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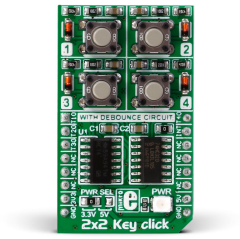
2x2 Key click

2x2 Key click



2x2 Key click	
IC/Module	SN74HC14 datasheet [1] 74HC32 datasheet [2]
Interface	AN, RST, CS, PWM, INT
Power supply	3.3V or 5V
Product page	2x2 Key click [3]
Schematic	2x2 Key click schematic [4]

2x2 Key click has a 4 PCB button keypad. It carries the SN74HC14 Hex Schmitt-Trigger Inverter from Texas Instruments and 74HC32 quad 2-input OR gate from NXP. The click allows multiple key presses and is designed to use either 3.3V or 5V power supply.

The silkscreen markings on the click let you know which button is which. The buttons that can be independently read.

Features and usage notes

The debounce circuit

In electronics, two metal components tend to bounce or create multiple signals when they are in contact with each other, like when you push a button before they get to a stable state. You want a single contact to be recorded, but the microcontroller records this as if you pressed the button many times.

So debouncing is, as the name states, the removal of bounces or spikes of low and high voltages. Graphically speaking, you want a clean line, not spikes. A debounce circuit makes sure that there are no voltage changes on the output.

Interrupt service routine

All four Schmitt-trigger outputs are connected to input pins of the logic OR gate 74HC32, whose output is directly connected to the INT pin on mikroBUS. This pin is used to signalize an interrupt to the MCU any time a button is pressed.

In this way, the MCU software can be implemented as a simple polling routine, without any delays programmed in the code, like it would be necessary if there wasn't a hardware debouncing circuit present.

Thanks to the INT pin you can easily program a common interrupt service routine, in order to detect when a button is pressed (the state of the button changes from low to high logic level).

Key features

- 74HC32 quad 2-input OR gate
  - High noise immunity
  - Low power dissipation
- SN74HC14 Hex Schmitt-Trigger Inverter
  - Outputs Can Drive Up to 10 LSTTL Loads
  - Low Power Consumption, 20-μA Max ICC
- 4 black PCB buttons onboard
- Interface: PWM, INT, AN, RST, CS pins
- Runs on either 3.3V or 5V power supply

Additional information

- J2 is the interrupt enable pin (by default it is in the enable status).
- J1 is the power selection pin.

Pinout diagram

This table shows how the pinout on 2x2 Key click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS™				Pin	Notes
When button T1 is pressed the pin is active	**T1-OUT**	1	AN	PWM	16	**T4-OUT**	When button T4 is pressed the pin is active
When button T2 is pressed the pin is active	**T2-OUT**	2	RST	INT	15	**TINT**	Interrupt pin that notifies the MCU that a button is pressed
When button T3 is pressed the pin is active	**T3-OUT**	3	CS	TX	14	NC	
	NC	4	SCK	RX	13	NC	
	NC	5	MISO	SCL	12	NC	
	NC	6	MOSI	SDA	11	NC	
Power supply	**+3.3V**	7	+3.3V	+5V	10	**+5V**	Power supply
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Programming

The demo initialises the TFT display and sets pins to operate in input direction. The main fucntion of the demo uses the polling method to check if inputs are on an active level. The TFT display shows the button state according to detect level.

```
void main()
{
    system_init();

    Draw_Taster(X1, Y1, RELEASED, "T1");
    Draw_Taster(X2, Y1, RELEASED, "T2");
    Draw_Taster(X1, Y2, RELEASED, "T3");
    Draw_Taster(X2, Y2, RELEASED, "T4");

    while(1)
    {
        if(Taster_Pressed(TAST1, &t1_state))
            Draw_Taster(X1, Y1, PRESSED, "T1");

        if(Taster_Released(TAST1, &t1_state))
            Draw_Taster(X1, Y1, RELEASED, "T1");

        if(Taster_Pressed(TAST2, &t2_state))
            Draw_Taster(X2, Y1, PRESSED, "T2");

        if(Taster_Released(TAST2, &t2_state))
            Draw_Taster(X2, Y1, RELEASED, "T2");

        if(Taster_Pressed(TAST3, &t3_state))
            Draw_Taster(X1, Y2, PRESSED, "T3");

        if(Taster_Released(TAST3, &t3_state))
            Draw_Taster(X1, Y2, RELEASED, "T3");

        if(Taster_Pressed(TAST4, &t4_state))
            Draw_Taster(X2, Y2, PRESSED, "T4");

        if(Taster_Released(TAST4, &t4_state))
            Draw_Taster(X2, Y2, RELEASED, "T4");

        t1_state = TAST1;
        t2_state = TAST2;
        t3_state = TAST3;
        t4_state = TAST4;

        Delay_ms(POLLING_PERIOD);
    }
```

```
}
```

Resources

- SN74HC14 datasheet [1]
- 74HC32 datasheet [2]
- Demo code / Library [5]
- 2x2 Key click schematic [4]
- mikroBUS™ standard specifications [6]

References

[1] http://www.ti.com/lit/ds/symlink/sn74hc14.pdf
[2] http://www.nxp.com/documents/data_sheet/74HC_HCT32.pdf
[3] http://www.mikroe.com/click/2x2-key/
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