

Parts List

MCU

Arduino Uno R3 or Sparkfun Redboard. While other MCU boards might be used, these were the only ones verified to work during development.

The Arduino Uno R3 (<https://store.arduino.cc/usa/arduino-uno-rev3>) uses a USB-B type connector. A USB-A to USB-B cord used to be supplied with the Arduino Uno R3 when ordered from them, not sure if this is still the practice.

The Sparkfun Redboard (<https://www.sparkfun.com/products/13975>) uses a mini-B USB connector. Ensure you have the appropriate USB cord for connecting the MCU board to the device you plan on using in order to install the sketch on the MCU board.

You will need to install the Arduino IDE (free download @ <https://www.arduino.cc/en/main/software>).

Other components

The symbol (*) denotes a variable quantity. The prototype was designed and built for 4 Original iGaging Absolute scales as input. This quantity may be reduced to the number of scales you wish to interface. It is also advisable to have extra components if you don't have much experience building something like this.

1. Proto-shield
 - a. https://www.amazon.com/gp/product/B07RGPZ2RW/ref=ppx_yo_dt_b_asin_title_o07_s00?ie=UTF8&psc=1
2. Bluetooth module (qty 1)
 - a. <https://www.microcenter.com/product/616259/inland-hc-05-bluetooth-transmission-module-for-arduino-bottom-master-slave>
 - b. https://www.amazon.com/gp/product/B071YJG8DR/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1
3. USB mini-B breakout boards (qty 4*)
 - a. <https://www.sparkfun.com/products/9966>

- b. https://www.digikey.com/en/products/detail/sparkfun-electronics/BOB-09966/5673777?utm_adgroup=Adapter%2C%20Breakout%20Boards&utm_source=google&utm_medium=cpc&utm_campaign=Shopping_Prototyping%2C%20Fabrication%20Products&utm_term=&utm_content=Adapter%2C%20Breakout%20Boards&gclid=CjwKCAjwiaX8BRBZEiwAQQxGx8mPzdk1PoP1xZIUQmVaiYb4CsyZr-ItmEkUacQ-uvFjrh34IvhL0hoCQb8QAvD_BwE
4. Pin Headers
 - a. https://www.amazon.com/gp/product/B0817JG3XN/ref=ppx_yo_dt_b_asin_title_o07_s01?ie=UTF8&psc=1
 5. Stackable Header for connecting Bluetooth module (qty 1)
 - a. <https://www.sparkfun.com/products/11894>
 - b. <https://www.sparkfun.com/products/9280>
 6. Screw Terminal Block Connectors
 - a. https://www.amazon.com/gp/product/B07WR5NMWN/ref=ppx_yo_dt_b_asin_title_o06_s00?ie=UTF8&psc=1
 7. Wire, solid core, 22AWG to 26 AWG in size (Do NOT use PVC insulated wire, silicone insulated wire recommended)
 - a. <https://www.adafruit.com/product/1311>
 8. Resistors– these components were sourced from various suppliers. Resistors should be of the ¼ watt rated, through hole (THT), axial lead, carbon film type.
 - a. 4.7 kΩ resistors (4*) for scale clock pull-up circuits.
 - b. 220 Ω (qty 1) resistor for Bluetooth module voltage divider.
 - c. 330 Ω (qty 1) resistor for Bluetooth module voltage divider.
 - d. This resistor pack contains all needed sizes: <https://www.sparkfun.com/products/10969>
 9. 0.1 μF capacitor. The capacitor is optional, but it is HIGHLY recommended. It is a ceramic 0.1 microfarad (104 designation) added for signal conditioning and noise suppression.
 - a. <https://www.sparkfun.com/products/8375>
 10. PCB Standoffs. Used to mount the Arduino in the enclosure.
 - a. https://www.amazon.com/ZYAMY-Standoff-Assortment-Mounting-Hardware/dp/B07CN3N8BS/ref=sr_1_14?dchild=1&keywords=pcb+standoffs&qid=1604348980&sr=8-14

11. Plastic enclosure/Project box. This can be any enclosure large enough to contain the controller that is/can be sealed tight against moisture, swarf, coolant, and other things that can be detrimental to the electronic/electrical components. Plastic is necessary to prevent interference with the Bluetooth module signal, the enclosure can NOT be metal. Penetrations will need to be cut/drilled to allow for passage of the power cord and scale USB cords. The penetrations will require sealing with grommets, silicone sealant, or other.
12. Wall wart. Used to provide power to the controller MCU board via barrel jack. Verify it is within the required supply voltage and amperage for the MCU used. Needs to be similar to this: <https://www.sparkfun.com/products/15314>. This site gives the power requirements for the Arduino Uno R3 under the “Tech Specs” tab: <https://store.arduino.cc/usa/arduino-uno-rev3>

The Resistors and capacitor can be sourced in various electronic component kits available on Amazon and other suppliers, along with other useful items such as pushbuttons for use on the shield. Some of these kits contain necessary items such as pin headers, one of the items listed above. If you decide to go with an alternative component kit, ensure it contains the EXACT items needed.

The following is a list of websites where many/all of these components are available.

(This is NOT an all-inclusive list)

- Amazon - <https://www.amazon.com/>
- Sparkfun - https://www.sparkfun.com/?_ga=1.192057506.907504000.1432950319
- Adafruit - <https://www.adafruit.com/>
- Digikey - <https://www.digikey.com/>
- Mouser Electronics - <https://www.mouser.com/>
- Arduino Store - <https://store.arduino.cc/usa/>