

BT Audio click



PID: MIKROE-2399

RS Product Number: [136-0845](#)

If you are getting tired of all those cables you need just to listen to your favorite song over speakers, what you need is BT Audio click with Microchip's RN52 Bluetooth audio module. With onboard 3.5mm jacks for both a microphone and a speaker, this is a complete solution for streaming audio from a smartphone or PC over a wireless connection.

Bluetooth class 2 radio and DSP processor combined

Microchip's RN52 Bluetooth audio module delivers high quality audio in small form factor (26.0 mm x 13.5 mm x 2.7 mm). The module combines a class 2 Bluetooth radio and an embedded DSP processor, controlled and configured by simple ASCII commands.

Learn more from the vendor's [data sheet](#).

BT Audio Click can stream audio files

DSP, or digital signal processor, is what makes this module special, because it can actually stream audio – it converts and compresses the radio waves sent from your phone or computer into digital data, and then sends it to your speakers or headphones.

As a use case example, we built a multimedia station project. Read about it in this [tutorial](#).

Quality of sound over Bluetooth

The module supports aptX, audio codec for high quality stereo audio streaming over a Bluetooth connection. So the quality of the sound is not something you will have to compromise on, as aptX encodes a CD-quality (16-bit / 44.1kHz) audio stream.

The RN52 module supports HSP/HFP, A2DP, AVRCP and SPP, as well as digital I/O, stereo speaker output, stereo microphone input. The module also supports iAP profile discovery for connecting the BT Audio click to Apple devices like, iPods, iPhones or MAC computers.

HSP/HFP stands for Hands-Free Profile and Headset Profile for an audio connection between Bluetooth on your phone and the headset.

Bluetooth range

BT Audio click has a 10m range in open space. The range is smaller indoors, but still enough to cover a few rooms.

BT Audio click communicates with the target board MCU through the mikroBUS™ UART interfaces, with few additional pins. The board uses a 3.3V power supply only.

See more details on the [documentation page](#).

Applications

Wireless audio docking stations, wireless speakers and headphones, smart medical devices, VoIP handsets, intercom push-to-talk audio connection, etc.

Key Features

- RN52 Bluetooth audio module
- Audio decoders: SBC, AAC, aptX
- Digital signal processor
- Embedded Bluetooth profiles: A2DP, AVRCP, HFP/HSP and SPP
- Integrated Amplifier for Driving 16Ω Speakers
- Green LED indicates power is on
- Operational range of 10m in open space
- RF TX power 4dBm
- Maximum Data Rate 3 Mbps
- Frequency Band 2.4 ~ 2.48 GHz
- 3.5 mm Audio jacks for speaker and microphone
- UART interface
- 3.3V power supply

Specification

| | |
|------------------|---|
| Product Type | Bluetooth |
| Applications | Wireless audio docking stations, wireless speakers and headphones, smart medical devices, VoIP handsets, intercom push-to-talk audio connection, etc. |
| On-board modules | Microchip's RN52 Bluetooth audio, 3.5mm jacks for both a microphone and a speaker |
| Key Features | Audio decoders: SBC, AAC, aptX, Embedded Bluetooth profiles: A2DP, AVRCP, HFP/HSP and SPP, Integrated Amplifier for Driving 16Ω Speakers |
| Key Benefits | Operational range of 10m in open space, Green LED indicates power is on |
| Interface | UART |
| Power Supply | 3.3V |
| Compatibility | mikroBUS |
| Click board size | L (57.15 x 25.4 mm) |
| Weight | 27g |

BT Audio click features Microchip's RN52 Bluetooth audio module capable of streaming high quality audio. The module combines class 2 Bluetooth radio and an embedded DSP processor, controlled and configured by simple ASCII commands and GPIO. The board has two audio jacks, input (microphone) and line out (for connecting speakers).

Features and usage notes

Connectivity to Apple devices

The module also supports iAP profile discovery for connecting BT Audio click to Apple devices like iPods, iPhones or MAC computers.

- The RN52 supports HSP/HFP, A2DP, AVRCP and SPP, as well as digital I/O, stereo speaker output, stereo microphone input, up to 11 General Purpose I/O's, and 2 LED status outputs.
- The HSP/HFP stands for Hands-Free Profile and Headset Profile for an audio connection between Bluetooth on your phone and the headset.

The module is fully Bluetooth qualified and provides global modular approval. The ADC can sample up to 200 kHz using different inputs as sample triggers and it supports 8/10/12 bit resolution. Any of the 8 analogue inputs can be used both as single-ended inputs and as differential pairs for measuring the voltage across them. The ADC supports full 0 V to VCC input range.

The BT Audio click runs on 3.3V power supply only.

Key features


The demo is a GUI application made for the mikromedia+ for STM32F7 with a shield. The Application uses BT Audio library to interface between the touch screen and click board to play music and make phone calls.

```
1 void play_btnOnClick()
2 {
3     connection_status_t connection;
4
5     bt_audio_query_connection_status( &connection );
6     if( !connection.A2DP_connection )
7         return;
8     if( music_state_t == PAUSED )
9     {
10        bt_audio_pause_play_track();
11        music_state_t = PLAYING;
12        if( first_song )
13        {
14            get_track_data();
15            first_song = false;
16        }
17    }
18 }
```

The complete project is available on Libstock

Pinout diagram

This table shows how the pinout on BT Audio click corresponds to the pinout on the mikroBUS™ socket.

| Notes | Pin |  mikroBUS™ | | | | Pin | Notes |
|-----------------------------|-----------------|--|-------|-----|----|--------------|---------------------------------------|
| Defines baud rate of module | BAUD | 1 | AN | PWM | 16 | CMD | Puts module in command/data operation |
| | | 2 | RST | INT | 15 | FIRST | Factory reset |
| Powers up the module | POWER_EN | 3 | CS | TX | 14 | RX | |
| | | 4 | SCK | RX | 13 | TX | |
| | | 5 | MISO | SCL | 12 | | |
| | | 6 | MOSI | SDA | 11 | | |
| +3.3V power input | +3.3V | 7 | +3.3V | +5V | 10 | NC | This click supports 3.3V only |
| Ground | GND | 8 | GND | GND | 9 | GND | Ground |

Downloads

[BT Audio click Examples](#)

[BT Audio click Documentation](#)

[BT Audio click Schematic](#)