

Micro Pump Click



PID: MIKROE-6529

Micro Pump Click is a compact add-on board designed for precise air and fluid movement in embedded applications. This board features the [JSB1523018](#), a mini pump from TCSTec, controlled by the [DRV8213](#) brushed DC motor driver from Texas Instruments. The board delivers a high flow rate of 80~130mL/min and operates at a pressure of 80kPa, while maintaining low power consumption and offering flexible PWM control through IN1 and IN2 pins. It also features a GAIN SEL jumper for output current optimization and an IP pin for current regulation and feedback. Ideal for use in medical devices, smart home appliances, hydroponic systems, or portable air pumps, Micro Pump Click provides a compact and efficient solution for projects that require reliable, small-scale air or water flow control.

For more information about **Micro Pump Click** visit the official [product page](#).

How does it work?

Micro Pump Click is based on the JSB1523018, a compact powerful mini pump from TCSTec, made for airflow and fluid transfer in a wide range of applications. This miniature water and oxygen pump stands out for its exceptional performance in a small form factor, delivering an impressive flow rate of 80~130mL/min. Designed to deliver consistent and reliable performance, the JSB1523018 operates at a pressure of 80kPa, making it ideal for tasks that require a steady air supply, such as integration into smart home devices like sweeping robots. Its robust output allows it to support continuous operation while maintaining low power consumption, which is crucial for energy-efficient designs. Such high efficiency makes it perfectly suited for maintaining optimal oxygen levels in small aquatic systems, ensuring a stable and healthy environment for aquatic life.

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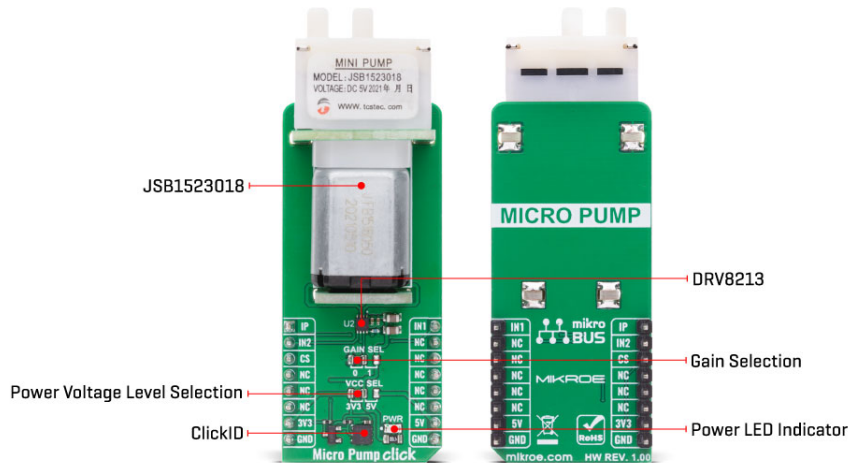
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Beyond consumer electronics, the JSB1523018 finds its place in critical medical and industrial applications. Its precise and compact design makes it suitable for use in medical devices including CPAP machines, nebulizers, and portable ventilators, where controlled airflow is essential. The pump also serves well in confined air circulation systems, hydroponic solutions, and small fish tank aeration, providing a quiet and dependable source of air or fluid movement. Additionally, it can be used in portable air pumps for inflating small objects or in air sampling equipment where lightweight, low-noise operation is necessary.

The operation of the pump on the Micro Pump Click is managed by the DRV8213, a brushed DC motor driver from Texas Instruments, ensuring control of the JSB1523018 pump. This driver enables simple control through its IN1 and IN2 pins, which are compatible with a standard PWM interface, allowing users to easily adjust the motor speed and direction using pulse-width modulation signals. For added flexibility, the board includes a GAIN SEL jumper that allows users to configure the gain factor based on the required output current range, optimizing performance for specific applications.

In addition to the primary control pins, the board also uses the IP pin, which enables the integrated current regulation feature of the DRV8213. This functionality helps limit the pump current to a predefined maximum value, offering protection and improved efficiency. Moreover, the IP signal can provide real-time current feedback to the host MCU during both drive and brake/slow-decay states of the H-bridge, giving developers more insight and control over the pump's operation and enhancing the overall safety and reliability of the system.

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 | Brushed |
| Applications | Ideal for use in medical devices, smart home appliances, hydroponic systems, or portable air pumps |
| On-board modules | JSB1523018 - mini pump from TCSTec |
| Key Features | Mini water and oxygen pump for air and fluid |

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| | |
|------------------|--|
| | transfer, high flow rate of 1.1L/min, operating pressure of 80kPa, controlled via brushed DC motor driver, standard PWM interface, adjustable gain, integrated current regulation and feedback, and more |
| Interface | Analog,PWM |
| Feature | ClickID |
| Compatibility | mikroBUS™ |
| Click board size | L (57.15 x 25.4 mm) |
| Input Voltage | 3.3V or 5V |

Pinout diagram

This table shows how the pinout on Micro Pump Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

| Notes | Pin |  | | | | Pin | Notes |
|------------------------|-------------|---|------|-----|----|------------|------------------------|
| Analog Current Output | IP | 1 | AN | PWM | 16 | IN1 | Brushed Driver Control |
| Brushed Driver Control | IN2 | 2 | RST | INT | 15 | NC | |
| ID COMM | CS | 3 | CS | RX | 14 | NC | |
| | NC | 4 | SCK | TX | 13 | NC | |
| | NC | 5 | MISO | SCL | 12 | NC | |
| | NC | 6 | MOSI | SDA | 11 | NC | |
| 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 |
| JP1 | GAIN SEL | Left | Gain Selection 0/1: Left position 0, Right position 1 |

Micro Pump Click electrical specifications

| Description | Min | Typ | Max | Unit |
|--------------------|-----|-----|-----|-------|
| Supply Voltage | 3.3 | - | 5 | V |
| Operating Pressure | - | - | 80 | kPa |
| Flow Rate | 0.8 | - | 1.3 | L/min |

Software Support

[Micro Pump Click](#) demo application is developed using the [NECTO Studio](#), ensuring compatibility with [mikroSDK](#)'s open-source libraries and tools. Designed for plug-and-play

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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 Micro Pump Click board. It initializes the Click module, calibrates the offset for accurate current measurements, and then controls the motor in different states while measuring and logging the output current in milliamps (mA).

Key Functions

- micropump_cfg_setup Config Object Initialization function.
- micropump_init Initialization function.
- micropump_drive_motor This function drives the micro pump motor in the selected state.
- micropump_calib_offset This function calibrates the zero current offset value.
- micropump_get_out_current This function reads the current output measurement in mA.

Application Init

Initializes the logger and the Micro Pump Click driver and performs offset calibration.

Application Task

Alternates the motor's operational states between COAST and FORWARD. For each state, it logs the motor's current consumption.

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](#)

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Downloads

[DRV8213 datasheet](#)

[Micro Pump click example package](#)

[Micro Pump click 2D and 3D files v100](#)

[JSB1523 datasheet](#)

[Micro Pump click schematic v100](#)

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