

## MDBT42Q Click



PID: MIKROE-6686

**MDBT42Q Click** is a compact add-on board that provides Bluetooth Low Energy connectivity for short-range wireless communication for embedded applications. It is based on the [MDBT42Q-AT2](#) module from [RAYTAC](#), built around the Nordic nRF52810 SoC. This module combines a 32-bit ARM Cortex-M4F processor with 192kB Flash and 24kB RAM, and comes preloaded with RAYTAC's AT command firmware for easy configuration over UART in the peripheral/slave role. Key features include support for Bluetooth 5.2/5.1/5.0/5.4 specifications, selectable on-air data rates of 1Mbps or 2Mbps, five TX power levels, low-power modes with GPIO wake-up, and an onboard chip antenna for excellent connectivity. MDBT42Q Click is ideal for IoT devices, wireless sensors, smart home systems, asset tracking, and healthcare or fitness monitoring applications.

For more information about **MDBT42Q Click** visit the official [product page](#).

### How does it work?

MDBT42Q Click is based on the MDBT42Q-AT2 module from RAYTAC designed to provide Bluetooth Low Energy (BLE) connectivity. This certified BT 5.2 stack module is based on the Nordic nRF52810 SoC, a highly integrated solution that combines a 32-bit ARM Cortex-M4F processor with 192kB of Flash memory and 24kB of RAM, ensuring efficient operation in wireless applications. Acting exclusively in the peripheral/slave role, the module comes preloaded with RAYTAC's AT command firmware, which simplifies configuration and control through a UART interface. As a recommended third-party module by Nordic Semiconductor, MDBT42Q-AT2 meets multiple international standards, being certified for FCC, IC, CE, Telec (MIC), KC, SRRC, and NCC compliance, while its onboard chip antenna guarantees excellent

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.

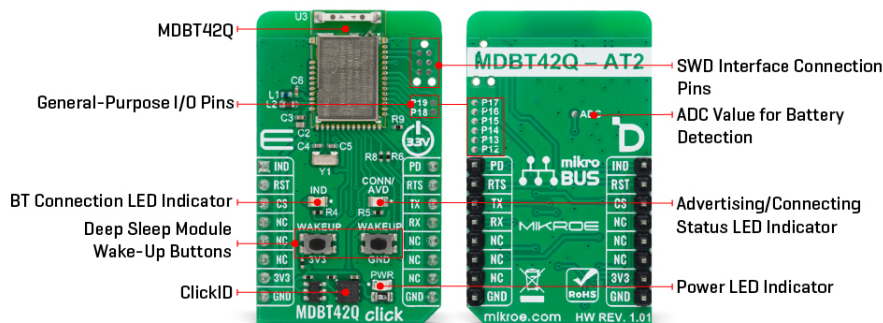


ISO 27001: 2013 certification of informational security management system.  
 ISO 14001: 2015 certification of environmental management system.  
 OHSAS 18001: 2008 certification of occupational health and safety management system.



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

connectivity performance in compact embedded designs.



The module offers flexible configuration options, allowing users to choose on-air data rates of either 1Mbps or 2Mbps, set transmission power across five selectable levels, and adjust advertising time. For better user interaction, it supports customizable LED indication patterns that reflect advertising and connection status, with a yellow CONN/ADV LED as a clear status marker. To optimize energy consumption, it provides both DC-to-DC and LDO power modes, a dedicated power-down state with GPIO wake-up support, and efficient use of resources to extend battery life in portable systems.

Its data handling capabilities include support for a maximum MTU size of 247 bytes, enabling payloads of up to 244 bytes, ensuring reliable and flexible data exchange in BLE applications. With these features, MDBT42Q Click is ideal for IoT devices, wireless sensors, smart home automation, asset tracking systems, healthcare and fitness monitors, and other scenarios where low-power, short-range wireless connectivity is required.

This Click board™ establishes communication between the MDBT42Q-AT2 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. In addition to the UART pins for communication with the module, this Click board also features a PD active-high pin used to enable the UART interface, a reset pin (RST) enabling easy module resetting, blue IND LED indicator for Bluetooth connection status (also available through IND pin), 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.

The board integrates dedicated wake-up buttons that provide a reliable way to bring the module out of deep sleep mode. Since the wake-up mechanism is logic-selective, it requires a clearly defined signal transition to activate the module, which is why two separate buttons are provided: one tied to the 3V3 rail and the other to GND. By pressing either of these, a valid high or low logic level is momentarily introduced, triggering the wake-up event in accordance with the module's power management logic.

The board is also equipped with a set of carefully placed test points that provide developers with easy access to key signals for debugging, monitoring, and feature expansion. A dedicated group of test points labeled P12 through P19 enables support for up to eight programmable GPIO outputs, offering flexibility to configure these pins according to application requirements. In addition to general-purpose I/O, an ADC test point is also provided, allowing straightforward

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).

retrieval of analog-to-digital conversion values. This feature is particularly useful for monitoring supply conditions, most notably battery voltage levels, ensuring that power status can be tracked in real time and incorporated into the system's operation logic.


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 devices, wireless sensors, smart home systems, asset tracking, and healthcare or fitness monitoring applications
On-board modules	MDBT42Q-AT2 - Bluetooth low energy or BLE 5.2 stack module from RAYTAC
Key Features	Based on the Nordic nRF52810 SoC with a 32-bit ARM Cortex-M4F processor, 192kB Flash memory and 24kB RAM, preloaded AT command firmware for simple UART configuration in peripheral role, certified compliance with FCC, IC, CE, Telec, KC, SRRC and NCC standards, onboard chip antenna, selectable on-air data rates, adjustable TX output power across five levels, power-down state with GPIO wake-up support, SWD pads for debug and flashing, and more
Interface	UART
Feature	ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V

## Pinout diagram

This table shows how the pinout on MDBT42Q Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
BT Connection Indicator	<b>IND</b>	1	AN	PWM	16	<b>PD</b>	UART Enable
Reset / ID SEL	<b>RST</b>	2	RST	INT	15	<b>RTS</b>	UART RTS
UART CTS / ID SEL	<b>CS</b>	3	CS	RX	14	<b>TX</b>	UART TX
	NC	4	SCK	TX	13	<b>RX</b>	UART RX
	NC	5	MISO	SCL	12	NC	
	NC	6	MOSI	SDA	11	NC	
Power Supply	<b>3.3V</b>	7	3.3V	5V	10	NC	
Ground	<b>GND</b>	8	GND	GND	9	<b>GND</b>	Ground

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).

## Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
LD2	IND	-	BT Connection LED Indicator
LD3	CONN/ADV	-	Advertising / Connecting Status LED Indicator
T1-T2	WAKEUP	-	Deep-Sleep Module Wake-Up Buttons

## MDBT42Q Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Frequency Range	2360	-	2500	MHz
Data Rate	1	-	2	Mbps
Output Power	-	4	8	dBm

## Software Support

[MDBT42Q 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 MDBT42Q Click board by processing data from a connected BT device.

### Key Functions

- `mdbt42q_cfg_setup` This function initializes Click configuration structure to initial values.
- `mdbt42q_init` This function initializes all necessary pins and peripherals used for this Click board.
- `mdbt42q_get_ind_pin` This function returns the BT connection active indicator (IND) pin logic state.
- `mdbt42q_reset_device` This function resets the device by toggling the reset pin logic state.
- `mdbt42q_cmd_run` This function sends a specified command to the Click module.
- `mdbt42q_cmd_set` This function sets a value to a specified command of the Click module.

### Application Init

Initializes the driver and logger.

### Application Task

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).

Application task is split in few stages:

- MDBT42Q\_POWER\_UP:

Powers up the device, performs a factory reset and reads system information.

- MDBT42Q\_CONFIG\_EXAMPLE:

Sets the BT device name.

- MDBT42Q\_EXAMPLE:

Performs a BT terminal example by processing all data from a connected BT device and sending back an adequate response messages.

## 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

[MDBT42Q click example package](#)

[MDBT42Q click 2D and 3D files v101](#)

[MDBT42Q datasheet](#)

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).

[MDBT42Q AT Commands](#)

[MDBT42Q click schematic v101](#)

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).