Notes on serial communication

# Initial code

Single character or number (0to9) = 2 Bytes

For (maximum) control command = 34 Bytes

char output[50] = "";

void serialEvent() {

  while (Serial.available()){

  // read the incoming byte:

  bool newLine = false;

  char inChar = (char)Serial.read();

  // add it to the output string:

  output[strlen(output)] = inChar;

  // if the incoming character is a newline, set a flag

  // so the main loop can do something about it:

  if (inChar == '\r') {

    newLine = true;

  }

  // if we got a newline, print the output string:

  if (newLine) {

    Serial.print("I received: ");

    Serial.println(output);

    // print how many bytes

    Serial.print("Number of bytes: ");

    Serial.println(strlen(output));

    // Print how many bytes

    // clear the string for new input:

    // clear the string for new input:

    memset(output, '\0', sizeof(output));

  }

  }

}

void setup() {

  Serial.begin(9600);

}

void loop() {

  while(1){

    serialEvent();

  }

}

# Breakdown of device communication

For communication:

* OhmMeter/Mag Board – **Atmega328p**
* Main Board- **Atmega328p**
* SSC-32u – **Atmega328p**
* Desktop PC Serial port

Communication protocol:

Setup:

* **Main board** *INIT position commands***>>** **SSC-32u**

Looping:

* **Main Board** *Move to starting position command* **>>SSC-32u**
* **Main board** *pick up/test position command* **>>** **SSC-32u**
* **Main board** *TEST ohm command* **>>** **OhmMeter/Mag Board**
* **OhmMeter/Mag Board** *Send AvgValue* **>>** **Main Board**
* **Main Board** *MagnetOn* command **>>** **OhmMeter/Mag Board**
* **Main Board** *Move to box position command, based on AvgValue* **>>SSC-32u**
* **Main Board** *MagnetOff* command **>>** **OhmMeter/Mag Board**

Settings:

**Setting 1:**

* **Main board** *send data log* **>>****Desktop PC Serial port**

**Setting 2:**

* **Desktop PC Serial port** *send box assignments* **>> Main board**

**Setting 3:**

* **Main board** *Read ohm meter (for testing)* **>> OhmMeter/Mag Board**
* **OhmMeter/Mag Board** *Return ohm reading (for testing)* **>> Main board**

**Setting 4:**

* **Main board** *Turn magnet on (for testing)* **>> OhmMeter/Mag Board**
* **Main board** *Turn magnet Off (for testing)* **>> OhmMeter/Mag Board**

# Breakdown of specific commands:

**Position commands:**

* **INIT position command**

Moves the arm to the starting position using the predefined command string:

#0P1425#1P1500#2P1500#3P700T2000

Immediately followed by base (servo 0) offset calibration (other calibration commands can be added too)

#2PO-100

* **Move to starting position command**

Moves the arm to the starting position using the predefined command string:

#0P1425#1P1500#2P1500#3P700T2000

* **pick up/test position command**

Moves the arm to the starting position using the predefined command string:

#0P1425#1P1500#2P1500#3P700T2000

Moves down to read resistor using predefined command string:

#0P1425#1P1243#2P1616#3P940T1000

Moves the arm back to the starting position using the predefined command string:

#0P1425#1P1500#2P1500#3P700T2000

* **Move to box position command, based on AvgValue**

Moves arm from starting position to the desired box. A command for each motor will be combined into a single string followed by a carriage return. This will allow all movements to execute at once.

Values will be generated from X, Y coordinates using the most recently received “AvgValue and the “getArmCode” function.

**Magnet commands:**

* *MagnetOn* command

*Is simply a string ‘MAG1’;*

* *MagnetOff* command

*Is simply a string ‘MAG1’;*