



# FAIO MULTIPLEXER JOYSTICK USER MANUAL

What if you could have a switch interface that would let you perform many actions using only 4 switches?

**Version 1.0**

[https://github.com/milador/FAIO\\_Multiplexer](https://github.com/milador/FAIO_Multiplexer)

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## Usage

The FAIO Multiplexer Joystick can be used in different configurations based on the needs of the end user. The FAIO Multiplexer hardware can be used along different software as input device for multiple devices. The hardware allows you connect up to four input 3.5mm adaptive switches which are marked A,B,C,D on both circuit board and the enclosure.

All four switches can be used as inputs when short pressed and switch D can be used to change the operation mode when it's pressed and hold for more than 2 seconds. Table 1 represents all the possible actions for switches and their corresponding led feedback.

Button	XAC	Action	Color
A	X1	Short press	Blue
B	X2	Short press	Yellow
C	A	Short press	Green
D	B	Short press	Red
D		Long Press	Mode Led Color

**Table 1: FAIO Multiplexer Joystick switch actions and feedback**

The device will blink two times in the color of operating mode when the initialization process is completed and will stay in that color. The led will blink momentary in color of the switch pressed as represented in Table 1 and the led color will go back to the color of operating mode. The mode can only change when switch D is pressed and hold for 2 seconds.

The Joystick version is great for usage along computer or for gaming purposes as it's able to simulate an USB joystick device. The Joystick version can operate in different modes as it's represented in Table 2.

Mode Number	Mode	Color
1	Mode 1	Teal
2	Mode 2	Pink
3	Settings	Orange

**Table 2: FAIO Multiplexer Joystick modes**

### Mode 1

The mode 1 will operate similar to a four key joystick which is great for playing computer-based games or XBOX games through XAC.

Button	Action	Color	Result
A	Short press	Blue	Press button 1
B	Short press	Yellow	Press button 2
C	Short press	Green	Press button 3
D	Short press	Red	Press button 4
D	Long Press	Mode Led Color	Change operating mode

**Table 3: FAIO Multiplexer Joystick mode 1 actions**

The time between each switch press actions is calculated by switch reaction levels which can be changed in settings mode or manually through the software. The switch reaction time variable is used to calculate the reaction time for each of the 10 levels as represented in Table 4.

## SWITCH\_REACTION\_TIME 50

The switch reaction time variable is set to 50 by default.

Level	10	9	8	7	6	5	4	3	2	1
Time (ms)	1*50	2*50	3*50	4*50	5*50	6*50	7*50	8*50	9*50	10*50

**Table 4: FAIO Multiplexer Joystick switch reaction time**

## Mode 2

The mode 2 will operate similar to mode but it allows you to press other four joystick buttons.

Button	Action	Color	Result
A	Short press	Blue	Press button 5
B	Short press	Yellow	Press button 6
C	Short press	Green	Press button 7
D	Short press	Red	Press button 8
D	Long Press	Mode Led Color	Change operating mode

**Table 5: FAIO Multiplexer Joystick mode 2 actions**

## Settings Mode

The settings mode is used to change the reaction level and reaction time using the A and B switches. The led will blink in blue when react level is increased and in red when reaction level is decreased. The number of led blinks indicate new reaction level. The led will blink 10 times when it reaches maximum or minimum reaction levels.

Button	Action	Color	Result
A	Short press	Blue	Increase Reaction level (Decrease Reaction time)
B	Short press	Red	Decrease Reaction level (Increase Reaction time)
D	Long Press	Mode Led Color	Change operating mode

**Table 6: FAIO Multiplexer Joystick settings actions**

There are total of 10 levels and the switch reaction times and morse reaction times can be calculated using Tablets 7.

Level	10	9	8	7	6	5	4	3	2	1
Time (ms)	1*50	2*50	3*50	4*50	5*50	6*50	7*50	8*50	9*50	10*50

**Table 7: FAIO Multiplexer Joystick reaction time**

## Customization

The FAIO Multiplexer joystick can easily be customized by changing the value of variables at the beginning of FAIO Multiplexer USB software. The following variables can be changed for customization purposes:

```
#define SWITCH_REACTION_TIME 50
```

The switch reaction time multiplier between each switch action

```
#define SWITCH_MODE_CHANGE_TIME 2000
```

The time that switch D needs to be hold in ms to perform mode change action

```
#define LED_BRIGHTNESS 150
```

The brightness of led for mode indication

```
#define LED_ACTION_BRIGHTNESS 150
```

The brightness of led for action indication

```
#define JOYSTICK_DEADZONE 5
```

The deadzone value of the joystick module

```
#define JOYSTICK_ENABLED false
```

This will enable usage of analog joystick module when it's available

```
//Switch properties
```

```
const switchStruct switchProperty[] {
```

```
    {1,"X1",1,5,5},
```

```
    {2,"X2",2,6,3},
```

```
    {3,"A",3,7,1},
```

```
    {4,"B",4,8,6}
```

```
};
```

The values of third and fourth columns can be changed to have different joystick button press actions and the fifth column can be changed for customization of led feedback.

```
//Settings Action properties
```

```
const settingsActionStruct settingsProperty[] {
```

```
    {1,"Increase Reaction",5},          //{1=Increase Reaction,5=blue}
```

```
    {2,"Decrease Reaction",6},         //{2=Decrease Reaction,6=red}
```

```
    {3,"Max Reaction",1},              //{3=Max Reaction,1=green}
```

```
    {4,"Min Reaction",1}               //{4=Min Reaction,1=green}
```

```
};
```

The third column can be changed for customization of led feedback.

```
//Mode properties
```

```
const modeStruct modeProperty[] {  
    {1,"Mode 1",8},  
    {2,"Mode 2",2},  
    {4,"Settings",4}  
};
```

The third column can be changed for customization of led feedback.

```
const colorStruct colorProperty[] {  
    {1,"Green",{0,50,0}},  
    {2,"Pink",{50,00,20}},  
    {3,"Yellow",{50,50,0}},  
    {4,"Orange",{50,20,0}},  
    {5,"Blue",{0,0,50}},  
    {6,"Red",{50,0,0}},  
    {7,"Purple",{50,0,50}},  
    {8,"Teal",{0,128,128}}  
};
```