

## Diff pressure click



PID: MIKROE-2387

RS Product Code: [136-0841](#)

Diff pressure click carries NXP's MPXV5010DP signal conditioned, temperature compensated and calibrated pressure sensor with two axial ports to accommodate industrial grade tubing. The click is designed to run either on 3.3V or 5V power supply. It communicates with the target microcontroller over SPI interface (CS, SCK, MISO).

Diff pressure click is designed for comparing two pressure measurements. For example, measuring the difference in the pressure of gasses in a variable diameter flow tube.

### How it works

The two ports are designated as Pressure side (P1) and Vacuum side (P2). The sensor is designed to operate with a positive differential pressure where  $P1 > P2$ . The measurement range is from 0 to 10 kPa. In the temperature range between 0° and 85°C, the sensor has a maximum error rate of 5.0%.

### MPXV5010DP features

MPXV5010DP IC has an analogue output. The signal passes through the on board 22-bit ADC before being outputted through the mikroBUS SPI interface (CS, SCK, MISO).

## Key features

- MPXV5010DP pressure sensor
- Temperature Compensated over -40° to +125°C
- 5.0% Maximum Error over 0° to 85°C
- SPI interface
- 3.3V or 5V power supply

## Specification

Product Type	Pressure / Altitude
Applications	Differential pressure measurement for controlling industrial processes
On-board modules	NXP MPXV5010DP
Key Features	0 to 10 kPa measurement range
Key Benefits	On board 22-bit ADC, Two ports for industrial grade tubing
Interface	SPI
Power Supply	3.3V or 5V
Compatibility	mikroBUS
Click board size	S (28.6 x 25.4 mm)
Weight	25g

## Pinout diagram

This table shows how the pinout on Diff pressure click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	 mikroBUS™				Pin	Notes
		1	AN	PWM	16		
Not connected	NC	2	RST	INT	15	NC	Not connected
SPI Chip Select	<b>CS_M</b>	3	CS	TX	14	NC	Not connected
SPI Clock	<b>SCK_M</b>	4	SCK	RX	13	NC	Not connected
SPI Master Input Slave Output	<b>MISO_M</b>	5	MISO	SCL	12	NC	Not connected
Not connected	NC	6	MOSI	SDA	11	NC	Not connected
Power supply	<b>+3.3V</b>	7	3.3V	5V	10	<b>+5V</b>	Power supply
Ground	<b>GND</b>	8	GND	GND	9	<b>GND</b>	Ground

# Programming

The following code snippet initializes SPI, UART and the Diff Pressure click and reads the difference between the two pressures to the UART terminal.

```
1 void main()
2 {
3     //Local Declarations
4     int32_t buffer = 0;
5     char uart_text[20] = { 0 };
6     float difference = 0;
7     status_t status;
8
9     //GPIOs
10    GPIO_Digital_Input( &GPIO_PORT_24_31, _GPIO_PINMASK_6 );
11    GPIO_Digital_Output( &GPIO_PORT_24_31, _GPIO_PINMASK_4 );
12
13    //UART
14    UART1_Init( 9600 );
15    Delay_ms(200);
16    UART1_Write_Text( "UART Initializedrn" );
17
18    // SPI
19    SPIM1_Init_Advanced( _SPI_MASTER_CLK_RATIO_4, _SPI_CFG_PHASE_CAPTURE_RISING |
20                        _SPI_CFG_POLARITY_IDLE_LOW | _SPI_CFG_SS_AUTO_DISABLE |
21                        _SPI_CFG_FIFO_DISABLE, _SPI_SS_LINE_NONE );
22    Delay_ms(200);
23    UART1_Write_Text( "SPI Initializedrn" );
24
25    //Diff Pressure Click
26    diff_pressure_init();
27    UART1_Write_Text( "Diff Pressure Click Initializedrn" );
28
29    while (1)
30    {
31        status = diff_pressure_read_adc( &buffer );    //Read ADC
32        if ( status == OK )
33        {
34            //Get Pressure Difference
35            difference = diff_pressure_get_kpa_difference( buffer );
36            //Write it out
37            UART1_Write_Text( "KPA Difference: " );
38            FloatToStr( difference, uart_text );
39            UART1_Write_Text( uart_text );
40            UART1_Write_Text( "rn" );
41            buffer = 0;
42        }
43        else if ( status == OVH )    //Overflow High
44            UART1_Write_Text( "Overflow happenedrn" );
45        else if ( status == OVL )    //Overflow Low
46            UART1_Write_Text( "Underflow happenedrn" );
47        else    //Data wasn't ready
48            UART1_Write_Text( "Not Readyrn" );
49    }
50 }
51
52 }
```

Code examples that demonstrate the usage of Diff press click with MikroElektronika hardware, written for mikroC for ARM, AVR, dsPIC, PIC and PIC32 are available on Libstock

## Downloads

[mikroBUS™ Standard specification](#)

[LibStock: Diff pressure click](#)

[Diff pressure click Schematic](#)

[MPXV5010DP datasheet](#)