MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Printer Click

PID: MIKROE-6460

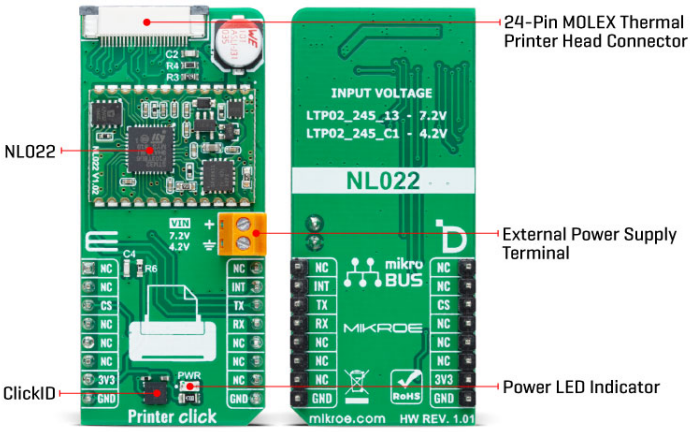
Printer Click is a compact add-on board designed for high-performance control of thermal printer heads. This board features the NL022, a thermal printer head controller from Norden Logic optimized for managing thermal print heads with various voltage ratings and configurations, compatibility with 24-pin MOLEX connector and diverse flat cable widths. The NL022 features an ARM-based architecture with vast RAM and Flash memory, real-time head temperature monitoring, and a responsive paper-out detection system. It supports ESC/POS commands, 170 languages including UTF-8 and UTF-16, and generates both 1D barcodes (UPC, EAN, CODE128) and on-chip 2D QR codes. Communication with the host MCU is established through a UART interface with an INT pin indicating ready-to-send status for smooth data exchange. This board is ideal for applications such as medical devices, taxi meters, ticket machines, handheld POS terminals, industrial meters, and cash registers, offering reliable and customizable thermal printing solutions.

How does it work?

Printer Click is based on the NL022, a thermal printer head controller from Norden Logic designed for high-performance control of thermal printer heads, such as Seiko's LTP02_245 series, including models like LTP02_245_13 with a 7.2V supply and LTP02_245_C1 with a 4.2V supply, but also LTP02-245-A, M23-DH-H69, JX-2R-17, TP2V MTP02, QJ02-245-13W, YAEN208, and M23-SX. The board receives power through the VIN terminal, which provides a stable and configurable input voltage to accommodate different thermal print heads, ensuring reliable operation across various supply requirements. This advanced controller communicates with the host MCU via the UART interface and adheres to the widely used ESC/POS programming standard, making it a highly adaptable solution for various printing applications, including medical devices, taxi meters, ticket machines, handheld POS terminals, industrial meters, and

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

cash registers.



The NL022 excels due to its ARM-based architecture, offering vast RAM and Flash memory, real-time head temperature monitoring, and a responsive paper-out detection system. It supports user-definable flash storage and incorporates an extensive selection of built-in language fonts covering 170 languages, including UTF-8 and UTF-16 character encoding, as well as Chinese and Japanese script support. Custom font management and compatibility with ESC commands allow users to tailor text and print output to specific requirements.

NOTE: It is highly recommended to verify that your module is running firmware version 1.22. If it is not, you will need to upgrade the firmware to version 1.22 to ensure improved functionality and access to newly supported printer heads. For detailed documentation and the latest updates regarding firmware releases, please visit the Norden Logic support page.

The NL022 also supports a wide range of font attributes such as double width, double height, bold, italic, reverse, underline, and normal styles, ensuring customizable print output. It enables seamless 1D barcode printing, including formats like UPC-A, UPC-E, EAN-13, EAN-8, CODE39, CODE93, ITF25, CODABAR, and CODE128-A, while 2D barcodes, such as QR codes, can be generated directly on-chip using ESC commands. Additionally, the NL022 integrates essential real-time monitoring functionalities, including an overheat monitor for thermal head protection, a paper-out detection system to prevent printing errors, and a platen-out monitor for smooth operation.

As previously mentioned, this board communicates with the host MCU through the UART interface, using the TX and RX pins with a default baud rate of 115200bps for efficient data exchange. In addition to the interface pins, the board also uses the INT pin, which serves for UART interface flow control, supporting either RTS hardware flow control or XON/XOFF software flow control. By default, software flow control (XON/XOFF) is enabled, while hardware flow control is not active.

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

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Type	Printer
Applications	Ideal for applications such as medical devices, taxi meters, ticket machines, handheld POS terminals, industrial meters, and cash registers
On-board modules	NL022 - thermal printer head controller from Norden Logic
Key Features	Supported printer heads with various voltage ratings and diverse flat cable widths, 24-pin MOLEX connector, UART interface, ready-to-send signal, font and barcode (1D and 2D) support, overheat monitor, paper-out detection, platen-out detection, 170 languages including UTF-8, UTF-16, Chinese, and Japanese scripts, and more
Interface	UART
Feature	ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V,External

Pinout diagram

This table shows how the pinout on Printer 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	NC	
	NC	2	RST	INT	15	**INT**	Ready-to-Send
ID COMM	**CS**	3	CS	RX	14	**TX**	UART TX
	NC	4	SCK	TX	13	**RX**	UART RX
	NC	5	MISO	SCL	12	NC	
	NC	6	MOSI	SDA	11	NC	
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

Printer Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Printer Head External Power Supply		4.2 / 7.2		V

Software Support

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Printer 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 Printer Click board by providing user interaction with a thermal printer, allowing the user to check paper status, display commands, and execute various printing tasks based on user commands through a UART interface.

Key Functions

- printer_cfg_setup Config Object Initialization function.
- printer_init Initialization function.
- printer_default_cfg Click Default Configuration function.
- printer_get_status This function reads the paper status and temperature of the printer and stores results in ctx->status string buffer.
- printer_get_fw_info This function reads the firmware information of the printer and stores results in ctx->fw_info string buffer.
- printer_print_string_lf This function prints a string message with line feed.

Application Init

Initializes the driver, performs the Click default configuration, and displays the list of supported commands on the USB UART.

Application Task

Checks the paper status and processes user commands.

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™

mikroSDK

Click board™ Catalog

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Click boards™

ClickID

Downloads

Printer click 2D and 3D files v101

NL022 datasheet

ESC/POS commands

Printer click schematic v101

Printer click example package

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Mikroe:

MIKROE-6460