EPOS Module Click

PID: MIKROE-6170

EPOS Module Click is a compact add-on board that provides a low-power modem solution for use in EPOS terminals and telephone-based systems. It is based on the CMX869B, a multi-standard v.32 bis modem from CML Microcircuits, which supports multiple communication protocols. The CMX869B has built-in functions such as DTMF encoding/decoding and a Powersave mode to optimize energy consumption. It also includes a fully isolated telephone interface via the P1200 transformer for reliable communication. This Click board™ communicates with the host MCU through a standard 4-wire SPI interface and includes visual indicators for line status. It is ideal for applications like EPOS terminals, telephone telemetry systems, remote utility meter readings, security systems, and industrial control.

NOTE: To ensure the EPOS Module Click board™ meets global telecom isolation standards, it is essential to implement appropriate isolation measures. Using any SPI Isolator Click board™ is advisable to enhance the safety and reliability of your project and should be positioned between the line side of the EPOS Module Click and the system in use. These precautions help comply with international telecom standards, which may require isolation up to 6500V in some countries.
Warning: Telecom isolation requirements vary significantly across different countries. Always consult the telecom regulations specific to your country before connecting to the line. The users are responsible for ensuring compliance with local telecom standards and regulations.
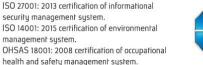
How does it work?

EPOS Module Click is based on the CMX869B, a multi-standard v.32 bis modem from CML Micro, which supports multiple protocols while offering low power consumption. This low-power modem solution is designed for applications involving EPOS (Electronic Point of Sale) terminals
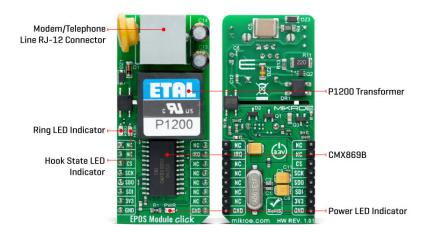
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and telephone-based systems. The CMX869B supports standards such as ITU V.32 bis, V.22 bis, V.22, V.21, and Bell 202 and 103, making it adaptable for numerous communication scenarios. It operates at data rates of up to 14.400bps and features automatic fallback to 4.800bps, with capabilities like retrain rate re-negotiation and automatic detection of V.22 and V.22 bis modems. This Click board™ is ideal for use in EPOS terminals, telephone telemetry systems, remote utility meter reading, security systems, industrial control, and other applications.

In addition to its robust modem functions, the CMX869B includes a high-quality DTMF (Dual-Tone Multi-Frequency) encoder and decoder, making it suitable for managing call signaling and detection in telephone systems. The modem can also transmit and detect user-programmed single and dual-tone signals, as well as handle modem calling and answering tones, ensuring compatibility with various proprietary communication protocols beyond standard modem operations. The Click board™ also offers a fully isolated EPOS/telephone-based connection, thanks to its built-in P1200 transformer, which ensures smooth communication while providing complete electrical isolation.

Data and control exchanges between the CMX869B and the host MCU are made through a C-BUS interface, compatible with a standard 4-wire SPI interface of the mikroBUS™ socket. The board also uses the mikroBUS™ socket's IRQ pin for interrupt requests related to call states like busy, dialing, and connected statuses, a red RING LED to indicate ringing signals, and a blue HOOK LED that serves as a hookswitch indicator to manage the line interface's connectivity status (0-OFF, 1-ON). An additional feature of the CMX869B is the Powersave mode, which conserves energy by deactivating all circuits except the essential C-BUS (SPI) interface.

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. Also, it comes equipped with a library containing functions and an example code that can be used as a reference for further development.

Specifications

Type	Signal Processing
Applications	Ideal for EPOS terminals, telephone telemetry systems, remote utility meter readings, security systems, and industrial control
On-board modules	CMX869B - multi-standard low power v.32 bis

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	modem from CML Microcircuits
Key Features	Supporting multiple protocols (v.32 bis, V.22 bis, V.22, V.21, Bell 202, Bell 103), DTMF encoder and decoder for call signaling and detection, fully isolated telephone interface with integrated P1200 transformer, SPI interface, Powersave mode, ringing and hookswitch status indicators, and more
Interface	SPI
Feature	No 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 EPOS Module Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikro™ BUS		Pin	Notes
	NC	1 AN	PWM 16	NC	
	NC	2 RST	INT 15	**IRQ**	Interrupt Request
SPI Chip Select	**CS**	3 CS	RX 14	NC	
SPI Clock	**SCK**	4 SCK	TX 13	NC	
SPI Data OUT	**SDO**	5 MISO	SCL 12	NC	
SPI Data IN	**SDI**	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
LD2	RING	-	Ring LED Indicator
LD3	HOOK	-	Hook State LED Indicator

EPOS Module Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V

Software Support

We provide a library for the EPOS Module Click as well as a demo application (example), developed using MIKROE compilers. The demo can run on all the main MIKROE development boards.

Mikroe produces entire development toolchains for all major microcontroller architectures.
Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.

ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.

ISO 9001: 2015 certification of quality management system (QMS).

Library Description

This library contains API for EPOS Module Click driver.

Key functions

- eposmodule_handshake_init This function performs a handshake init which resets the device settings to default.

- eposmodule_dial This function dials the selected number by alternating between DTMF and No-tone.

- eposmodule_send_message This function sends an array of bytes via V.23 FSK 1200bps modem in start-stop 8.1 mode.

Example Description

This example demonstrates the use of EPOS Module Click by showing the communication between the two click boards connected to PBX system.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on MIKROE github account.

Other MIKROE Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.EPOSModule

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. UART terminal is available in all MIKROE compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MIKROE 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

P1200 datasheet

EPOS Module click example on Libstock

EPOS Module click 2D and 3D files v100

EPOS Module click schematic v100

CMX869B datasheet

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