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Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
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Diff pressure click

From MikroElektonika Documentation

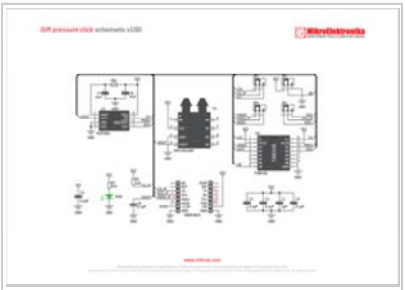
Diff pressure is a mikroBUS™ add-on board carrying an NXP MPXV5010DP signal conditioned, temperature compensated and calibrated pressure sensor with two axial ports to accommodate industrial grade tubing. It is designed for comparing two pressure measurements.

Diff pressure click

Diff pressure click

IC/Module	MPXV5010DP (http://www.nxp.com/files/sensors/doc/data_sheet/MPX5010.pdf)
Interface	SPI
Power supply	3.3V, 5V
Website	www.mikroe.com/click/diff-pressure (http://www.mikroe.com/click/diff-pressure)

Features and usage notes



Schematic also available in PDF (http://cdn-docs.mikroe.com/images/0/0d/Diff_pressure_click_sc

The two ports on Diff pressure click 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 P1 and P2 ports are not marked on the sensor itself, but according to the vendor's data sheet, P1 is on the side of part markings. In the case of Diff pressure click, that's the top half of the sensor.

The measurement range is from 0 to 10 kPa. In the temperature range between 0º and 85ºC, the sensor has a maximum error rate of 5.0%.

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

Diff pressure click is designed to use either a 3.3V or a 5V power supply. It's 3.3V by default. To change it to 5V, resolder the onboard jumpers (zero Ohm resistors)

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.

```
void main()
{
    //Local Declarations
    int32_t buffer = 0;
    char uart_text[20] = { 0 };
    float difference = 0;
    status_t status;

    //GPIOs
    GPIO_Digital_Input( &GPIO_PORT_24_31, _GPIO_PINMASK_6 );
    GPIO_Digital_Output( &GPIO_PORT_24_31, _GPIO_PINMASK_4 );

    //UART
    UART1_Init( 9600 );
    Delay_ms(200);
    UART1_Write_Text( "UART Initialized\r\n" );

    // SPI
    SPIM1_Init_Advanced( _SPI_MASTER_CLK_RATIO_4, _SPI_CFG_PHASE_CAPTURE_RISING |
                         _SPI_CFG_POLARITY_IDLE_LOW | _SPI_CFG_SS_AUTO_DISABLE |
                         _SPI_CFG_FIFO_DISABLE, _SPI_SS_LINE_NONE );
    Delay_ms(200);
    UART1_Write_Text( "SPI Initialized\r\n" );

    //Diff Pressure Click
    diff_pressure_init();
    UART1_Write_Text( "Diff Pressure Click Initialized\r\n" );

    while (1)
    {
        status = diff_pressure_read_adc( &buffer );    //Read ADC
        if ( status == OK )
        {
            //Get Pressure Difference
            difference = diff_pressure_get_kpa_difference( buffer );
            //Write it out
            UART1_Write_Text( "KPA Difference: " );
            FloatToStr( difference, uart_text );
            UART1_Write_Text( uart_text );
            UART1_Write_Text( "\r\n" );
            buffer = 0;
        }
        else if ( status == OVH )   //Overflow High
            UART1_Write_Text( "Overflow happened\r\n" );
        else if ( status == OVL )   //Overflow Low
            UART1_Write_Text( "Underflow happened\r\n" );
        else                        //Data wasn't ready
            UART1_Write_Text( "Not Ready\r\n" );
```

```
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 (http://libstock.mikroe.com/projects/view/1901/diff-pressure-click).

Resources

- Diff pressure click example on Libstock (http://libstock.mikroe.com/projects/view/1901/diff-pressure-click)

- Vendor's data sheet (http://www.nxp.com/files/sensors/doc/data_sheet/MPX5010.pdf)

- MCP3551 ADC data sheet (http://ww1.microchip.com/downloads/en/devicedoc/21950b.pdf)

- mikroBUS™ standard specifications (http://download.mikroe.com/documents/standards/mikrobus/mikrobus-standard-specification-v200.pdf)