

DC Motor 32 Click



PID: MIKROE-6832

DC Motor 32 Click is a compact add-on board designed for driving brushed DC motors in automotive and embedded motor control applications. This board is based on the [BTM9011EP](#), a MOTIX™ integrated full-bridge IC for brushed DC motor control from [Infineon Technologies](#). Key features include bidirectional and unidirectional motor control, operation from the 5V supply or an external 7V to 18V supply, and a maximum output current of 4.2A. It communicates with the host MCU through an SPI interface supporting clock frequencies up to 4MHz and provides intelligent protection against overtemperature, undervoltage, overcurrent, short-circuit, and cross-current conditions. It also supports current sense, open-load diagnostics, fault/current indication, and Click Snap support. This Click board™ is suitable for automotive brushed DC motor control, door modules, mirror modules, body control modules, and other inductive or resistive load applications.

For more information about **DC Motor 32 Click** visit the official [product page](#).

How does it work?

DC Motor 32 Click is based on the BTM9011EP, a MOTIX™ integrated full-bridge IC for brushed DC motor control from Infineon Technologies. The BTM9011EP is a monolithic full-bridge motor driver implemented in BCD technology and optimized for automotive motor drive applications requiring bidirectional or unidirectional control of inductive and resistive loads. DC Motor 32 Click supports operation from the 5V supply directly available from the host board, while it can also be powered from an external supply connected to the VEXT terminal in the range from 7V to 18V, allowing the board to drive motors that require a higher supply voltage. The power source is selected through the onboard VS SEL jumper by placing it in the appropriate 5V or EXT position. With a maximum output current of 4.2A, this Click board™ is suitable for

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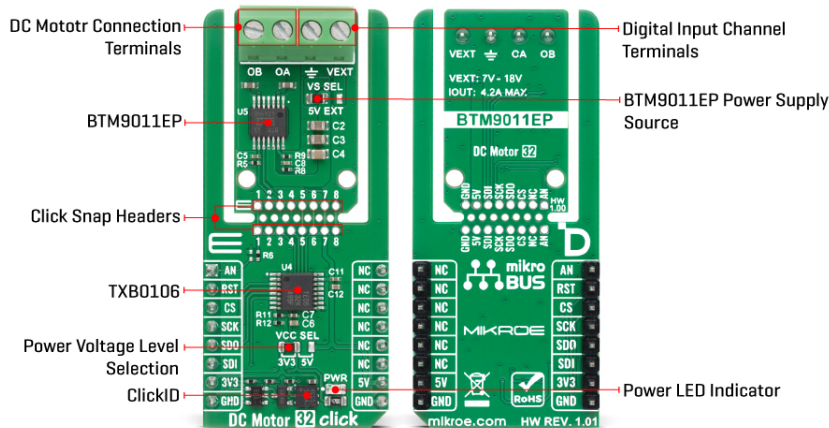


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automotive unidirectional and bidirectional brushed DC motor applications, including door modules, mirror modules, body control modules, and other automotive systems that require controlled driving of inductive or resistive loads.



This Click board™ is designed in a unique format supporting the newly introduced MIKROE feature called "Click Snap." Unlike the standardized version of Click boards, this feature allows the main sensor/IC/module area to become movable by breaking the PCB, opening many new possibilities for implementation. Thanks to the Snap feature, the BTM9011EP can operate autonomously by accessing its signals directly on the pins marked 1-8. Additionally, the Snap part includes a specified and fixed screw hole position, enabling users to secure the Snap board in their desired location.

Communication and control with the host MCU are performed through the SPI interface, supporting clock frequencies up to 4MHz, allowing configuration, control, and diagnostic data exchange through a simple digital interface. The BTM9011EP integrates intelligent protection features against overtemperature, undervoltage, overcurrent, short-circuit, and cross-current conditions, improving system reliability and helping protect both the driver and the connected motor during operation. In addition to protection, the device also provides diagnostic functions such as current sense and open-load detection. Information related to the output current and error flag is presented through the AN pin, allowing the host system to monitor operating conditions and detect fault states.

This Click board™ can operate with both 3.3V and 5V logic voltage levels selected via the VCC SEL jumper. Since the BTM9011EP operates at 5V minimum, a logic-level translator, the [TXB0106](#) is also used for proper operation and an accurate signal-level translation. 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.

Click Snap

Click Snap is an innovative feature of our standardized Click add-on boards, designed to bring greater flexibility and optimize your prototypes. By simply snapping the PCB along predefined lines, you can easily detach the main sensor/IC/module area, reducing the overall size, weight, and power consumption - ideal for the final phase of prototyping. For more details about Click Snap, visit the [official page](#) dedicated to this feature.

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Specifications

Type	Brushed
Applications	Ideal for automotive brushed DC motor control, door modules, mirror modules, body control modules, and other inductive or resistive load applications
On-board modules	BTM9011EP - MOTIX™ full-bridge IC for BDC motors from Infineon Technologies
Key Features	Bidirectional and unidirectional brushed DC motor driving, power supply source selection, SPI communication, intelligent protection against overtemperature, undervoltage, overcurrent, short-circuit, and cross-current conditions, current sense functionality, open-load diagnostic support, output current and error flag indication, Click Snap, and more
Interface	Analog, SPI
Feature	Click Snap, ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V or 5V, External

Pinout diagram

This table shows how the pinout on DC Motor 32 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
Current Sense / Error Flag	AN	1	AN	PWM	16	NC	
ID SEL	RST	2	RST	INT	15	NC	
SPI Select / ID COMM	CS	3	CS	RX	14	NC	
SPI Clock	SCK	4	SCK	TX	13	NC	
SPI Data OUT	SDO	5	MISO	SCL	12	NC	
SPI Data IN	SDI	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
JP5	VS SEL	Left	BTM9011EP Power

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			Supply Selection 5V/EXT: Left position 5V, Right position EXT
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DC Motor 32 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
External Power Supply	7	-	18	V
Output Current	-	-	4.2	A

Software Support

[DC Motor 32 Click](#) demo application is developed using the [NECTO Studio](#), ensuring compatibility with [mikroSDK](#)'s open-source libraries and tools. Designed for plug-and-play 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 DC Motor 32 Click board for controlling a DC motor. The application switches between different operation modes (forward, brake, reverse, and off) and measures the output current in each state.

Key Functions

- `dcmotor32_cfg_setup` This function initializes Click configuration structure to initial values.
- `dcmotor32_init` This function initializes all necessary pins and peripherals used for this Click board.
- `dcmotor32_default_cfg` This function executes a default configuration of DC Motor 32 Click board.
- `dcmotor32_set_operation_mode` This function sets the selected device operation mode.
- `dcmotor32_get_out_current` This function calculates the output current from the measured ADC voltage.

Application Init

Initializes the logger and DC Motor 32 Click driver, and applies the default configuration.

Application Task

Cycles through motor operation modes, measures the output current, and logs the results to the serial terminal.

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](#).

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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](#)

Downloads

[DC Motor 32 click example package](#)

[DC Motor 32 click 2D and 3D files v101](#)

[DC Motor 32 click schematic v101](#)

[BTM9011EP datasheet](#)

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