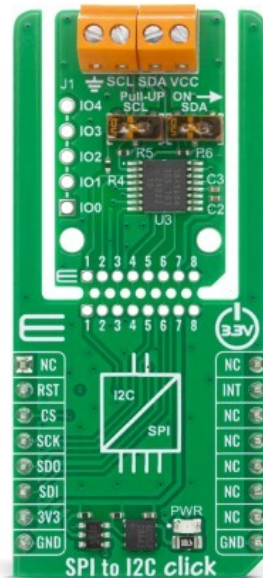


## SPI to I2C Click



PID: MIKROE-6789

**SPI to I2C Click** is a compact add-on board that enables communication between SPI and I2C interfaces, allowing a host microcontroller to control multiple I2C peripherals even without native I2C support. It is based on the [SC18IS604](#), an SPI-to-I2C bridge from [NXP](#), which manages all I2C-bus operations including protocol handling, arbitration, and timing to ensure reliable data transfer. The board operates as an SPI slave supporting Mode 3 and provides a single I2C controller channel, integrating five GPIO pins, 255-byte transmit and receive buffers, and support for SPI speeds up to 1.2MHz and I2C Fast-mode up to 375kHz. It also features Deep Power-Down mode with CS wake-up, interrupt and reset pins, and onboard pull-up switches for easy configuration. SPI to I2C Click is ideal for embedded applications requiring protocol bridging, such as connecting sensors, memory devices, or peripheral modules in mixed-interface systems.

For more information about **SPI to I2C Click** visit the official [product page](#).

### How does it work?

SPI to I2C Click is based on the SC18IS604, an SPI-to-I2C bridge from NXP that functions as an interface between the SPI bus of a host microcontroller or microprocessor and a serial I2C bus, allowing the host to directly control multiple I2C peripherals without requiring native I2C hardware support. Acting as an I2C-bus controller, the SC18IS604 manages all bus-specific operations, including protocol handling, arbitration, and timing, ensuring reliable and synchronized data transfer between the two communication standards. The module operates as an SPI slave device, supporting SPI Mode 3, and provides a single primary I2C-bus controller channel for communication with I2C devices. SPI to I2C Click is ideal for embedded applications

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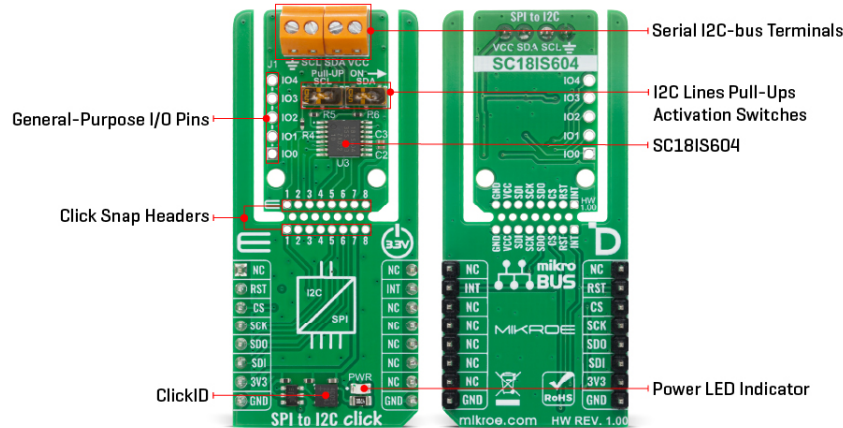


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that require bridging between SPI and I2C communication domains, such as integrating sensors, memory modules, and peripheral controllers in systems where only one of the two interfaces is natively supported.



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/IC/module area to become movable by breaking the PCB, opening many new possibilities for implementation. Thanks to the Snap feature, the SC18IS604 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.

The SC18IS604 integrates five general-purpose input/output (GPIO) pins accessible through an unpopulated J1 header, which can be used for custom digital control or status monitoring applications. The board's I/O pins are 5V tolerant, enabling flexible integration with a wide range of microcontrollers. Supporting high-speed SPI communication up to 1.2MHz and I2C Fast-mode operation up to 375kHz, SPI to I2C Click ensures efficient data throughput in mixed-interface embedded systems. It incorporates 255-byte transmit and receive buffers to handle large data transactions and includes a Deep Power-Down mode with SPI Chip Select (CS) wake-up functionality for low-power applications. An internal oscillator eliminates the need for an external clock source, simplifying the design process.

The board also provides an active LOW interrupt output on the INT pin, which alerts the host MCU when the SC18IS604 requires service, and an active LOW reset pin (RST) that restores internal registers to default states and resets the I2C and SPI hardware. Additionally, the board features two pull-up enable switches that conveniently activate onboard pull-up resistors on the I2C signal lines, making configuration straightforward.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. It also comes equipped with a library containing functions and 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, designed to bring greater flexibility and optimize your prototypes. By simply snapping the PCB along predefined

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lines, you can easily detach the main sensor/IC/module area, reducing the overall size, weight, and power consumption - ideal for the final phase of prototyping. For more details about Click Snap, visit the [official page](#) dedicated to this feature.

## Specifications

Type	SPI
Applications	Ideal for embedded applications requiring protocol bridging, such as connecting sensors, memory devices, or peripheral modules in mixed-interface systems
On-board modules	SC18IS604 - SPI to I2C-bus bridge from NXP
Key Features	Single primary I2C-bus controller channel, five general-purpose input/output pins, 5V tolerant I/O pins, support for high-speed SPI communication and I2C Fast-mode operation, 255-byte transmit and receive buffers, Deep Power-Down mode with SPI Chip Select wake-up functionality, an internal oscillator for clock generation, Click Snap design support, and more
Interface	GPIO,I2C,SPI
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 SPI to I2C Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
	NC	1	AN	PWM	16	NC	
Reset / ID SEL	<b>RST</b>	2	RST	INT	15	<b>INT</b>	Interrupt
SPI Select / ID COMM	<b>CS</b>	3	CS	RX	14	NC	
SPI Clock	<b>SCK</b>	4	SCK	TX	13	NC	
SPI Data OUT	<b>SDO</b>	5	MISO	SCL	12	NC	
SPI Data IN	<b>SDI</b>	6	MOSI	SDA	11	NC	
Power Supply	<b>3.3V</b>	7	3.3V	5V	10	NC	
Ground	<b>GND</b>	8	GND	GND	9	<b>GND</b>	Ground

## Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
SW1-SW2	Pull-UP ON	Right	I2C Lines Pull-Ups Activation Switches

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## SPI to I2C Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
SPI Clock Frequency	-	-	1.2	MHz
I2C Clock Frequency	-	-	375	kHz
GPIO Voltage Tolerance	-	5	-	V
TX/RX Buffer Size	-	255	-	bytes

## Software Support

[SPI to I2C Click](#) demo application is developed using the [NECTO Studio](#), ensuring compatibility with [mikroSDK](#)'s open-source libraries and tools. Designed for plug-and-play implementation and testing, the demo is fully compatible with all development, starter, and mikromedia boards featuring a [mikroBUS™](#) socket.

## Example Description

This example demonstrates the use of SPI to I2C Click board by reading the manufacturer ID of a 3D Hall 11 Click board connected to the I2C port and controlling the GPIO pins.

### Key Functions

- spitoi2c\_cfg\_setup Config Object Initialization function.
- spitoi2c\_init Initialization function.
- spitoi2c\_default\_cfg Click Default Configuration function.
- spitoi2c\_i2c\_read\_after\_write This function performs a write then read with a repeated start to the I2C target device.
- spitoi2c\_gpio\_write This function writes a desired data to the gpio port.
- spitoi2c\_gpio\_read This function reads data from the gpio port.

### Application Init

Initializes the driver and performs the Click default config which enables the device and sets the GPIO pins 0-2 as push-pull output and others as input. Then sets the I2C clock to 99KHz, I2C address to 127 and disables I2C timeout. After that, reads and displays the chip firmware version.

### Application Task

Reads the manufacturer ID of a 3D Hall 11 Click board connected to the I2C port, toggles the output pins and displays the GPIO port state. The results will be displayed on the USB UART approximately once per second.

## Application Output

This Click board can be interfaced and monitored in two ways:

- Application Output - Use the "Application Output" window in Debug mode for real-time data monitoring. Set it up properly by following [this tutorial](#).
- UART Terminal - Monitor data via the UART Terminal using a [USB to UART converter](#). For detailed instructions, check out [this tutorial](#).

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## Additional Notes and Information

The complete application code and a ready-to-use project are available through the NECTO Studio Package Manager for direct installation in the [NECTO Studio](#). The application code can also be found on the MIKROE [GitHub](#) account.

## Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

## Downloads

[SPI to I2C click example package](#)

[SPI to I2C click 2D and 3D files v100](#)

[SPI to I2C click schematic v100](#)

[SC18IS604 datasheet](#)

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