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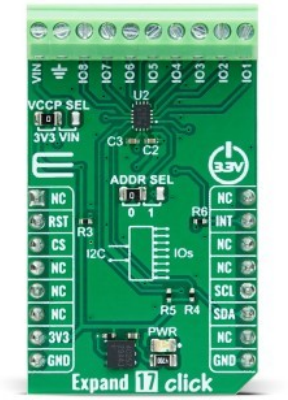
Expand 17 Click



PID: MIKROE-6054

Expand 17 Click is a compact add-on board designed to expand the number of input/output pins in your system. This board features the TCAL6408, an 8-bit I/O expander from Texas Instruments, which communicates via the I2C protocol. The TCAL6408 features programmable output drive strength, latchable inputs, pull-up/pull-down resistors, and configurable open-drain or push-pull outputs, offering flexible and enhanced I/O performance with minimal power consumption and reduced EMI. Additionally, it supports independent logic and main power supplies, with the ability to select the main power source through a jumper. Expand 17 Click is ideal for applications requiring additional I/Os, such as controlling switches, sensors, push-buttons, and LEDs.

How does it work?

Expand 17 Click is based on the TCAL6408, an 8-bit I/O expander from Texas Instruments designed to provide input/output expansion through the I2C protocol. This Click board™ offers an ideal solution for adding more I/Os to the system when dealing with switches, sensors, push-buttons, LEDs, fans, and other peripherals. The TCAL6408 IC features agile I/O configuration registers, providing programmable output drive strength, latchable inputs, maskable interrupts, programmable pull-up/down resistors, and the ability to configure open-drain or push-pull outputs. These advanced features ensure enhanced I/O performance with improved speed, power consumption, and reduced electromagnetic interference (EMI).

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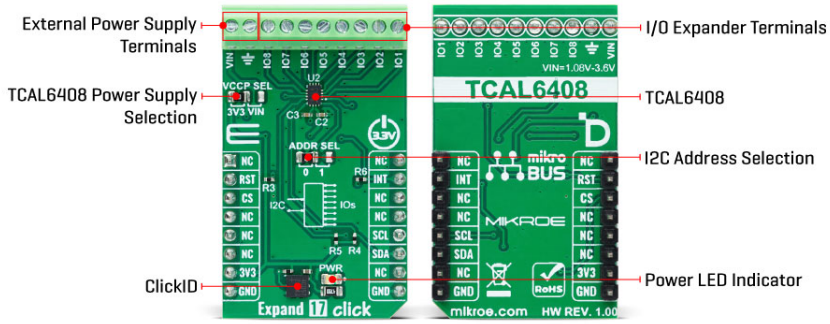

The TCAL6408 supports independent logic and power supplies. The logic voltage is supplied via the 3.3V mikroBUS™ power rail, while the main power can be selected between 3.3V from the mikroBUS™ or an externally provided supply through the VIN terminal, with a range of 1.08V to 3.6V. The main power selection is managed by the VCCP SEL jumper, allowing users to set the appropriate power source for the TCAL6408 based on their application's requirements.

Expand 17 Click communicates with the host MCU via the standard 2-wire I2C interface, supporting clock frequencies up to 1MHz. The I2C address is easily configurable using the onboard ADDR SEL jumper. Additionally, this board also uses an active-low reset (RST) pin, used for initializing the device, and an open-drain active-low interrupt (INT) pin, which provides notification of changes in input status, ensuring efficient handling of external events and inputs.

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. Also, it comes equipped with a library containing functions and an example code that can be used as a reference for further development.

Specifications

Type	Port expander
Applications	Ideal for applications requiring additional I/Os, such as controlling switches, sensors, push-buttons, and LEDs
On-board modules	TCAL6408 - 8-bit I/O expander from Texas Instruments
Key Features	8-bit I/O expander, I2C interface, programmable output drive strength and pull-up/pull-down resistors, configurable open-drain or push-pull outputs, latchable inputs and maskable interrupts, independent logic and main power supplies, and more
Interface	I2C
Feature	ClickID
Compatibility	mikroBUS™

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Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V,External

Pinout diagram

This table shows how the pinout on Expand 17 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	
Reset	**RST**	2	RST	INT	15	**INT**	Interrupt
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
JP1	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1
JP2	VCCP SEL	Left	TCAL6408 Power Supply Selection 3V3/VIN: Left position 3V3, Right position VIN

Expand 17 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
External Power Supply	1.08	-	3.6	V
Output Current	-	-	25	mA

Software Support

We provide a library for the Expand 17 Click as well as a demo application (example), developed using MIKROE compilers. The demo can run on all the main MIKROE development 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

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This library contains API for Expand 17 Click driver.

Key functions

- expand17_set_io_dir This function is used to set input or output direction of pins.
- expand17_set_output_state This function is used to set output state of the pins.
- expand17_get_input_state This function is used to get state of the input pins.

Example Description

This example demonstrates the use of Expand 17 Click by setting and reading the ports state.

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.Expand17

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

Expand 17 click example on Libstock

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Expand 17 click 2D and 3D files v100

TCAL6408 datasheet

Expand 17 click schematic v100