# CAP TOUCH 5 CLICK

PID: MIKROE-3786
Weight: 17 g

Cap Touch 5 Click is a capacitive touch sensing Click board™ which features the CY8CMBR3106S-LQXI CapSense® Express™ controller which enables advanced, yet easy-to-implement, capacitive touch sensing user interface solutions. It supports up to 16 capacitive sensing inputs, eliminates time-consuming firmware development. This controller is ideal for implementing capacitive buttons, sliders, and proximity sensing solutions with minimal development-cycle times.

Cap Touch 5 Click is supported by a mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

HOW DOES IT WORK?

The Cap Touch 5 click features the CY8CMBR3106S-LQXI CapSense® Express™ controller which has an advanced analog sensing channel and the Capacitive Sigma Delta PLUS (CSD PLUS) sensing algorithm, which delivers a signal-to-noise ratio (SNR) of greater than 100:1 to ensure touch accuracy even in extremely noisy environments. This controller is enabled with Cypress's SmartSense™ Auto-tuning algorithm, which compensates for manufacturing variations and dynamically monitors and maintains optimal sensor performance in all environmental conditions. In addition, SmartSense Auto-tuning enables a faster time-to-market by eliminating the time-consuming manual tuning efforts during development and production ramp-up.
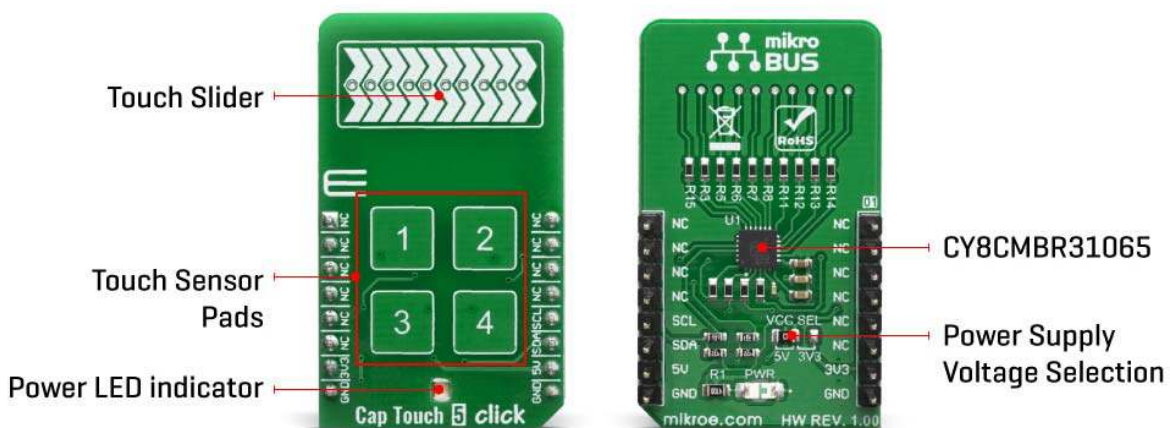
Advanced features, such as LED brightness control, proximity sensing, and system diagnostics, save development time. These controllers enable robust liquid-tolerant designs by eliminating false touches due to mist, water droplets, or streaming water. The CapSense controller locks up the user interface in firmware to prevent touch inputs in streaming water.

Additionally, it implements the advanced noise immunity algorithm, EMC, for stable operation in extremely noisy conditions. Besides that, it is also perfectly suited for low-power applications, such as those operated by a battery, when a capacitive sensing controller that has ultra-low average power consumption have to be selected. The CY8CMBR3106S-LQXI controller draws an average current of 22 μA per sensor.

The Cap Touch 5 click supports four CapSense buttons. It's sensitivity can be specified individually for each CapSense button and slider. Higher sensitivity values can be used for thick overlays or small button diameters, while lower sensitivity values should be used for large buttons or thin overlays to minimize power consumption. Therefore, this Click board™ comes without the overlay, so it is up to the user to choose the desired application and implementation.

SPECIFICATIONS

Type	Capacitive
Applications	Ideal for implementing capacitive buttons, sliders, and proximity sensing solutions with minimal development-cycle times.
On-board modules	CY8CMBR3106S-LQXI CapSense® Express™ controller
Key Features	High sensitivity (0.1 pF), Low-power CapSense, Industrial temperature range: –40 °C to +85 °C, liquid-tolerant
Interface	I2C
Compatibility	mikroBUS
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V

PINOUT DIAGRAM

This table shows how the pinout on Cap Touch 5 click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS		Pin	Notes
	NC	1	AN	PWM	16	NC	
	NC	2	RST	INT	15	NC	
	NC	3	CS	RX	14	NC	

	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	**SCL**	I2C Clock
	NC	6	MOSI	SDA	11	**SDA**	I2C Data
Power Supply	**3.3V**	7	3.3V	5V	10	**5V**	Power Supply
Ground	**GND**	8	GND	GND	9	**GND**	Ground

ONBOARD SETTINGS AND INDICATORS

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	VCC SEL	Left	Power supply voltage selection: left position 3.3V, right position 5V

SOFTWARE SUPPORT

We provide a library for the CapTouch 5 Click on our LibStock page, as well as a demo application (example), developed using MikroElektronika compilers. The demo can run on all the main MikroElektronika development boards.

Library Description
The library covers all the necessary functions to control Cap Touch 5 Click.

Key functions:

- `void captouch5_config_sensors( uint16_t sens_data )` - Function for configuring sensor.
- `void captouch5_config_slider( uint8_t slider_data )` - Function for configuring slider.
- `void captouch5_read_button_status( T_CAPTOUCH5_BUTTONS *buttons )` - Function read button status.

Examples description

The application is composed of three sections :

- System Initialization - Initializes I2C module

- Application Initialization - Initializes driver init, tests communication and configures device

- Application Task - Waiting for touch sensor to detect something and then logs what is touched

```c
void applicationTask(  )
{
    uint16_t temp_byte;
    uint16_t last_temp;
    uint8_t error_data;
    uint8_t temp_slider;

    state_check = 0;

    error_data = captouch5_process(  );

    if ( error_data == CAPTOUCH5_ERROR )
    {
        mikrobus_logWrite( "***** ERROR *****", _LOG_LINE );
        mikrobus_logWrite( " ", _LOG_LINE );
        mikrobus_logWrite( " ", _LOG_LINE );
        state_check = 1;
        return;
    }

    temp_byte = captouch5_read_slider_position(  );
    captouch5_read_button_status( &buttons );

    if ( temp_byte != last_temp )
    {
        mikrobus_logWrite( "Slider position value: ", _LOG_TEXT );
        WordToStr( temp_byte, demo_text );
        mikrobus_logWrite( demo_text, _LOG_LINE );
        mikrobus_logWrite( " ", _LOG_LINE );
        mikrobus_logWrite( " ", _LOG_LINE );
        last_temp = temp_byte;
```

```
        state_check = 1;
    }


    captouch5_read_buttons(   );


    Delay_ms ( 100 );


    if ( state_check == 1 )
    {
        mikrobus_logWrite( "--- Waiting for command ---", _LOG_LINE );
        mikrobus_logWrite( " ", _LOG_LINE );
        mikrobus_logWrite( " ", _LOG_LINE );
    }
}
```

Additional Functions :

- _captouch5_readButtons() - Logs button press
- _captouch5_deviceConfig() - Configures device

Note :

- Click will go to sleep if doesn't get any command in 340ms
- When you start device try restarting your board few times to start device

The full application code, and ready to use projects can be found on our LibStock page. Other mikroE Libraries used in the example:
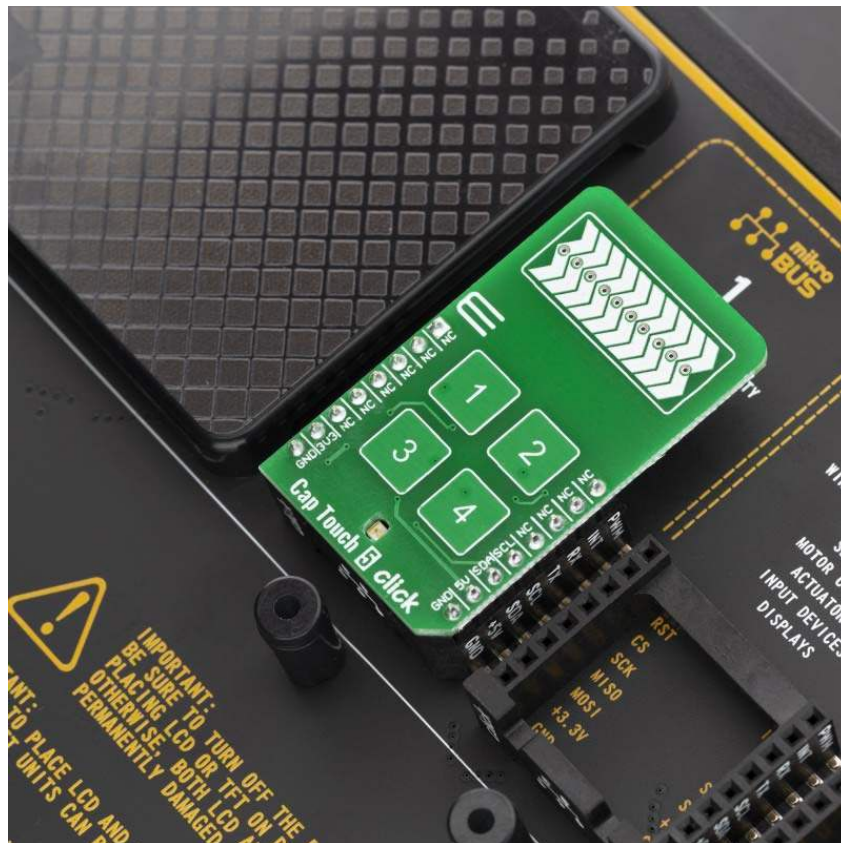
- I2C
- UART
- Conversions

Additional notes and informations
Depending on the development board you are using, you may need USB UART click, USB UART 2 click or RS232 click to connect to your PC, for development systems with no UART to USB interface available on the board. The terminal available in all MikroElektronika compilers, or any other terminal application of your choice, can be used to read the message.

MIKROSDK

This Click board™ is supported with mikroSDK - MikroElektronika Software Development Kit. To ensure proper operation of mikroSDK compliant Click board™ demo applications, mikroSDK should be downloaded from the LibStock and installed for the compiler you are using.

For more information about mikroSDK, visit the official page.

https://www.mikroe.com/cap-touch-5-click/11-8-19