Humidity Meter Using OLED Display- Arduino Compatible Project

This is an easy to build, very compact, and low profile Arduino compatible platform to build a humidity meter/Gauge using a 0.96Inch OLED display. The project consists of Atmega328 microcontroller, 0.96Inch OLED display, 3.3V regulator, and HIH5030 analog humidity sensor from Honeywell. The HIH5030 sensor provides an analog voltage output, the analog voltage is near linear voltage output vs %RH, the sensor output is connected to A0 (Arduino-ADC pin 0) of the ATmega328 microcontroller. The sensor output is 0.25V to 2.5V vs 0 to 100% RH. Connector CN2 is provided for boot-loader flashing and Arduino programming. Use Pin 4 GND and Pin5 VCC to power the project.

The HIH-5030 Low Voltage Humidity Sensors operate down to 2.7 Vdc, often ideal in battery-powered systems where the supply is a nominal 3 Vdc. The HIH 5030 complements our existing line of 5 Vdc SMD (Surface Mount Device) humidity sensors. The HIH-5030 Humidity Sensors are designed specifically for high volume OEM (Original Equipment Manufacturer) users. Direct input to a controller or other device is made possible by this sensor near linear voltage output. With a typical current draw of only 200 A, the HIH-5030 is ideally suited for many low drains, battery operated systems. Tight sensor interchangeability reduces or eliminates OEM production calibration costs.

Arduino Code

This is Arduino compatible project, a new Atmega328 microcontroller requires flashing the boot-loader and then program the Arduino code. Follow the link below to learn the programming process. Example code is provided as a download to test the project, this code is not accurate required proper calibration and mapping.
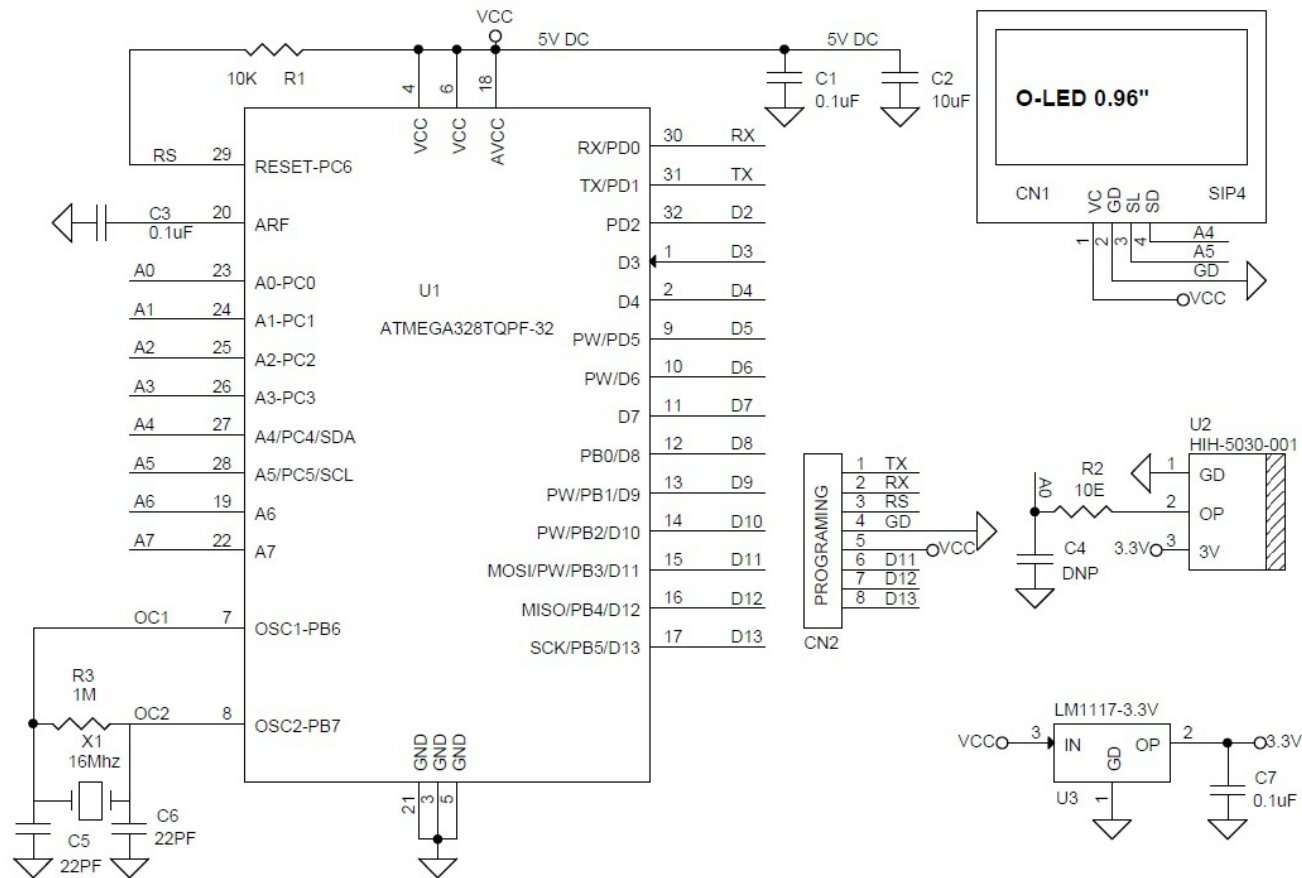https://www.arduino.cc/en/Tutorial/BuiltInExamples/ArduinoToBreadboard
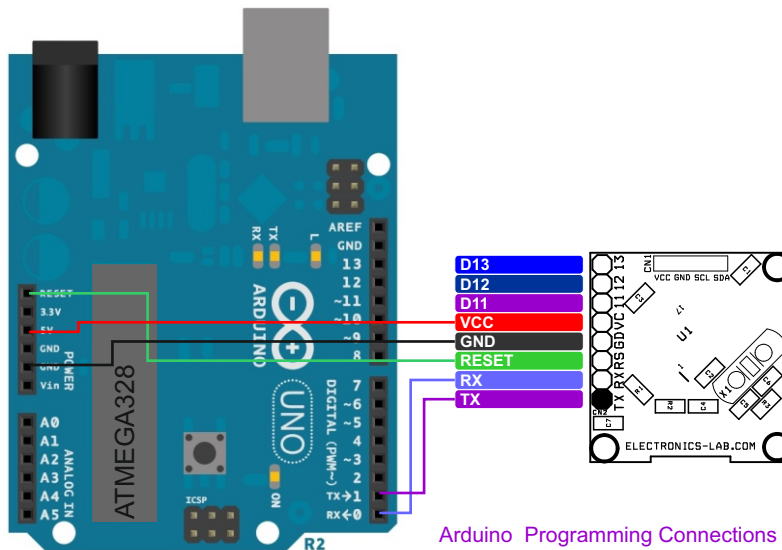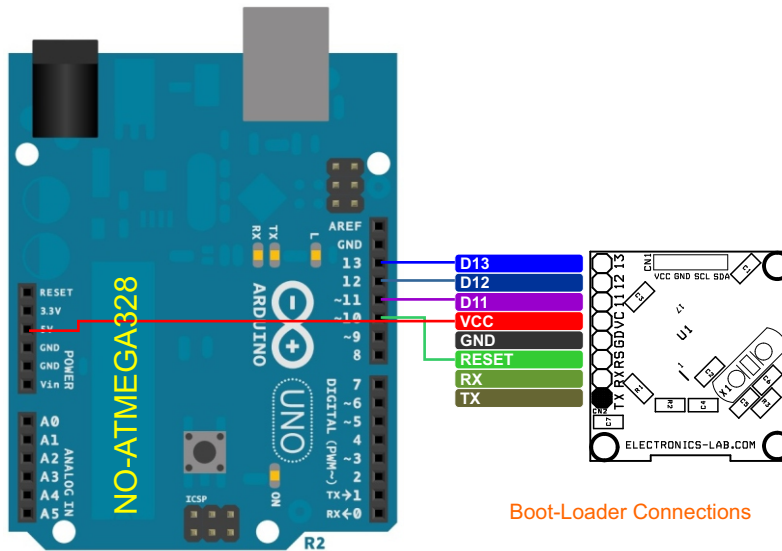
Applications

- Industrial Air compressors
- Battery-powered systems
- Drying equipment HVAC (includes air conditioning, air movement, thermostats, humidifiers, de-humidifiers, humidistats, enthalpy sensing)
- Office automation equipment
- Process equipment Refrigeration (includes bulk and transport systems)
- Telecommunications cabinets
- Weather stations and meteorology equipment
- Medical Hospital air compressors
- Infant incubators
- Microenvironments
- Sleep apnea equipment
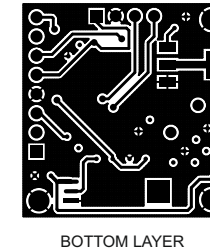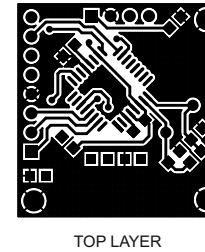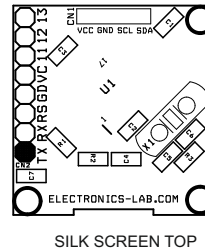- Treadmill stress monitoring equipment

Features

- Supply 5V DC @ 10mA
- 0.96" OLED display
- Low power humidity sensor
- Onboard voltage regulator
- Programming header
- PCB dimensions: 28.42 x 27.31 mm

07005

VCC

10K R1   5V DC   5V DC

RS   29   RESET-PC6

| | 4 | 6 | 18 |
| | VCC | VCC | AVCC |

C1   C2
0.1uF   10uF

O-LED 0.96"

CN1   VC GD SL SD   SIP4

RX/PD0   30   RX
TX/PD1   31   TX
PD2   32   D2

C3   20   ARF
0.1uF

D3   1   D3
D4   2   D4

A0   23   A0-PC0
A1   24   A1-PC1

U1
ATMEGA328TQPF-32

PW/PD5   9   D5
PW/D6   10   D6
D7   11   D7

A2   25   A2-PC2
A3   26   A3-PC3
A4   27   A4/PC4/SDA
A5   28   A5/PC5/SCL

PB0/D8   12   D8
PW/PB1/D9   13   D9
PW/PB2/D10 14   D10

A4
A5
GD
VCC

A6   19   A6
A7   22   A7

MOSI/PW/PB3/D11   15   D11
MISO/PB4/D12   16   D12
SCK/PB5/D13   17   D13

OC1   7   OSC1-PB6

CN2   PROGRAMING

1	TX
2	RX
3	RS
4	GD
5	
6	D11
7	D12
8	D13

VCC

A0

R2
10E

U2
HIH-5030-001

1	GD
2	OP
3	3V

3.3V

C4
DNP

R3
1M

OC2   8   OSC2-PB7

X1
16Mhz

| 21 | 3 | 5 |
| GND | GND | GND |

C6
22PF

C5
22PF

LM1117-3.3V

VCC   3   IN   OP   2   3.3V

GD

U3   1

C7
0.1uF

NO-ATMEGA328

AREF
GND
D13
D12
D11
VCC
GND
RESET
RX
TX

Boot-Loader Connections

ATMEGA328

D13
D12
D11
VCC
GND
RESET
RX
TX

Arduino Programming Connections

SILK SCREEN BOTTOM

SILK SCREEN TOP

ELECTRONICS-LAB.COM

TOP LAYER

BOTTOM LAYER

PCB DIMENSIONS 28.42MM X 27.31MM

BOM						
NO.	QNTY.	REF.	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	1	CN1	4 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5317-ND
2	1	CN2	8 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5321-ND
3	1	C1	10uF/16V SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
4	3	C2,C3,C7	0.1uF/50V SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
5	3	C4,C5,C6	SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
6	1	R1	10K 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
7	1	R2	100E 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
8	1	R3	1M 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
9	1	U1	ATMEGA328TQPF-32	MICROCHIP	DIGIKEY	ATMEGA328PB-AURCT-ND
10	1	U2	HIH-5030-001	HONEYWELL	DIGIKEY	480-3294-1-ND
11	1	U3	LM1117-3.3V	ON SEMI	DIGIKEY	488-LM1117MPX-33NOPBCT-ND
12	1	X1	16Mhz	ECS INC	DIGIKEY	X1103-ND