

# Digilent Robotic Starter Kit with Cerebot 32MX4 Reference Manual



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## Overview

The Digilent Robotic Starter Kit (RSK) is an ideal platform for robotic applications. When used with any of several available Digilent Embedded Controllers and our extensive line of Peripheral Modules (PMods), countless designs can be implemented, from basic experiments through more advanced systems.

Included parts:

- Rugged metal platform with holes on 1/2" center
- Two 1/19 ratio motor/gearbox drives with ABS plastic wheels (1/53 gear ratio motors are available)
- Two Digilent PMOD HB5, 2A H-bridge motor amplifiers with attachment clips
- Rugged plastic wheels and drag button
- Rugged metal motor mount
- AA Battery Holder (holds four AA batteries)
- All wiring and assembly hardware included

## Functional Description

The rugged steel components have holes on 1/2" centers allowing Digilent circuit boards and other products (even those from other vendors) to be easily attached.

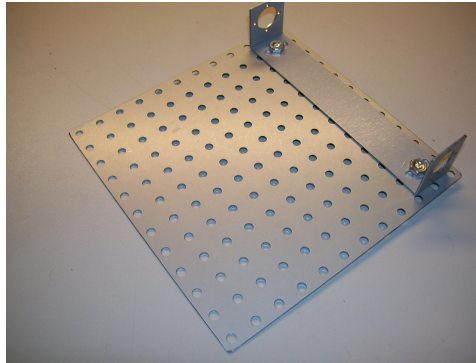
The following tools are recommended for robot assembly:

- Regular and small Phillips head screwdriver
- Small wrench
- Pliers
- Wire stripper

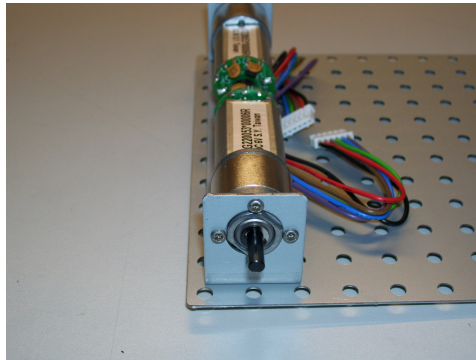
## Example Assembly

There are many ways in which to assemble the Digilent Robotic Starter Kit. An example assembly, using the Cerebot 32MX4 board *RSK\_StartupDesign\_Cerebot32MX4* reference design, is detailed below:

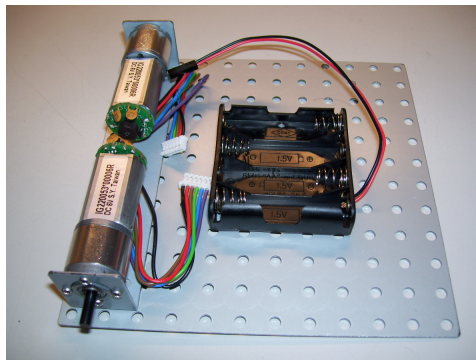
1. Take out the metal platform and place the metal motor mount on the top right side. Attach screws accordingly.



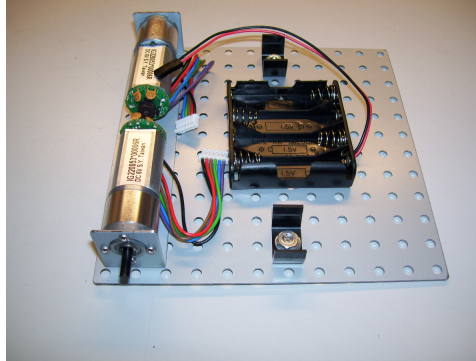
2. Attach motors to the metal motor mount with miniature screws.



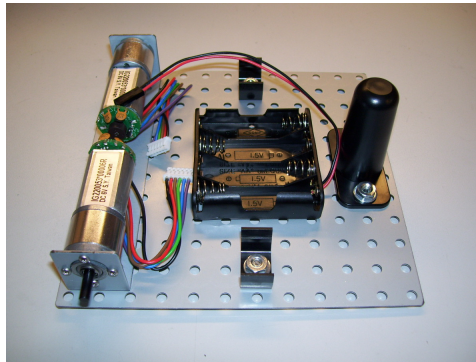
3. Attach the battery holder to the metal platform, below the motor mount using the sticky Velcro.



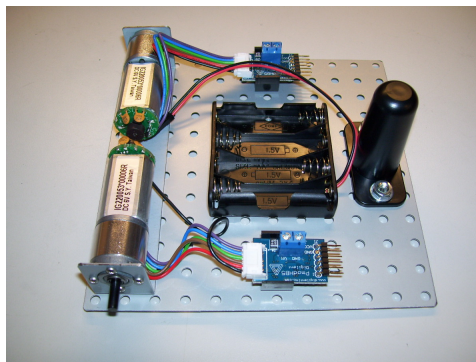
4. Attach the Pmod clips to the metal platform on either side of the battery holder.



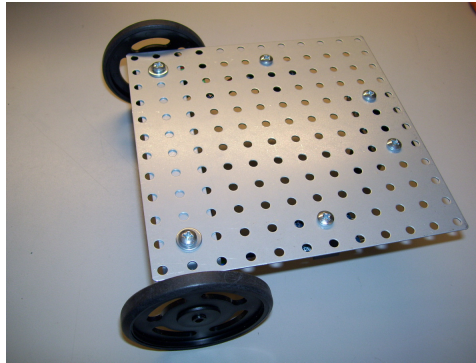
5. Attach the drag button to the metal platform, below the battery holder.



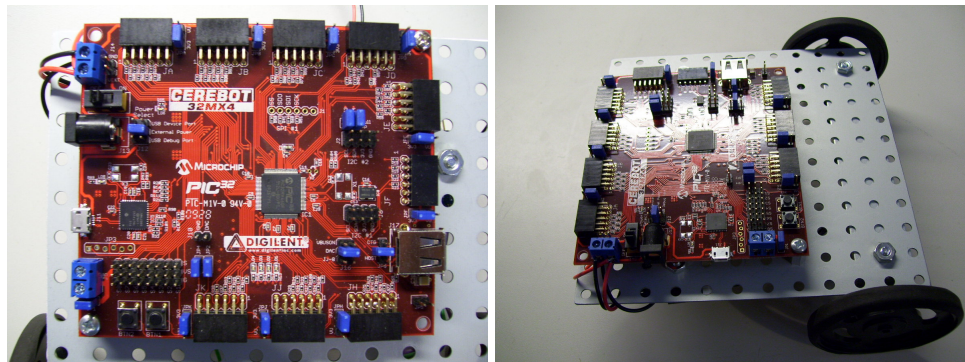
6. Attach the two Pmod HB5 modules to the Pmod clips and connect them to the motors accordingly.



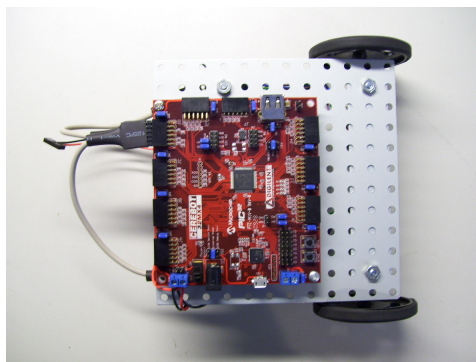
7. Attach the plastic wheels to the motors.



8. Examine the Cerebot 32MX4 board by comparing to the picture below, making note that the blue shorts are attached to each jumper as depicted. Attach the Cerebot 32MX4 board to the top side of the metal platform. Be careful not to cross thread screws while mounting the Cerebot 32MX4 Board.

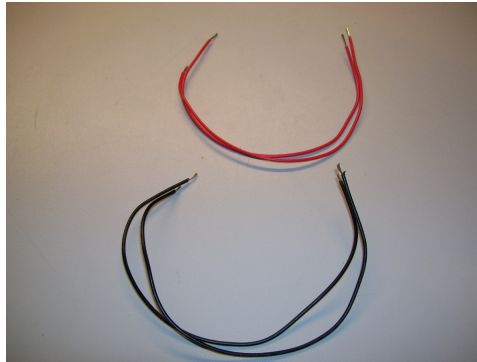


9. Connect the two Pmod HB5 modules to ports on the Cerebot 32MX4 board via 6-pin cable connectors to port JD. Use the marker on the cable connector to ensure that pin placements are in alignment when connecting the boards.

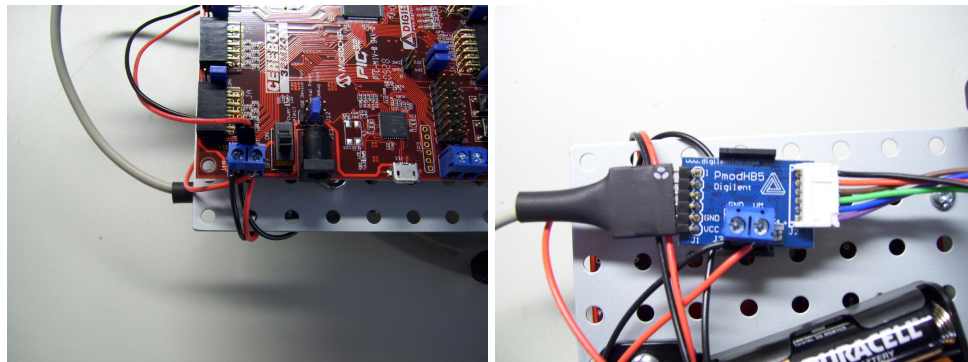




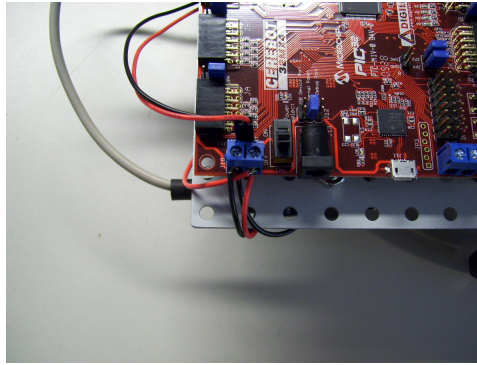
10. Strip a centimeter's length of wire sheath from both ends of all red and black 22 guage power wires.



11. Route power wires from each Pmod HB5 to the J18 power connector on the Cerebot 32MX4 board, noting ground and voltage connections.



12. Attach the power cable from the battery back to the J14 battery power connector on the Cerebot 32MX4 board.



13. MPLAB can now be used to program the *RSK\_StartupDesign\_Cerebot32MX4* reference design to the board. Note that running the reference design that turns the motors requires that the power select mode jumper J12 be shorted to External Power. Once the board has been programmed with the reference design, pressing button 2 should cause the motors to turn while pressing button 1 should cause them to stop. This should confirm that the RSK has been assembled correctly.