

# PoE Source Click



PID: MIKROE-6958

**PoE Source Click** is a compact add-on board designed for implementing a single-port Power over Ethernet source interface, allowing Ethernet data and injected power to be delivered from a local LAN connection to a connected powered device. This board is based on the [MP3921](#), a single-port IEEE 802.3af/at-compliant PSE power controller for Power over Ethernet from [MPS](#). It integrates powered-device detection, single-event and two-event classification, current limiting, disconnected load detection, automatic and I2C software-configurable operation, a 9-bit ADC for voltage and current monitoring, adjustable current limits, and configurable system functions. The board also features an external power supporting up to 50V, selectable interrupt routing, a LED for active power-path indication, and OUT+/OUT- terminals for output voltage measurement. It is suitable for PSE switches and routers, midspan injectors, NVRs, DVRs, IP camera power delivery, and PoE-enabled network systems.

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

## How does it work?

PoE Source Click is based on the MP3921, a single-port IEEE 802.3af/at-compliant PSE power controller for Power over Ethernet from MPS. The MP3921 integrates the key functions required for PoE power sourcing, including powered-device detection, single-event and two-event classification, current limiting, and disconnected load detection. These features allow the board to identify a valid PoE powered device, classify its power requirements, control the power delivery path, and detect when the load has been removed. The device supports both automatic operation and software-configurable operation through an I2C interface, giving the host MCU flexibility to manage PoE behavior according to the needs of the application. This Click board is suitable for Power over Ethernet switches and routers, PSE midspan power

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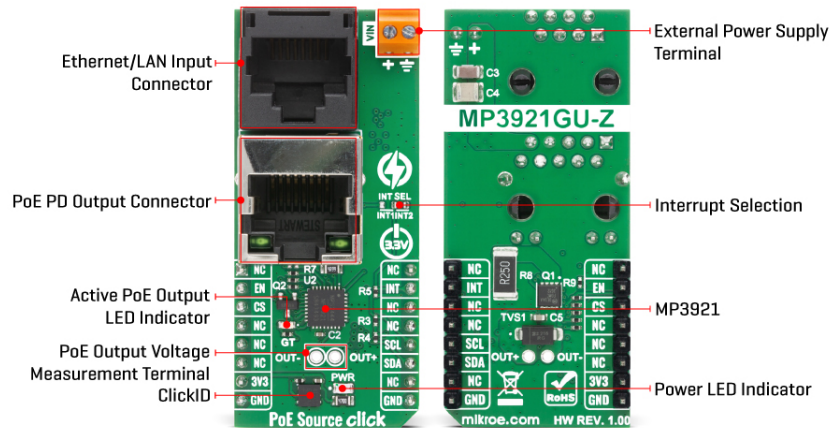


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injectors, surveillance network video recorders, digital video recorders, IP camera power delivery systems, and other applications that require controlled single-port PoE power sourcing capabilities.



The MP3921 also includes a 9-bit analog-to-digital converter for monitoring current and voltage, adjustable current limits, and configurable system functions. In addition to the communication interface pins, the board includes EN pin for device enable function, and an INT SEL jumper used to select one of the two interrupt outputs available from the MP3921. The INT1 signal provides an interrupt request for all interrupt source events, while INT2 is intended for high-priority interrupt requests, allowing the host controller to distinguish between general and urgent PoE-related events. The board is powered through the external VIN terminal, which supports input voltages up to 50V, providing the supply rail used for PoE power injection.

PoE Source Click also includes two RJ45 Ethernet connectors that allow it to operate as a PoE source or injector between the local Ethernet network and a powered device. The black RJ45 connector is used as the LAN input and should be connected to a router or LAN switch on the same network as the host PC, while the shielded gray RJ45 connector serves as the PoE output for connecting a powered device such as an IP camera. Ethernet data is passed between the two connectors, while the board injects power from the VIN terminal toward the PoE output.

The red GT LED indicates the gate or power-path status and lights up when the PoE output stage is enabled, showing that power delivery toward the connected powered device is active. The OUT+/OUT– terminal provides direct access to the PoE output voltage for measurement and testing purposes, allowing the user to verify the active output voltage with a voltmeter while the powered device remains connected through the PoE Output RJ45 connector.

This Click board™ can be operated only with a 3.3V logic voltage level. Appropriate logic voltage level conversion must be performed before using it with MCUs operating at 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         | PoE                                                                                                                          |
|--------------|------------------------------------------------------------------------------------------------------------------------------|
| Applications | Ideal for PSE switches and routers, midspan injectors, NVRs, DVRs, IP camera power delivery, and PoE-enabled network systems |

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|                  |                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| On-board modules | MP3921 - single-port IEEE 802.3af/at PSE controller for Power over Ethernet from MPS                                                                                                                                                                                                                                                                                                       |
| Key Features     | Single-port IEEE 802.3af/at-compliant PSE power control, powered-device detection, single-event and two-event classification, current limiting, disconnected load detection, automatic operation mode, I2C software-configurable operation, 9-bit ADC for voltage and current monitoring, adjustable current limits, configurable system functions, selectable interrupt outputs, and more |
| Interface        | I2C                                                                                                                                                                                                                                                                                                                                                                                        |
| Feature          | ClickID                                                                                                                                                                                                                                                                                                                                                                                    |
| Compatibility    | mikroBUS™                                                                                                                                                                                                                                                                                                                                                                                  |
| Click board size | L (57.15 x 25.4 mm)                                                                                                                                                                                                                                                                                                                                                                        |
| Input Voltage    | 3.3V                                                                                                                                                                                                                                                                                                                                                                                       |

## Pinout diagram

This table shows how the pinout on PoE Source 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         |           |
| Device Enable | <b>EN</b>   | 2        | RST  | INT | 15 | <b>INT</b> | Interrupt |
| ID COMM       | <b>CS</b>   | 3        | CS   | RX  | 14 | NC         |           |
|               | NC          | 4        | SCK  | TX  | 13 | NC         |           |
|               | NC          | 5        | MISO | SCL | 12 | <b>SCL</b> | I2C Clock |
|               | NC          | 6        | MOSI | SDA | 11 | <b>SDA</b> | I2C Data  |
| Power Supply  | <b>3.3V</b> | 7        | 3.3V | 5V  | 10 | NC         |           |
| Ground        | <b>GND</b>  | 8        | GND  | GND | 9  | <b>GND</b> | Ground    |

## Onboard settings and indicators

| Label | Name    | Default | Description                                                               |
|-------|---------|---------|---------------------------------------------------------------------------|
| LD1   | PWR     | -       | Power LED Indicator                                                       |
| LD2   | GP      | -       | Active PoE Output LED Indicator                                           |
| JP1   | INT SEL | Right   | Interrupt Selection<br>INT1/INT2: Left position INT1, Right position INT2 |

## PoE Source Click electrical specifications

| Description           | Min | Typ | Max | Unit |
|-----------------------|-----|-----|-----|------|
| Supply Voltage        | -   | 3.3 | -   | V    |
| External Power Supply | -   | -   | 50  | V    |
| ADC Resolution        | -   | 9   | -   | bit  |

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## Software Support

[PoE Source 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 PoE Source Click board for Power over Ethernet (PoE) sourcing. The application reads detection and classification results of the connected powered device (PD), as well as voltage, current, and temperature measurements.

### Key Functions

- `poesource_cfg_setup` This function initializes Click configuration structure to initial values.
- `poesource_init` This function initializes all necessary pins and peripherals used for this Click board.
- `poesource_default_cfg` This function executes a default configuration of PoE Source Click board.
- `poesource_read_vin` This function reads and calculates the input voltage value.
- `poesource_read_vout` This function reads and calculates the output voltage value.
- `poesource_read_iout` This function reads and calculates the output current value in mA.

### Application Init

Initializes the logger and PoE Source Click driver, and applies the default configuration.

### Application Task

Reads and parses detection/classification results, measures input voltage, output voltage, output current, and die temperature, and logs the results to the serial terminal.

## 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

[PoE Source click example package](#)

[PoE Source click 2D and 3D files v100](#)

[PoE Source click schematic v100](#)

[MP3921 datasheet](#)

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