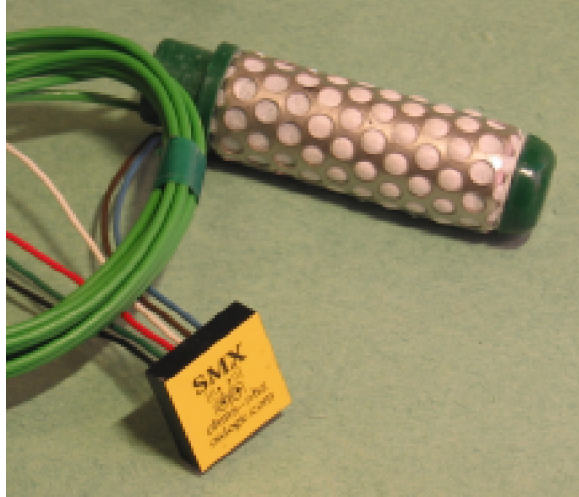


SMX

Electrical Interface for Moisture Sensors and WATERMARK™

The SMX is an interface module for sensors that measure the electrical resistance of moist substrates. It provides three types of outputs, allowing the sensor to easily interface with a wide range of general purpose data logging equipment and meters. Additionally, it prevents corrosion of the sensor (using AC excitation), and galvanically isolates it from unwanted underground currents.



The SMX is available as an OEM assembled circuit board, suitable for incorporation into custom systems. It is also available potted in industrial epoxy with 6 wire leads, suitable for outdoor deployment.

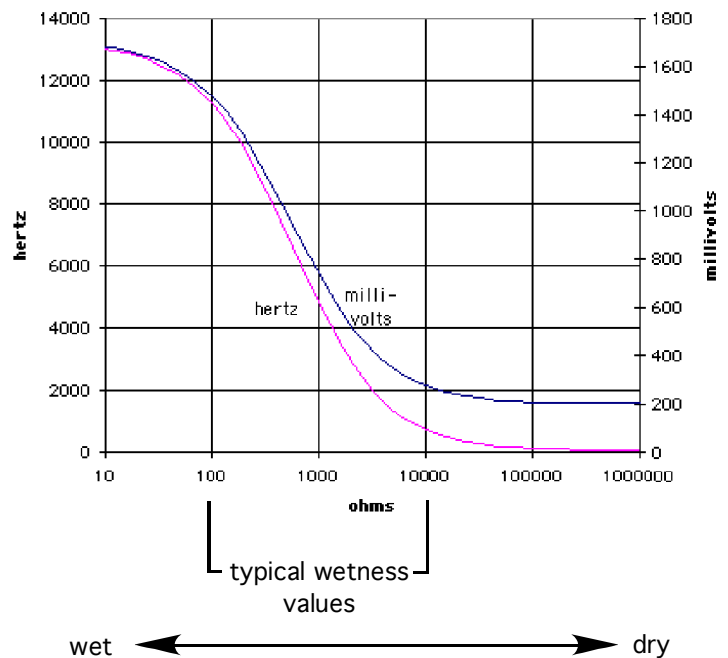
The SMX is commonly used with the IRROMETER WATERMARK™ sensor. When buried at root depth, the WATERMARK reaches equilibrium with the local soil moisture and produces AC electrical resistance that is inversely proportional to soil moisture. (It also depends slightly on temperature.) The SMX converts AC resistance

to frequency, voltage, and current that can be read by data-loggers.

Specifications:

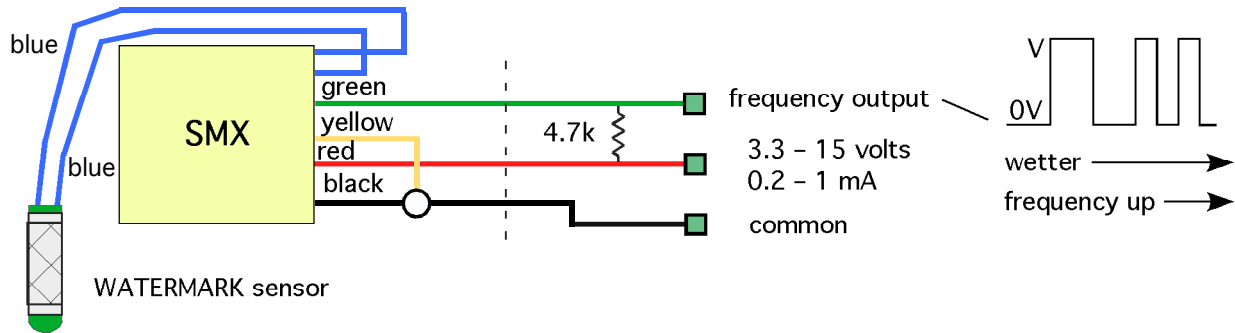
- Supply voltage: 3.3 to 15 VDC
- Frequency output: 50 Hz (dry) to 7 kHz (wet)
open collector square wave (needs pull-up resistor to read out frequency.)
- Frequency output with sensor short circuit: ~13 kHz
- Typical voltage output:
0.2 volts (dry) to 1.0 volt (wet)
- Voltage output with sensor short circuit: ~1.7 V
- Typical current output (also supply current):
0.2 mA (dry) to 1.0 mA (wet)
- Current output with sensor short circuit: ~1.7 mA
- Supply variation: < 0.01% per volt.
- Operating temperature: -0°C to +50°C
- Temperatures below 0°C: no meaningful signal

SMX output vs resistance

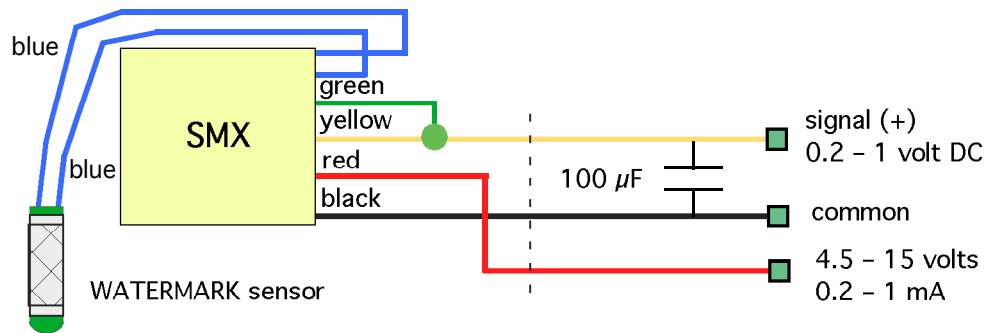


SMX output configurations

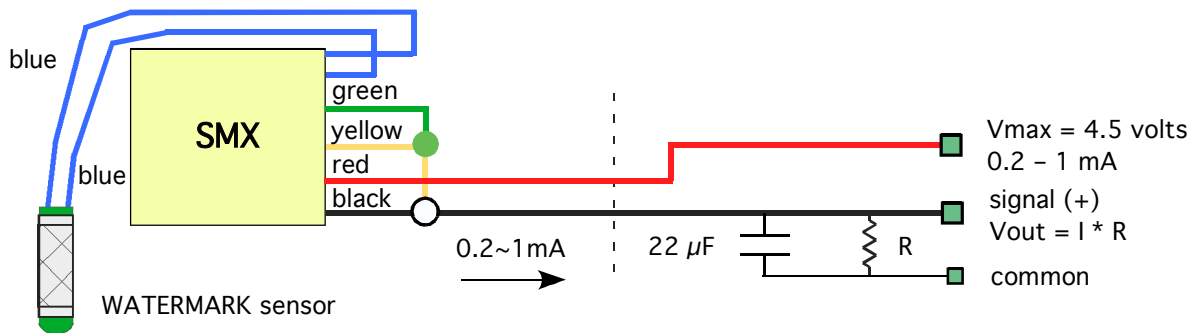
I. Digital Frequency Output: 50 – 10,000 Hz. This output can be measured using a COUNT or PERIOD function on a data logger.



II. Voltage output: 0.2 – 1 volts. This can be measured using analog-to-digital on a data logger.



III. Two Wire Current Output: 0.2 – 1 mA. The current on the two wire circuit may be converted to a voltage at the input of the data logger. A 1 kΩ resistor will convert the 0.2 – 1.0 mA current into a 0.2 – 1 volt signal. This can be measured using analog-to-digital on a data logger.



SMX top view (component side)

