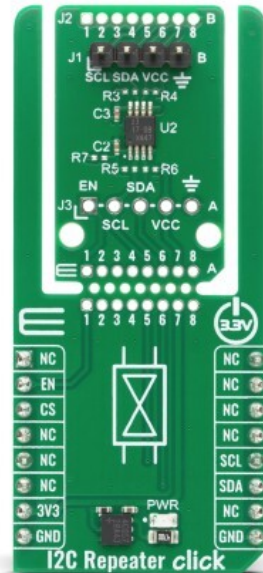


## I2C Repeater Click



PID: MIKROE-6785

**I2C Repeater Click** is a compact add-on board that extends and accelerates I2C communication between two buses, providing voltage-level translation, buffering, and improved signal integrity for high-speed applications. It is based on the [NCA9700](#), a dual-channel bidirectional level translating I2C bus repeater and accelerator from [nexperia](#) optimized for Fast-mode Plus operation up to 1MHz. This IC features integrated edge accelerators that speed up the LOW-to-HIGH transitions of SCL and SDA signals, buffers both clock and data lines, and enables up or down voltage translation between port A and port B with independent operation from 1.08V to 3.6V. Each I/O pin integrates 4.3kΩ pull-up resistors while allowing additional ones to further improve rise times. The board features MIKROE's Click Snap format enabling the main circuit area to be detached and used autonomously through direct pin access. This makes I2C Repeater Click ideal for smartphones, tablets, portable medical devices, instrumentation, IoT products, and other power-sensitive applications requiring robust and accelerated I2C communication.

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

### How does it work?

I2C Repeater Click is based on the NCA9700, a dual-channel bidirectional level translating I2C bus repeater/accelerator from nexperia. This board is designed to extend and accelerate I2C communication between two buses while providing reliable voltage-level translation, buffering, and improved signal integrity for high-speed applications up to 1MHz (Fast-mode Plus operation). This makes I2C Repeater Click ideal for high-performance, low-power systems such as smartphones, tablets, portable medical devices, instrumentation and test equipment, IoT

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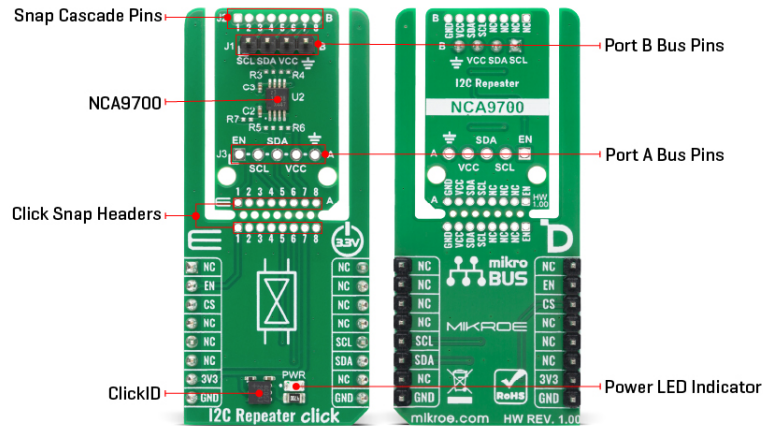


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devices, and other power-sensitive applications where accelerated I2C communication is required.



The high performance of the NCA9700 is achieved through integrated edge accelerators on all ports that speed up LOW-to-HIGH transitions of SCL and SDA signals. The NCA9700 buffers both clock and data lines while enabling up or down voltage translation between port A and port B, each independently operating from 1.08V to 3.6V to offer flexibility for mixed-voltage systems. Each I/O pin features integrated 4.3kΩ pull-up resistors, eliminating the need for external resistors while allowing additional ones to be added to further improve rise times. Unlike devices based on pass-FET topology, the NCA9700 provides true signal buffering with no static or incremental offsets and guarantees lock-free operation thanks to its innovative buffer implementation.

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 up many new possibilities for implementation. Thanks to the Snap feature, the NCA9700 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.

In addition to the I2C communication pins, the I2C Repeater Click also uses the EN pin that serves as the device enable input, allowing the user or system controller to activate or disable the repeater/accelerator. Besides, there is also an unpopulated J2 header at the top of the board, allowing for daisy-chaining and control of multiple Snap units in a series or in star, and their ports A and B can be exchanged. Only when the I2C clock stretching needs to be supported, the NCA9700 port A must be connected to the I2C host side and the NCA9700 port B to the I2C peripheral side.

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

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greater flexibility and optimize your prototypes. By simply snapping the PCB along predefined 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	I2C
Applications	Ideal for smartphones, tablets, portable medical devices, instrumentation, IoT products, and other power-sensitive applications requiring robust and accelerated I2C communication
On-board modules	NCA9700 - level translating I2C bus repeater/accelerator from nexperia
Key Features	Dual-channel bidirectional level translating I2C bus repeater and accelerator, Fast-mode Plus operation up to 1MHz, integrated edge accelerators for faster LOW-to-HIGH transitions, true signal buffering without pass-FET topology, independent voltage translation between port A and port B from 1.08V to 3.6V, integrated 4.3kΩ pull-up resistors on each I/O pin, Click Snap format, 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 I2C Repeater 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	
Device Enable	<b>EN</b>	2	RST	INT	15	NC	
ID COMM	<b>CS</b>	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	<b>SCL</b>	I2C Clock
	NC	6	MOSI	SDA	11	<b>SDA</b>	I2C Data
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
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LD1	PWR	-	Power LED Indicator
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## I2C Repeater Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Voltage Range per Port	1.08	-	3.6	V
I2C Frequency	-	-	1	MHz

## Software Support

[I2C Repeater 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 communication through the I2C Repeater Click board. It initializes the device, sets the slave I2C address of an external I2C sensor (e.g. 6DOF IMU 11 Click), and reads its device ID register, verifying if the expected ID is returned.

## Key Functions

- `i2crepeater_cfg_setup` This function initializes Click configuration structure to initial values.
- `i2crepeater_init` This function initializes all necessary pins and peripherals used for this Click board.
- `i2crepeater_enable_device` This function enables the device by setting the EN pin to high logic state.
- `i2crepeater_set_i2c_address` This function sets the slave address for I2C communication.
- `i2crepeater_i2c_read_reg` This function reads data from a specific register of the I2C slave.

## Application Init

Initializes the logger and the I2C Repeater Click, then enables the device.

## Application Task

Sets the I2C address of a connected I2C sensor and reads its device ID, then logs whether the returned ID matches the expected value.

## 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

[I2C Repeater click example package](#)

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

[NCA9700 datasheet](#)

[I2C Repeater click schematic v100](#)

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