DESCRIPTION

The Latching Button module is a simple and easy to use 4 channel latching push buttons plus 2 channel push button normally open tactile switches. Only the 6 buttons are integrated in this compact module allowing a module size of only 50x25mm board dimension. Microcontroller users may simply enable the internal pull-up (or pull down in some microcontrollers) resistors and avoid the need for external resistors. Arduino / Saleng-Uno users in particular, may directly insert the module into the header pins for digital pins 8 – 13 (see figure 2). The Momentary Button module is part of Layad Circuits' Kimat series of rapid prototyping products.

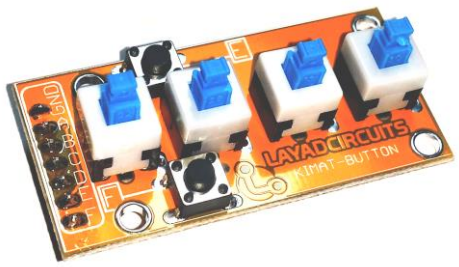


Figure 1: The Kimat – Latching Buttons module

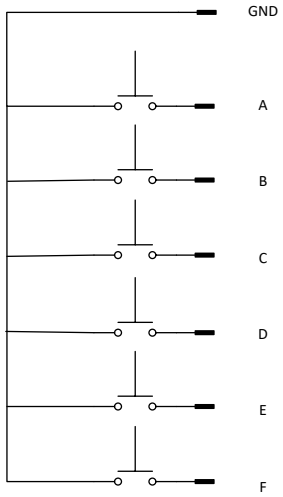
FEATURES

- 4 Channel Latching push buttons
- 2 Channel Momentary push buttons
- Compatible with 3.3V or 5V controllers
- Compact form factor, board dimensions: 50x25mm
- Standard 2.54mm pitch headers
- Pin header connects directly with Arduino headers

PIN FUNCTIONS

Pin Label	Function/Operation/Remarks
Gnd	Common ground pin for all buttons
A ~ D	Individual pins for the latching buttons
E ~ F	Individual pins for the momentary buttons

SCHEMATIC



Buttons A~D are latching pushbuttons while buttons E and F are momentary pushbuttons.

APPLICATION NOTES

When the male pin headers are installed at the bottom side, the module may connect directly, without wires, with the Arduino / Saleng Uno's headers 8-13 as show in figure 2.

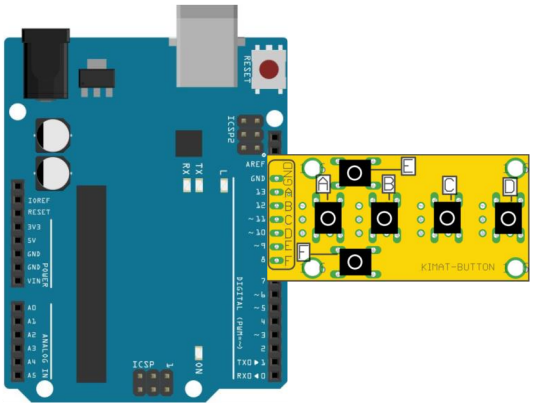


Figure 2: The buttons module mates directly with the Arduino pins 8~13 and GND and may be connected without wiring

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Below is an example Arduino sketch demonstrating how the module may be used. This follows the connection as shown in figure 2. The sketch simply enables the internal pull-up resistors and then prints the state of each pin. As this is a demonstration, it is noteworthy that certain applications may require debounce code.

```
const byte KEYA = 13;
const byte KEYB = 12;
const byte KEYC = 11;
const byte KEYD = 10;
const byte KEYE = 9;
const byte KEYF = 8;
byte a,b,c,d,e,f; //stores button states

void setup() {
  pinMode(KEYA,INPUT_PULLUP);
  pinMode(KEYB,INPUT_PULLUP);
  pinMode(KEYC,INPUT_PULLUP);
  pinMode(KEYD,INPUT_PULLUP);
  pinMode(KEYE,INPUT_PULLUP);
  pinMode(KEYF,INPUT_PULLUP);
  Serial.begin(9600);
}

void loop() {
  a = digitalRead(KEYA);
  b = digitalRead(KEYB);
  c = digitalRead(KEYC);
  d = digitalRead(KEYD);
  e = digitalRead(KEYE);
  f = digitalRead(KEYF);

  if(a == LOW) Serial.print("ON \t");
  else Serial.print("OFF \t");
  if(b == LOW) Serial.print("ON \t");
  else Serial.print("OFF \t");
  if(c == LOW) Serial.print("ON \t");
  else Serial.print("OFF \t");
  if(d == LOW) Serial.print("ON \t");
  else Serial.print("OFF \t");
  if(e == LOW) Serial.print("ON \t");
  else Serial.print("OFF \t");
  if(f == LOW) Serial.print("ON \t");
  else Serial.print("OFF \t");
  Serial.println();
  delay(100);
}
```

To test, upload the sketch and open the serial monitor with a baud rate of 9600.

If you need to use other pins, you may simply connect each pin individually.

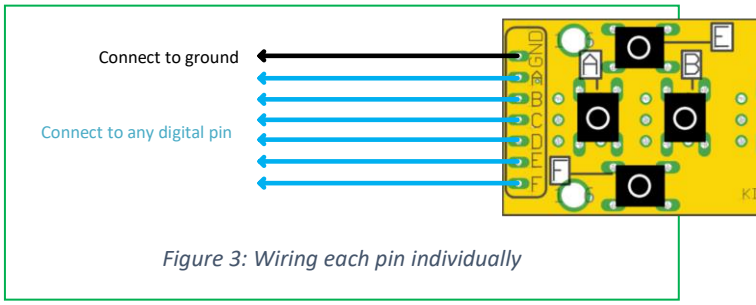

Figure 3: Wiring each pin individually

If you are connecting to pins that are consecutive, you could also use a digital pin as ground by declaring that pin as output and setting it LOW.

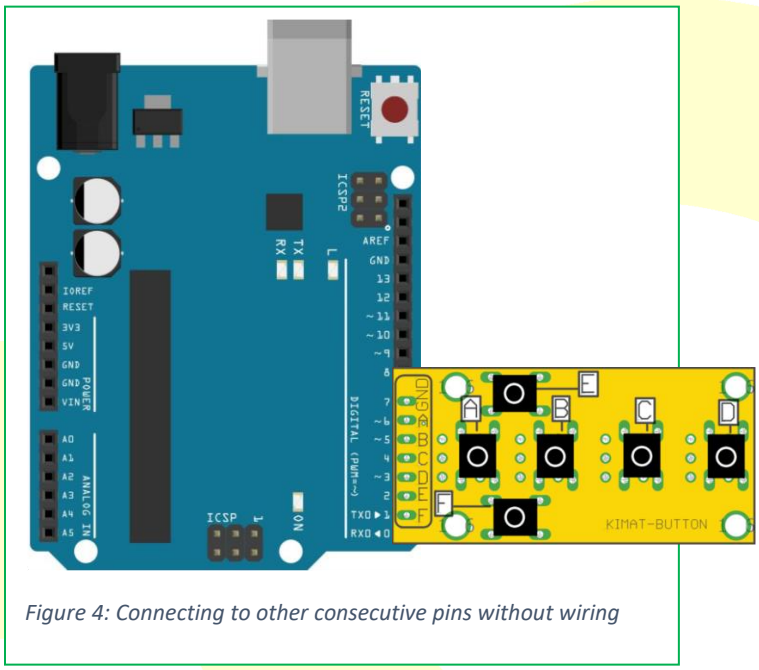

Figure 4: Connecting to other consecutive pins without wiring

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The following Arduino sketch demonstrates how to use the setup shown in figure 4.

```
const byte KEYA = 6;
const byte KEYB = 5;
const byte KEYC = 4;
const byte KEYD = 3;
const byte KEYE = 2;
const byte KEYF = 1;
const byte GROUND = 7;

byte a,b,c,d,e,f; //stores button states

void setup() {
  pinMode(KEYA,INPUT_PULLUP);
  pinMode(KEYB,INPUT_PULLUP);
  pinMode(KEYC,INPUT_PULLUP);
  pinMode(KEYD,INPUT_PULLUP);
  pinMode(KEYE,INPUT_PULLUP);
  pinMode(KEYF,INPUT_PULLUP);
  pinMode(GROUND,OUTPUT);
  digitalWriteGROUND, LOW);
  Serial.begin(9600);
}

void loop() {
  a = digitalRead(KEYA);
  b = digitalRead(KEYB);
  c = digitalRead(KEYC);
  d = digitalRead(KEYD);
  e = digitalRead(KEYE);
  f = digitalRead(KEYF);

  if(a == LOW) Serial.print("ON \t");
  else Serial.print("OFF \t");
  if(b == LOW) Serial.print("ON \t");
  else Serial.print("OFF \t");
  if(c == LOW) Serial.print("ON \t");
  else Serial.print("OFF \t");
  if(d == LOW) Serial.print("ON \t");
  else Serial.print("OFF \t");
  if(e == LOW) Serial.print("ON \t");
  else Serial.print("OFF \t");
  if(f == LOW) Serial.print("ON \t");
  else Serial.print("OFF \t");
  Serial.println();
  delay(100);
}
```

In case of the Arduino Mega, there are several schemes to avoid wiring. Figure 5 shows how to wire at either

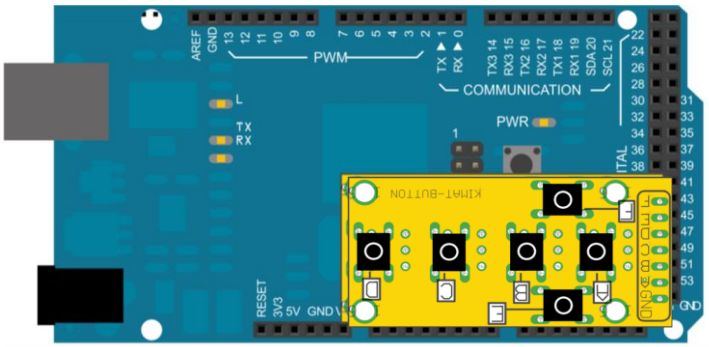

Figure 5: Direct Connection with Arduino Mega pins 42,44,46,48,50 and 52 and GND pin

pins 42,44,46,48,50, 52 or pins 43,45,47,49,51, 53 and the true GND pins beside 52 and 53.

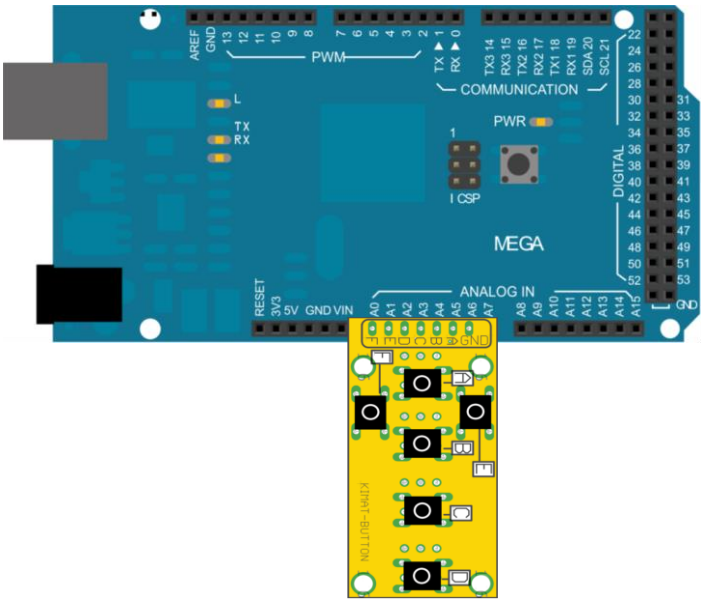

Figure 6: Direct Connection with Arduino Mega pins A0~A5 and with pin A6 used as ground. Set A6 as Output and initialize it to LOW state

Figure 6 uses pin A0~A5 as inputs and A6 as ground. A6 would have to be set as an output and initialized to the LOW state.

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