

# LEM click

PID: MIKROE-2553

Weight: 38 g

**LEM click** carries the LTS 6-NP current transducer and MCP3201 ADC converter. The click can measure AC and DC current with exceptional speed, **up to 200 KHz**. LEM click is designed to run on either 3.3V or 5V power supply. It communicates with the target microcontroller over SPI interface, or directly with analog output.



**DO NOT TOUCH THE BOARD WHILE THE EXTERNAL POWER SUPPLY IS ON!**

**Note:** LEM click has exposed pins/pads. To stay safe take precaution when applying high voltage to the click. The click is to be used by trained personnel only when applying high voltage.

## LTS 6-NP features

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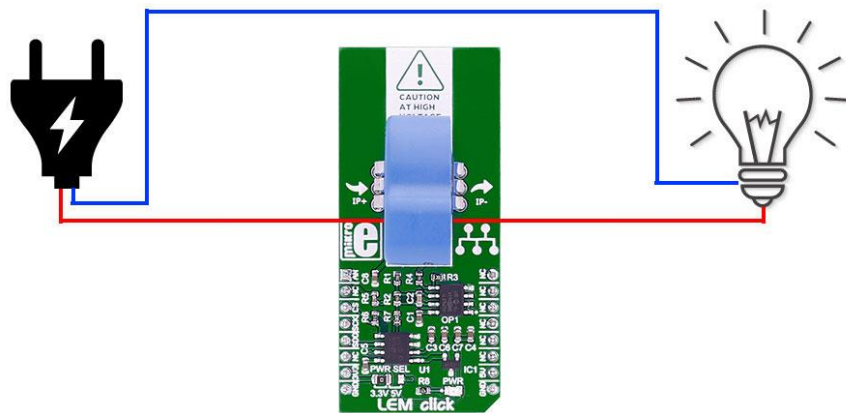
LTS 6-NP is a closed loop (compensated) multi-range current transducer using the Hall effect.

Intended for electronic measurement of currents: DC, AC, pulsed, mixed with galvanic separation between the primary circuit and the secondary circuit.

## How it works

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The conductor can be placed through the hole on the sensor:



There is on board ADC to read out the analog output value of the sensor, or it can be read from the AN pin.

## MCP3201 A/D converter

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The MCP3201 is a 12-bit Analog-to-Digital (A/D) Converter with on-board sample and hold circuitry. The device provides a single pseudo-differential input.

The MCP3201 is capable of sample rates of up to 100 ksps at a clock rate of 1.6 MHz.

## Key features

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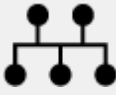
- LTS 6-NP current transducer
- Unipolar voltage supply
- Incorporated measuring resistance
- Low temperature drift
- Optimized response time
- MCP3201 ADC converter
- SPI interface
- 3.3V or 5V power supply

## Specification

<b>Type</b>	Measurements
<b>Applications</b>	LEM click can be used for AC variable drives, Servo motor control, Power supplies, etc.
<b>On-board modules</b>	LTS 6-NP current transducer, MCP3201 A/D converter
<b>Key Benefits</b>	The click can measure AC and DC current with exceptional speed, up to 200 KHz.
<b>Interface</b>	SPI
<b>Peripherals include</b>	Onboard screw terminal
<b>Input Voltage</b>	3.3V or 5V
<b>Compatibility</b>	mikroBUS
<b>Click board size</b>	L (57.15 x 25.4 mm)

## Pinout diagram

This table shows how the pinout on **LEM click** corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	 mikroBUS™				Pin	Notes
		1	AN	PWM	16		
Analog output	<b>AN</b>	<b>1</b>	AN	PWM	<b>16</b>	NC	Not connected
Not connected	NC	<b>2</b>	RST	INT	<b>15</b>	NC	Not connected
Chip select	<b>CS</b>	<b>3</b>	CS	TX	<b>14</b>	NC	Not connected
SPI Clock	<b>SCK</b>	<b>4</b>	SCK	RX	<b>13</b>	NC	Not connected

SPI Master Input Slave Output	<b>MISO</b>	<b>5</b>	MISO	SCL	<b>12</b>	NC	Not connected
Not connected	NC	<b>6</b>	MOSI	SDA	<b>11</b>	NC	Not connected
Power supply	<b>+3.3V</b>	<b>7</b>	3.3V	5V	<b>10</b>	<b>+5V</b>	Power supply
Ground	<b>GND</b>	<b>8</b>	GND	GND	<b>9</b>	<b>GND</b>	Ground

## Jumpers and settings

Designator	Name	Default Position	Default Option	Description
JP1	PWR.SEL.	Left	3V3	Power Supply Voltage Selection 3V3/5V, left position 3V3, right position 5V

## LEDs and buttons

Designator	Name	Type	Description
TB1		SCREW TERMINAL	Current input to sensor

## Programming

Code examples for LEM click, written for MikroElektronika hardware and compilers are available on [Libstock](#).

## Code snippet

The following code snippet shows the example for LEM click, which calls functions that will initialize both the click and the display, and then show measured data.

```
01 static void systemInit( void )
02 {
03     LEM_init();
04 }
05
06 void main()
07 {
08     float currentRead;           /**< Read value */
09     char txt[10];                /**< Read value as string */
10     char oldTxt[10];            /**< Old read value */
11     char lab[10] = {0};         /**< Current label text */
12     char res;                   /**< Comparing of old and new value */
13
14     systemInit();
15     displayInit();
16
17
18     while(1)
19     {
20         currentRead = getCurrent_A();
21         sprintf(txt, "%2.3fA", currentRead);
22         res = strcmp(txt,oldTxt);
23         if(res != 0)
24         {
25             updateLabel(txt, 180, 140, lab);
26             strcpy(oldTxt,txt);
27         }
28         delay_ms(250);
29     }
30
31 }
```

## Downloads

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mikroBUS™ Standard specification

LTS 6-NP datasheet

LibStock: LEM click library

LEM click schematic