

Charger 30 Click



PID: MIKROE-6610

Charger 30 Click is a compact add-on board that provides a single-cell Li-ion or Li-polymer battery charging and system power management solution for embedded applications, enabling users to quickly integrate reliable charging and power-path control into their systems. It is based on the [MP2731](#), a 4.5A switch-mode battery charge management device from Monolithic Power Systems ([MPS](#)). This board combines synchronous switching with NVDC system power path management to lower impedance, shorten charging time, and extend battery life, while offering an input voltage range of 3.7V to 16V at the VIN terminal and up to 4.5A output through the SYS terminal. Communication and control are achieved via an I2C interface, allowing configuration of charging parameters, system settings, and USB On-The-Go (OTG) operation, supported by a charge enable and a BATTERY switch for safe isolation or system resets. This makes Charger 30 Click ideal for portable applications such as smartphones, tablets, wireless cameras, and other battery-powered embedded devices.

For more information about **Charger 30 Click** visit the official [product page](#).

How does it work?

Charger 30 Click is based on the MP2731, a 4.5A switch-mode battery charge management device from Monolithic Power Systems (MPS). It provides a single-cell Li-ion or Li-polymer battery charging and system power management solution. This IC combines synchronous switching with NVDC system power path management to reduce impedance, shorten charging times, and extend battery lifespan, making it ideal for portable applications such as smartphones, tablets, wireless cameras, and other battery-powered embedded devices. The board accepts an input voltage from 3.7V to 16V through its VIN terminal and delivers up to

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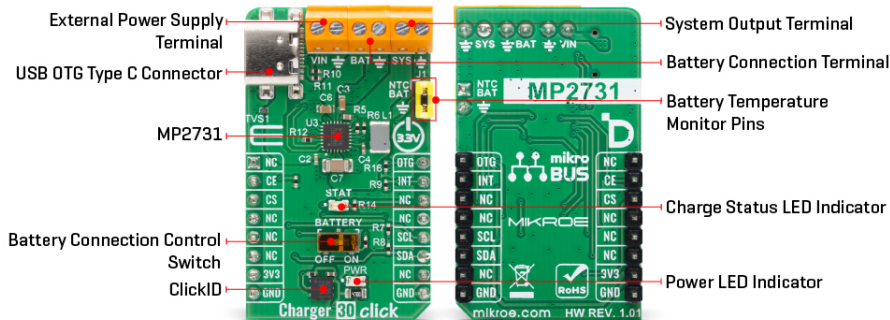


ISO 27001: 2013 certification of informational security management system.
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4.5A to the system load via the SYS terminal, ensuring stable power delivery under demanding conditions.



Communication and control are handled through an I2C serial interface, which allows flexible configuration of charging parameters, system settings, and OTG operation. Battery charging is enabled or disabled by software and by forcing the CE pin to a LOW logic level, which can also be used to restart a new charging cycle. The MP2731 automatically detects the battery voltage and executes a multi-stage charging profile, terminating the charge when full capacity is reached and automatically initiating a new cycle if the battery voltage drops below the recharge threshold.

Charger 30 Click also incorporates a dedicated BATTERY switch to disconnect the battery from the system power path, enabling a system power reset or safe battery isolation without unplugging the cell. A red STAT LED connected to the open-drain status output indicates charger operation modes by lighting steadily during active charging, turning off when charging is complete, or blinking when charging is suspended. The board integrates a standard USB host connector with fast charge capabilities and supports USB On-The-Go (OTG) operation by supplying a default 5V boost output for powering external peripherals.

The OTG function is enabled through I2C control, and the OTG pin on the Click can be pulled LOW to suspend boost operation during OTG mode. Many safety and protection features ensure reliable and secure operation, including a programmable charging safety timer, battery temperature monitoring via dedicated NTC header pins, and built-in overvoltage and overcurrent protections. In the event of a fault condition, the device asserts an INT interrupt signal to the host MCU to allow immediate response and system protection.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. It also comes equipped with a library containing functions and example code that can be used as a reference for further development.

Specifications

Type	Battery charger
Applications	Ideal for portable applications such as smartphones, tablets, wireless cameras, and other battery-powered embedded devices

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On-board modules	MP2731 - 4.5A switch-mode battery charge management device from MPS
Key Features	Single-cell Li-ion or Li-polymer battery charging and system power management solution, synchronous switching with NVDC system power path management, I2C serial interface for configuration of charging parameters, system settings and OTG operation, automatic battery voltage detection with multi-stage charging profile and automatic recharge, BATTERY switch for battery isolation or system reset, and more
Interface	I2C
Feature	ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V, External

Pinout diagram

This table shows how the pinout on Charger 30 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	OTG	OTG Boost Suspend
Charging Control	CE	2	RST	INT	15	INT	Interrupt
ID COMM	CS	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	NC	
Ground	GND	8	GND	GND	9	GND	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
LD2	STAT	-	Charge Status LED Indicator
SW1	BATTERY	Right	Battery Connection Control Switch OFF/ON: Left position OFF, Right position ON

Charger 30 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
External Power Supply (VIN)	3.7	-	16	V

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System Output Current	-	-	4.5	A
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Software Support

[Charger 30 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 Charger 30 Click board by reading and logging the charging status, input and battery voltage, current consumption, and fault diagnostics. The demo configures the default setup and then periodically polls for system status and fault information.

Key Functions

- `charger30_cfg_setup` This function initializes Click configuration structure to initial values.
- `charger30_init` This function initializes all necessary pins and peripherals used for this Click board.
- `charger30_default_cfg` This function executes a default configuration of Charger 30 Click board.
- `charger30_read_status` This function reads multiple status and monitoring registers and stores the values into the provided status structure.

Application Init

Initializes the logger and the Charger 30 Click driver and applies the default configuration.

Application Task

Periodically reads and logs charger status and fault registers along with voltage, current.

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](#).

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™](#)

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[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[Charger 30 click example package](#)

[Charger 30 click 2D and 3D files v101](#)

[MP2731 datasheet](#)

[Charger 30 click schematic v101](#)

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