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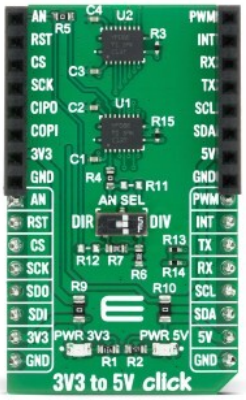
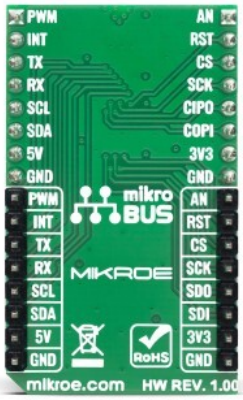
3V3 to 5V Click





PID: MIKROE-6901

3V3 to 5V Click is a compact add-on board designed for voltage-level translation between 3.3V host systems and 5V mikroBUS-compatible peripherals, enabling safe signal adaptation in mixed-voltage embedded designs. This board is based on the TXS0108E, an 8-bit level-shifting voltage translator for open-drain and push-pull applications from Texas Instruments. It features two TXS0108E translators, an onboard mikroBUS socket implemented as headers for connecting an additional Click board or compatible module, translated communication and control lines between the host and peripheral voltage domains, an AN SEL switch for direct or resistor-divider-based analog signal routing, and LED indicators for active power rail monitoring. It is suitable for prototyping, system integration, hardware evaluation, legacy 5V module interfacing, sensor board adaptation, communication interface testing, and mixed-voltage embedded systems.

For more information about **3V3 to 5V Click** visit the official product page.

How does it work?

3V3 to 5V Click is based on the TXS0108E, an 8-bit level-shifting voltage translator for open-drain and push-pull applications from Texas Instruments. This Click board features an onboard mikroBUS socket implemented as headers, allowing an additional Click board or mikroBUS-compatible module to be connected and operated with translated logic voltage levels. The voltage translation is performed through two TXS0108E level-shifting voltage translators, enabling communication and signal adaptation between a 3.3V host MCU side and a 5V peripheral side. This makes 3V3 to 5V Click suitable for applications where a 3.3V host needs to interface safely and reliably with 5V Click boards, legacy 5V logic modules, sensor boards, communication interfaces, or mixed-voltage embedded systems. It is especially useful during

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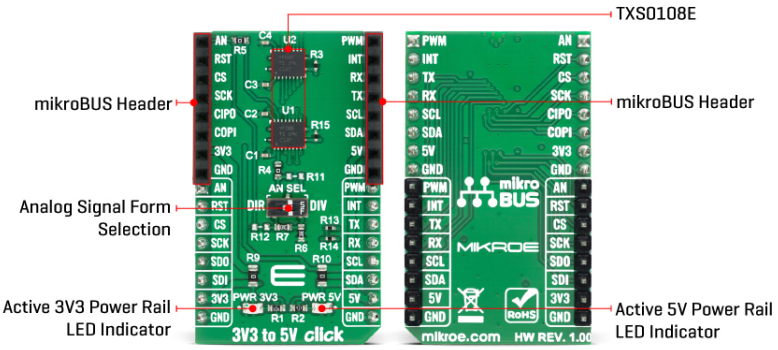
prototyping, system integration, hardware evaluation, and development environments where voltage compatibility between the host controller and connected peripherals must be ensured without redesigning the main hardware platform.



The board also includes an AN SEL switch, which determines how the analog AN signal from the additional mikroBUS header is routed to the main mikroBUS AN pin and then to the host MCU. When the switch is placed in the DIR position, the AN signal is connected directly without voltage division, which is used when the analog signal is already within the safe input range of the host side, typically up to 3.3V. This is the default switch position. When the switch is placed in the DIV position, the AN signal passes through a resistor divider formed by R11 and R12 before reaching the main AN pin. By default, these resistors are not populated, allowing the divider ratio to be configured according to the application requirements.

This option is used when the connected Click board or external module can generate a higher analog signal level, such as up to 5V, which must be scaled down to a safe range for a 3.3V ADC input on the host MCU. In addition, the board features two green LED indicators labeled 3V3 and 5V, providing a clear visual indication of the active power rails during operation.

This Click board™ is designed to bridge 3.3V host systems with 5V mikroBUS-compatible peripherals by translating the required signal lines between the two voltage domains. It allows 3.3V MCU platforms to communicate properly with connected 5V modules while maintaining safe logic-level compatibility. Also, this Click board™ comes equipped with a library containing easy-to-use functions and an example code that can be used as a reference for further development.

Specifications

Type	Adapter,Boost
Applications	It is suitable for prototyping, system integration, hardware evaluation, legacy 5V module interfacing, sensor board adaptation, communication interface testing, and mixed-voltage embedded systems
On-board modules	TXS0108E - 8-bit level-shifting voltage translator for open-drain and push-pull aplications from Texas Instruments

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Key Features	3.3V-to-5V voltage-level translation, support for open-drain and push-pull signal applications, compatibility with additional Click boards and mikroBUS-compatible modules, signal adaptation between 3.3V host MCU side and 5V peripheral side, translated communication and control lines, analog signal routing switch, and more
Interface	Analog,GPIO,I2C,PWM,SPI,UART
Feature	ClickID
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 3V3 to 5V Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Analog Output	**AN**	1	AN	PWM	16	**PWM**	PWM Input
Reset	**RST**	2	RST	INT	15	**INT**	Interrupt
SPI Chip Select	**CS**	3	CS	RX	14	**TX**	UART TX
SPI Clock	**SCK**	4	SCK	TX	13	**RX**	UART RX
SPI Data OUT	**SDO**	5	MISO	SCL	12	**SCL**	I2C Clock
SPI Data IN	**SDI**	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 3V3	-	Active 3V3 Power Rail LED Indicator
LD2	PWR 5V	-	Active 5V Power Rail LED Indicator
SW1	AN SEL	Left	Analog Signal Form Selection DIR/DIV: Left position DIR, Right position DIV

3V3 to 5V Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V

Software Support

3V3 to 5V Click demo application is developed using the NECTO Studio, ensuring compatibility

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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 the 3V3 to 5V Click board to control and toggle all mikroBUS pins. The application alternates between two toggle modes: toggling all pins simultaneously a fixed number of times with a defined delay, and toggling pins sequentially with a separate delay between each pin change.

Key Functions

- c3v3to5v_cfg_setup This function initializes Click configuration structure to initial values.
- c3v3to5v_init This function initializes all necessary pins and peripherals used for this Click board.
- c3v3to5v_toggle_all This function toggles all mikroBUS pins together a desired number of times with the selected delay between each toggle.
- c3v3to5v_toggle_seq This function toggles all mikroBUS pins one by one with the selected delay between each toggle.

Application Init

Initializes the logger and the 3V3 to 5V Click driver. After driver setup and mikroBUS mapping, the digital output pins are initialized and the example is ready to run.

Application Task

Executes two toggle demonstrations in a loop:

- Toggles all output pins together 5 times with a 500 ms delay.
- Toggles all output pins sequentially with a 300 ms delay.

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.

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

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TXS0108E datasheet