

H-Bridge Driver Click



PID: MIKROE-4696

H-Bridge Driver Click is a compact add-on board that contains an H-bridge gate driver, also known as a full-bridge pre-driver. This board features the [MC33883](#), an H-Bridge gate driver with an integrated charge pump and independent high and low side gate drive channels from [NXP Semiconductors](#). The gate driver channels are independently controlled by four separate input pins, allowing the device to be optionally configured as two independent high side gate drivers and two independent low side gate drivers. Gate driver outputs can source and sink up to 1.0A peak current pulses, permitting large gate-charge MOSFETs to be driven and/or high pulse-width modulation (PWM) frequencies to be utilized. This Click board™ is suitable for automotive engine applications (electric pumps), energy storage systems (ESS), uninterruptible power supply (UPS), and more.

H-Bridge Driver 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?

H-Bridge Driver Click as its foundation uses the MC33883, an H-bridge gate driver (or full-bridge pre-driver) with integrated charge pump and independent high and low-side driver channels from NXP Semiconductors. Gate driver outputs can source and sink up to 1.0A peak current pulses, permitting large gate-charge MOSFETs to be driven and/or high pulse-width modulation (PWM) frequencies to be utilized. It also supports a Sleep mode of operation with its low supply current, typical of 10µA.

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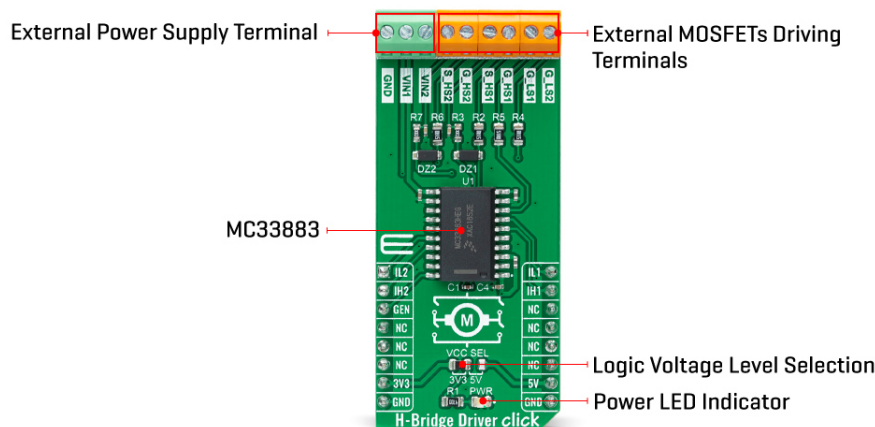
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The VIN1 and VIN2 terminals are the power supply inputs to the device. VIN1 is used for the output high-side drivers and the charge pump, while VIN2 is used for the linear regulation. They can be connected together or with different voltage values with VIN1 up to 45V and VIN2 up to 28V. These pins also have undervoltage (UV) and overvoltage (OV) shutdown features. If one of the supply voltage drops below the undervoltage threshold or rises above the overvoltage threshold, the gate outputs are switched low to switch off the external MOSFETs. When the supply returns to a level above the UV threshold or below the OV threshold, the device resumes normal operation according to the established condition of the input pins.

The gate driver channels are independently controlled by four separate pins, routed to the RST, AN, PWM, and INT pins of the mikroBUS™ socket. Those pins allow the device to be optionally configured as two independent high side gate drivers and two independent low side gate drivers. In addition, it also has a pin used to place the device in Sleep mode. When the GEN pin, routed to the CS pin of the mikroBUS™ socket, is in a logic low state, the device is in Sleep mode; otherwise, it is fully operational.

This Click board™ can operate with both 3.3V and 5V logic voltage levels selected via the VCC SEL jumper. This way, it allows both 3.3V and 5V capable MCUs to use the GPIO communication lines properly. However, the 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	Can be used for automotive engine applications (electric pumps), energy storage systems (ESS), uninterruptible power supply (UPS), and more.
On-board modules	MC33883 - H-bridge gate driver (or full-bridge pre-driver) with integrated charge pump and independent high and low-side driver channels from NXP Semiconductors
Key Features	Full-bridge pre-driver, built-in high side charge pump, UVLO and OVLO features, Sleep mode, PWM up to 100kHz, and more.
Interface	GPIO

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ClickID	No
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 H-Bridge Driver click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
Input Low Side 2	IL2	1	AN	PWM	16	IL1	Input Low Side 1
Input High Side 2	IH2	2	RST	INT	15	IH1	Input High Side 1
Global Enable	GEN	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	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V

H-Bridge Driver click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage VCC	3.3	-	5	V
Supply Voltage VIN1	-	-	55	V
Supply Voltage VIN2	-	-	28	V
Operating Temperature Range	-40	+25	+125	°C

Software Support

We provide a library for the H-Bridge Driver 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](#).

Library Description

The library covers all the necessary functions to control the H-Bridge Driver Click board™. User can use functions that control four separate input pins.

Key functions:

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- void hbridgedriver_glo_enable (uint8_t state); - Function is used to turn the device on or off.
- void hbridgedriver_in_ls_2 (uint8_t state); - Function is used to set the state of the 'IL2' pin.
- void hbridgedriver_in_ls_1 (uint8_t state); - Function is used to set the state of the 'IL1' pin.

Examples description

The application is composed of three sections :

- System Initialization - Initializes GPIO and LOG structures, and sets AN, RST, CS, PWM and INT pins as output and start to write log.
- Application Initialization - Initializes GPIO driver and turns the device on.
- Application Task - Demonstrates use of the H-Bridge Driver Click board™ by turning connected MOSFETs gates high or low in order to drive the motor forward, in reverse, brake or coast.

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](#)

[Click Boards™](#)

Downloads

[H-Bridge Driver click schematic](#)

[MC33883 datasheet](#)

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[H-Bridge Driver click 2D and 3D files](#)

[H-Bridge Driver click example on Libstock](#)

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