Welcome!

Thank you for purchasing our *AZ-Delivery WTV020 SD Card Sound Audio Module*. On the following pages, you will be introduced to how to use and set-up this handy device.`

Have fun!

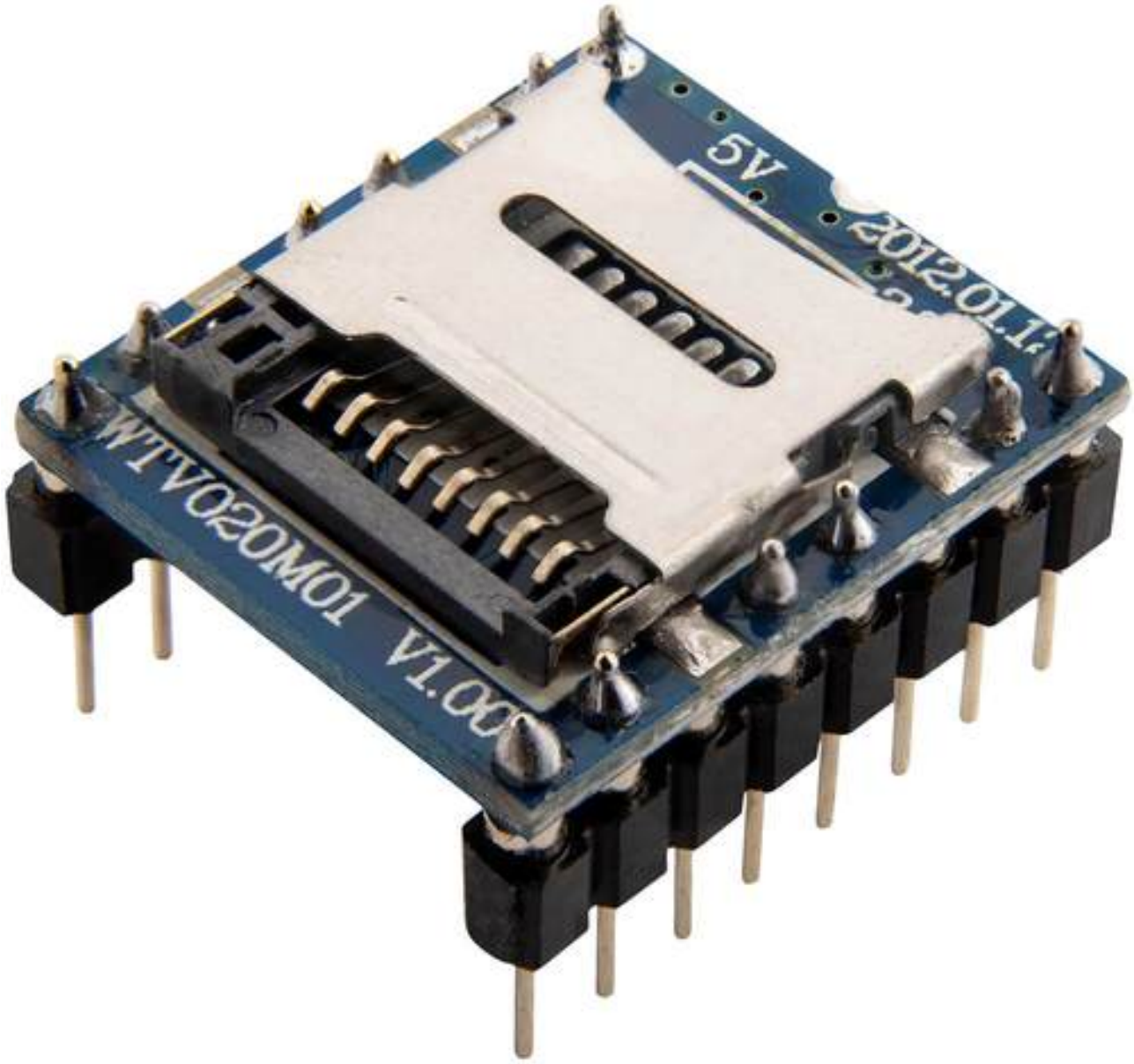


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Introduction

The WTV020 is a small, simple IC for embedding audio-playback module that can be used in various projects. The WTV020 chip based audio module allows the access to the audio files that are stored on micro-SD memory card.

The module includes a battery connector and a micro-SD card slot. Simply load audio files onto a micro-SD card and plug it in, power up the module and trigger the playback. Playback can be triggered in either key or serial mode.

The key-mode provides a stand alone operation where a host microcontroller is not required. With only 3 push buttons, a 3V battery and a speaker, an extremely compact and low component count MP3-Player like system can be implemented.

The module can be used in automobiles (audio player, car alarm), Smart home systems, Voice medical devices, household appliances, game machines, communications equipment (telephone), industrial control, toys and etc.

Specifications

Operating voltage range	2.7V to 3.5V
Quiescent current	3uA
SPI flash memory	64MB max.
Digital Audio Converter	16Bit DAC/PWM audio output.
Sampling rate 1	6kHZ to 36KHZ (AD4 format)
Sampling rate 2	6KHz ~ 16KHz (WAV format)
Key mode	MP3 mode and two line serial mode
SD-Card file system	FAT16
Memory support	1GB SD card max.
Dimensions	20x18x12mm (0.78x0.70x0.47in)

To insert the micro SD card, slide up the upper metal surface of the base down slightly and then fold it up. Then insert the micro SD card and fold down the cover again and lightly move up to lock.

NOTE: Before using the module the SD-Card has to be prepared by formatting it to FAT16 file system.

Before copying audio files to SD card, files must be renamed in order in which they can be played. For WAV format files should be named in this order: 0000.wav, 0001.wav, 0002.wav and for AD4 format: 0000.ad4, 0001.ad4, 0002.ad4. Maximum number of files that can be loaded to SD card is 512.

Features

On-board micro-SD memory card adapter for storing of audio, voice and music files (up to 512 files).

- Supports 64Mb to 2GB micro-SD memory cards (FAT format).
- Low-cost module for all embedded Audio-Sound applications.
- Supports 4-bit ADPCM (.ad4) file formats with sampling rates from 6Khz to 36Khz.
- Two operation modes:

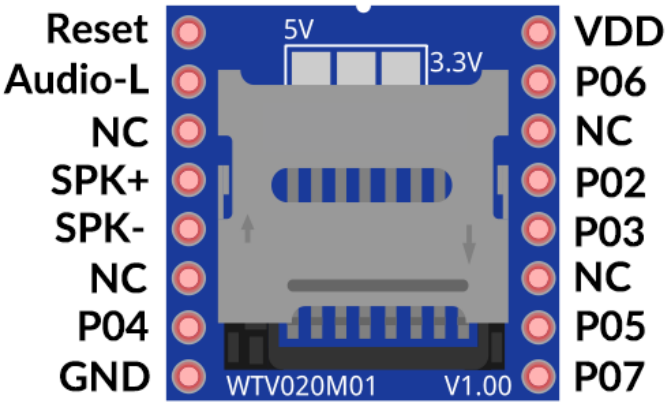
•**Serial Mode:** Supports a 2-Wire (Data, Clock) interface to any micro-controller.

•**Key Mode:** Supports a simple stand alone operation without a host micro controler.

- Differential 2 line PWM output for direct speaker connection (8Ohm/0.5W).
- Dedicated 16-bit DAC/PWM audio output to use with an external amplifier.
- Low power consumption

Pinout

The module has 16 pins. The pinout is shown on the following image:



Reset – pin for RESET button.

Audio-L – DAC audio output(+) to amplifier.

SPK+ PWM audio output to the speaker.

SPK- PWM audio output to the speaker.

P04 – pin for VOL+ button / CLK in two line serial.

GND – ground pin. Connect it to the GND pin of the MCU board.

VDD – power input pin. Connect it to the 3V3 pin of the MCU board.

P06 – busy pin. Used for signal output test, when playing the voice, BUSY output level is HIGH, can be connected to a LED for indication.

P02 – pin for NEXT button.

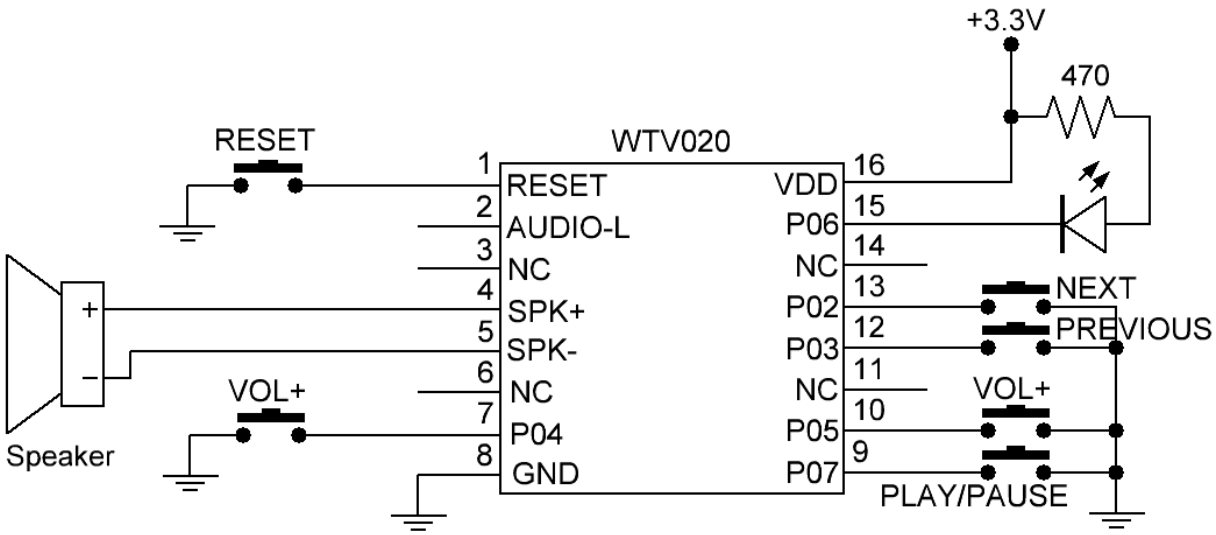
P03 – pin for PREVIOUS button.

P05 – pin for VOL- button / DI (data in) in two line serial.

P07 – pin for PLAY/ PAUSE button.

Schematic

The following image is the schematic and shows how to connect and use WTV020 module without the host MCU:



How to set-up Arduino IDE

If the Arduino IDE is not installed, follow the *link* and download the installation file for the operating system of choice. The Arduino IDE version used for this eBook is **1.8.13.**



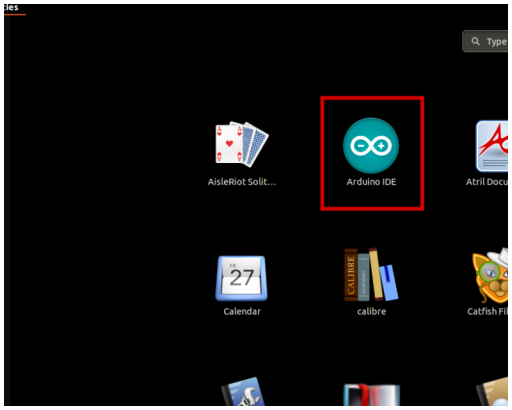
For *Windows* users, double click on the downloaded *.exe* file and follow the instructions in the installation window.

For *Linux* users, download a file with the extension *.tar.xz*, which has to be extracted. When it is extracted, go to the extracted directory and open the terminal in that directory. Two *.sh* scripts have to be executed, the first called *arduino-linux-setup.sh* and the second called *install.sh*.

To run the first script in the terminal, open the terminal in the extracted directory and run the following command:
sh arduino-linux-setup.sh user_name
user_name - is the name of a superuser in the Linux operating system. A password for the superuser has to be entered when the command is started. Wait for a few minutes for the script to complete everything.

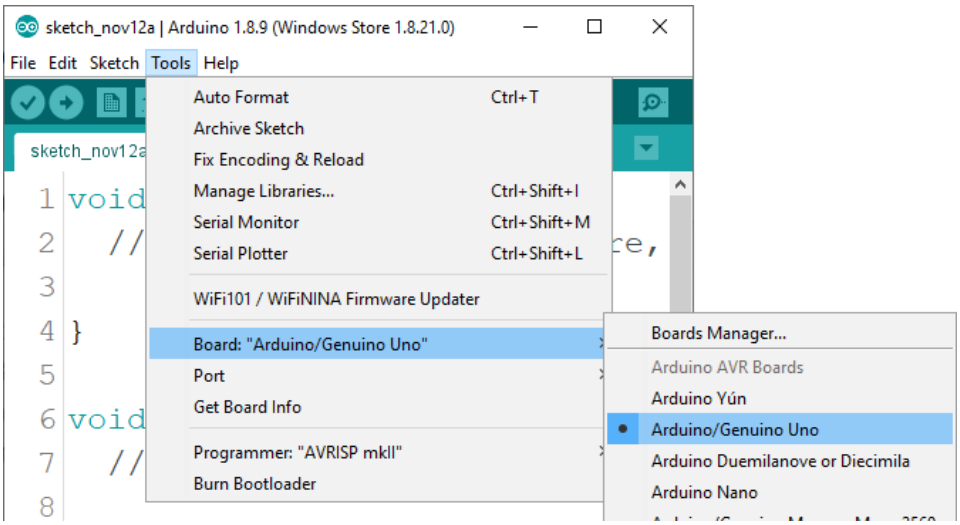
The second script, called *install.sh*, has to be used after the installation of the first script. Run the following command in the terminal (extracted directory): **sh install.sh**

After the installation of these scripts, go to the *All Apps*, where the *Arduino IDE* is installed.



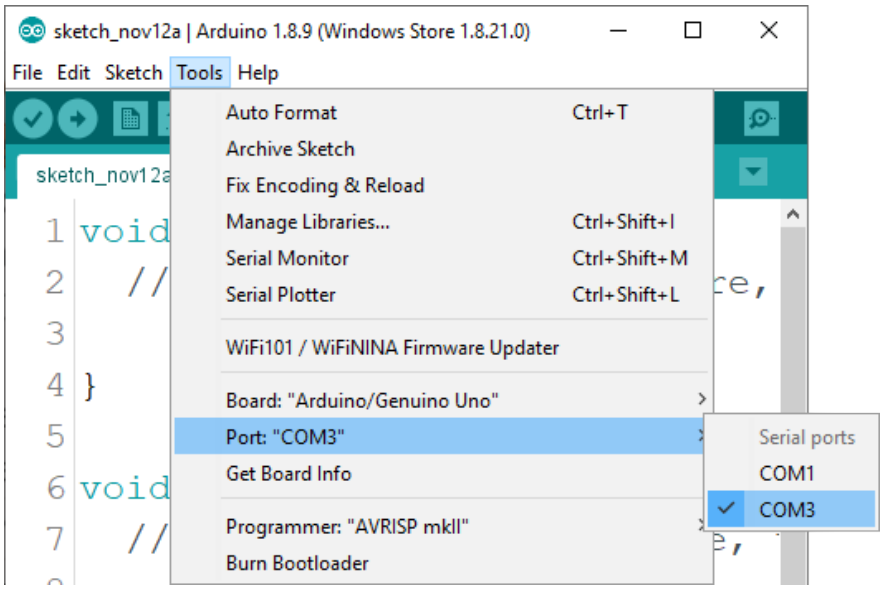
Almost all operating systems come with a text editor preinstalled (for example, *Windows* comes with *Notepad*, *Linux Ubuntu* comes with *Gedit*, *Linux Raspbian* comes with *Leafpad*, etc.). All of these text editors are perfectly fine for the purpose of the eBook.

Next thing is to check if your PC can detect an micro controller board. Open freshly installed Arduino IDE, and go to:
Tools > Board > {your board name here}
{your board name here} should be the *Arduino/Genuino Uno*, as it can be seen on the following image:



The port to which the micro controller board is connected has to be selected. Go to: *Tools > Port > {port name goes here}*
and when the micro controller board is connected to the USB port, the port name can be seen in the drop-down menu on the previous image.

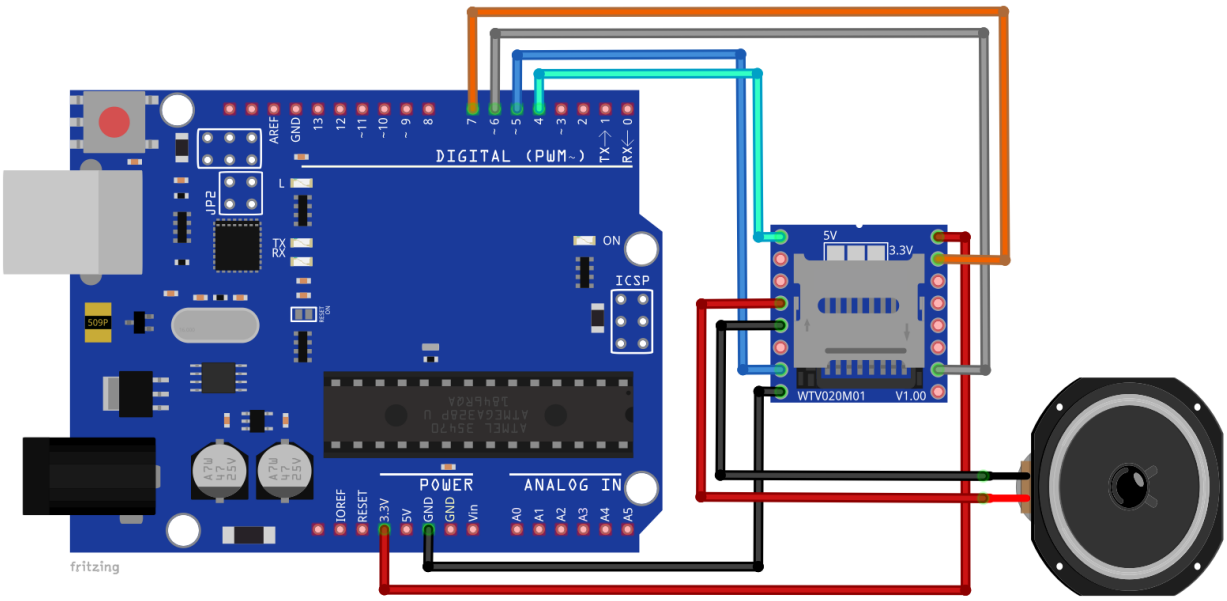
If the Arduino IDE is used on Windows, port names are as follows:



For *Linux* users, for example port name is */dev/ttyUSBx*, where *x* represents integer number between *0* and *9*.

Connecting the module with AZ-Micro controller

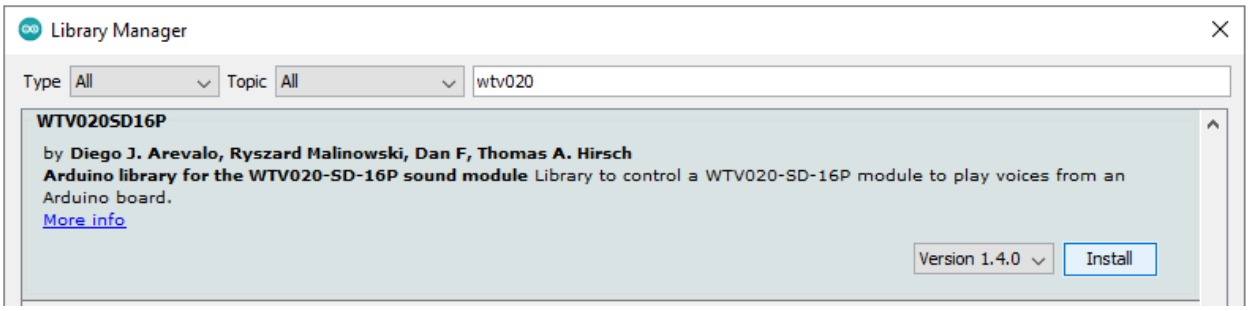
Connect the module with the AZ-Micro controller as shown on the following connection diagram:



Module pin	AZ-Micro controller pin	Wire color
Reset	D4	Cyan wire
P04	D5	Blue wire
GND	GND	Black wire
VDD	+3.3V	Red wire
P06	D7	Orange wire
P05	D6	Gray wire
Module pin	**Speaker pin**	**Wire color**
SPK+	Red wire	Red wire
SPK-	Black wire	Black wire

Library for Arduino IDE

To use the module with AZ-Micro controller, it is recommended to download an external library. The library that is going to be used is called *wtv020sd16p*. To download and install it, open Arduino IDE and go to: *Tools* > *Manage Libraries*. When a new window opens, type *wtv020* in the search box and install the library as shown in the following image:



Sketch examples

```
#include <Wtv020sd16p.h>

int resetPin = 2;  // Reset pin number
int clockPin = 3;  // Clock pin number
int dataPin = 4;   // Data pin number
int busyPin = 5;   // Busy pin number

Wtv020sd16p wtv020sd16p(resetPin,clockPin,dataPin,busyPin);

void setup() {
  wtv020sd16p.reset();
}

void loop() {
  wtv020sd16p.playVoice(0);
  wtv020sd16p.asyncPlayVoice(1);
  delay(5000);
  wtv020sd16p.pauseVoice();
  delay(5000);
  wtv020sd16p.pauseVoice();
  delay(5000);
  wtv020sd16p.stopVoice();
  wtv020sd16p.asyncPlayVoice(2);
  delay(2000);
  wtv020sd16p.mute();
  delay(2000);
  wtv020sd16p.unmute();
  delay(2000);
  wtv020sd16p.stopVoice();
}
```

Now is the time to learn and make your own projects. You can do that with the help of many example scripts and other tutorials, which can be found on the Internet.

If you are looking for the high quality microelectronics and accessories, AZ-Delivery Vertriebs GmbH is the right company to get them from. You will be provided with numerous application examples, full installation guides, eBooks, libraries and assistance from our technical experts.

https://az-delivery.de

Have Fun!

Impressum

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