

DC Motor 15 Click



PID: MIKROE-4334

DC Motor 15 Click is a compact add-on board that contains a motor driver with current sense and regulation. This board features the DRV8874, an integrated motor driver with N-channel H-bridge, charge pump, current sensing, and adjustment from Texas Instruments. Current sensing and regulation feature eliminates the need for a large power shunt resistor, saving board area, and reducing system cost. The current-sense output allows an MCU to detect motor stall or changes in load conditions. The DRV8874 can also regulate the motor current during Start-Up and high-load events without interaction from MCU. This Click board™ is suitable for a brushed DC and servo motor and actuator drive, home appliances, handheld power tools, and many more.

DC Motor 15 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?

DC Motor 15 Click is based on the DRV8874, an integrated motor driver with N-channel H-bridge, charge pump, current sensing and proportional output, current regulation, and protection circuitry from Texas Instruments. The DRV8874 operates from the external power supply from 4.5V to 37V providing a wide range of output load currents for various types of motors and loads. The charge pump feature improves efficiency by supporting N-channel MOSFET half-bridges and 100% duty cycle driving. This Click board™ also integrates current sensing, regulation, and feedback. These features allow for the DRV8874 to sense the output current without an external sense resistor or sense circuitry reducing system cost and complexity. This also allows for the device to limit the output current in the case of the motor

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.

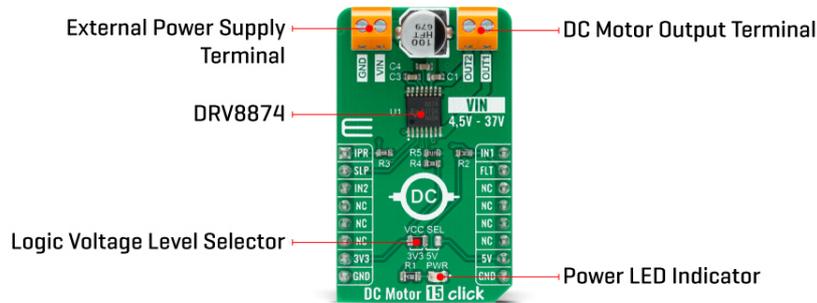


ISO 27001: 2013 certification of informational security management system.
 ISO 14001: 2015 certification of environmental management system.
 OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).

stall or high torque events and give detailed feedback to the MCU about the load current through a current proportional output on the AN pin of the mikroBUS™ labeled as IPR.



The DRV8874 integrates an H-bridge output power stage that can be operated in different control modes set by the PMODE pin setting. The PMODE pin on this Click board™ is set to a logic low level that means that the device is latched into PH/EN mode. PH/EN mode allows for the H-bridge to be controlled with a speed and direction type of interface through two GPIO pins labeled as IN2 and IN1, routed to the PWM and CS pins of the mikroBUS™ socket. It also has a Sleep Mode that achieves ultra-low quiescent current draw by shutting down most of the internal circuitry. The SLP pin routed to the RST pin of the mikroBUS™ socket provides an ultra-low power mode to minimize current draw during system inactivity.

DC Motor 15 Click communicates with MCU using several GPIO pins as mentioned before in the product description. In addition to the pins used to adjust the speed and rotation direction of the motor, this Click board™ also has an interrupt labeled as FLT routed to the INT pin of the mikroBUS™ socket used to protect the device and the output load. The DRV8874 enters a Fault Mode when a fault is encountered, and leave the Fault Mode, and re-enter the Active Mode when the recovery condition is met.

This Click board™ is designed to be operated with both 3.3V and 5V logic voltage levels that can be selected via VCC SEL jumper. This allows for both 3.3V and 5V capable MCUs to use the GPIO lines properly. However, the Click board™ comes equipped with a library that contains easy to use functions and an example code that can be used as a reference for further development.

Specifications

Type	Brushed
Applications	Can be used for a brushed DC and servo motor and actuator drive, home appliances, handheld power tools, and many more.
On-board modules	DC Motor 15 Click is based on the DRV8874, an integrated motor driver with N-channel H-bridge, charge pump, current sensing and proportional output, current regulation, and protection circuitry from Texas Instruments.

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.
 ISO 14001: 2015 certification of environmental management system.
 OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).

Key Features	High output current capability, integrated current sensing and regulation, proportional current output, selectable current regulation and control modes, low power consumption, and more.
Interface	GPIO
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on DC Motor 15 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
Analog Current Output	IPR	1	AN	PWM	16	IN1	Motor control input 1
Sleep Mode	SLP	2	RST	INT	15	FLT	Fault Indicator
Motor Control Input 2	IN2	3	CS	RX	14	NC	
		4	SCK	TX	13	NC	
		5	MISO	SCL	12	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 Supply Voltage Selection 3V3/5V: Left position 3V3, Right position 5V

DC Motor 15 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	4.5	-	3.7	V
Maximum Output Current	0	-	6	A
Current sense output current	-	-	3	mA
Operating Temperature Range	-40	-	+125	°C

Software Support

We provide a library for the DC Motor 15 Click on our [LibStock](#) page, as well as a demo application (example), developed using MikroElektronika [compilers](#). The demo can run on all the main MikroElektronika [development boards](#).

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).

Library Description

The library covers all the necessary functions to control DC Motor 15 Click board™. DC Motor 15 Click communicates with the target board through the RST, CS, PWM and INT pins on mikroBUS™. This library offers functions for setting or clearing of RST, CS and PWM pins, and check the state of the INT pin, also user can use functions that drive motor forward and in reverse or apply brake functions.

Key functions:

- void dcmotor15_forward (); - Function is used to drive the motor forward.
- void dcmotor15_reverse (); - Function is used to drive the motor in reverse.
- void dcmotor15_brake (); - Function is used to brake the motor.

Examples description

The application is composed of three sections :

- System Initialization - Initializes LOG structure and sets RST, CS and PWM pins as output, and INT pin as input.
- Application Initialization - Initializes GPIO driver, powers up the device and starts log.
- Application Task - This example demonstrates the use of DC Motor 15 Click by driving the connected motor forward for 5 seconds, than braking for 2 second, and driving it in reverse for 5 more seconds, braking again for 2 second afterwards.

The full application code, and ready to use projects can be found on our [LibStock](#) page.

Other mikroE Libraries used in the example:

- UART

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. The terminal available in all MikroElektronika [compilers](#), or any other terminal application of your choice, can be used to read the message.

mikroSDK

This Click board™ is supported with [mikroSDK](#) - MikroElektronika 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](#)

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.
 ISO 14001: 2015 certification of environmental management system.
 OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).

[Click boards™](#)

Downloads

[DC Motor 15 click 2D and 3D files](#)

[DRV8874 datasheet](#)

[DC Motor 15 click example on Libstock](#)

[DC Motor 15 click schematic](#)

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).