

Brushless 26 Click



PID: MIKROE-5843

Brushless 26 Click is a compact add-on board that controls brushless DC motors with any MCU. This board features the DRV8317H, a three-phase PWM motor driver from Texas Instruments. It provides three integrated MOSFET half-bridges for driving three-phase brushless DC (BLDC) motors with 5V, 9V, 12V, or 18V DC rails or 2s to 4s batteries. It comes with an integrated three-phase current sensing, eliminating the need for an external sense resistor. This Click board™ makes the perfect solution for the development of brushless DC (BLDC) motor modules, air purifiers, dishwasher pumps, vacuum robots, washer and dryer pumps, coffee machines, and more.

Brushless 26 Click is supported by a [mikroSDK](#) compliant library, which includes functions that simplify software development. This [Click board™](#) comes as a fully tested product, ready to be used on a system equipped with the [mikroBUS™](#) socket.

How does it work?

Brushless 26 Click is based on the DRV8317H, a three-phase PWM motor driver from Texas Instruments. Its integrated protection features include VM undervoltage lockout, VM overvoltage protection, charge pump undervoltage, overcurrent protection, overtemperature warning and shutdown, and fault condition indication pin. The motor driver provides two configurable schemes, a 6x or a 3x PWM, which can be used to implement sensor or sensorless field-oriented control (FOC), sinusoidal control, or trapezoidal control using an external microcontroller. It is capable of driving a PWM frequency of up to 200KHz.

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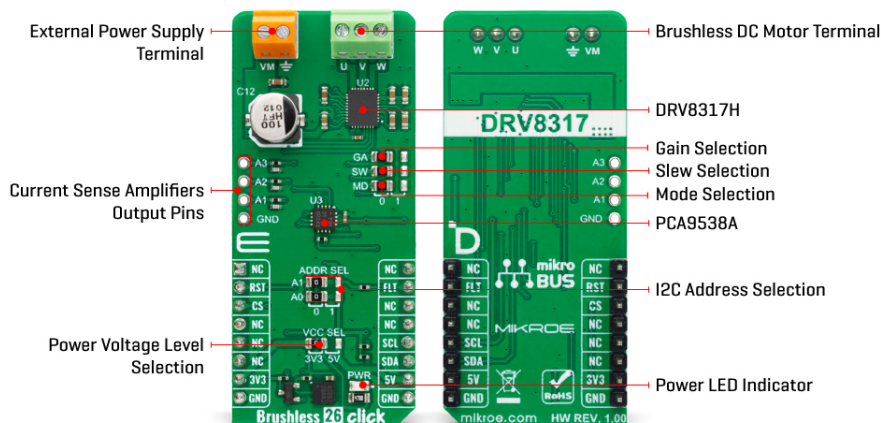
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To control all high and low side driver control inputs of the DRV8317H, Brushless 26 Click features the [PCA9538A](#), a low-voltage 8-bit I2C I/O port with interrupt and reset from NXP. Besides driver control inputs, this I/O port also controls the Sleep mode of the motor driver. The BLDC motor can be connected over the screw terminal, labeled U, V, and W. Additional screw terminal is just aside for connecting an external power supply in a range of 4.5V up to 20V.

The DRV8317H is a hardware variant of this motor driver, so the Brushless 26 Click is equipped with jumper selections of the gain, slew, and mode; by default, all three are set to 0. This way, you can set the current sense amplifier gain (GA) and output slew rate (SW) through pin voltage levels. The mode jumper (MD) allows you to use a 6x or 3x PWM mode. The 6x PWM is set by default. Additionally, three current sense amplifiers are available over the 4-pin header labeled A1, A2, and A3.

Brushless 26 Click uses a standard 2-wire I2C interface of the PCA9538A to communicate with the host MCU, supporting clock frequencies up to 400kHz. The I2C address of the PCA9538A can be set over the ADDR SEL jumpers, where 0 is selected by default. If a fault condition occurs, the DRV8317H will pull the FLT pin to a low logic state. The RST pin resets the PCA9538A I/O port.

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	Brushless
Applications	Can be used for the development of brushless DC (BLDC) motor modules, air purifiers, dishwasher pumps, vacuum robots, washer and dryer pumps, coffee machines, and more
On-board modules	DRV8317H - three-phase PWM motor driver from Texas Instruments
Key Features	Three-phase BLDC motor driver, configurable slew rate for EMI mitigation, programmable faint current sensing, supports up to 200kHz

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	PWM frequency, integrated shoot-through protection, wide power supply voltage operating range, multiple control interface options, integrated current sensing, and more
Interface	I2C
ClickID	Yes
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 Brushless 26 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
	NC	1	AN	PWM	16	NC	
Reset	RST	2	RST	INT	15	INT	Fault Interrupt
	NC	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	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V
JP2-JP3	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1
JP4	MD	Left	Mode Selection 0/1: Left position 0, Right position 1
JP5	SW	Left	Slew Selection 0/1: Left position 0, Right position 1
JP6	GA	Left	Gain Selection 0/1: Left position 0, Right position 1

Brushless 26 Click electrical specifications

Description	Min	Typ	Max	Unit
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Supply Voltage	3.3	-	5	V
External Power Supply Voltage	4.5	-	20	V
Peak Current	-	-	5	A

Software Support

We provide a library for the Brushless 26 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

This library contains API for Brushless 26 Click driver.

Key functions

- brushless26_reset_port_exp Brushless 26 reset port expander function.
- brushless26_set_pins Brushless 26 set pins function.
- brushless26_drive_motor Brushless 26 drive motor function.

Example Description

This example demonstrates the use of the Brushless 26 Click board™ by driving the motor in both directions at different speeds.

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.Brushless26

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.

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For more information about mikroSDK, visit the [official page](#).

Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[Brushless 26 click example on Libstock](#)

[Brushless 26 click 2D and 3D files](#)

[PCA9538A datasheet](#)

[DRV8317 datasheet](#)

[Brushless 26 click schematic](#)

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