

ROCHESTER INSTITUTE OF TECHNOLOGY

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## K64 Motor Shield Adapter

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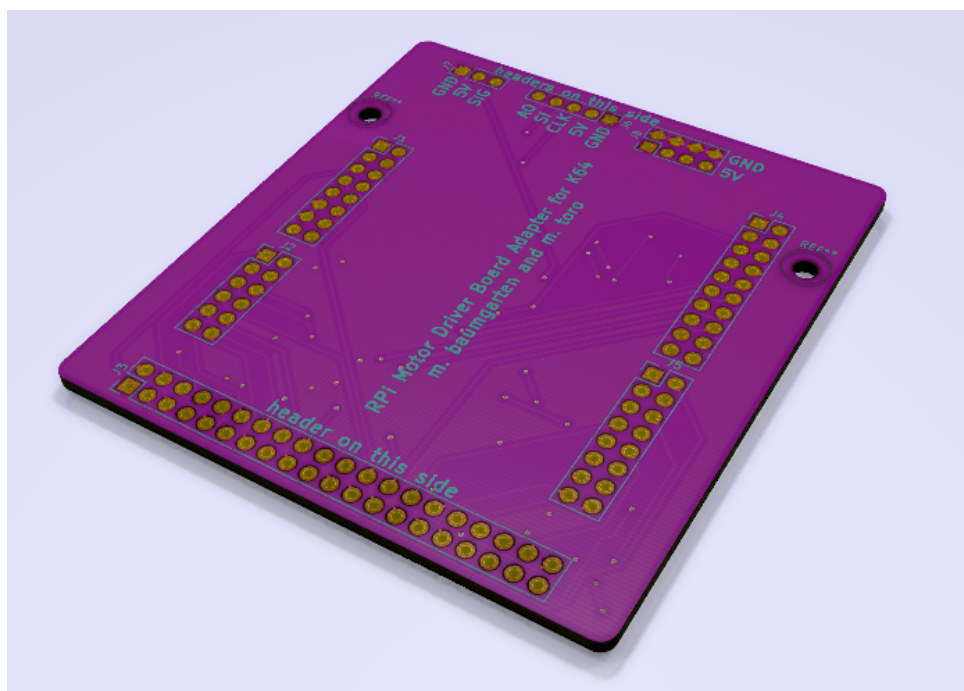


Figure 1: 3D Rendering of the Adapter Board (front)

# 1 Description

This adapter board was created to simplify using the FRDMK64 Microcontroller with the MC33886 Raspberry Pi Motor Driver Board. The adapter ties 4 PWM-enabled k64 pins to the PWM inputs on the motor driver board. In addition, the adapter has a header for servo control and a line scan camera. Most of the exposed pins on the K64 are accessible through the motor shield when using this adapter. Mounting holes are included to secure the motor shield at the top of the board.

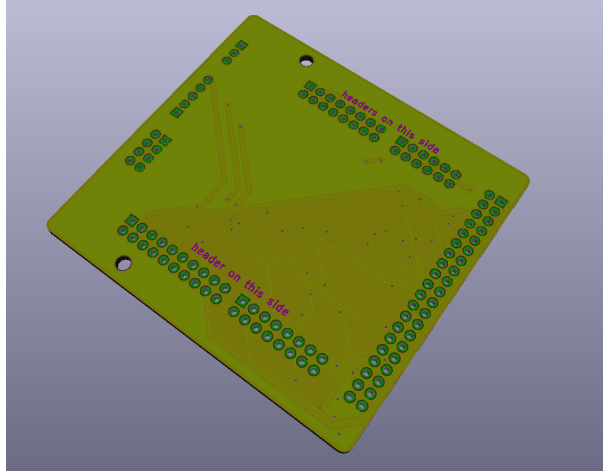


Figure 2: 3D Rendering of the Adapter Board (back)

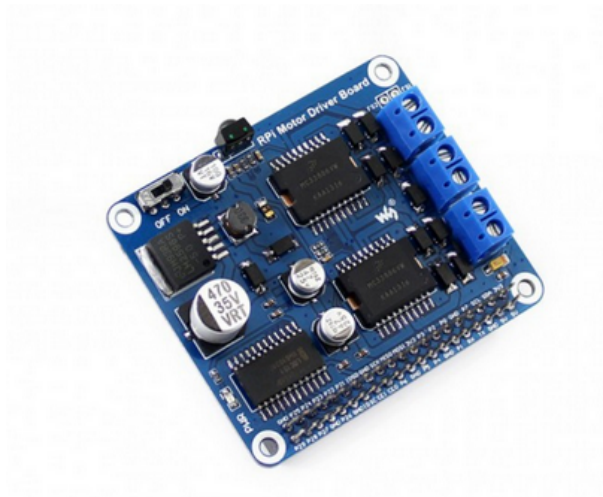


Figure 3: Raspberry Pi Motor Shield

## 2 Pinout

The adapter board sits on top of the K64 and populates all four headers. The raspberry pi motor shield has a female header on its bottom side which connects to the top of the adapter board. The motor shield has a male header on top. Each pin on this header is connected to a pin on the k64. Table 1 displays the corresponding pin label on the motor shield to its k64 pin.

Motor Shield Pin	K64 Pin
P0	PTB18
P1	PTE24(IR)
P2	PTC9
P3	PTD0
P4	PTE25
P5	PTB11
P6	PTB10
P7	PTB19
P21	PTC10
P22	PTC1(A1)
P23	PTC2(A2)
P24	ADC1.DP0
P25	PTB2(EN_A)
P26	PTB3(EN_B)
P27	RST
P28	PTC3(B1)
P29	PTC4(B2)
SCL	PTA2
SDA	PTA1
IDSC	DAC0.OUT
CE1	ADC1.DP1
CE0	PTB20
IDSD	PTC11
SCK	PTD3
MISO	PTD2
MOSI	PTD1
Rx	PTC16
Tx	PTC17

Table 1: K64 and Motor Shield Adapter Pin Associations

A1, A2, B1, B2 are tied directly to the PWM input on the motor shield. EN\_A and EN\_B are tied to the H-Bridge enable pins on the motor shield. In order to use one of the motor outputs the respective enable pin must be set to logic 1. For example, to use h-bridge A, PTB2 must be in GPIO mode and set high.

P1(PTE24) is tied directly to an IR receiver on the motor shield. This pin should only be used as an input from this device as the IR receiver cannot be disabled.

Header Pin	K64 Pin
SIG	PTC8
CLK	PTB9
SI	PTB23
AO	ADC0_DP0

Table 2: Additional Adapter Shield Header Pins

Table 2 displays the associations between the camera and servo header pins and the K64 pins.

### 3 Extra Power Supply

There are drill holes on the top right of the adapter shield to fit a 2x4 header. The top row of these pins is tied to ground and the bottom row is tied to 5v. Please note that the motor shield can supply up to 2 amps to the K64 and the adapter shield.

## 4 Appendix

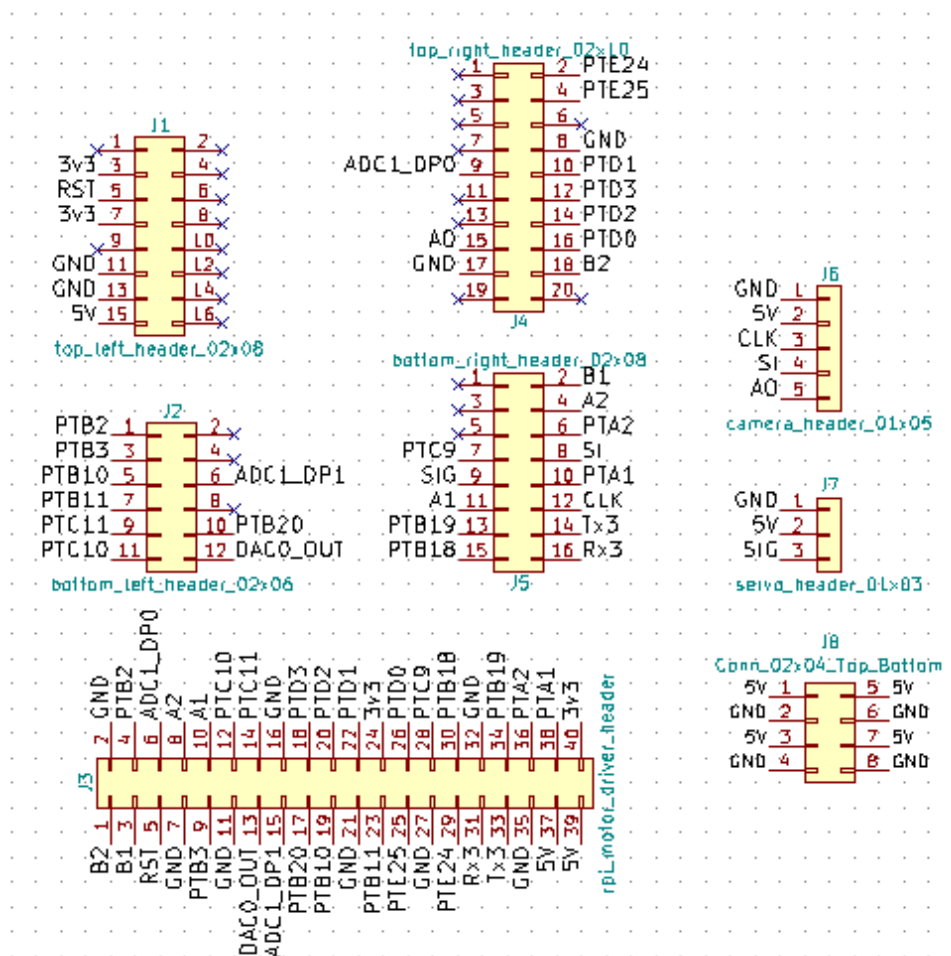


Figure 4: Adapter Schematic

Figure 4 displays the circuit schematic of the adapter shield.