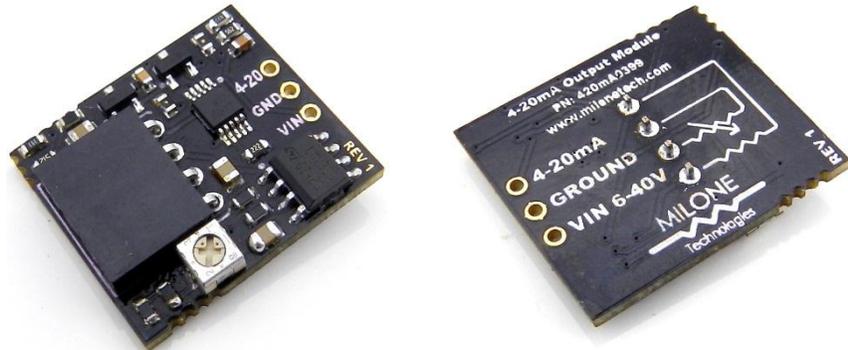


4-20mA Linear Resistance to Current Module PN-420MA0399

• Description

The linear resistance to current module was designed for the eTape liquid level sensors. The eTape sensor plugs directly into the four pin header on the module. The module is designed to convert the variable resistance output of the eTape liquid level sensor, to a linear output current between ~4 volts to ~20 mA DC. Applying the output current of the module to a microcontroller, PLC or other current monitoring device can more accurately measure and monitor the liquid level output of the eTape sensor.



• Theory of Operation

The module converts the variable resistive output of the eTape sensor to a voltage using a dual operational amplifier designed to amplify the change in resistance. The first stage of the amplification circuit is a “difference amplifier” followed by a “unity gain amplifier”. This module has a trimmer potentiometer which is used to adjust the gain to calibrate the module across the range of 8-inch to 32-inch eTape sensors.

• Specifications

Thickness: 0.17" (4.3mm)

Length: 0.85" (21.6 mm)

Width: 0.75" (19.1 mm)

Current Output Range: ~4 – ~20 mA +/-5%

Connector: 4 Pin Female & 3 Pin Male Header

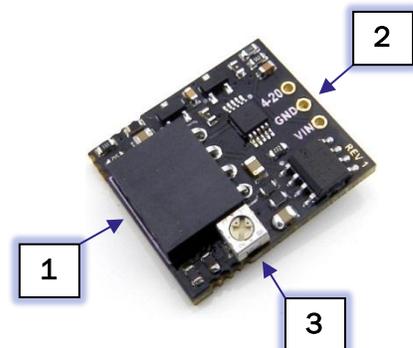
Temperature Range: -40°F - 257°F (-40°C - 125°C)

Power Requirements: 6 – 40VDC

• Connection and Installation

Connect to the module by attaching the eTape sensor to the four pin socket [1] located at the bottom of the module. Then connect Power (VIN) and ground (GND) to the three pin header [2] located at the top of the module (6 – 40 VDC). Connect your current monitoring device to the output pin (4-20mA).

- 1- eTape Sensor Socket
- 2- Power and Output header
- 3- Calibration Trimmer Pot



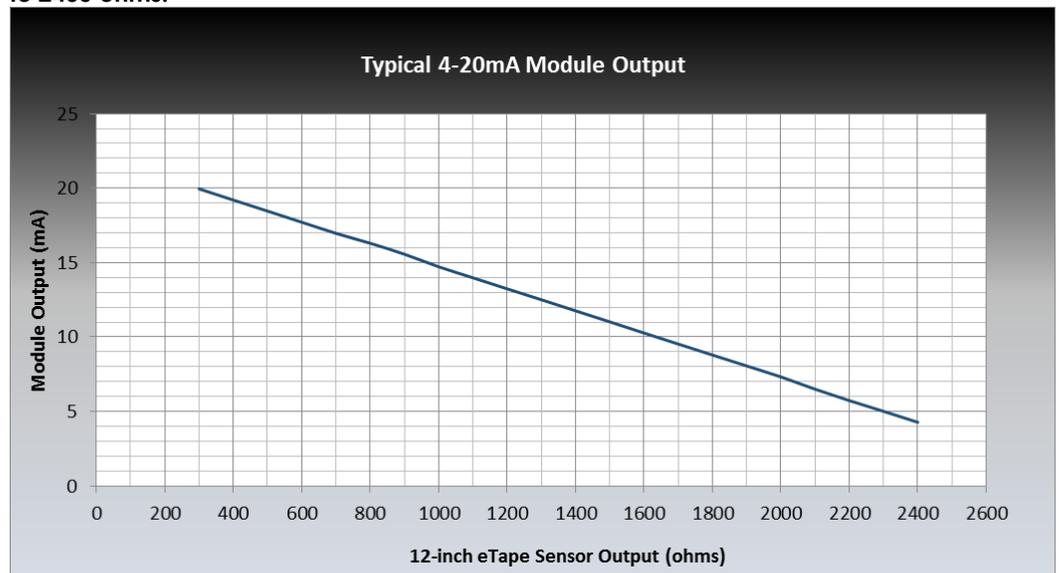
4-20mA Linear Resistance to Current Module PN-420MA0399

● Calibration

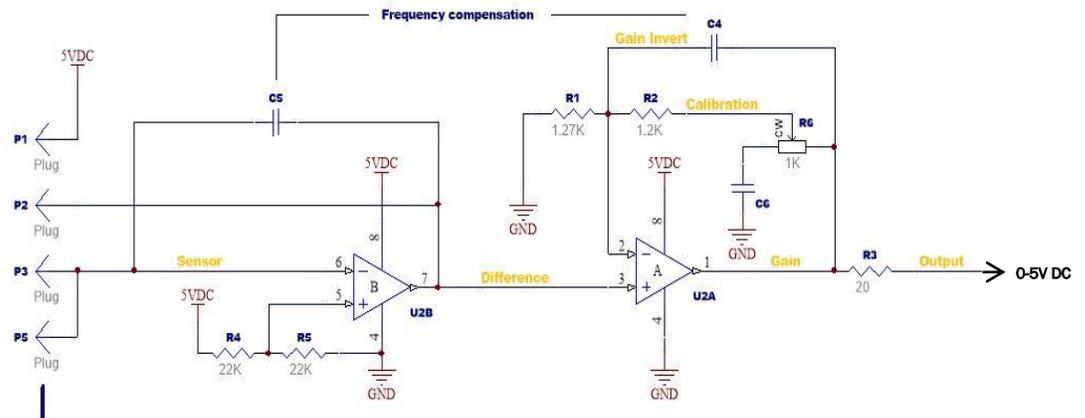
To calibrate the module, submerge the eTape sensor to the maximum level. The output current will be at a maximum at this level (approximately 20mA DC). Monitor the output current (4-20mA) using a digital multi-meter (DMM). Adjust the trimmer pot using a small flat head or Philips screwdriver until maximum current of approximately 20mA is displayed. Be sure not to overturn the trimmer pot which has a 250 degree maximum turning angle. The module is now calibrated to the eTape sensor. Note: Using Loctite or other adhesives to seal or hold the trimmer pot in place may change the resistance value and thereby change the calibration.

● Sensor Output

The following graph represents the typical 4-20mA module output with a gain setting per the calibration sequence above and an idealized 12" eTape sensor input resistance range of 300 to 2400 ohms.



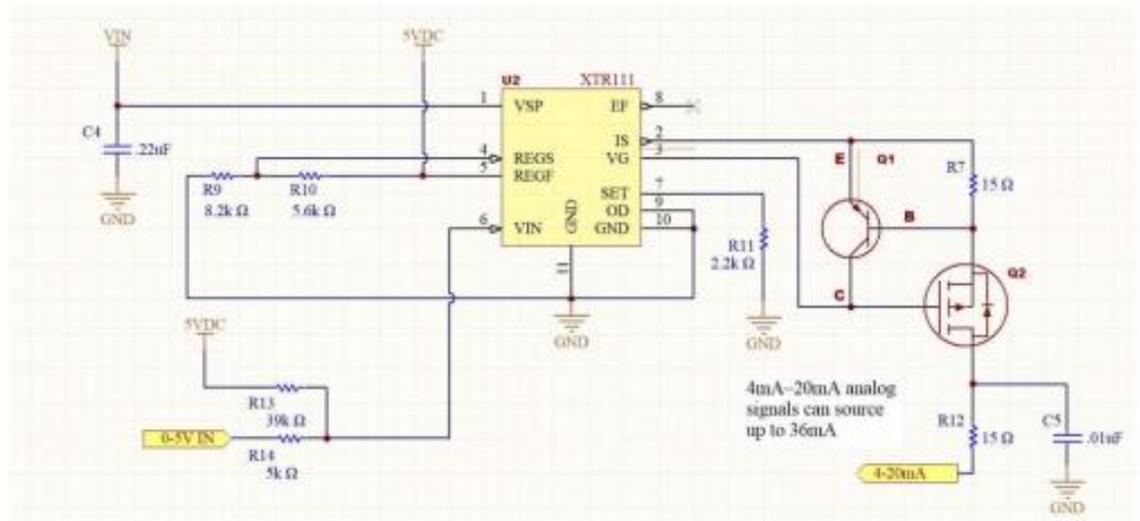
● Circuit Diagram (Part 1 - 0-5V Converter)



Liquid Level Sensor Connection

4-20mA Linear Resistance to Current Module PN-420MA0399

- Circuit Diagram (Part 2 - 4-20mA Converter)



- Technical Support

If you require technical support for the 4-20mA module or eTape liquid level sensor, please contact our technical support department by email at: techsupport@milonetech.com.