MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
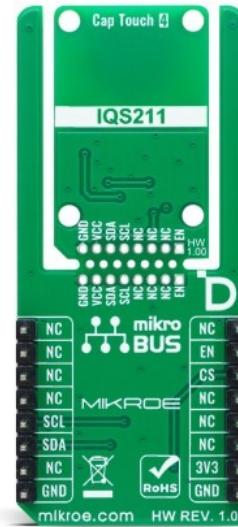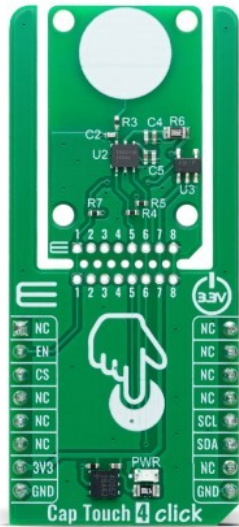Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
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Cap Touch 4 Click

PID: MIKROE-6399

Cap Touch 4 Click is a compact add-on board for wake-on-touch and activation applications. This board features the IQS211B, a single-channel capacitive controller from Azoteq, featuring ProxSense® technology for highly sensitive self-capacitance measurements. The board includes a defined circular touch-sensing area, signal conditioning for parasitic capacitance, and a low-power Sleep mode with wake-up functionality, ensuring efficient energy consumption. It communicates via the I2C interface with a fixed address of 0x47, operates at 3.3V logic, and features the new Click Snap for added flexibility. Cap Touch 4 Click is ideal for human interface devices, proximity-activated solutions, white goods, and similar touch-sensitive applications.

How does it work?

Cap Touch 4 Click is based on the IQS211B, a single-channel capacitive proximity and touch controller from Azoteq, designed for applications requiring activation or wake-on-touch functionality. The IQS211B uses ProxSense® technology to provide highly sensitive self-capacitance measurements, making it ideal for proximity-activated solutions, human interface devices, and white goods. The onboard touch-sensing pad is marked on the front side of the board, offering a defined circular touch-sensing area, ensuring easy user interaction. Additionally, it includes signal conditioning to compensate for parasitic capacitance and provide accurate signal gain, ensuring reliable touch and proximity detection in varying environmental conditions.

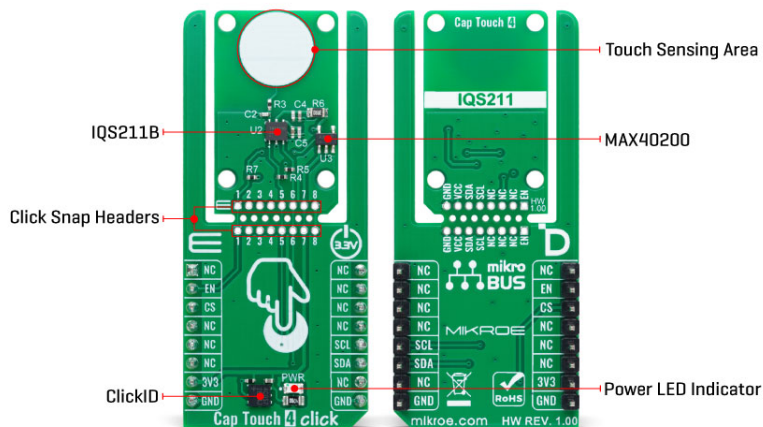Mikroe produces entire development toolchains for all major microcontroller architectures.
Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.

ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.

ISO 9001: 2015 certification of quality management system (QMS).

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As mentioned, the IQS211B offers advanced features such as automatic detection and environmental compensation through its integrated finite state machine, eliminating the need for constant host MCU interaction. This allows for smooth operation without external interference. It also includes an integrated LDO regulator to enhance immunity against power supply noise, an internal oscillator for consistent performance, and built-in calibration capacitors to maintain accuracy over time.

This Click board™ is designed in a unique format supporting the newly introduced MIKROE feature called "Click Snap." Unlike the standardized version of Click boards, this feature allows the main sensor area to become movable by breaking the PCB, opening up many new possibilities for implementation. Thanks to the Snap feature, the IQS211B can operate autonomously by accessing its signals directly on the pins marked 1-8. Additionally, the Snap part includes a specified and fixed screw hole position, enabling users to secure the Snap board in their desired location.

Cap Touch 4 Click uses a standard 2-wire I2C interface to communicate with the host MCU. During standard operation, the IQS211B sensor performs capacitance conversions and conserves energy by entering a low-power Sleep mode. The duration of this sleep period is adjustable and controlled by the sample period settings. A key feature of the IQS211B is its ability to activate its wake-up function, enabling it to respond to any activity detected on the I2C bus immediately. Once awakened, the sensor begins conversions without delay, ensuring prompt responsiveness in real-time applications. The device uses a fixed I2C address of 0x47 for ease of integration, simplifying communication setup across various systems.

This Click board™ can be operated only with a 3.3V logic voltage level and activated via the EN pin of the mikroBUS™ socket, providing a power-enabling function. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. Also, it comes equipped with a library containing functions and an example code that can be used as a reference for further development.

Click Snap

Click Snap is an innovative feature of our standardized Click add-on boards, introducing a new level of flexibility and ease of use. This feature allows for easy detachment of the main sensor area by simply snapping the PCB along designated lines, enabling various implementation possibilities. For detailed information about Click Snap, please visit the official page dedicated to this feature.

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Specifications

Type	Capacitive
Applications	Ideal for human interface devices, proximity-activated solutions, white goods, and similar touch-sensitive applications
On-board modules	IQS211B - single-channel capacitive controller from Azoteq
Key Features	High-sensitivity ProxSense® technology, one touch-sensing pad, internal signal conditioning, low power operation, Click Snap feature, I2C interface, and more
Interface	I2C
Feature	Click Snap,ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Cap Touch 4 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikro™ BUS		Pin	Notes
	NC	1	AN	PWM	16	NC	
Device Enable	**EN**	2	RST	INT	15	NC	
ID COMM	**CS**	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	NC	
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator

Cap Touch 4 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V

Software Support

We provide a library for the Cap Touch 4 Click as well as a demo application (example), developed using MIKROE compilers. The demo can run on all the main MIKROE development

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boards.

Package can be downloaded/installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on MIKROE github account.

Library Description

This library contains API for Cap Touch 4 Click driver.

Key functions

- captouch4_read_system_flags This function reads the system flags register.

- captouch4_read_cap_counts This function reads the counts number directly proportional to capacitance. The system is calibrated to make the counts as sensitive as possible to changes in capacitance for relative measurements.

- captouch4_read_lta This function reads the long-term averate (LTA) value. The LTA is used as reference to compare with capacitance counts.

Example Description

This example demonstrates the use of Cap Touch 4 Click by reading the proximity, touch, and movement events.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on MIKROE github account.

Other MIKROE Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.CapTouch4

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. UART terminal is available in all MIKROE compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MIKROE 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.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

ClickID

Downloads

Cap Touch 4 click example on Libstock

Cap Touch 4 click 2D and 3D files v100

IQS211B datasheet

Cap Touch 4 click schematic v100