

Life Metrics Click



PID: MIKROE-6851

Life Metrics Click is a compact add-on board for advanced multi-vital sign monitoring and evaluation in biomedical, wearable, and health-focused embedded applications. It is based on the [AS7058A](#) multi-vital sign analog front-end from [ams OSRAM](#), integrated with the [SFH 7074](#) optical biomonitring sensor. The board supports photoplethysmography (PPG), electrocardiogram (ECG), bioelectrical impedance (BioZ), and electrodermal activity (EDA) measurements, complemented by precise temperature sensing via the [AS6223A](#) sensor and motion tracking using the [LIS2DH12](#) three-axis accelerometer, while dedicated ECG connectors, interrupt signaling, 1.8V low-noise architecture, and bidirectional level shifting ensure reliable and flexible system integration through the I2C interface. This Click board™ is ideal for wearable health devices, fitness and wellness monitoring systems, medical research platforms, biometric sensing solutions, and embedded applications requiring real-time vital sign monitoring.

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

How does it work?

Life Metrics Click is based on the AS7058A analog front-end (AFE) from ams OSRAM, combined with the SFH 7074 biomonitring optical sensor, the AS6223A high-accuracy digital temperature sensor, and the LIS2DH12 three-axis accelerometer, forming a complete platform for simultaneous acquisition of multiple physiological and motion parameters. This board is designed as a multi-vital sign monitoring solution for advanced biomedical and wearable embedded applications, like wearable health devices, fitness monitoring systems, medical research equipment, and next-generation biometric sensing applications where synchronized acquisition of multiple human vital parameters is essential.

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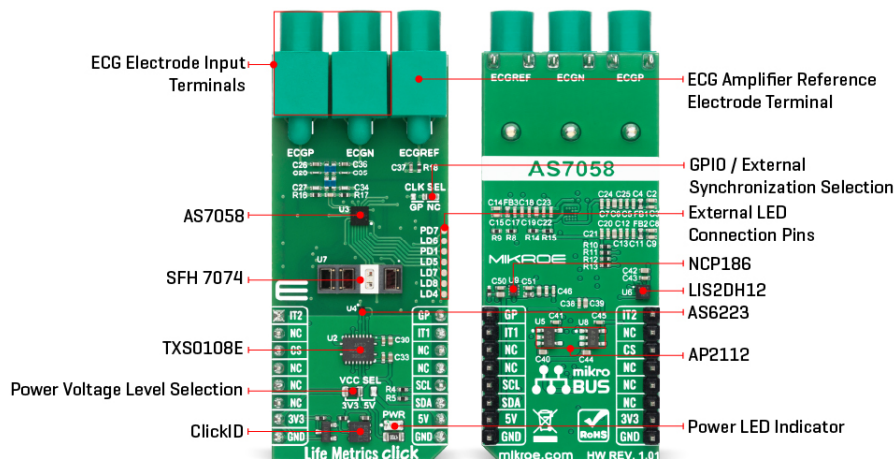
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The core of the board, the AS7058A, is an integrated multi-vital sign monitoring IC designed to measure photoplethysmography (PPG), electrocardiogram (ECG), bioelectrical impedance (BioZ), and electrodermal activity (EDA), providing a unified approach to human health monitoring. PPG enables pulse rate and blood oxygen evaluation by sampling light modulated through blood vessel expansion and contraction, while ECG represents the reference method for measuring the electrical activity generated by the heart. EDA measurement allows assessment of skin conductivity related to hydration and stress levels, whereas BioZ enables body composition analysis using controlled electrical impedance measurements.

The board includes dedicated ECG connectors compatible with a custom set of [wires](#) and [electrodes](#) available from MIKROE, allowing reliable acquisition of bioelectrical signals in evaluation setups. The AS7058A operates in conjunction with the SFH 7074 optical biomonitors sensor, optimized for vital sign detection through integrated emitters and photodiodes, enabling accurate optical measurements required for PPG analysis. Environmental and body temperature monitoring, along with motion and orientation detection, are enabled by the AS6223A high-accuracy digital temperature sensor and the LIS2DH12 ultra-low-power three-axis accelerometer, which together provide precise temperature measurement and configurable activity tracking through the shared I2C interface, supporting accurate contextual interpretation of vital sign data.

All mentioned ICs on Life Metrics Click communicates with the host microcontroller through a standard I2C interface. The entire sensing subsystem operates at a 1.8V logic level, ensuring low power consumption and compatibility with modern low-voltage biomedical electronics. To provide stable operation and simplify integration with a wide range of host platforms, the board also uses TXS0108E bidirectional voltage level translators that safely adapt signal levels between the mikroBUS™ interface and the onboard low-voltage circuitry. Power regulation is handled by two AP2112 low-dropout (LDO) voltage regulators, which generate dedicated 1.8V supply rails separately for the analog and digital domains of the board, minimizing noise coupling and improving measurement accuracy for sensitive biosignal acquisition.

In addition to standard communication pins, Life Metrics Click uses several control and signaling lines to extend functionality. The IT1 pin is routed as an interrupt output from the AS7058 vital sign monitoring AFE, allowing the host MCU to react immediately to measurement events or data-ready conditions, while the IT2 pin carries the interrupt signal generated by the LIS2DH12 accelerometer for motion detection, wake-up events, or positional changes. The board also exposes a GP (General Purpose) digital I/O pin that enables flexible assignment of auxiliary functions. This GPIO can share the “ON” signal generated by the internal LED or

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VCSEL driver of the AS7058, enabling synchronization or external control of additional LED driver devices when required by advanced optical measurement setups. Activation of this functionality is controlled through the CLK SEL jumper, which must be positioned appropriately to enable signal routing; by default, the jumper is set to the NC position, leaving the feature disabled to ensure standard operation.

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	Biometrics, ECG, Heart Rate
Applications	Ideal for wearable health devices, fitness and wellness monitoring systems, medical research platforms, biometric sensing solutions, and embedded applications requiring real-time vital sign monitoring
On-board modules	AFE AS7058A + SFH 7074 - multi-vital sign monitoring device from ams OSRAM
Key Features	Multi-vital sign monitoring with integrated PPG, ECG, BioZ, and EDA measurement capabilities, digital temperature sensing for environmental and body temperature monitoring, ultra-low-power three-axis accelerometer, shared I2C communication interface for simplified host MCU integration, 1.8V low-voltage architecture optimized for biomedical sensing applications, and more
Interface	I2C
Feature	ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on Life Metrics Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
LIS2DH12 Interrupt	IT2	1	AN	PWM	16	GP	General-Purpose I/O
	NC	2	RST	INT	15	IT1	AS7058 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

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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	CLK SEL	Right	GPIO / External Synchronization Selection GP/NC: Left position GP, Right position NC

Life Metrics Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V

Software Support

[Life Metrics 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 Life Metrics Click board by reading ECG/PPG samples from the AFE FIFO and (optionally) reading accelerometer and temperature measurements. ECG/PPG samples are parsed and logged in a simple format suitable for plotting (e.g. serial plotter).

Key Functions

- `lifemetrics_cfg_setup` This function initializes Click configuration structure to initial values.
- `lifemetrics_init` This function initializes all necessary pins and peripherals used for this Click board.
- `lifemetrics_default_cfg` This function executes a default configuration of Life Metrics Click board.
- `lifemetrics_afe_read_fifo` This function checks FIFO interrupt/status flags and reads FIFO sample data into the provided buffer.
- `lifemetrics_accel_get_data` This function reads both acceleration and accelerometer temperature data.
- `lifemetrics_temp_read_temp` This function reads the raw data from the temperature sensor and converts it to degrees Celsius.

Application Init

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Initializes the logger and Life Metrics Click driver, performs default device configuration, reads the external temperature sensor ID, and starts AFE measurements when enabled.

Application Task

Reads and parses AFE FIFO samples (ECG/PPG) and logs them. When enabled, it also reads accelerometer data and temperature values and logs the results.

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](#)

[Click boards™](#)

[ClickID](#)

Downloads

[SFH 7074 datasheet](#)

[Life Metrics click example package](#)

[AS7058A datasheet](#)

[AS6223A datasheet](#)

[LIS2DH12 datasheet](#)

[Life Metrics click schematic v101](#)

[Life Metrics click 2D and 3D files v101](#)

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