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Control Meccano Meccanoid

Connect a Meccanoid to your EZ-B by using an Arduino as the translator.

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Introduction

You may have seen some of the EZ-Robot community converting the Meccano Meccanoid to use EZ-Robot parts to add real robot features to the Meccanoid toy. While most users prefer to replace the low torque and twitchy Meccano servos with HDD Servo. Some users may wish to keep the Meccano servos to use with the EZ-B.
The Meccano servos use a modified UART protocol with 1 start bit and 2 stop bits, which is not compatible with the EZ-B natively. The solution is to use an Arduino and the provided sketch as a translator between the EZ-B and Meccano servos.
For those interested in what can be accomplished by changing the servos, check tezsmith's EZ-Robot'd Meccanoid out: https://www.ez-robot.com/Community/Forum/Thread?threadId=9320
If you wish to continue using the Meccano servos, keep reading the rest of this tutorial.

Program and Connect Arduino

The Meccanoid servos use a different serial protocol than standard. The difference is that there is 1 start bit and 2 stop bits. The way around this is to program an Arduino to become a translator for the EZ-B.

1. Connect UART1 TX to Arduino RX

2. Connect Arduino pins to servo chains:

- Pin 5 (chain1): Left Arm
- Pin 6 (chain2): Head
- Pin 7 (chain3): Right Arm

*Note: The meccanoid servo communication requires a pull-up resistor, according to the manual. Check the manual for the appropiate pull-up schematic.

The Arduino sketch below will listen to serial commands from the EZ-B and send the commands to the appropriate Meccanoid servo chain. Each command is 3 bytes long (command, param1, param2).
The commands are:

- Command 0: set servo color
- Command 1: set servo position

For more details of the commands, examine the comments in the Loop().
Download the following libraries for the arduino sketch: meccanoid-library.zip
Here is the program for the Arduino Sketch: MeccanoidEZB.zip

The EZ-B will now send commands to the Arduino over Serial at 9600 using the first UART port. Of course, you can change that UART to any other UART of the EZ-B v4, as long as you update the script.
Here is an example ez-script to move the left shoulder to 90 degrees.

```

UARTInit(0, 0, 9600)
definearray($mecaSend, 3)
$mecaSend[0] = 0x01 # move servo
$mecaSend[1] = 0x00 # LEFT_ARM_PITCH
$mecaSend[2] = 90   # 90 degrees
UARTWriteBinary(0, 0, $mecaSend)

```

Here is an example ez-script to change the color of the right shoulder to red.

```

UARTInit(0, 0, 9600)
definearray($mecaSend, 3)
$mecaSend[0] = 0x00 # change color
$mecaSend[1] = 0x05 # RIGHT_ARM_PITCH
$mecaSend[2] = 0xf1 # JOINT_RED
UARTWriteBinary(0, 0, $mecaSend)

```

*Note: in the examples, the UARTInit() is called for each example. This command only needs to be called one time. It is only placed in each example to demonstrate the UART initialization command. You can place this command in your CONNECT script for the EZ-B. The CONNECT script is located in the connection control by pressing the GEAR icon.

The EZ-Robot 2.5 Amp Motor Controller will power the Meccanoid's movement motors just fine. Consult the HBridge ARC manual for more information:
With PWM (recommended: https://www.ez-robot.com/Tutorials/Help.aspx?id=192
Without PWM: https://www.ez-robot.com/Tutorials/Help.aspx?id=70