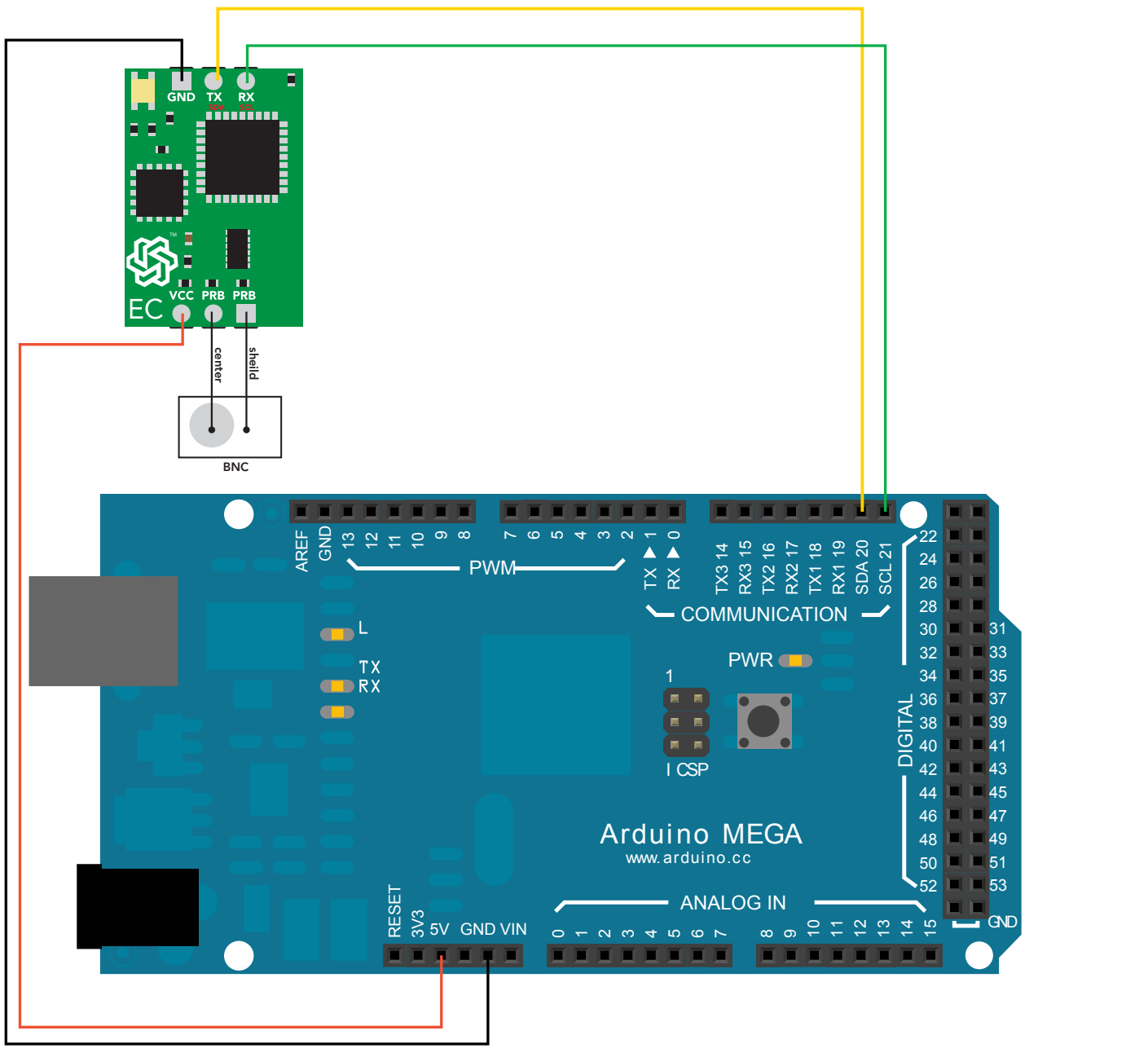
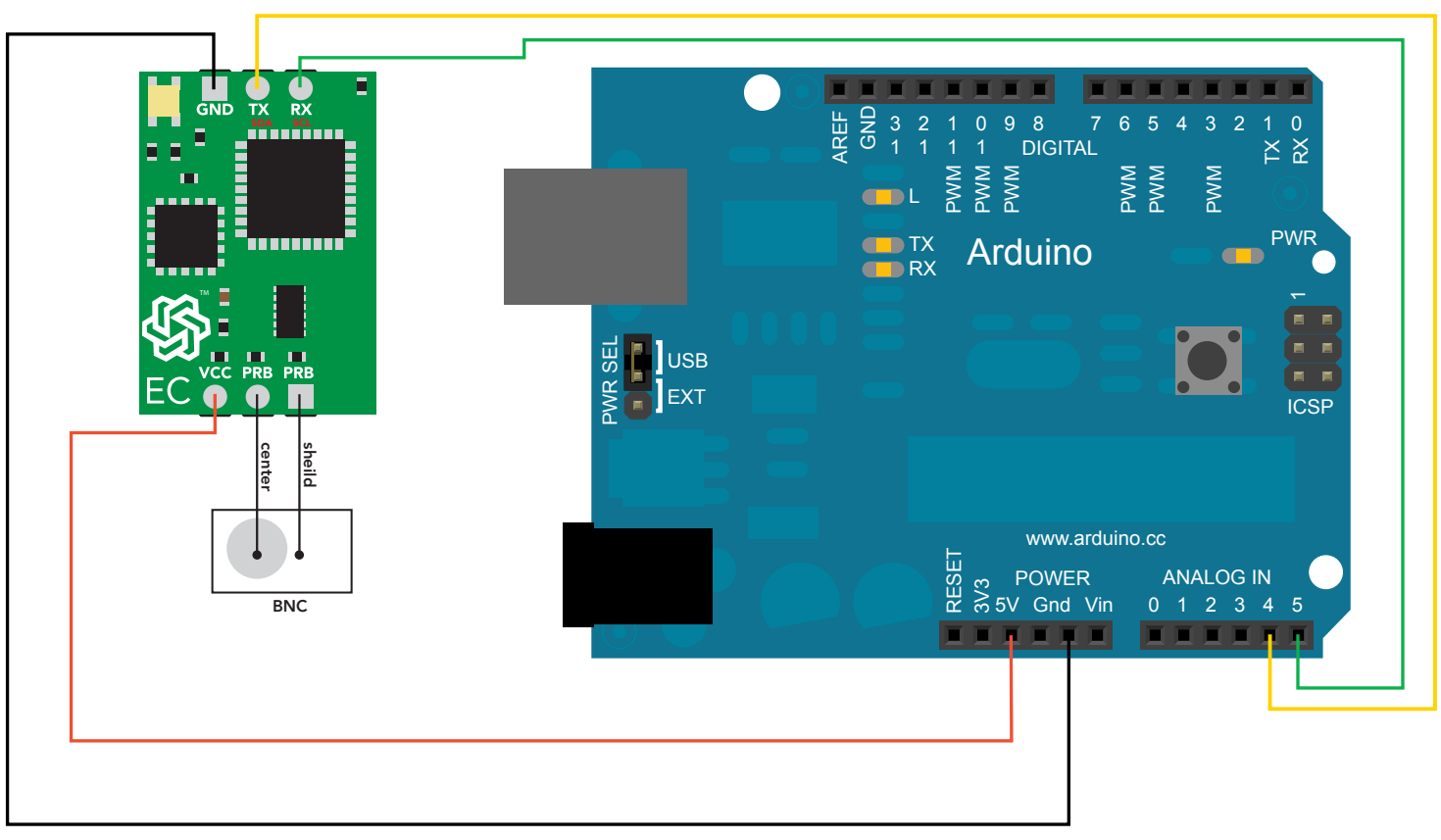
Atlas Scientific™
Environmental Robotics

Conductivity I²C Sample Code

Conductivity I²C






```
//**THIS CODE WILL WORK ON ANY ARDUINO**
//This code has intentionally has been written to be overly lengthy and includes unnecessary steps.
//Many parts of this code can be truncated. This code was written to be easy to understand.
//Code efficiency was not considered. Modify this code as you see fit.
//This code will output data to the Arduino serial monitor. Type commands into the Arduino serial monitor to control the EZO EC Circuit in I²C mode.


#include <Wire.h>                       //enable I²C.
#define address 100                     //default I²C ID number for EZO EC Circuit.


char computerdata[20];                  //we make a 20 byte character array to hold incoming data from a pc/mac/other.
byte received_from_computer=0;          //we need to know how many characters have been received.
byte serial_event=0;                    //a flag to signal when data has been recived from the pc/mac/other.
byte code=0;                            //used to hold the I²C response code.
char ec_data[48];                       //we make a 48 byte character array to hold incoming data from the EC circuit.
byte in_char=0;                         //used as a 1 byte buffer to store in bound bytes from the EC Circuit.
byte i=0;                               //counter used for ec_data array.
int time=1400;                          //used to change the delay needed depending on the command sent to the EZO Class EC Circuit.

char *ec;                               //char pointer used in string parsing.
char *tds;                              //char pointer used in string parsing.
char *sal;                              //char pointer used in string parsing.
char *sg;                               //char pointer used in string parsing.

float ec_float;                         //float var used to hold the float value of the conductivity.
float tds_float;                        //float var used to hold the float value of the TDS.
float sal_float;                        //float var used to hold the float value of the salinity.
float sg_float;                         //float var used to hold the float value of the specific gravity.


void setup()                            //hardware initialization.
{
  Serial.begin(9600);                   //enable serial port.
  Wire.begin();                         //enable I²C port.
}


void serialEvent(){                     //this interrupt will trigger when the data coming from
        received_from_computer=Serial.readBytesUntil(13,computerdata,20);   //the serial monitor(pc/mac/other) is received.
        computerdata[received_from_computer]=0;                             //we read the data sent from the serial monitor
        serial_event=1;                                                     //(pc/mac/other) until we see a <CR>. We also count
      }                                                                     //how many characters have been received.
                                                                            //stop the buffer from transmitting leftovers or garbage.


void loop(){                                                                //the main loop.

 if(serial_event){                                                          //if the serial_event=1.
      if(computerdata[0]=='c'||computerdata[0]=='r')time=1400;              //if a command has been sent to calibrate or take a reading we
     else time=300;                                                         //wait 1400ms so that the circuit has time to take the reading.
                                                                            //if any other command has been sent we wait only 300ms.

  Wire.beginTransmission(address);      //call the circuit by its ID number.
  Wire.write(computerdata);             //transmit the command that was sent through the serial port.
  Wire.endTransmission();               //end the I²C data transmission.

  delay(time);                          //wait the correct amount of time for the circuit to complete its instruction.

  Wire.requestFrom(address,48,1);       //call the circuit and request 48 bytes (this is more then we need).
  code=Wire.read();                     //the first byte is the response code, we read this separately.

  switch (code){                        //switch case based on what the response code is.
    case 1:                             //decimal 1.
      Serial.println("Success");        //means the command was successful.
     break;                             //exits the switch case.

    case 2:                             //decimal 2.
      Serial.println("Failed");         //means the command has failed.
    break;                              //exits the switch case.

    case 254:                           //decimal 254
      Serial.println("Pending");        //means the command has not yet been finished calculating.
    break;                              //exits the switch case.

    case 255:                           //decimal 255.
      Serial.println("No Data");        //means there is no further data to send.
    break;                              //exits the switch case.
   }

  while(Wire.available()){              //are there bytes to receive.
   in_char = Wire.read();               //receive a byte.
   ec_data[i]= in_char;                 //load this byte into our array.
   i+=1;                                //incur the counter for the array element.
    if(in_char==0){                     //if we see that we have been sent a null command.
       Wire.endTransmission();          //reset the counter i to 0.
       break;                           //end the I²C data transmission.
       }                                //exit the while loop.
    }

  Serial.println(ec_data);              //print the data.
  serial_event=0;                       //reset the serial event flag.
  //if(computerdata[0]=='r') string_pars();   //Uncomment this function if you would like to break up the comma separated string
    }                                   //into its individual parts.
}


  void string_pars(){                   // this function will break up the CSV string into its 4 individual parts. EC|TDS|SAL|SG.
                                        //this is done using the C command “strtok”.

   ec=strtok(ec_data, ",");             //let's pars the string at each comma.
   tds=strtok(NULL, ",");               //let's pars the string at each comma.
   sal=strtok(NULL, ",");               //let's pars the string at each comma.
   sg=strtok(NULL, ",");                //let's pars the string at each comma.

   Serial.print("EC:");                 //We now print each value we parsed separately.
   Serial.println(ec);                  //this is the EC value.

   Serial.print("TDS:");                //We now print each value we parsed separately.
   Serial.println(tds);                 //this is the TDS value.

   Serial.print("SAL:");                //We now print each value we parsed separately.
   Serial.println(sal);                 //this is the salinity value.

   Serial.print("SG:");                 //We now print each value we parsed separately.
   Serial.println(sg);                  //this is the specific gravity value.


 //Uncomment this section if you want to take the values and convert them into floating point number.
    /*
    ec_float=atof(ec);
    tds_float=atof(tds);
    sal_float=atof(sal);
    sg_float=atof(sg);
    */
  }
```

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