CMUcam4

Programming Guide v1.02

For CMUcam4 v1.02 Firmware

Firmware Programming Tools

Please check the list below to program the CMUcam4:

1. You will need one of the following (or similar) **USB to Serial Converters** to program the CMUcam4
    - ☐ An FTDI 5V Breakout Board
        - You will also need an external power supply capable of powering the CMUcam4
        - Please connect the **FTDI 5V Breakout Board** to the **6-pin** connector on the CMUcam4
    - ☐ An FTDI 3.3V Breakout Board
        - You will also need an external power supply capable of powering the CMUcam4
        - Please connect the **FTDI 3.3V Breakout Board** to the **6-pin** connector on the CMUcam4
    - ☐ A Prop Clip
        - You will also need an external power supply capable of powering the CMUcam4
        - Please connect the **Prop Clip** to the **4-pin** connector on the CMUcam4
    - ☐ A Prop Plug
        - You will also need an external power supply capable of powering the CMUcam4
        - Please connect the **Prop Plug** to the **4-pin** connector on the CMUcam4
    - ☐ An FTDI 5V Cable w/ 5V I/O
        - **Recommended for 5V tolerant systems**
        - Please connect the **FTDI 5V Cable w/ 5V I/O** to the **6-pin** connector on the CMUcam4
    - ☐ An FTDI 5V Cable w/ 3.3V I/O
        - **Recommended for 3.3V tolerant systems**
        - Please connect the **FTDI 5V Cable w/ 3.3V I/O** to the **6-pin** connector on the CMUcam4

2. You will also need to download one of the following propeller loader tools to program the CMUcam4
    - ☐ For Windows Users – Follow the instructions on screen to install **The Propeller Tool**
        - **NOTE: You will need to change the default Propeller Tool propeller reset signal option**
            1. Run the **Propeller Tool**
            2. Go to **Edit** -> **Preferences…** -> **Operation** -> **Propeller Reset Signal**
            3. Select **DTR & RTS** from the drop-down list
            4. Click **Accept**
    - ☐ For Linux and Macintosh Users – Follow the instructions on screen to install **BST**
        - **NOTE: You cannot use the FTDI 5V Cables with BST**

Downloading the Firmware

Please follow the steps below to program the CMUcam4:

- For **Propeller Tool** Users:

    1. Connect the **USB to Serial Converter** to your computer and the **CMUcam4**
        - Also connect an external power supply, if necessary, to power the **CMUcam4**
    2. The **Green Power LED** should be lit up now
        - The **Red Auxiliary LED** will also be lit up if the **CMUcam4** was programmed previously
    3. Run the **Propeller Tool**
    4. Go to **File** -> **Open**
    5. Select **Propeller Applications (*.binary, *.eeprom)** from the **Files of type** drop-down list
    6. Find and select either the **!CMUcam4_Firmware.binary** or **!CMUcam4_Firmware.eeprom** file
        - Both the **.binary** and **.eeprom** files are equivalent for programming the **CMUCam4**
    7. Click **Open**
    8. The **Object Info** dialog box should now appear
    9. Click **Load EEPROM**
    10. Wait until the programming process is finished
    11. Close the **Object Info** dialog box and then go to **Run** -> **Parallax Serial Terminal…**
    12. Select **19200** from the **Baud Rate** drop-down list
    13. Select the COM port the **CMUcam4** is connected to from the **Com Port** drop-down list
        - Click **Enable** if necessary
    14. Type **RS** and press enter and the **CMUCam4** should respond with:

```
ACK

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:
```

    15. That's it you're done!

- **Propeller Tool** Download Troubleshooting:

Problem: The **Propeller Tool** displays **"No serial ports found"** when you click **Load EEPROM**
Solution: Double check the connection between the **USB to Serial Converter** and your computer

Problem: The **Propeller Tool** displays **"No Propeller chip found on any serial port"** when you click **Load EEPROM**
Solution: Double check the connection between the **USB to Serial Converter** and the **CMUcam4**

Problem: The **Propeller Tool** displays **"Write failure on COM"** during the programming process
Solution: Double check the connection between your computer the **CMUcam4**

Problem: The **Propeller Tool** displays **"Read failure on COM"** during the programming process
Solution: Double check the connection between your computer the **CMUcam4**

Problem: The **Propeller Tool** displays **"Propeller lost on COM"** during the programming process
Solution: Try again and if this problem still occurs your **CMUcam4** is most likely damaged

Problem: The **Propeller Tool** displays **"EEPROM programming error on COM"** during the programming process
Solution: Try again and if this problem still occurs your **CMUcam4** is most likely damaged

Problem: The **Propeller Tool** displays **"EEPROM verify error on COM"** during the programming process
Solution: Try again and if this problem still occurs your **CMUcam4** is most likely damaged

- For **BST (Brad's SPIN Tool)** Users:

    1. Connect the **USB to Serial Converter** to your computer and the **CMUcam4**
        - Also connect an external power supply, if necessary, to power the **CMUcam4**
    2. The **Green Power LED** should be lit up now
        - The **Red Auxiliary LED** will also be lit up if the **CMUcam4** was programmed previously
    3. Run **BST**
    4. Go to **File** -> **Open**
    5. Find and select either the **!CMUcam4_Firmware.binary** or **!CMUcam4_Firmware.eeprom** file
        - Both the **.binary** and **.eeprom** files are equivalent for programming the **CMUCam4**
    6. Click **Open**
    7. The **Binary Download** dialog box should now appear
    8. Click **EEPROM**
    9. Wait until the programming process is finished and then click **OK**
    10. Close the **Binary Download** dialog box and then go to **View** -> **Serial Terminal**
    11. Go to **Baud** and select **19200** from the drop-down list
    12. Go to **Format** and select **8 Bits** and **Parity None** from the drop-down list
    13. Go to **Port** and select the COM port the **CMUcam4** is connected to from the drop-down list
    14. Go to **Communicate** and select **Connect** from the drop-down list
    15. Type **RS** and press enter and the **CMUCam4** should respond with:

```
ACK

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:
```

    16. That's it you're done!

- **BST (Brad's SPIN Tool)** Download Troubleshooting:

Problem: **BST** displays **"We can't find a propeller on port"** when you click **EEPROM**
Solution: Double check the connection between the **USB to Serial Converter** and your computer

Problem: **BST** displays **"We can't find a propeller on port COM"** when you click **EEPROM**
Solution: Double check the connection between the **USB to Serial Converter** and the **CMUcam4**

Problem: **BST** displays **"Communication Timeout verifying RAM"** during the programming process
Solution: Double check the connection between your computer the **CMUcam4**

Problem: **BST** displays **"Communication Timeout verifying EEPROM"** during the programming process
Solution: Try again and if this problem still occurs your **CMUcam4** is most likely damaged