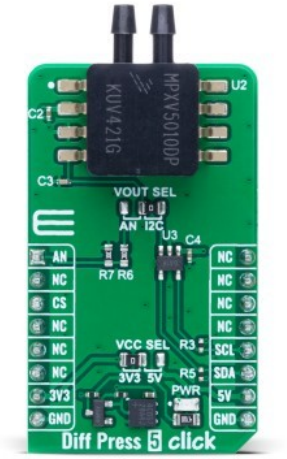
MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Diff Press 5 Click



PID: MIKROE-6527

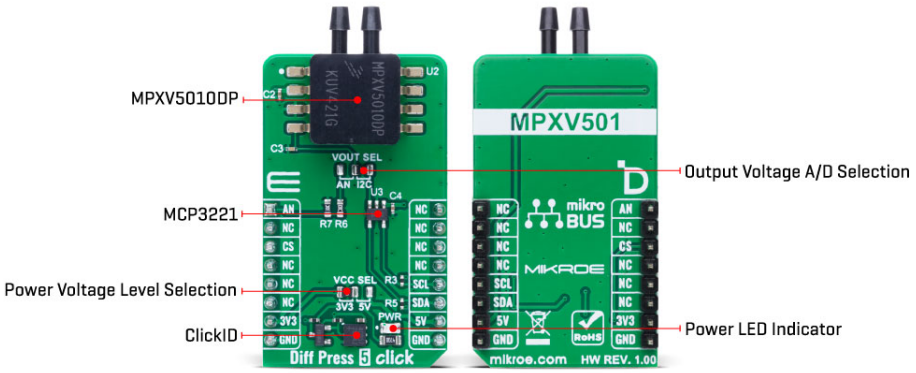
Diff Press 5 Click is a compact add-on board designed for differential pressure measurement in various industrial and commercial applications. This board features the MPXV5010DP, a high-precision dual port differential pressure sensor from NXP, ensuring accurate and reliable readings. It provides an analog output that can be converted to a digital value using the MCP3221 12-bit ADC via an I2C interface or directly accessed through the mikroBUS™ analog output pin. It supports a pressure range from 0 to 10kPa, offers a typical sensitivity of 450mV/kPa, and includes built-in temperature compensation for stable performance. Diff Press 5 Click is ideal for HVAC systems, respiratory monitoring, process control, liquid level sensing, and other applications requiring precise pressure measurement.

For more information about **Diff Press 5 Click** visit the official product page.

How does it work?

Diff Press 5 Click is based on the MPXV5010DP, a high-precision dual port differential pressure sensor from NXP, designed to deliver accurate and reliable pressure readings across a variety of applications, particularly those involving microcontrollers or microprocessors equipped with A/D inputs. At its core, the MPXV5010DP is a piezoresistive transducer that uses state-of-the-art monolithic silicon technology to ensure high performance. By integrating micromachining techniques, thin-film metallization, and bipolar processing, this sensor provides a precise and proportional analog output signal in response to applied pressure. Its axial port has been specially adapted to accommodate industrial-grade tubing, making it suitable for use in demanding environments.

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
www.mikroe.com



A key feature of this sensor is its built-in temperature compensation and calibration, achieved through the integration of shear-stress strain gauge technology, signal conditioning, and compensation circuitry within a single monolithic chip. This ensures consistent performance across a range of operating conditions. Housed in a durable epoxy unibody and thermoplastic (PPS) surface-mount package, the MPXV5010DP supports a pressure range from 0 to 10kPa (equivalent to 1019.78mm H_2O) with a typical sensitivity of 450mV/kPa (4.413mV/kPa H_2O). Diff Press 5 Click is well-suited for use in HVAC systems, respiratory monitoring devices, process control applications, liquid level sensing in appliances, and other scenarios where accurate differential pressure measurement is essential.

The MPXV5010DP's analog output can also be converted to a digital value using MCP3221, a 12-bit successive approximation A/D converter from Microchip, using a 2-wire I2C compatible interface, or sent, as mentioned, directly to an analog output pin of the mikroBUS™ socket labeled as AN. Selection can be performed via an onboard SMD jumper labeled VOUT SEL, placing it in an appropriate position marked as AN and I2C.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VCC SEL jumper. This way, both 3.3V and 5V capable MCUs can use the communication lines properly. 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	Pressure
Applications	Ideal for HVAC systems, respiratory monitoring, process control, liquid level sensing, and other applications requiring precise pressure measurement
On-board modules	MPXV5010DP - dual port differential pressure type sensor from NXP
Key Features	High-precision differential pressure measurement, high sensitivity, integrated temperature compensation and calibration, selectable output mode, operates at different voltage levels, industrial-grade tubing compatibility, durable epoxy unibody and

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
www.mikroe.com

	thermoplastic surface-mount package, and more
Interface	Analog,I2C
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 Diff Press 5 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	NC	
	NC	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	**5V**	Power Supply
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V
JP2	VOUT SEL	Right	Output Voltage A/D Selection AN/ADC: Left position AN, Right position ADC

Diff Press 5 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Pressure Range	0	-	10	kPa
Sensitivity	-	450	-	mV/kPa

Software Support

Diff Press 5 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.

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
www.mikroe.com

Example Description

This example demonstrates the use of the Diff Press 5 Click board. It showcases how to initialize the device, calibrate the zero-pressure offset, and read the differential pressure data in Pascals (Pa) from the sensor.

Key Functions

- diffpress5_cfg_setup Config Object Initialization function.
- diffpress5_init Initialization function.
- diffpress5_default_cfg Click Default Configuration function.
- diffpress5_calib_offset This function calibrates the zero current offset value.
- diffpress5_read_vout_avg This function reads a desired number of sensor voltage output samples and averages it.
- diffpress5_read_pressure This function reads the differential pressure measurement.

Application Init

Initializes the logger and the Diff Press 5 Click driver. The application then performs zero-pressure offset calibration to ensure accurate pressure measurements. During the calibration, it is crucial to avoid applying pressure to the sensor.

Application Task

Continuously reads the differential pressure from the sensor and logs the values in Pascals (Pa).

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

Click board™ Catalog

Click boards™

ClickID

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
www.mikroe.com

Downloads

Diff Press 5 click example package

Diff Press 5 click 2D and 3D files v100

Diff Press 5 click schematic v100

MPXV5010DP datasheet