



C++ Code Snippets

PART III: Serial

Communications via LCD for

Arduino IDE/Teensy 3.2

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“The Knack”

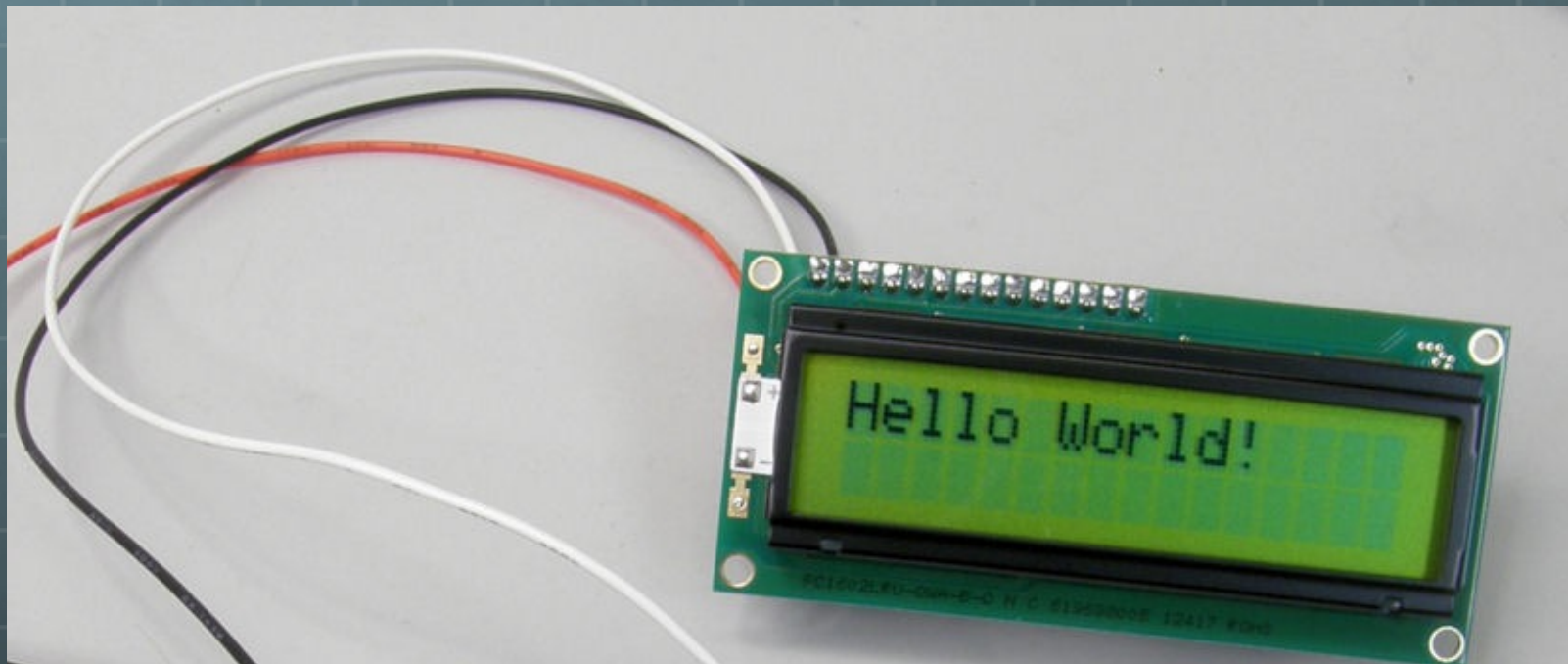
<https://www.youtube.com/watch?v=g8vHhgh6oMo>



<http://instrumentationandcontrol.net/dilbert-the-knack-the-curse-of-the-engineer/>

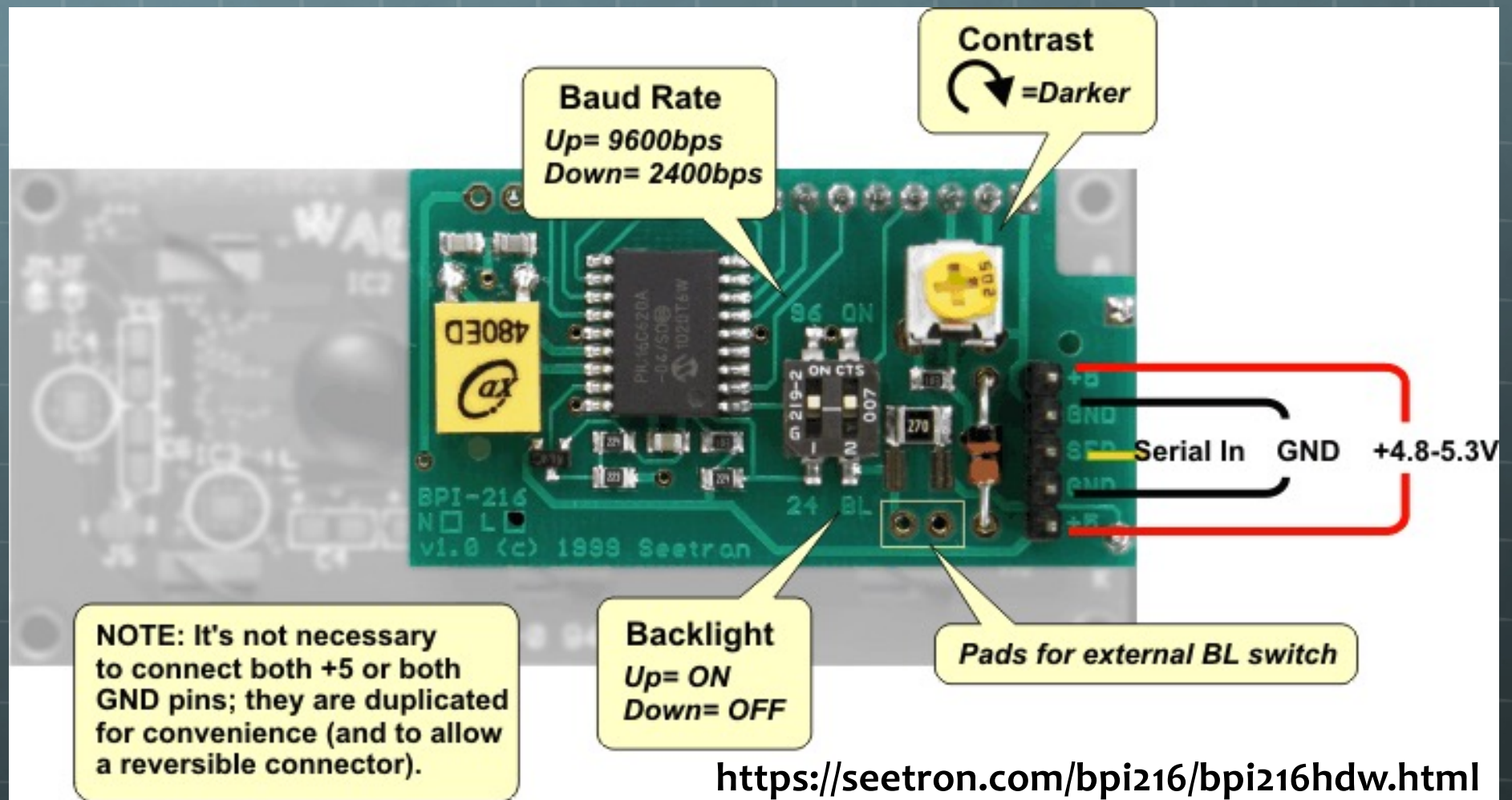
PowerTip PC1602Q B

16 x 2 LCD Display

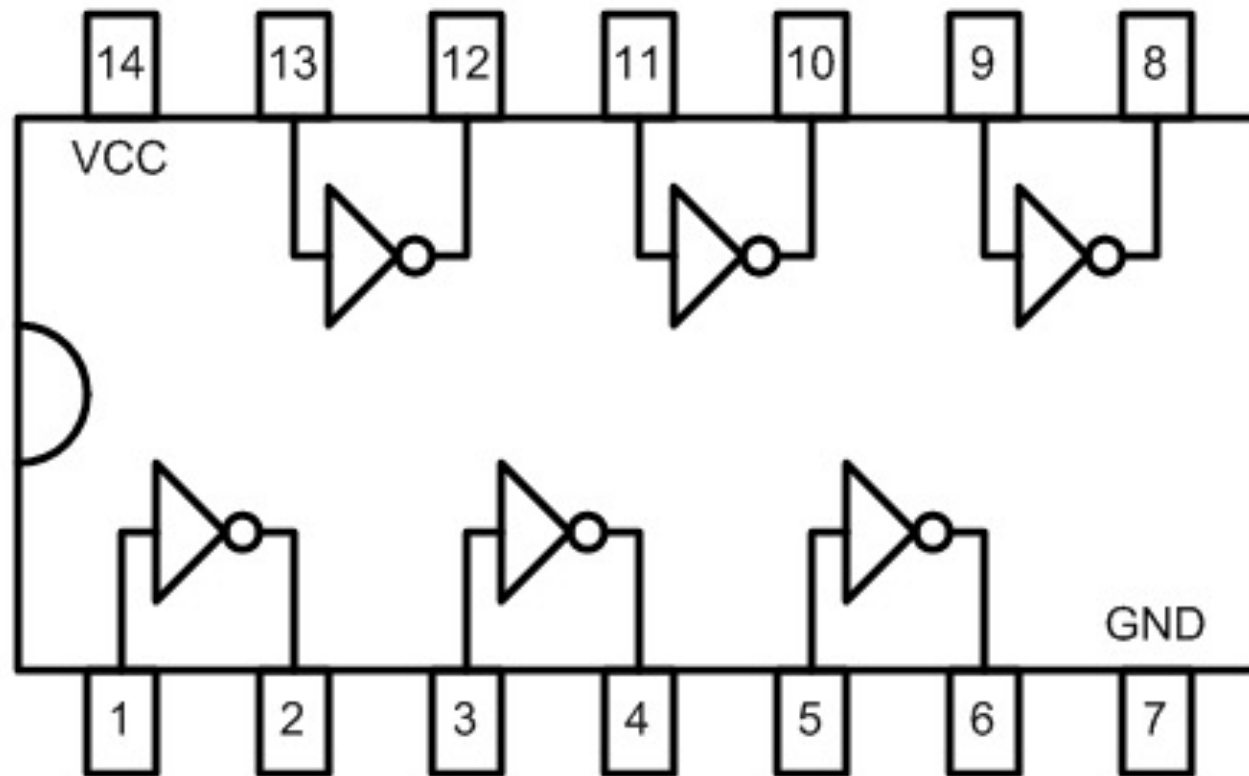


<http://seetrontech.blogspot.com/2011/12/arduino-hello-world-for-bpi-216-serial.html>

BPI-216 LCD Driver Board



7404 IC



7404 Hex Inverter

Welcome to Teensy 3.2

32 Bit Arduino-Compatible Microcontroller

To begin using Teensy, please visit the website & click Getting Started.

www.pjrc.com/teensy

Digital Pins

digitalRead
digitalWrite
pinMode

Analog Pins

analogRead
analogReference
analogReadRes

PWM Pins

analogWrite
analogWriteRes

Touch Sense Pins

touchRead

Serial Ports

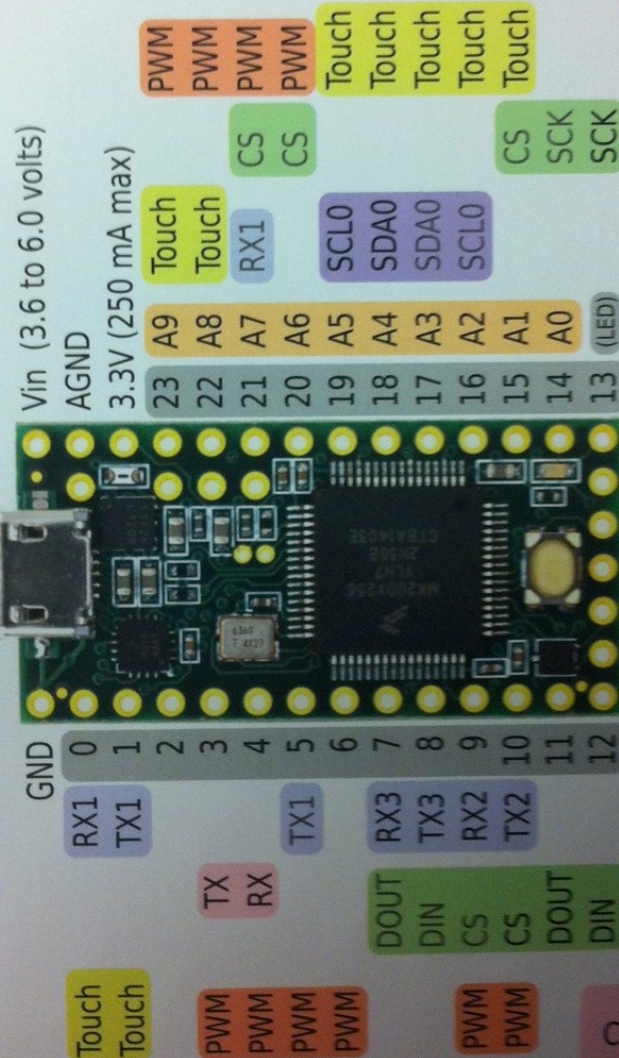
Serial1
Serial2
Serial3

I²C Port

Wire Library

SPI Port

SPI Library



A14/DAC
Program
GND
3.3V
VBat

All digital pins have
interrupt capability.

CAN Bus

Sample Code for BPI-216

/*

This code was adapted from <http://seetrontech.blogspot.com/2011/12/arduino-hello-world-for-bpi-216-serial.html>

J. Wright, 2017

Note: To use this with an Arduino or Teensy, one must invert the TX Serial Output with an inverter gate

Inverter used: 7404 IC

Pin 14 = +5

Pin 7 = GND

Pin 1 = Input from Microcontroller TX

Pin 2 = Inverted Output to SER input of LCD Module (Seetron BPI-216 driving a PowerTip PC1602Q B)

*/


```
#include <SoftwareSerial.h> // Library already in your IDE

const int rxPin = 255        // Not used for LCD – set to invalid pin as we need
                             // something for command below
const int txPin = 5          // Connect BPI/BPK's SER input to this pin

const char clearScreen[ ] = {
    254,1,254,128,0};        // https://www.seetron.com/bpi216/bpi216prog.html
const char message1[ ] = "Hello 467 World" ;
const char message2[ ] = "Code Hard" ;
const char message3[ ] = "Flowchart?" ;

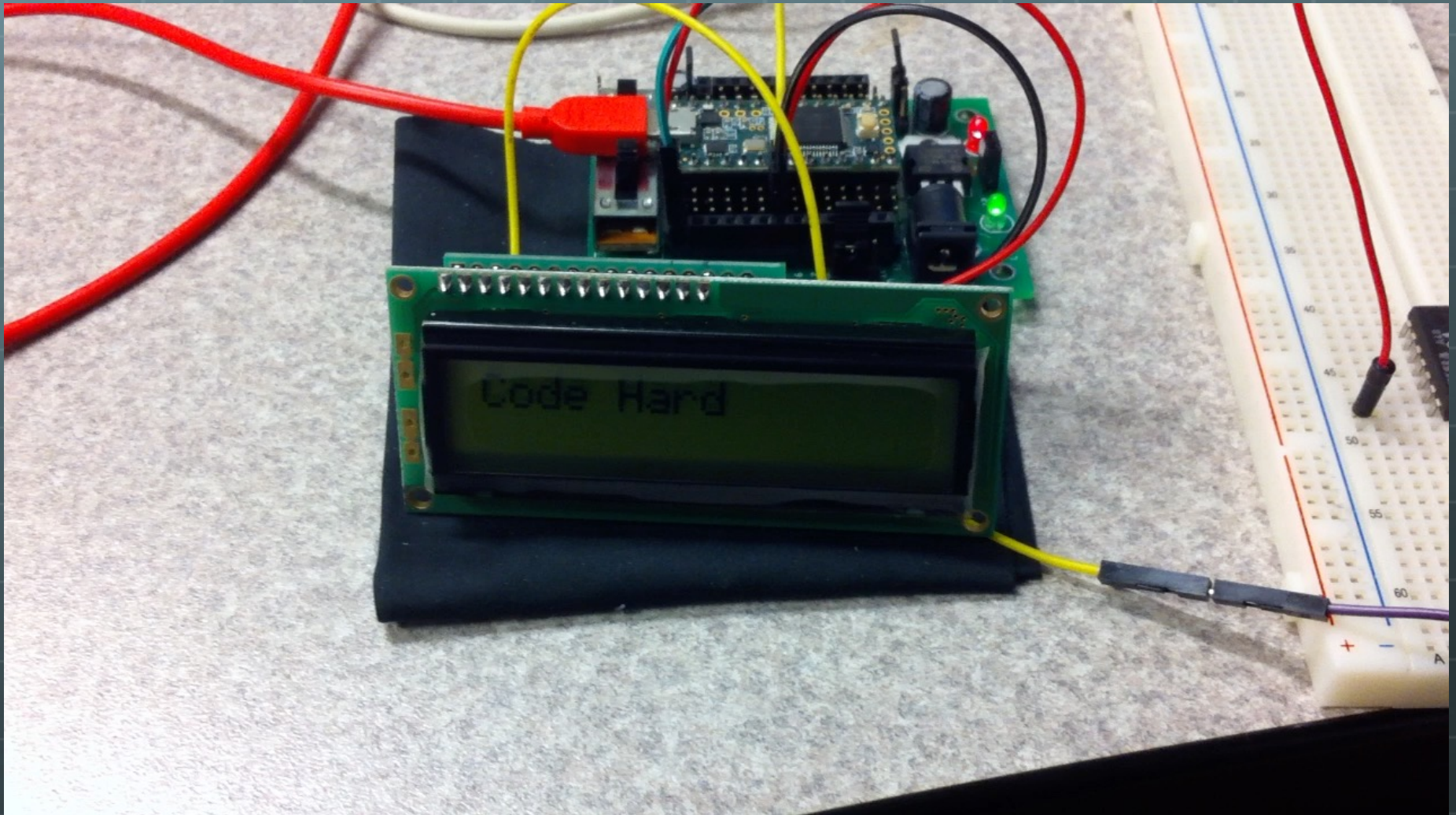
SoftwareSerial mySerial = SoftwareSerial(rxPin, txPin);
```



```
void setup() {  
  pinMode(txPin, OUTPUT);           // Define pin mode for tx:  
  digitalWrite(txPin, LOW);         // Stop bit state for inverted serial  
  mySerial.begin(9600);              // Set the data rate  
  delay(1000);                      // Wait for 1000ms to establish communications  
  mySerial.print(clearScreen);  
  mySerial.print(message1);  
}
```

```
void loop() {  
  delay(1000);  
  mySerial.print(clearScreen);  
  delay(1000);  
  mySerial.print(message2);  
  delay(1000);  
  mySerial.print(clearScreen);  
  delay(1000);  
  mySerial.print(message3);  
}
```

Video of Teensy to BPI-216 LCD



<https://youtu.be/rBc9dd79qe4>

Parallax 27977-ND

2x16 LCD



<https://www.digikey.com/product-detail/en/parallax-inc/27977/27977-ND/1127249>

Sample Code for the Parallax 27977-ND LCD

/ This code is for a Parallax 27977-ND 2x16 LCD. For more information/commands look up <https://www.parallax.com/sites/default/files/downloads/27979-Parallax-Serial-LCDs-Product-Guide-v3.1.pdf>*

This LCD does not require an inverter IC. This LCD does allow for tones/sound to be generated.

Sample code below developed/tested by Ethan Bressler (2019) & Edited by J. Wright (2019)/*

```
#include <SoftwareSerial.h>                                //Library already in your IDE
const int rxPin= 7;                                       // Not used, but needed for command below
                                                         // 255 produces a "/" character on first pass so we use 7
const int txPin= 8;                                       // Connect SER input to this pin
const char message1[ ] = "Hello 467 World";
const char message2[ ] = "Code Really Hard";

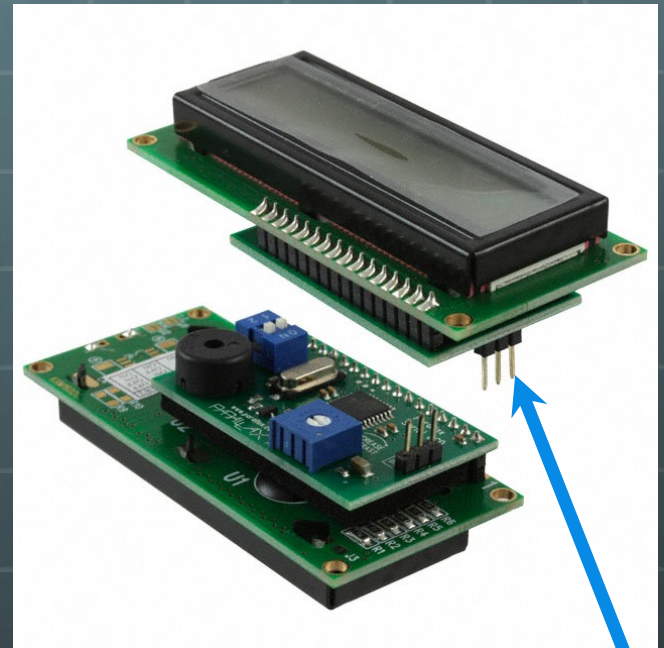
SoftwareSerial mySerial= SoftwareSerial(rxPin, txPin);
```

```
void setup() {  
  pinMode(txPin, OUTPUT);           // Define pin mode for tx:  
  digitalWrite(txPin, LOW);         // Stop bit state for inverted serial  
  mySerial.begin(9600);              // Set the data rate  
  delay(1000);                       // Wait for 1000ms to establish com  
}
```

```
void loop() {  
  mySerial.write(220);               //220 represents Note A (sound) -- Use Parallax PDF  
  mySerial.print(message1);          //Prints "Hello 467 World"  
  delay(5000);  
  mySerial.write(12);                //Clears screen and set to position 0,0  
  delay(1000);                       //Need a minimum of 5ms after a clear command  
  mySerial.write(220);  
  mySerial.print(message2);          //Prints "Code Really Hard"  
  delay(1000);  
  mySerial.write(12);  
  delay(1000);  
}
```


Which One Do I have?

Seetron BPI-216



Parallax 27977

Any Questions?



<https://camdenkelly.com/common-job-interview-questions-and-answers/>