MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

BT Audio 4 Click

PID: MIKROE-6685

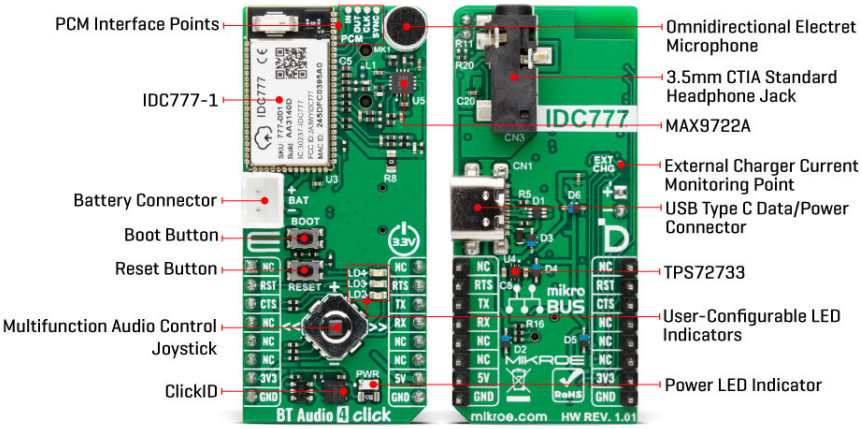
BT Audio 4 Click is a compact add-on board designed to provide high-quality wireless audio streaming and data communication over Bluetooth in both Classic and LE Audio modes. This board is based on the IDC777-1, a fully integrated Bluetooth 5.4 module from IOT747 supporting LE Audio Unicast and Auracast, controlled via UART. It supports multiple Bluetooth profiles such as HFP, A2DP (Sink/Source), AVRCP, SPP, and BLE, and includes both analog and digital audio interfaces for full headset functionality. It features a PCM interface for digital audio connectivity, a MAX9722A stereo amplifier with a CTIA-compliant 3.5mm jack for headphone output, and an onboard electret microphone for voice input. This Click board™ is ideal for audio-visual systems, teleconferencing equipment, portable audio devices, and industrial or automotive Bluetooth audio applications.

For more information about **BT Audio 4 Click** visit the official product page.

How does it work?

BT Audio 4 Click is based on the IDC777-1 module from IOT747 that enables high-quality wireless audio and data communication over Bluetooth. This fully integrated solution supports both Bluetooth Classic and LE Audio modes, including the latest LE Audio Unicast and Auracast (Broadcast) functionalities using the advanced LC3 codec. The IDC777-1 is controlled via a simple UART interface that also handles data transmission, and supports multiple simultaneous connections and profiles such as HFP, A2DP (Sink and Source), AVRCP, SPP, and BLE, making it ideal for both receiver and transmitter roles in complex audio systems, including audio-visual products, industrial audio and data interfaces, automotive and aerospace applications, teleconferencing equipment, and various retail, sports, and leisure devices.

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com



The module offers extremely low power consumption, making it ideal for battery-powered applications. With a typical RF sensitivity of -97dBm and a maximum transmit power of 9dBm, the IDC777-1 ensures stable connectivity within a 25-meter range. Audio interfaces include both analog and digital options such as I2S, PCM, and SPDIF, and the module supports advanced audio standards including aptX, aptX HD, aptX Lossless, AAC, and Wide Band Speech. Certified for global use with approvals including FCC (US), RED (Europe), MIC (Japan), KCC (Korea), and SRRC (China), the module is also supplied with reference Android and iOS apps to accelerate development.

The IDC777-1 operates exclusively at 3.3V, while the board accepts power from multiple sources, including the 5V mikroBUS™ rail, USB connector, or an external battery via the BAT connector. A low-dropout regulator, the TPS72733, converts these inputs to a clean and stable 3.3V supply required for the module's optimal operation. The BT Audio 4 Click supports both digital and analog audio paths, enabling versatile Bluetooth audio applications.

The IDC777-1 provides a PCM interface for connecting to external digital audio devices, with signals routed to clearly labeled test points on the board. It supports sample rates up to 384kHz for DAC and up to 96kHz for ADC, allowing integration with high-quality audio systems. In addition to digital audio, the board also features the MAX9722A stereo headphone amplifier paired with a CTIA-compliant 3.5mm jack for driving standard headphones with microphone support, and a CMC-2242PBL-A omnidirectional electret microphone for voice input, enabling hands-free calls, voice control, or audio streaming. Combined with the IDC777-1's processing, the board functions as a complete Bluetooth headset or audio interface for both playback and voice transmission.

Communication between the IDC777-1 and the host MCU is made through a UART interface, using standard UART RX and TX pins and hardware flow control pins (CTS/RTS- Clear to Send/Ready to Send) for efficient data transfer. The module defaults to a communication speed of 115200bps, allowing data exchange over AT commands. Along with the communication and control pins, this Click board™ also includes a reset pin (RST) and a RESET button, enabling easy module resetting, and a BOOT button. The BOOT button can be used to initiate the module's boot sequence or to wake it from a dormant or sleep state, providing convenient control during development, pairing, or low-power operation scenarios.

BT Audio 4 Click features three user-configurable LEDs in red, blue, and green, which can be used to indicate device status, connection state, streaming activity, or other custom functions, depending on application requirements. It also includes a multifunctional 5-directional joystick

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

that provides intuitive audio control, allowing the user to adjust volume (up/down), navigate tracks (left/right), and control playback with a press for play/pause functionality. On the back side of the board, a dedicated test point labeled EXT CHG is available, reserved for external charger current monitoring. Although not used in this design, it is provided for optional measurement or debugging, as recommended in the IDC777-1 datasheet.

While both mikroBUS™ power rails are available, BT Audio 4 Click operates exclusively on a 3.3V logic level, which is required by the IDC777-1 module. Therefore, level shifting must be performed when interfacing with MCUs that use different logic voltages. The board also comes equipped with a library containing functions and example code that can be used as a reference for further development.

Specifications

Type	Speech recognition
Applications	Ideal for audio-visual systems, teleconferencing equipment, portable audio devices, and industrial or automotive Bluetooth audio applications
On-board modules	IDC777-1 - fully integrated Dual Mode LE Audio (LC3 Codec AuraCast and UniCast) and Classic Bluetooth module from IOT747
Key Features	Bluetooth Classic and LE Audio with Unicast and Auracast functionality, multiple Bluetooth profiles such as HFP, A2DP, AVRCP, SPP, and BLE, UART communication, low power consumption, RF sensitivity of -97dBm, transmit power up to 9dBm, integrated PCM digital audio interface, MAX9722A stereo headphone amplifier, CTIA-compliant 3.5mm audio jack, onboard electret microphone for voice input, three user-configurable LEDs, multifunctional 5-directional joystick for audio control, and more
Interface	UART
Feature	ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V,5V,External

Pinout diagram

This table shows how the pinout on BT Audio 4 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

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

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	**5V**	Power Supply
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
LD2-LD4	LD2-LD4	-	User-Configurable LED Indicators
T1	BOOT	-	Boot Button
T2	RESET	-	Reset Button
JS1	-	-	Multifunctional Audio Control Joystick

BT Audio 4 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Frequency Range	2.402	-	2.480	MHz
RF Sensitivity	-	-97	-	dBm
Transmit Power	-	-	+9	dBm
Audio Sample Rate (DAC)	-	-	384	kHz
Audio Sample Rate (ADC)	-	-	96	kHz

Software Support

BT Audio 4 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 how to communicate with the BT Audio 4 Click board over UART. It initializes the device, resets it, retrieves the device name, and then continuously processes and logs any incoming UART messages from the device.

Key Functions

- btaudio4_cfg_setup This function initializes Click configuration structure to initial values.
- btaudio4_init This function initializes all necessary pins and peripherals used for this Click board.
- btaudio4_cmd_run This function sends a specified command to the Click module.
- btaudio4_cmd_set This function sets a value to a specified command parameter of the Click module.
- btaudio4_cmd_get This function is used to get the value of a given command parameter from the Click module.

Application Init

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Initializes the logger and the BT Audio 4 Click driver, performs a device reset, and reads the device name.

Application Task

Continuously processes UART data received from the Click board and logs it to the terminal. Acts as a passive receiver of incoming messages, useful for monitoring notifications.

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

BT Audio 4 click example package

BT Audio 4 click 2D and 3D files v101

IDC777-1 datasheet

IDC777-1 Command Manual

BT Audio 4 click schematic v101