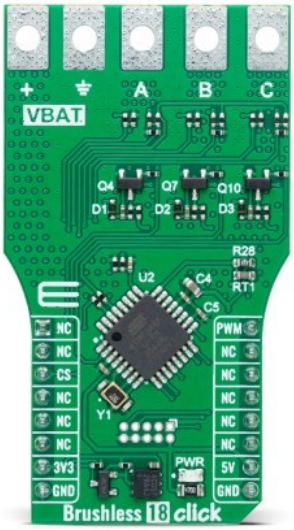
MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Brushless 18 Click



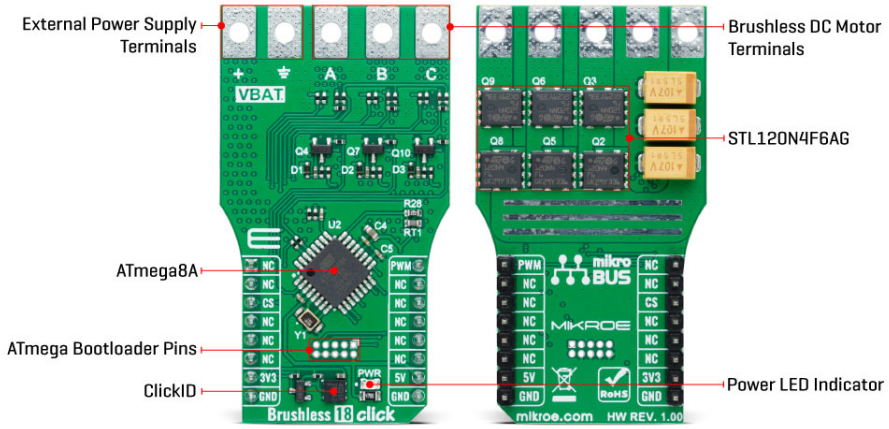
PID: MIKROE-6395

Brushless 18 Click is a compact add-on board that controls three-phase sensorless brushless DC (BLDC) motors. This board features the ATmega8A, an 8-bit microcontroller from Microchip, ensuring precise and efficient motor control. This board features six high-performance N-channel MOSFETs (STL120N4F6AG) for switching power from an external source to the motor's stator coils, supporting currents up to 50A and operating with input voltages ranging from 0 to 40V. It also includes unpopulated bootloader pins for easy firmware updates and operation controlled solely through a PWM signal from the mikroBUS™ socket. Brushless 18 Click is ideal for high-speed, durable, and efficient motor control applications, such as drone propulsion, electronic cooling systems, small household appliances, and robotic mechanisms.

How does it work?

Brushless 18 Click is based on the ATmega8A, an 8-bit microcontroller from Microchip, offering a practical and efficient solution for controlling three-phase sensorless brushless motors (BLDC motors). These motors boast significant advantages over traditional DC motors. Their contactless design offers extended durability, superior torque, and high rotational speed, making them an excellent choice for lightweight, high-performance applications. These applications include propulsion systems for drones, where high speed, lightweight construction, and energy efficiency are critical; electronic cooling devices such as computer fans and industrial cooling systems that demand quiet and reliable operation; small household appliances like vacuum cleaners and air purifiers, and robotic mechanisms where their high torque and control accuracy are essential for smooth and precise movements.

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



This Click board™ ensures precise control over BLDC motor operation and processes driving commands received via the PWM signal from the mikroBUS™ socket, enabling smooth and reliable motor control. Since the ATmega8A's output cannot directly drive the motor coils, it functions as the controller for a power circuit. This circuit consists of six high-performance N-channel MOSFETs, the STL120N4F6AG from STMicroelectronics, capable of efficiently switching power from an external source to the motor's stator coils. These MOSFETs can handle currents up to 50A, allowing the board to support demanding motor applications. The external power source can range from 0 to 40V, providing versatility in various use cases.

The motor is connected via dedicated onboard terminals A, B, and C, ensuring secure and straightforward connections. This design, paired with robust components, allows Brushless 18 Click to deliver reliable performance and make it a go-to solution for high-speed motor-driven applications.

A unique feature of this Click board™ is the inclusion of bootloader pins, which are unpopulated by default and designed for the onboard ATmega8A microcontroller. These pins provide direct access to the microcontroller's bootloader functionality, enabling easy firmware updates and reprogramming without needing an external programmer. This feature simplifies development and testing processes, allowing users to quickly load and debug custom firmware directly on the Click board™, making it an efficient and developer-friendly solution for various applications.

This Click board™ uses both power rails, 3.3V and 5V, with the 3.3V rail dedicated exclusively to the ClickID functionality, while the 5V rail powers all other components, including the onboard ATmega8A microcontroller. Due to this design, the board requires appropriate logic voltage level conversion when interfacing with external MCUs operating at different logic levels. Also, it comes equipped with a library containing functions and an example code that can be used as a reference for further development.

Specifications

Type	Brushless
Applications	Ideal for BLDC motor control applications such as drone propulsion, electronic cooling systems, small household appliances, and robotic mechanisms
On-board modules	ATmega8A - 8-bit MCU from Microchip

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

Key Features	Three-phase sensorless brushless DC (BLDC) motor control, six N-channel MOSFETs for efficient power switching, motor currents up to 50A, power source up to 40V, controlled via PWM signal, bootloader pins for easy firmware updates, and more
Interface	PWM
Feature	ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V,5V,External

Pinout diagram

This table shows how the pinout on Brushless 18 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
	NC	1	AN	PWM	16	**PWM**	PWM Control
	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	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

Brushless 18 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
External Power Supply	0	-	40	V
Output Motor Current	-	-	50	A

Software Support

We provide a library for the Brushless 18 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

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

This library contains API for Brushless 18 Click driver.

Key functions

- brushless18_throttle_calib This function performs the ESC throttle calibration.
- brushless18_drive_motor This function drives the motor at the selected speed and direction.

Example Description

This example demonstrates the use of the Brushless 18 Click 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.Brushless18

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.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

ClickID

Downloads

ATmega8A datasheet

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

[Brushless 18 click example on Libstock]

[Brushless 18 click 2D and 3D files v100]

[STL120N4F6AG datasheet]

[Brushless 18 click schematic v100]