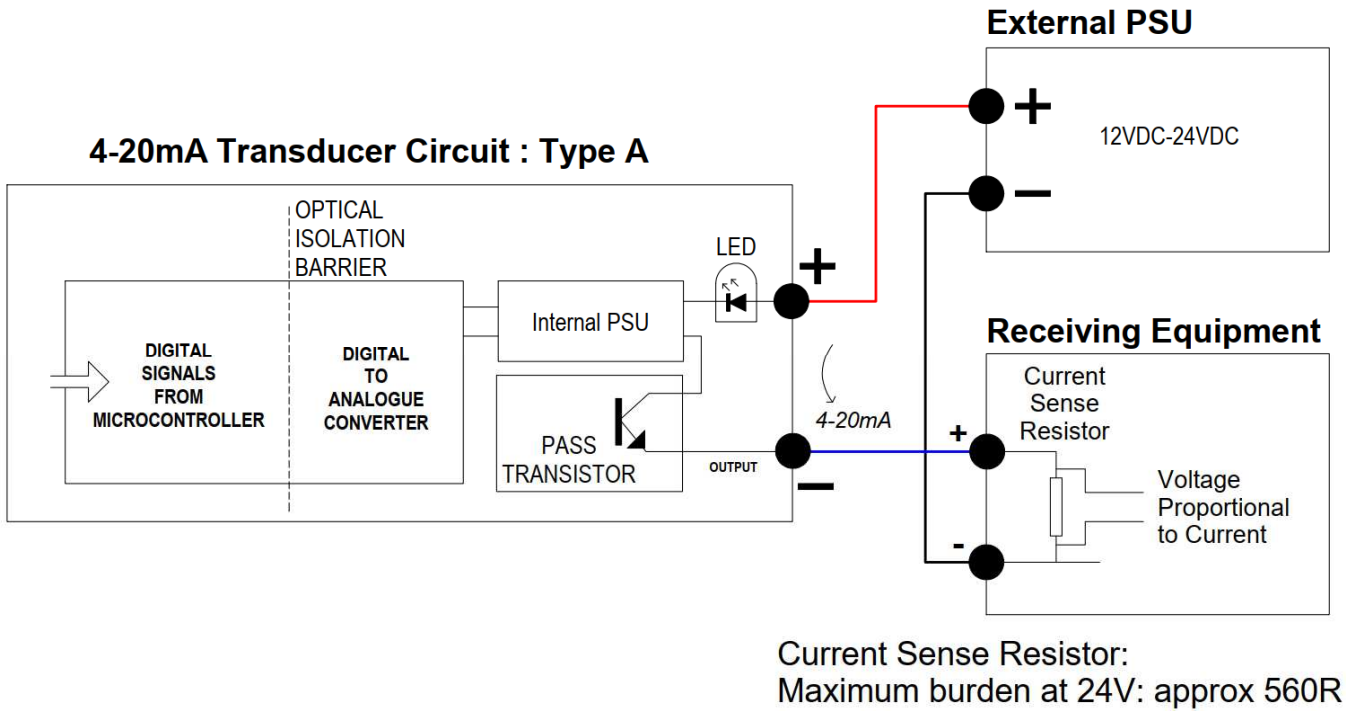
Micha Solar manufacturers a range of Loop-Powered 4-20mA transducers. Loop-Powered means that the current control circuitry is powered by the loop circuit itself and an external power source is required.

Optical isolation is used to separate the measured input signal control from the output side as these often have different voltage potentials or grounds

A microcontroller generates precise digital signals which are optically transmitted to the loop side then converted to an analogue control which regulates the current flowing from the Positive to the Negative output terminals. Typically, the 4-20mA signal is converted to a voltage by passing it through a Current Sense Resistor, which is then measured by the receiving equipment as shown in the diagram below:



Current Sense Resistor:
Maximum burden at 24V: approx 560R

Using Ohms Law, the converted output signal is calculated as V = IR (Volts = Current x Resistance)

For example, if the resistance is 1,000Ω and the current flowing is 12mA (0.012A), the voltage across the resistor will be 0.012 x 1,000 = 1.2V

Due to internal loop circuit dissipation through the pass transistor, we recommend that the current sense resistor has a minimum value of 560Ω when used with a 24V supply.

Notes:

1. The above circuit shows the **Micha Solar** 'Type A' transducer, which requires an external loop supply. For some models, we can provide a 'Type B' which includes a separate, isolated DC-DC converter to provide the built-in 'external' power source for the loop. However, it is common for the end user to source a separate PSU module as this is a more cost-effective solution.
2. If the 4-20mA signal is routed to DC-powered receiving equipment, such as an RTU or PLC, we recommend that the loop is powered by the same power source.
3. When using Battery Voltage Transducer (Micha PN: 101920), it may be possible to power the loop from the input supply if the receiving equipment is powered from a separate and isolated power supply. If the receiving equipment is being powered from the same battery, care should be taken to avoid any ground loop on the negative rail.