

BGM113 Click



PID: MIKROE-6584

BGM113 Click is a compact add-on board that provides Bluetooth low energy connectivity for embedded applications, offering a complete solution for wireless communication and secure data exchange. It is based on the [BGM113A256V21](#) wireless Gecko Bluetooth module from [Silicon Labs](#), which integrates the radio, onboard Bluetooth stack, and GATT-based profiles while also being capable of hosting end-user applications. Powered by a 32-bit ARM Cortex-M4 core running at 38.4MHz with 256kB of flash memory and 32kB of RAM, the module delivers efficient performance, while its integrated antenna ensures robust 2.4GHz communication with a TX power of up to +3dBm and RX sensitivity down to -92dBm, achieving ranges up to 50 meters. BGM113 Click is ideal for IoT sensors, health and wellness devices, industrial and building automation, commercial and retail systems, and smart accessories for smartphones, tablets, and PCs.

For more information about **BGM113 Click** visit the official [product page](#).

How does it work?

BGM113 Click is based on the BGM113A256V21, a wireless Gecko Bluetooth module from Silicon Labs that brings reliable Bluetooth low energy connectivity into embedded applications. The BGM113A256V21 provides an all-in-one solution that integrates radio, Bluetooth stack, and GATT-based profiles while also being capable of hosting end-user applications. Powered by a 32-bit ARM Cortex-M4 core running at 38.4MHz with 256kB of flash memory and 32kB of RAM, the module ensures efficient operation for a wide range of IoT and embedded use cases. Its Bluetooth 4.2 compliance and onboard Bluetooth Smart stack enable easy integration, while the integrated antenna supports communication across the 2.4GHz band with a TX output power up to +3dBm and RX sensitivity down to -92dBm, allowing a reliable connection range of

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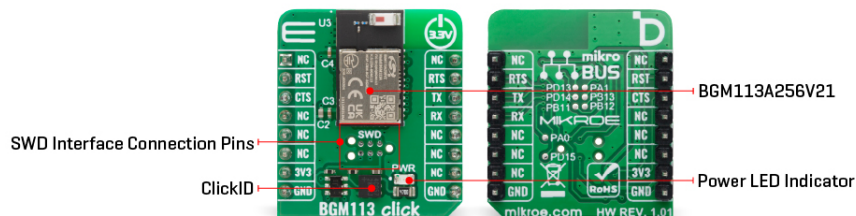


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up to 50 meters.



The BGM113A256V21 also incorporates an autonomous hardware crypto accelerator and random number generator, ensuring secure communication in sensitive applications. With its low power design, onboard resources, and strong RF performance, BGM113 Click is an excellent choice for IoT sensors, health and wellness devices, industrial and building automation systems, commercial and retail solutions, as well as accessories for smartphones, tablets, and PCs where stable, secure, and energy-efficient Bluetooth connectivity is required.

This Click board™ establishes communication between the BGM113A256V21 module and the host MCU through a UART interface, using standard UART RX and TX pins and hardware flow control via CTS and RTS pins. The default communication speed is set at 115200bps, ensuring efficient data exchange. Along with the communication and control pins, this Click board™ also includes a reset pin (RST) enabling easy module resetting, and SWD pads designed for use with MIKROE's [6-pin Needle Cable](#), providing an optional flash and debug SWD (Serial Wire Debug) interface functionality.

On the back side of the board, the remaining GPIO pins of the module are exposed in the form of test points, allowing easy access for evaluation, debugging, or expansion purposes. Each of these GPIO pins can be individually configured as either an input or an output, providing flexibility for a wide range of application requirements. In addition to the basic configurations, the module also supports more advanced modes, such as open-drain and open-source operation, enabling interfacing with different logic levels and external components.

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. It also comes equipped with a library containing functions and example code that can be used as a reference for further development.

Specifications

Type	2.4 GHz Transceivers,BT/BLE
Applications	Ideal for IoT sensors, health and wellness devices, industrial and building automation, commercial and retail systems, and smart accessories for smartphones, tablets, and PCs

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On-board modules	BGM113A256V21 - wireless Gecko Bluetooth® module from Silicon Labs
Key Features	Integration of radio, onboard Bluetooth stack and GATT-based profiles, 32-bit ARM Cortex-M4 core, autonomous hardware crypto accelerator with random number generator, Bluetooth 4.2 compliance, integrated 2.4GHz antenna, UART interface with hardware flow control, SWD pads for optional flash and debug access, GPIO pins exposed as test points, and more
Interface	UART
Feature	ClickID
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on BGM113 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	
Reset / ID SEL	RST	2	RST	INT	15	RTS	UART RTS
UART CTS / ID COMM	CTS	3	CS	RX	14	TX	UART TX
	NC	4	SCK	TX	13	RX	UART RX
	NC	5	MISO	SCL	12	NC	
	NC	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

BGM113 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Frequency Range	-	2.4	-	GHz
TX Power	-	-	+3	dBm
RX Sensitivity	-	-92	-	dBm
Communication Range	-	-	50	m

Software Support

[BGM113 Click](#) demo application is developed using the [NECTO Studio](#), ensuring compatibility

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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 usage of the BGM113 Click board. The application initializes the module, resets the device, checks communication, retrieves the BT address, and manages bondings. It also configures the device to be discoverable and bondable and handles various BT-related events such as connection state changes, security mode, and GATT operations.

Key Functions

- `bgm113_cfg_setup` This function initializes Click configuration structure to initial values.
- `bgm113_init` This function initializes all necessary pins and peripherals used for this Click board.
- `bgm113_send_packet` This function sends a desired command packet from the Click context object.
- `bgm113_read_packet` This function reads an event or response packet from the ring buffer and stores it in the Click context object.
- `bgm113_set_gap_mode` This function configures the current BT LE GAP Connectable and Discoverable modes.

Application Init

Initializes the logger and sets up the BGM113 Click configuration. Resets the device, checks communication, retrieves the BT address, and deletes existing bondings. Configures the device to be bondable and sets LE GAP modes.

Application Task

Continuously reads packets from the BGM113, parses the contents, and logs relevant information regarding system events, BT connections, and bonding information.

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](#)

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[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[BGM113 click example package](#)

[BGM113 click 2D and 3D files v101](#)

[BGM113 datasheet](#)

[BGM113 click schematic v101](#)

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