Overview

The Digilent Basic Robotic Development Kit (RDK-Basic) 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:

- PmodBTN
- PmodSWT
- PmodCLS (6-pin connector cable included)
- Cerebot MX4cK or Cerebot 32MX4
- rugged metal platform with holes on ½-inch center
- one angled metal plate expansion
- two 1/19 ratio motor/gearbox drives with ABS plastic wheels (1/53 gear ratio motors are available)
- two Digilent PmodHB5 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 ½-inch centers allowing Digilent circuit boards and other vendors’ products to be easily attached.

The following tools are recommended for robot assembly:

- regular and small Phillips head screwdriver
- small wrench
- pliers
- wire stripper

Note: The Cerebot MX4cK uses the same ports and jumper positions for this project as the Cerebot 32MX4. You may safely follow all of the pictures while assembling your kit.
Example Assembly

The following example assembly makes use of the RDK_Basic reference design, available at www.digilentinc.com:

1. Attach the angled plate expansion to the end of the main metal platform as shown.

2. Turn the assembly upside-down and attach the motor mount.

3. Attach the battery holder to the metal platform using the adhesive-backed Velcro.
4. Attach motors to the metal motor mount with the miniature screws.

5. Attach the Pmod clips to the metal platform on either side of the battery holder.
6. Attach the drag button to the metal platform below the battery holder.

7. Attach the two PmodHB5 modules to the Pmod clips and connect them to the motors accordingly.

8. Attach the plastic wheels to the motors.
9. Compare the Cerebot MX4cK board to the picture below. Note that the blue shorts are attached to each jumper as depicted. Remove the rubber feet from the bottom of the corners of the Cerebot MX4cK. Attach the standoffs to the board using the corresponding mounting screws. Mount the Cerebot MX4cK board to the top side of the metal platform. Be careful not to cross thread screws while mounting the Cerebot MX4cK board.

*Note: The Cerebot 32MX4 can also be used with this procedure.*
10. Connect the two PmodHB5 modules to port JD on the Cerebot MX4cK board using the 2x6 Pin to dual 6 pin cable. Use the marker on the cable connector to ensure that pin placements are in alignment when connecting the boards.

11. Strip 1/2-inch of insulation from both ends of all red and black 22 gauge power wires.
12. Route power wires from each PmodHB5 to the J18 power connector on the Cerebot MX4cK board, noting ground and voltage connections.

13. Attach the power cable from the battery back to the J14 battery power connector on the Cerebot MX4cK board.
14. Connect the PmodBTN to the top JE Pmod header, and connect the PmodSWT to the top JA Pmod header.

15. Using the included standoff kit, mount the PmodCLS on the angled mounting bracket.
16. Connect the 6-pin JTAG extension cable to top JB Pmod header and the other end to J1 of the PmodCLS.

![Image of PmodCLS with JTAG Cable Connected]

17. On the PmodCLS, place the JP1 jumper in the SS position and the JP2 Jumper in the MD0 position.

![Image of PmodCLS with JP1 and JP2 Jumpers Placed]

MPLAB can now be used to program the *RDK_Basic* reference design to the board. For more information on how to program the Cerebot MX4cK using MPLAB, see the Cerebot MX4cK LED Demo project at www.digilentinc.com. 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, the PmodCLS will display “Hello From Digilent!” and pushing the buttons on the PmodBTN or toggling the switches on the PmodSWT will cause the robot to perform movements.