



CMUcam4

Programming Guide v1.00

For CMUcam4 v1.00 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
CMUcam4 v1.00
:
```

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
```

```
CMUcam4 v1.00
```

```
:
```

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