Falcon BMS to Arduino Interface Tool (BMSAIT)

ECM panel demo sketch

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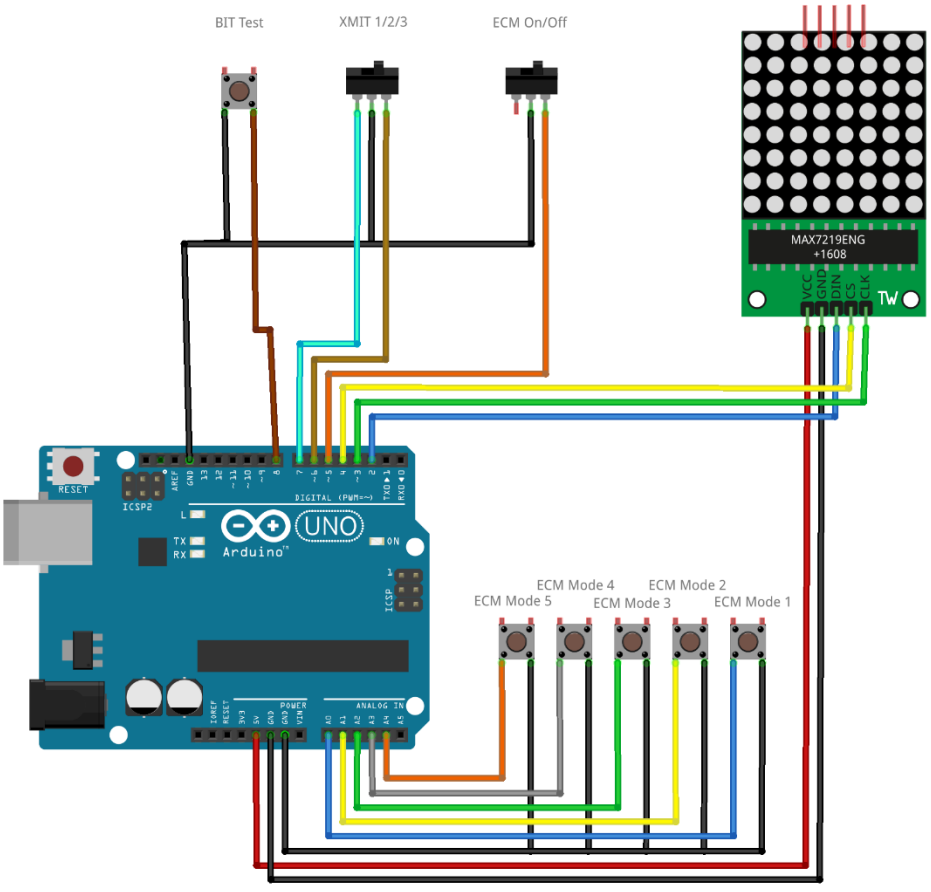
1. Overview

This example describes the steps to simulate the functions of the ECM panel in conjunction with Falcon BMS.

The following hardware is needed to set up this example:

- An arduino board (i.e. UNO)
- One toggle switch ON/OFF
- One toggle switch ON/OFF/ON
- Six momentary buttons
- A 8x8 LEDMatrix PCM with attached Max7219 controller
- 4 red LED
- 4 blueLED
- 4 green LED
- 4 yellow LED
- Resistors (about 220 ohms)
- Connector cables

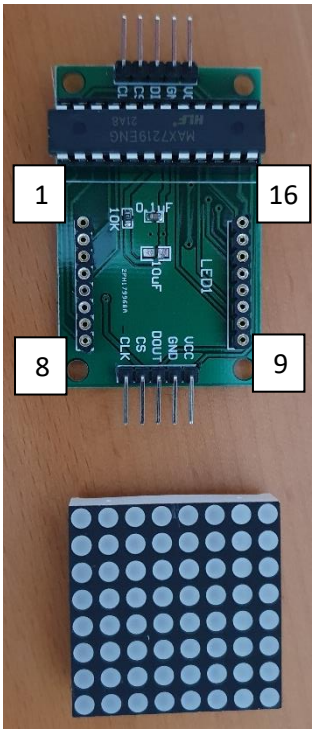
2. Wiring

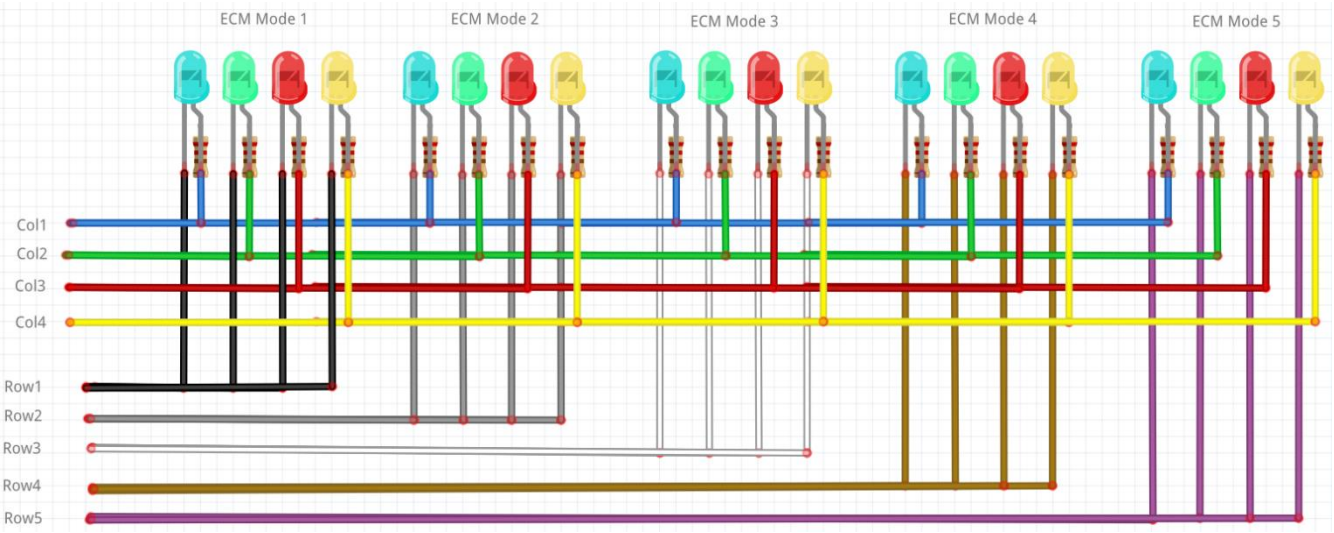


PIN Arduino	Input connections
GND	GND
5	Switch ECM on/off
6	Switch XMIT 1 – 2
7	Switch XMIT 3 – 2
8	Button BIT Test

Arduino Connection	Max7219 connection
GND	GND
5V	Vcc
2	DIN
4	CS
3	CLK

MAX7219 Output Pin	function	ECM panel	BMSAIT Arduinio UserConfig Ref2	Ref3
1	row 5	ECM4		4
2	row 7			
3	column 2	LED A	1	
4	column 3	LED F	2	
5	row 8			
6	column 5			
7	row 6	ECM5		5
8	row 3	ECM2		2
9	row 1			
10	column 4	LED S	3	
11	column 6			
12	row 4	ECM3		3
13	column 1	LED T	0	
14	row 2	ECM1		1
15	column 7			
16	column 8			





3. Arduino setup

If you haven't installed the Arduino IDE software, please read chapter 4.1.4 of the main BMSAIT documentation.

Start the Arduino IDE and load the .ino file from the folder \Arduino Sketch\BMSAIT_ECM\.
If you followed the wiring instructions of chamter 2, you will be able to upload the sketch without any changes. If you chose a different wiring, you will have to alter the configuration of the Arduino sketches.

4. BMSAIT windows app setup

Run the BMSAIT windows app and make sure to complete the basic settings. It is mandatory to reference the BMSAIT-Variablen.csv.

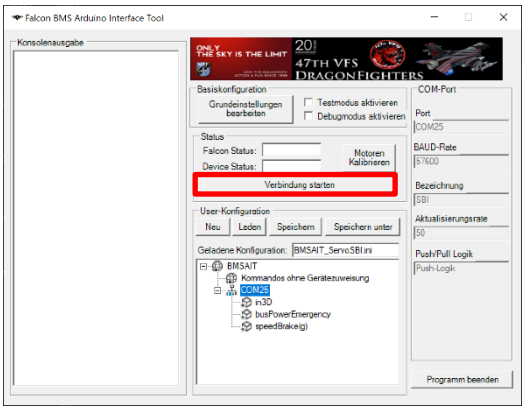
This example includes the BMSAIT-demoECM.ini file in the folder "/windows app ini/". Select „Load" from the windows app and select this .ini file.

To complete the configuration of the windows app, is it necessary to check the COM port of your Arduino board. Right click the COM port node in the configuration window and select "edit device". A new window will allow to change details of the selected Arduino board. Here, you need to select the correct COM port of your device. If you are not sure which COM port is assigned to your device, you can check your windows device manager or select "Scan" in the BMSAIT device management window. The scan will allow you to identify all arduinos that have been flashed with a BMSAIT software.

In the BMSAIT main window, right click your ECM device and select "Add input command". On the input command window, select the input commands of the ECM panel and check the assigned keyboard/joystick commands. If you want to use keyboard inputs, reference your BMS setup to transfer the assigned inputs to the BMSAIT commands. If you want to use directX key commands, assign an available joystick button from one of the vjoy devices.

At this point, you should save your changes („save as" and select a new file name).

Now launch the connector.



5. Falcon BMS setup

After connecting the windows app to the Arduino devices, you need to check the assigned input commands. In the Falcon BMS Setup, if you selected keyboard commands, pushing a button should show the corresponding callback.

If you selected directX commands, you need to assign the assigned directX keys of the ECM buttons/switches to the callbacks of Falcon BMS.

6. Testing

Run Falcon BMS in Instant Action mode. When in 3D, the LED of the ECM panel should match the lights that can be seen in the cockpit. Use the CMS Button of your HOTAS to give or refuse ECM conset. The LED from your ECM panel should still match the lighting of the ECM panel in BMS. If hitting the ECM BIT Test, all lights in the sim and on your ECM panel should light up.