

Charger 24 Click



PID: MIKROE-6653

Charger 24 Click is a compact add-on board designed to provide USB-C charging for single-cell lithium-ion or lithium-polymer batteries in portable applications. It is based on the [MAX77751](#), a highly integrated autonomous charger IC from [Analog Devices](#) with built-in USB Type-C detection and power management features. The board features a synchronous switch-mode DC-DC converter supporting both buck and boost operation, enabling up to 3.15A of programmable charging current. It includes adaptive input current limiting (AICL), BC1.2 and USB-C source detection, reverse-boost output capability, and Smart Power Selector™ functionality for system-first power routing. Charger 24 Click also provides visual indicators for charging and input status, along with simple logic control for enabling or disabling the charging process. This Click board™ is ideal for use in mobile point-of-sale terminals, wearable device cradles, GPS trackers, wireless headphones, power banks, portable medical devices, and mobile routers.

For more information about **Charger 24 Click** visit the official [product page](#).

How does it work?

Charger 24 Click is based on the MAX77751, a USB-C autonomous charger IC from Analog Devices for single-cell lithium-ion or lithium-polymer [batteries](#) in portable applications. This charger supports power negotiation with USB Type-C power sources through its integrated Configuration Channel (CC) detection pins, which enable automatic source identification and input current limit configuration without requiring software intervention. At its core, the MAX77751 has a synchronous switch-mode DC-DC converter capable of operating in both buck and boost modes, ensuring efficient power conversion. While in charging mode, the device operates as a buck converter, accepting input voltages from 4.3V to 13.7V and delivering up to

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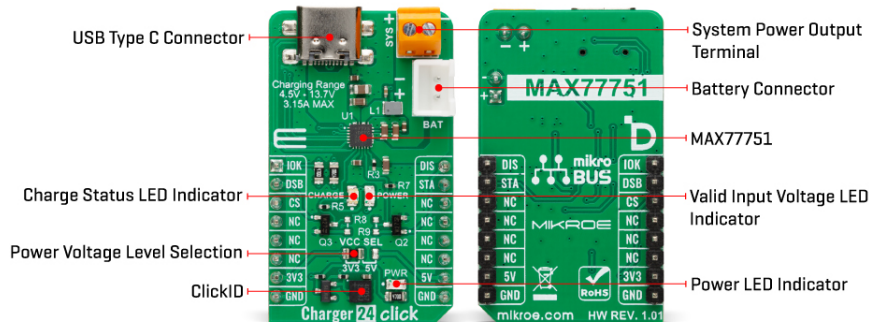


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3.15A of current to the battery without the need for external MOSFETs. The charging current can be set between 500mA and 3.15A using an external resistor; the default 24.9kΩ resistor on Charger 24 Click provides a fast charge current of 3.15A. The Charger 24 Click is an excellent solution for a wide range of battery-powered applications, including mobile point-of-sale terminals, wireless headphones, portable medical equipment, GPS trackers, wearable device cradles, power banks, and mobile routers.



The MAX77751 also includes adaptive input current limiting (AICL), a protective feature that reduces the input current dynamically to prevent undervoltage situations when using weaker or unstable power adapters. In addition to USB-C compatibility, the IC supports BC1.2 detection through its D+ and D- pins, enabling automatic identification of legacy USB and proprietary charging sources upon insertion of the USB plug. The Charger 24 Click also features reverse-boost functionality, allowing it to supply up to 5.1V at 1.5A to external devices when the DSB pin is pulled LOW, enabling applications such as powering peripherals from the battery. For system monitoring, the board includes a red LED linked to the STA pin to indicate charging activity and a green LED on the IOK pin to signal valid input voltage. Charging can be disabled at any time by setting the DIS pin to a HIGH logic level.

Although the MAX77751 does not provide over-discharge protection, it is equipped with a SYS output that supports system powering via the integrated Smart Power Selector™. This feature prioritizes powering the system directly from the board and routes any excess power to the battery, allowing system startup even when the battery is missing or deeply discharged. It also intelligently supplements insufficient board current with power from the battery when necessary.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VCC SEL jumper. 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.

Specifications

Type	Battery charger
Applications	Ideal for use in mobile point-of-sale terminals, wearable device cradles, GPS trackers, wireless headphones, power banks, portable medical devices, and mobile routers

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On-board modules	MAX77751 - USB-C autonomous charger for 1-cell Li+ batteries from Analog Devices
Key Features	USB-C autonomous charging support, supports single-cell Li-Ion/Li-Poly batteries, programmable charging current up to 3.15A, reverse-boost, USB Type-C CC detection, BC1.2 legacy USB detection, adaptive input current limiting (AICL), Smart Power Selector™ system-first power routing, synchronous buck-boost DC-DC converter, and more
Interface	GPIO
Feature	ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V, External

Pinout diagram

This table shows how the pinout on Charger 24 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Valid Input Voltage	IOK	1	AN	PWM	16	DIS	Battery Charge Control
Reverse-Boost Control	DSB	2	RST	INT	15	STA	Charge Status
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
LD2	POWER	-	Valid Input Voltage LED Indicator
LD3	CHARGE	-	Charge Status LED Indicator
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

Charger 24 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
External Input Voltage	4.3	5	13.7	V

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Charging Current	0.5	-	3.15	A
Reverse Boost Output Voltage	-	5.1	-	V
Reverse Boost Output Current	-	1.5	-	A

Software Support

[Charger 24 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 24 Click board. The application initializes the device, enables battery charging, and continuously monitors the charging and USB power status. It displays whether the battery is currently charging, fully charged, or if no input is detected, as well as whether the USB power is valid.

Key Functions

- `charger24_cfg_setup` This function initializes Click configuration structure to initial values.
- `charger24_init` This function initializes all necessary pins and peripherals used for this Click board.
- `charger24_enable_charging` This function enables battery charging on the Charger 24 Click board.
- `charger24_get_iok_pin` This function returns the logic state of the IOK pin.
- `charger24_get_status` This function checks the battery charging status by polling the STAT pin.

Application Init

Initializes the logger and the Charger 24 Click driver and enables charging while disabling boost mode.

Application Task

Periodically reads and logs the charging and USB power status.

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.

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Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[Charger 24 click example package](#)

[Charger 24 click 2D and 3D files v101](#)

[Charger 24 click schematic v101](#)

[MAX77751 datasheet](#)

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