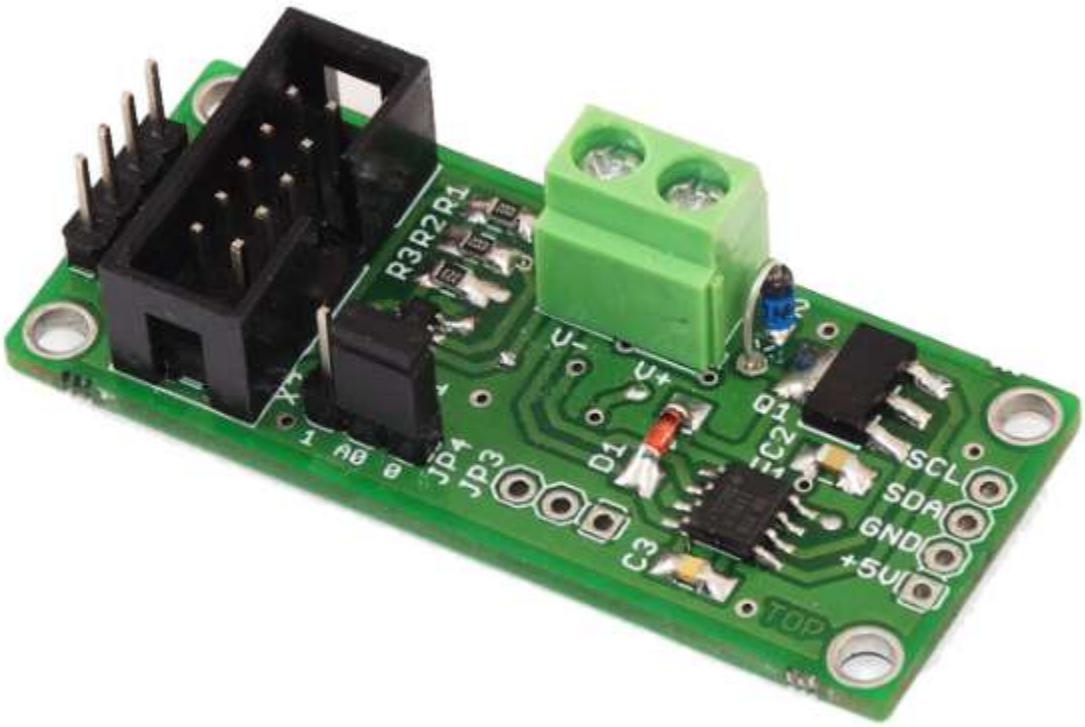
Research
Design Lab



4-20mA Current Loop Transmitter XTR116U

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1. Overview

The XTR116 are precision current output converters are designed to transmit analog 4-to-20mA signals over an industry standard current loop. They provide accurate current scaling and output current limit functions. 4-20mA Current Loop Transmitter a serial I2C Bus interface. 4-20mA Current Loop Transmitters device input and output of the address, control and data signals are transmitted in serial fashion via two-wire bidirectional I2C Bus.

2. Features

- Low Quiescent Current: 200µA
- 5V regulator for external circuits.
- VREF for sensor excitation:XTR116: 4.096V
- Low span error: 0.05%
- Low nonlinearity error: 0.003%
- Wide loop supply range: 7.5V to 36V
- SO-8 Package
- I2C Interface.

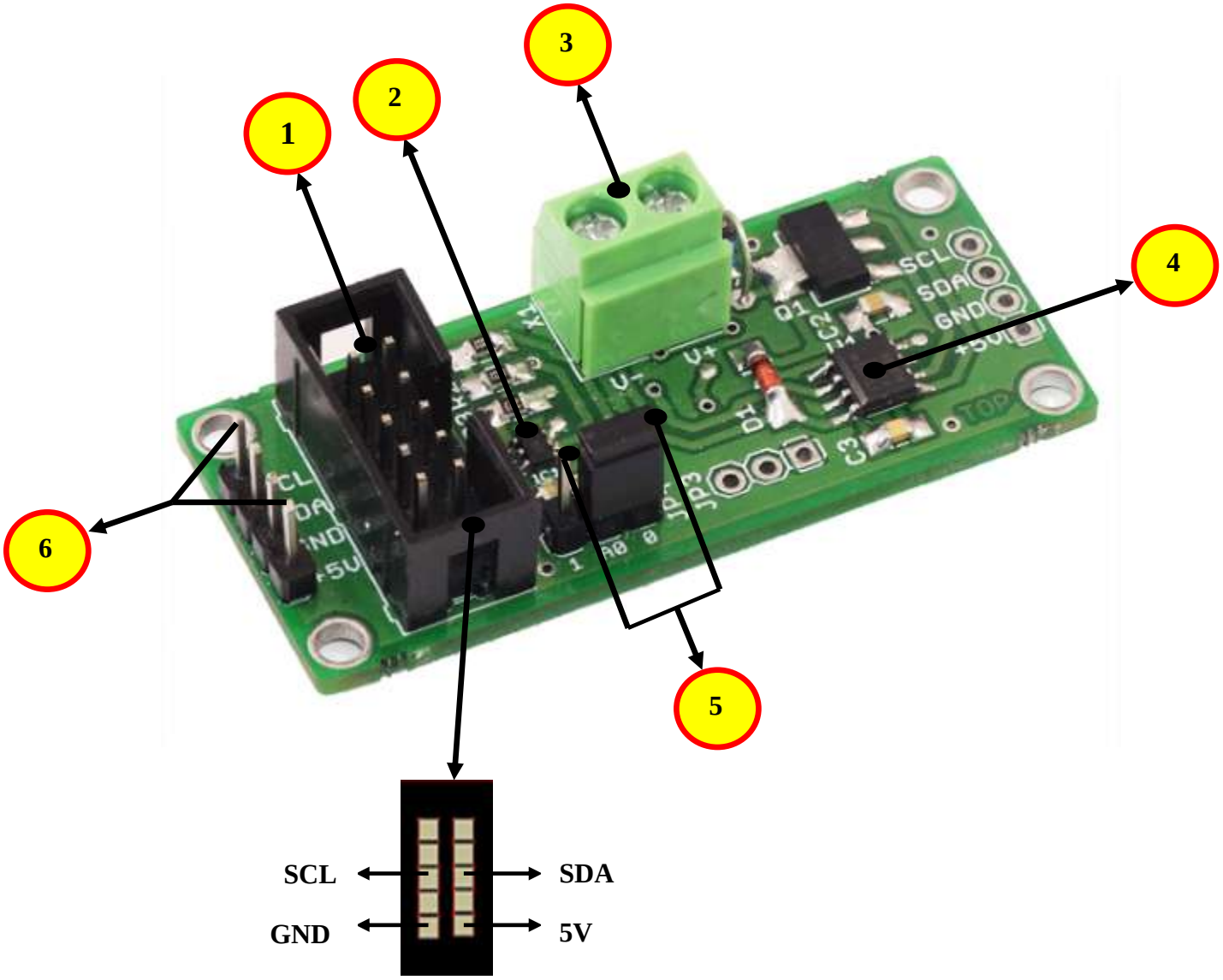
3. Application

- 2-Wire, 4-20mA Current Loop Transmitter
- Smart Transmitter
- Industrial Process Control
- Set Point or Offset Trimming
- Sensor Calibration
- Closed- Loop Servo Control
- Low power Portable Instrumentation
- PC Peripherals
- Data Acquisition System

4. Specification

Supply Voltage	7.5 V ~ 36 V
Reference Voltage	4.096V
Supply Current	210-400uA
Low Quiescent Current	200µA
Wide Loop Supply Range	7.5V to 36V
Current Gain	100
Noise	0.1Hz to 10 Hz
Small Signal Bandwidth	380 KHz
Slew Rate	3.2 mA/µs
Bit Resolution	12
Temperature Range	-40°C to +125°C

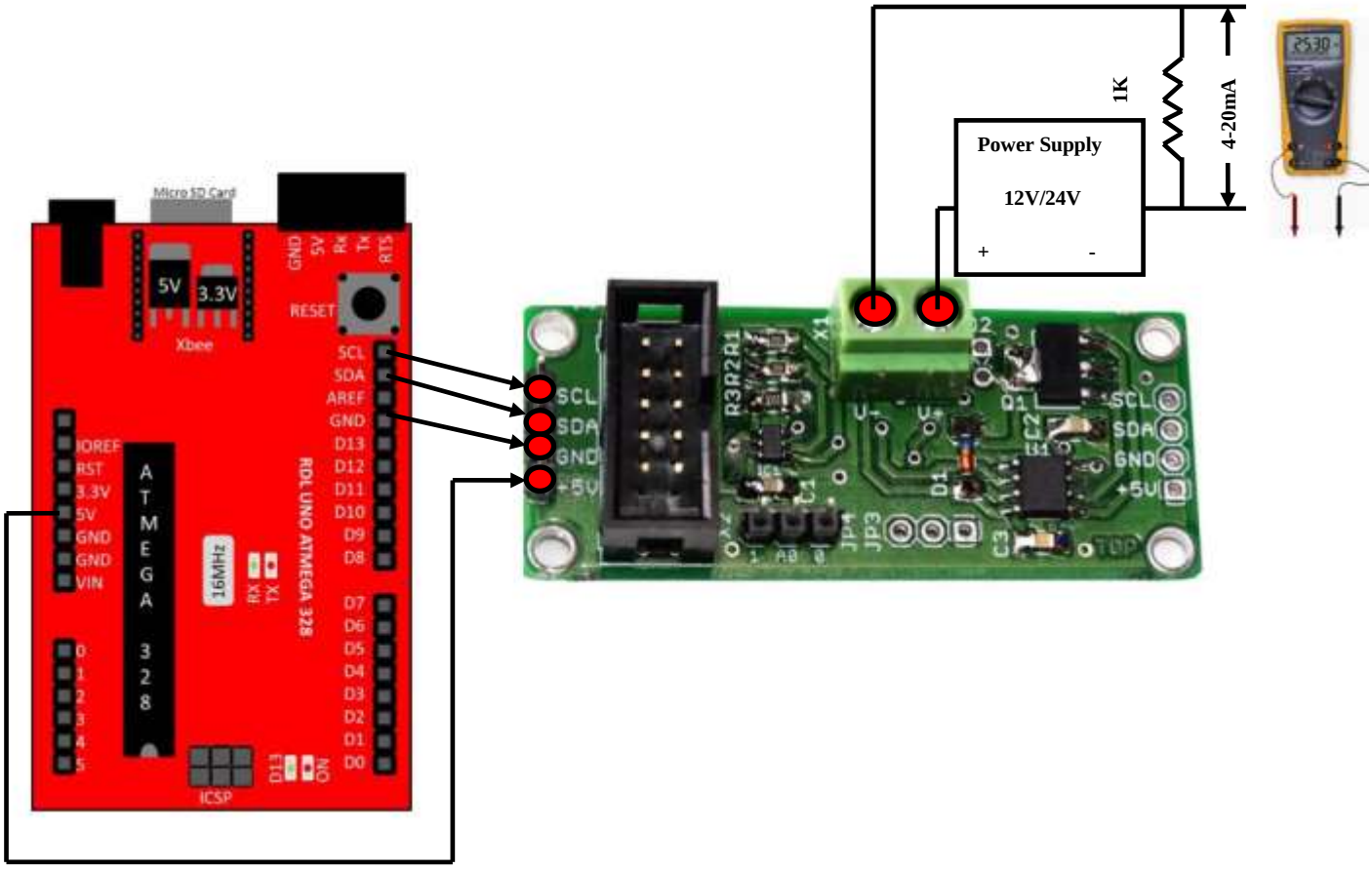
5. Narration



1. RDL Bus
2. MCP4725 IC
3. Output
4. XTR116U IC
5. Address Selection Pins
6. I2C Pin Header

6. Practical Interfacing Circuit

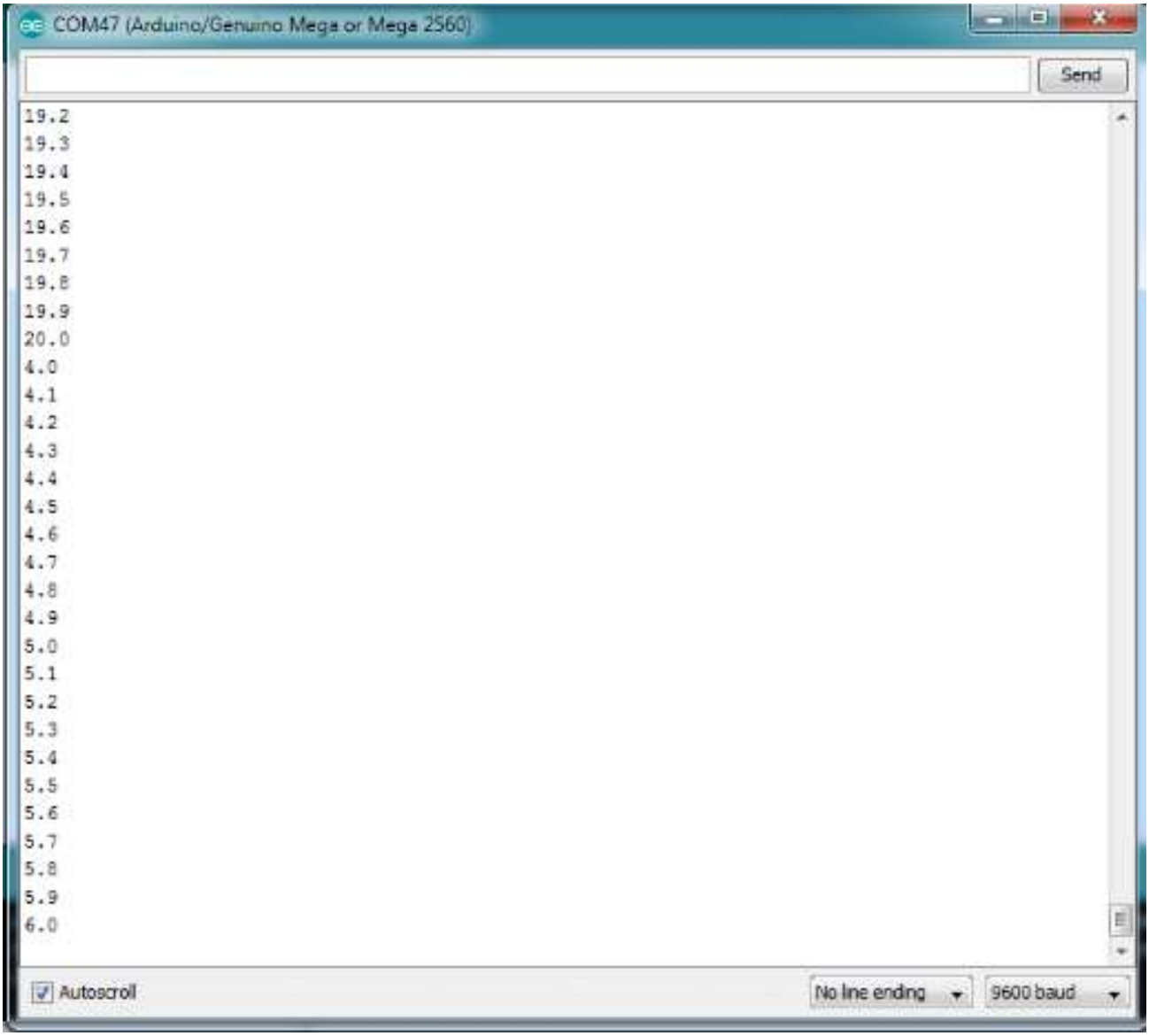
- **Interfacing Arduino UNO and 4-20mA Current Loop Transmitter XTR116U**



Code

```
#include <MCP4725.h>

MCP4725 dac(SDA, SCL);

void setup(void)
{
dac.begin();
Serial.begin(9600);
}

void loop(void)
{
float ampout;
for (float v = 80; v <= 400 ; v++)
{
float k=v/100;
dac.setVoltage(k);

ampout=map(v,80,400,40,200);
ampout=ampout/10;
Serial.println(ampout,1);delay(300);
v++;
}
}
```

Output


COM47 (Arduino/Genuino Mega or Mega 2560)
Send
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20.0
4.0
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5.5
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5.9
6.0
Autoscroll
No line ending
9600 baud

7. Documents

- XTR116U Datasheet
  https://researchdesignlab.com/projects/XTR116U.pdf

- MCP4725 Datasheet
  https://researchdesignlab.com/projects/RDL_MCP4725.pdf

- Arduino Code
  https://researchdesignlab.com/rdl_4_20ma_current_loop_transmitter_xtr116u_code.html