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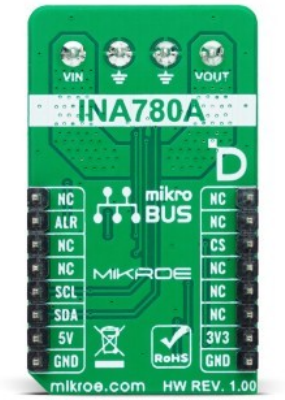
VCP Monitor 6 Click



PID: MIKROE-6101

VCP Monitor 6 Click is a compact add-on board designed for precise digital power monitoring applications. This board features the INA780A, a 16-bit I2C-output digital power monitor with EZShunt™ technology from Texas Instruments. Capable of measuring currents up to 20A and supporting voltages up to 85V, it accurately monitors current, voltage, and temperature, calculating power, energy, and charge. Programmable registers allow for fine-tuning measurement precision, supporting continuous and triggered operation modes. Ideal for power delivery, industrial battery packs, and telecom infrastructure, the VCP Monitor 6 Click ensures reliable and detailed power monitoring crucial for complex systems where accuracy and efficiency are paramount.

How does it work?

VCP Monitor 6 Click is based on the INA780A, a 16-bit I2C-output digital power monitor from Texas Instruments based on the innovative EZShunt™ technology. This component, designed for current sensing applications, integrates a current sensing element with a high-resolution 16-bit delta-sigma ADC. Capable of measuring currents up to 20A and supporting common-mode voltages up to 85V, the INA780A accurately monitors current, bus voltage, and internal temperature. It calculates essential parameters such as power, energy, and charge, which are crucial for precise decision-making in controlled systems. Flexible programmable registers enable fine-tuning of measurement precision and support both continuous and triggered operation modes. Ideal for diverse applications, including power delivery, industrial battery packs, telecom infrastructure, and enterprise servers, the VCP Monitor 6 Click ensures reliable and detailed power monitoring essential for complex systems where accuracy and efficiency are paramount.

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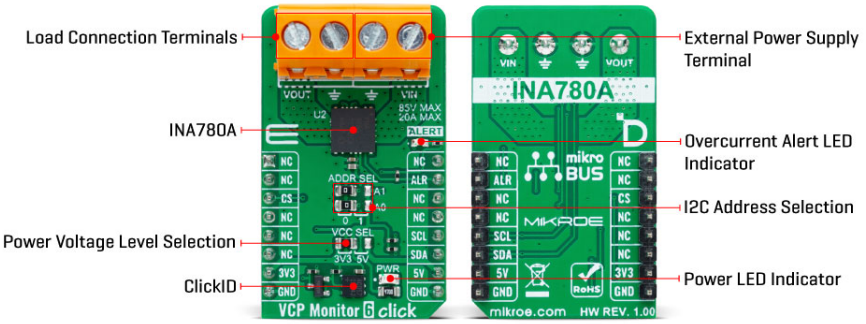

As mentioned, this digital power monitor integrates a temperature sensor that maintains an accuracy of ±2.5°C across its operational temperature range, ensuring reliable performance in various environmental conditions. It also features low offset and gain drift, essential for highly precise systems. Moreover, the INA780A offers flexibility with selectable ADC conversion times ranging from 50µs to 4.12ms and adjustable sample averaging from 1x to 1024x, minimizing noise and enhancing the quality of measured data for optimal system operation and control.

VCP Monitor 6 Click uses a standard 2-wire I2C communication protocol to enable the host MCU to control the INA780A. The I2C interface supports clock frequencies up to 400kHz, with the I2C address selectable via the ADDR SEL jumpers. The alert interrupt ALR pin can be used to report multiple diagnostics whenever the monitored output value crosses the associated out-of-range threshold or to indicate that the ADC conversion is complete. Detected abnormalities such as current under/over-limit, bus voltage under/over-limit, or power over-limit, besides the ALR pin, can also be visually displayed by a red ALERT LED.

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	Measurements
Applications	Ideal for power delivery, industrial battery packs, and telecom infrastructure
On-board modules	INA780A - digital power monitor with EZShunt™ technology from Texas Instruments
Key Features	EZShunt™ technology for precise digital power monitoring, measure currents up to 20A and supports voltages up to 85V, accurately monitoring current, bus voltage, and internal temperature, flexible operation with programmable registers for fine-tuning measurement precision, supports selectable ADC conversion times and adjustable sample averaging, multiple diagnostics, and more

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Interface	I2C
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 VCP Monitor 6 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	**ALR**	Alert 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	**5V**	Power Supply
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V
JP2-JP3	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1

VCP Monitor 6 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
External Power Supply	0	-	85	V
Load Current	0	-	20	A

Software Support

We provide a library for the VCP Monitor 6 Click as well as a demo application (example), developed using MIKROE compilers. The demo can run on all the main MIKROE development boards.

Package can be downloaded/installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on MIKROE github account.

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Library Description

This library contains API for VCP Monitor 6 Click driver.

Key functions

- vcpmonitor6_get_bus_voltage This function reads the BUS voltage output measurement in volts [V] by using I2C serial interface.
- vcpmonitor6_get_current This function reads the current measurement result in milliamperes [mA] by using the I2C serial interface.
- vcpmonitor6_get_power This function reads the power measurement result in Watts [W] by using the I2C serial interface.

Example Description

This library contains API for the VCP Monitor 6 Click driver for measurements of the voltage, current, power, energy, charge, and die temperature.

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.VCPMonitor6

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

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Click boards™

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