Wireless Customized Voice Announcer

R603 User Manual

Table of Contents

1. Introduction

R603 is a wireless customized voice announcer. With 10 default alarm sounds (emergency/doorbell/burglar alarm…) and programmable RGB LED light, R603 makes every application as special as customized. In addition to its highly customized features, its backup battery supports non-stop operation when the main power source fails. R603 not only helps you build a more comprehensive alarm system but also gives you more options for every application.

LoRa Wireless Technology

LoRa is a wireless communication technology famous for its long-distance transmission and low power consumption. Compared with other communication methods, LoRa spread spectrum modulation technique greatly extends the communication distance. It can be widely used in any use case that requires long-distance and low-data wireless communications. For example, automatic meter reading, building automation equipment, wireless security systems, and industrial monitoring. It has features like small size, low power consumption, long transmission distance, strong anti-interference ability and so on.

LoRaWAN

LoRaWAN uses LoRa technology to define end-to-end standard specifications to ensure interoperability between devices and gateways from different manufacturers.

2. Appearance

▲ Front

▲ Side

▲ Back

2. Features

- DC12V power supply
- 3* AAA 1.2V Ni-MH batteries as backup power
- Simple installation and setting
- IP30
- 10 default alarm sounds
- Customizable setting of volume and light
- Compatible with LoRaWANTM Class C
- Frequency hopping spread spectrum
- Configuration parameters can be configured through third-party software platforms, data can be read and alarms can be set via SMS text and email (optional)
- Applicable to third-party platforms: Actility/ThingPark, TTN, MyDevices/Cayenne

3. Setup Instructions

On/Off

Turn on	Plug in the power adapter or insert three 1.2V nickel metal hydride batteries. Note: a. The device is powered by DC12V even when the batteries are in. b. The white indicator flashes once when R603 is successfully powered on.

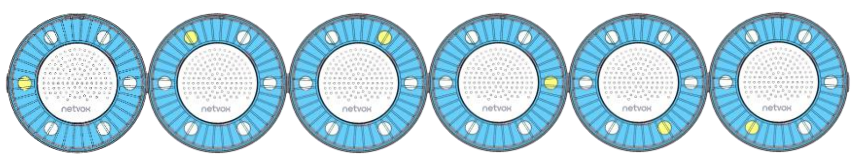
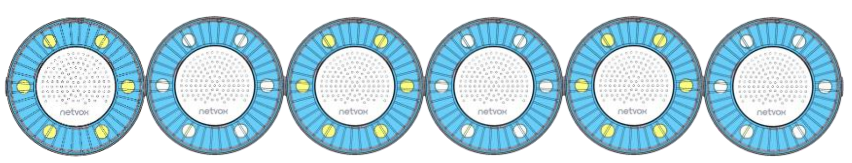
Network Joining

Never joined the network	Turn on the device to search the network. The network indicator stays on: Success The network indicator remains off: Fail
Had joined the network (without factory resetting)	Turn on the device to search the network. The network indicator stays on: Success The network indicator remains off: Fail
Fail to join the network	First 2 minutes: send join request every 15 seconds After 2 minutes: send join request every 30 minutes Note: Please check the device verification information on the gateway or consult your platform service provider.

Function Key

Press and hold for 5 seconds	Factory reset The network indicator flashes for 20 times: Success The network indicator remains off: Fail
Short press	Report data In the network: the network indicator flashes once and reports an uplink command. Not in the network: N/A

Remotely Control

Alarm Sounds and Lights	Control R603 alarm and light through AppServer 10 types of alarm sounds: a. 001.mp3: Emergency b. 002.mp3: Doorbell c. 003.mp3: Burglar d. 004.mp3: Water leaking e. 005.mp3: Help f. 006.mp3: No smoking g. 007.mp3: Poor air quality h. 008.mp3: The temperature is too high i. 009.mp3: Thief j. 010.mp3: Welcome 3 LED flash modes: a. N/A b. Flowing  c. Blinking 

Backup Battery

Working Principle	1. Backup batteries automatically provide power when DC power is unavailable. Powered by batteries, R603 operates 24 hours with no alarm triggered, whereas it works only 1.5 hours with alarms reported. 2. When the main power source, DC 12V, is available, backup batteries stop powering R603. 3. R603 only supports AAA 1.2V Ni-MH battery as backup power. Installing wrong batteries could cause an explosion. 4. With DC power connected, backup batteries start charging when they drop to low voltage (3.6V – 3.1V). The network indicator flashes once every 5 seconds until the batteries are fully charged. 5. If R603 is powered by dying batteries without the support of DC power, distorted sounds made by batteries could occur. Please reconnect the DC power and charge the batteries as soon as possible.

4. Data Report

After being powered on, the device will immediately send a version packet and report the status.

The device sends data according to the default configuration before any other configuration.

Default Setting:

Min Interval: 0x0E10 (3600s)

Max Interval: 0x0E10 (3600s)

LED color: Blue (0x00 0x00 0xFF) (change the LED color through command by setting 0x00 – 0xFF)

WarningStatus: 0x00_No Warning (reports when the audio ends);

0x01_Warning (reports when the audio starts)

SirenNo:

0x00_Emergency	0x05_ No smoking
0x01_DoorBell	0x06_ Poor air quality
0x02_Burglar	0x07_ The temperature is too high
0x03_Water leaking	0x08_ Thief
0x04_Help	0x09_ Welcome

StrobeMode:

0x00_ N/A (NoLedIndication)

0x01_Flowing (LedBlinkMode1 in Parallel to Warning)

0x02_Blinking (LedBlinkMode2 in Parallel to Warning)

Note:

a. Min Interval and Max Interval could be customized.

b. The above data is decoded based on the Netvox LoRaWAN Application Command document and http://www.netvox.com.cn:8888/cmddoc.

Data report configuration and sending period are as follows:

Min Interval (unit: second)	Max Interval (unit: second)
Any number between 1–65535	Any number between 1–65535

4.1 Example of ReportDataCmd

FPort: 0x06

Bytes	1	1	1	Var (Fix = 9 bytes)
	CmdID	DeviceType	ReportType	NetvoxPayLoadData

CmdID– 1 byte

DeviceType– 1 byte – Device Type of Device

ReportType – 1 byte – the presentation of the NetvoxPayLoadData, according to the devicetype

NetvoxPayLoadData– var bytes (Max = 9 bytes)

Tips

1. Battery Voltage:

a. If the battery is equal to 0x00, it means that the device is powered by a DC power supply

b. Powered by backup battery:

The voltage value is bit 0 – bit 6, bit 7=0 is normal voltage, and bit 7=1 is low voltage.

Battery=0xA0, binary= 1001 1111, if bit 7= 1, it means low voltage.

The actual voltage is 0001 1111 = 0x1F = 31, 31*0.1v =3.1v.

2. Version Packet:

When Report Type = 0x00 is the version packet, such as 01DE000A01202405130000, the firmware version is 2024.05.13.

3. Data Packet:

When Report Type=0x01 is the data packet.

Device	Device Type	Report Type	NetvoxPayLoadData		
R603	0xDE	0x01	Battery (1 byte, unit:0.1V)	WarningStatus (1 byte, 0x00_NoWarnring, 0x01_Warning)	Reserved (5 bytes, fixed 0x00)

Example of Uplink1: 01DE012601010000000000

1st byte (01): Version

2nd byte (DE): DeviceType 0xDE－R603

3rd byte (01): ReportType

4th byte (26): Battery — 3.8V 26 (HEX) = 38 (DEC), 38*0.1V = 3.8V

5th byte (01): WarningStatus — Warning

6th –11th byte (000000000000): Reserved

Example of Uplink2: 01DE010000000000000000

1st byte (01): Version

2nd byte (DE): DeviceType 0xDE－R603

3rd byte (01): ReportType

4th byte (00): Battery — 0V

(R603 is powered by DC with no backup batteries in the case.)

5th byte (00): WarningStatus — NoWarning

6th byte (00): ContactSwitchStatus — Off

7th –11th byte (0000000000): Reserved

4.2 Example of Report Configuration

FPort: 0x07

Bytes	1	1	Var (Fix = 9 bytes)
	CmdID	DeviceType	NetvoxPayLoadData

CmdID– 1 byte

DeviceType– 1 byte – Device Type of Device

NetvoxPayLoadData– var bytes (Max = 9 bytes)

Description	Device	Cmd ID	Device Type	NetvoxPayLoadData					
ConfigReport Req	R603	0x01	0xDE	MinTime (2 bytes, Unit: s)	MaxTime (2 bytes, Unit: s)	Reserved (5 bytes, Fixed 0x00)			
ConfigReport Rsp		0x81		Status (0x00_success)	Reserved (8 bytes, Fixed 0x00)				
ReadConfigReportReq		0x02		Reserved (9 bytes, Fixed 0x00)					
ReadConfigReportRsp		0x82		MinTime (2 bytes, Unit: s)	MaxTime (2 bytes, Unit: s)	Reserved (5 bytes, Fixed 0x00)			
StartSirenReq		0x03		SirenNo (1 byte) (0x00_0x09, Others_Reserved)	SirenLevel (0-30, 1 byte)	StrobeMode (1 byte) (0x00_NoLedIndication 0x01_LedBlinkMode1 in Parallel to Warning 0x02_ LedBlinkMode2 in Parallel to Warning)	Duration (2 bytes, Unit: 1s)	Reserved (4 bytes, Fixed 0x00)	
SetPeriodSirenReq		0x04		SirenNo (1 byte) (0x00_0x09, Others_Reserved)	SirenLevel (0-30, 1 Byte)	StrobeMode (1 byte) (0x00_NoLedIndication 0x01_LedBlinkMode1 in Parallel to Warning 0x02_ LedBlinkMode2 in Parallel to Warning)	Duration (2 bytes, Unit: 1s)	Period Time (2 bytes, Unit: 1s)	Reserved (2 bytes, Fixed 0x00)
SetPeriodSirenRsp		0x84		Status (0x00_success)	Reserved (8 bytes, Fixed 0x00)				
GetPeriodSirenReq		0x05		Reserved (9 bytes, Fixed 0x00)					

GetPeriodSirenRsp		0x85		SirenNo (1 byte) (0x00_0x09, Others_Reserved)	SirenLevel (0-30, 1 byte)	StrobeMode (1 byte) (0x00_NoLedIndication 0x01_LedBlinkMode1 in Parallel to Warning 0x02_ LedBlinkMode2 in Parallel to Warning}	Duration (2 bytes, Unit: 1s)	Period Time (2 bytes, Unit: 1s)	Reserved (2 bytes, Fixed 0x00)
StopPeriodSirenReq		0x06		Reserved (9 bytes, Fixed 0x00)					
StopPeriodSirenRsp		0x86		Status (0x00_success)	Reserved (8 bytes, Fixed 0x00)				
SetLEDColorReq		0x07		Red (1 byte)	Green (1 byte)	Blue (1 byte)	Reserved (6 bytes, Fixed 0x00)		
SetLEDColorRsp		0x87		Status (0x00_success)	Reserved (8 bytes, Fixed 0x00)				
GetLEDColorReq		0x08		Reserved (9 bytes, Fixed 0x00)					
GetLEDColorReq		0x88		Red (1 byte)	Green (1 Byte)	Blue (1 byte)	Reserved (6 bytes, Fixed 0x00)		

Note: a. MinTime = MaxTime; b.SirenLevel = 0x00 (mute); 0x1E (max volume level)

MinTime = 0x003C (1min), MaxTime = 0x003C (1min)

(1) ConfigReportReq

Downlink: 01DE003C003C0000000000

Response: 81DE000000000000000000 (configuration success)

81DE010000000000000000 (configuration fail)

ConfigReportRsp

Downlink: 02DE000000000000000000

Response: 82DE003C003C0100C80000 (current parameter)

(2) StartSirenReq

Execute the command and report WarningStatus = 0x01.

WarningStatus = 0x00 is sent after the alarm stops.

Set Emergency alarm

SirenNo = 0x00 (Emergency); SirenLevel = 0x0F (15); StrobeMode = 0x01 (Flowing); Duration = 0x000A (10s)

Downlink: 03DE000F01000A00000000

Set Doorbell

SirenNo = 0x01 (Doorbell); SirenLevel = 0x1E (30); StrobeMode = 0x02 (Blinking); Duration = 0x001E (30s)

Downlink: 03DE011E02001E00000000

Set Doorbell

SirenNo = 0x01 (Doorbell); SirenLevel = 0x1E (30); StrobeMode = 0x00 (N/A); Duration = 0x001E (30s)

Downlink: 03DE011E00001E00000000

Set Doorbell

SirenNo = 0x01 (Doorbell); SirenLevel = 0 (0x00); StrobeMode = 0x02 (Blinking); Duration = 0x001E (30s)

Downlink: 03DE010002001E00000000

Note: Set Duration = 0 (0x0000) to stop the alarm. e.g. Downlink: 03DE010000000000000000

(3) SetPeriodSirenReq

Executed command 30 seconds after it is sent.

WarningStatus = 0x01 is sent before an audio alert starts; WarningStatus = 0x00 is sent after the alarm stops.

Set SirenNo = 0x00 (Emergency); SirenLevel = 0x0F (15); StrobeMode = 0x01 (Flowing); Period = 0x0258 (10 minutes)

Downlink: 04DE000F01000A02580000

Response: 84DE000000000000000000 (configuration success)

84DE010000000000000000 (configuration fail)

Note: If an alarm is triggered while the SetPeriodSirenReq command is sending, the device stops the alarm and reports WarningStatus = 0x00.

If no alarm is triggered, the device responds 84DE000000000000000000.

GetPeriodSirenReq

Downlink: 05DE000000000000000000

Response: 85DE000F01000A02580000

StopPeriodSirenReq

Downlink: 06DE000000000000000000

Response: 86DE000000000000000000 (configuration success)

86DE010000000000000000 (configuration fail)

Note: If an alarm is triggered while the StopPeriodSirenReq command is sending, the device stops the alarm and reports WarningStatus = 0x00.

If no alarm is triggered, the device responds 86DE000000000000000000.

(4) SetLEDColorReq

(Last configuration would be kept after the device is factory reset.)

Set LED color as 0xFF 0x00 0x00 (Red)

Downlink: 07DEFF0000000000000000

Response: 87DE000000000000000000 (configuration success)

87DE010000000000000000 (configuration fail)

GetLEDColorReq

Downlink: 08DE000000000000000000

Response: 88DEFF0000000000000000 (configuration success)

4.3 Example of NetvoxLoRaWANRejoin

(NetvoxLoRaWANRejoin command is to check if the device is still in the network. If the device is disconnected, it will automatically rejoin back to the network.)

Fport: 0x20

CmdDescriptor	CmdID (1 byte)	Payload (5 bytes)	
SetNetvoxLoRaWANRejoinReq	0x01	RejoinCheckPeriod (4 bytes, Unit: 1s 0XFFFFFFFF Disable NetvoxLoRaWANRejoinFunction)	RejoinThreshold (1 byte)
SetNetvoxLoRaWANRejoinRsp	0x81	Status (1 byte, 0x00_success)	Reserved (4 bytes, Fixed 0x00)
GetNetvoxLoRaWANRejoinReq	0x02	Reserved (5 bytes, Fixed 0x00)	
GetNetvoxLoRaWANRejoinRsp	0x82	RejoinCheckPeriod (4 bytes, Unit:1s)	RejoinThreshold (1 byte)

(1) Configure parameters

RejoinCheckPeriod = 0x00000E10 (60min); RejoinThreshold = 0x03 (3 times)

Downlink: 0100000E1003

Response: 810000000000 (configuration succeed)

810100000000 (configuration fail)

(2) Read configuration

Downlink: 020000000000

Response: 8200000E1003

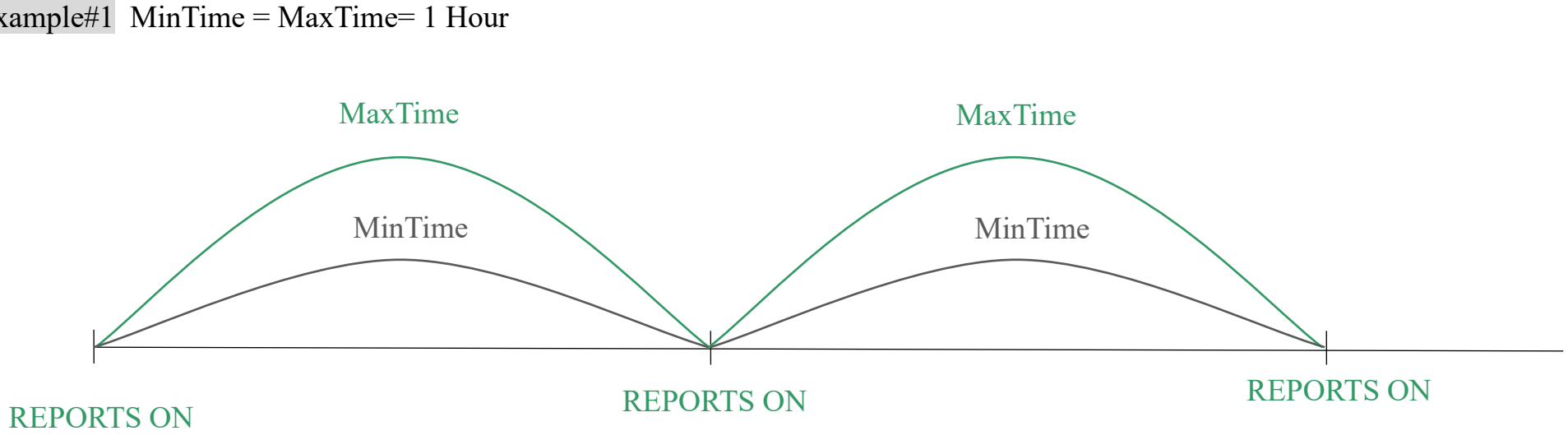
Note: a. Set RejoinCheckThreshold as 0xFFFFFFFF to stop the device from rejoining the network.

b. The last configuration would be kept as user reset the device back to the factory setting.

c. Default setting: RejoinCheckPeriod = 2 (hr) and RejoinThreshold = 3 (times)

4.4 Example for MinTime/MaxTime logic

Example#1 MinTime = MaxTime= 1 Hour

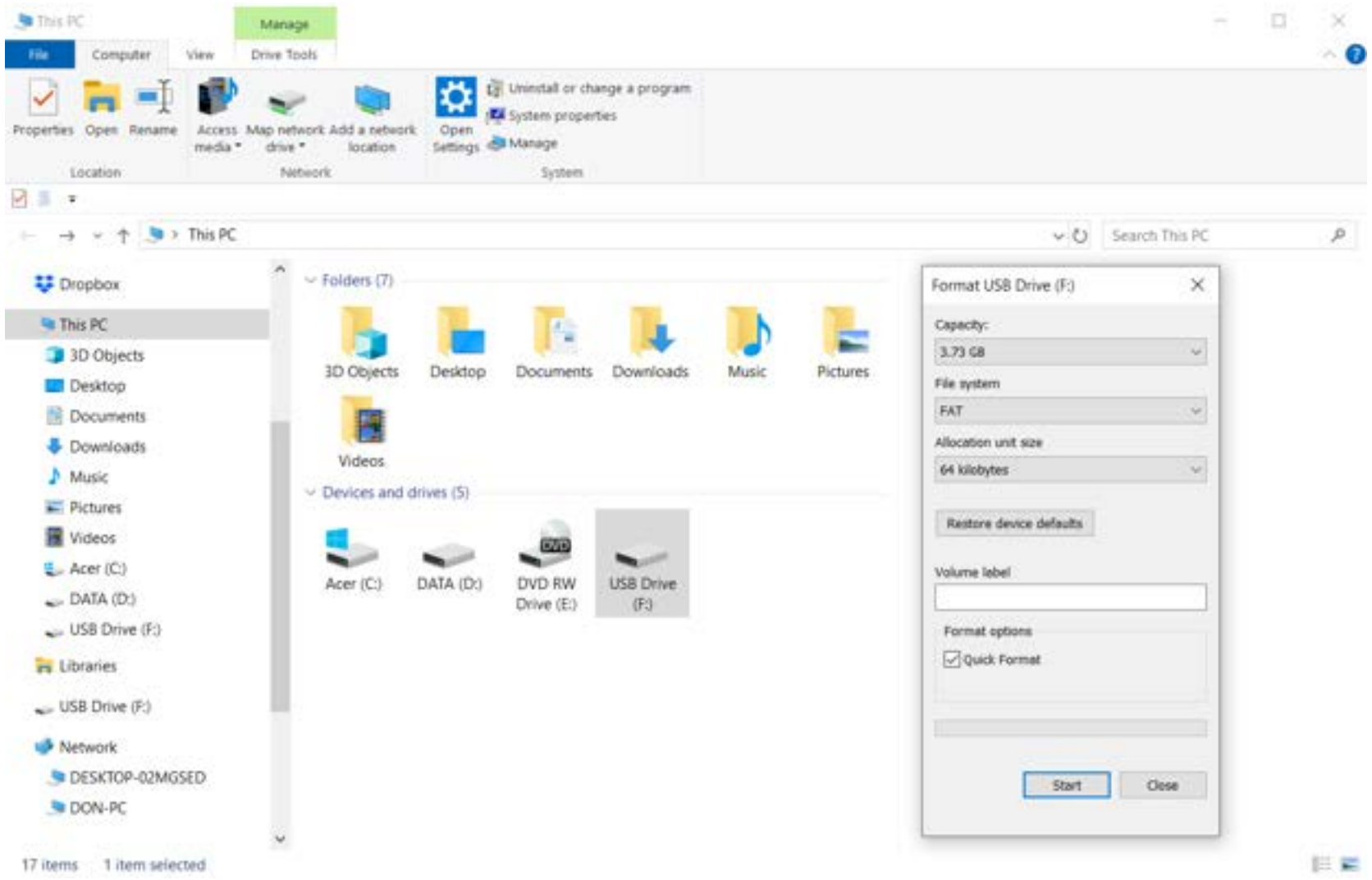


5. Alarm Sound Customization

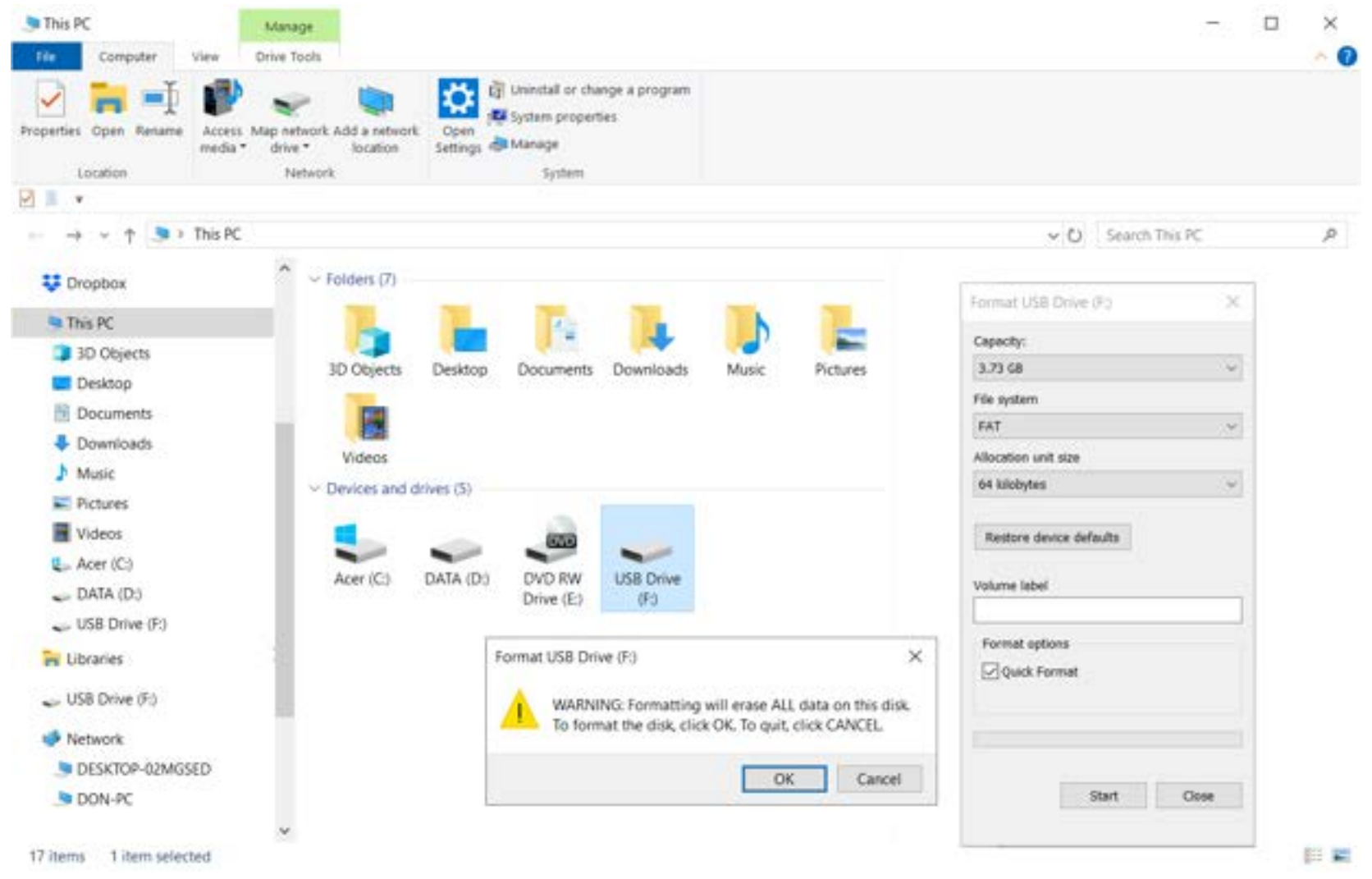
(1) Connect the computer and device with a Type-C cable.

(2) Wait 1 to 2 minutes until the virtual USB drive appears.

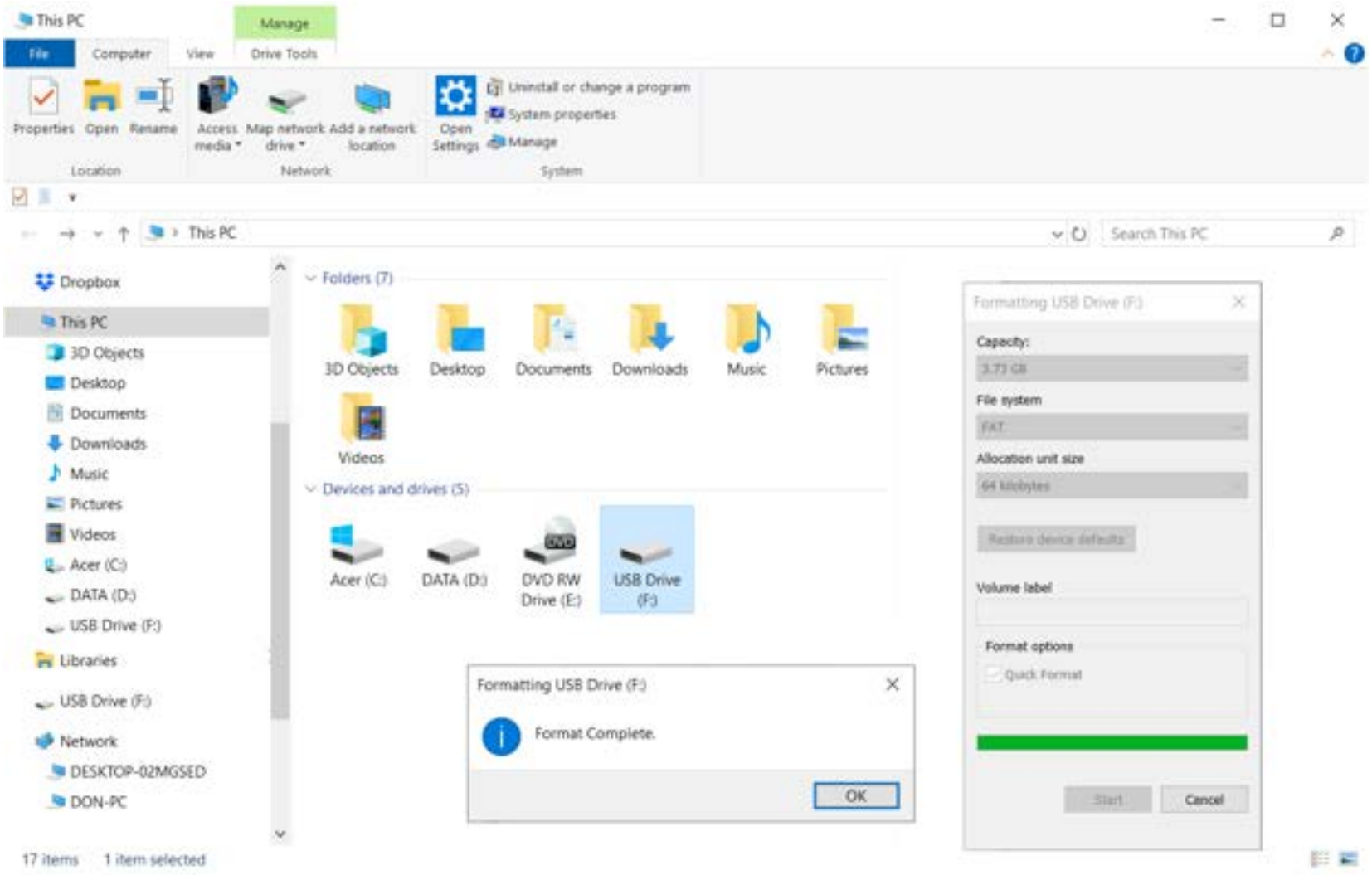
(3) Right click the USB Drive and select format.



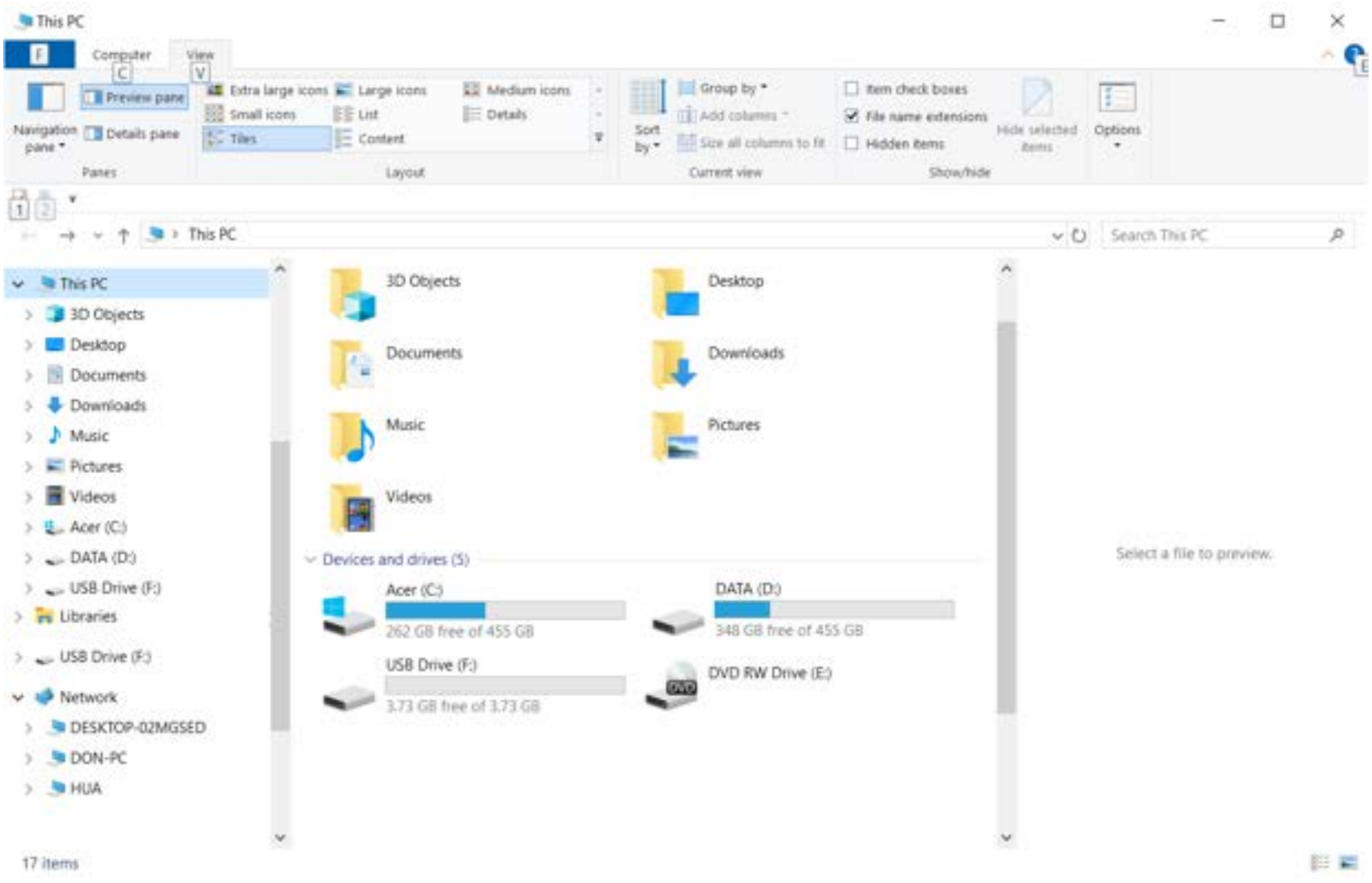
(4) Click OK to start formatting.



(5) Format complete.

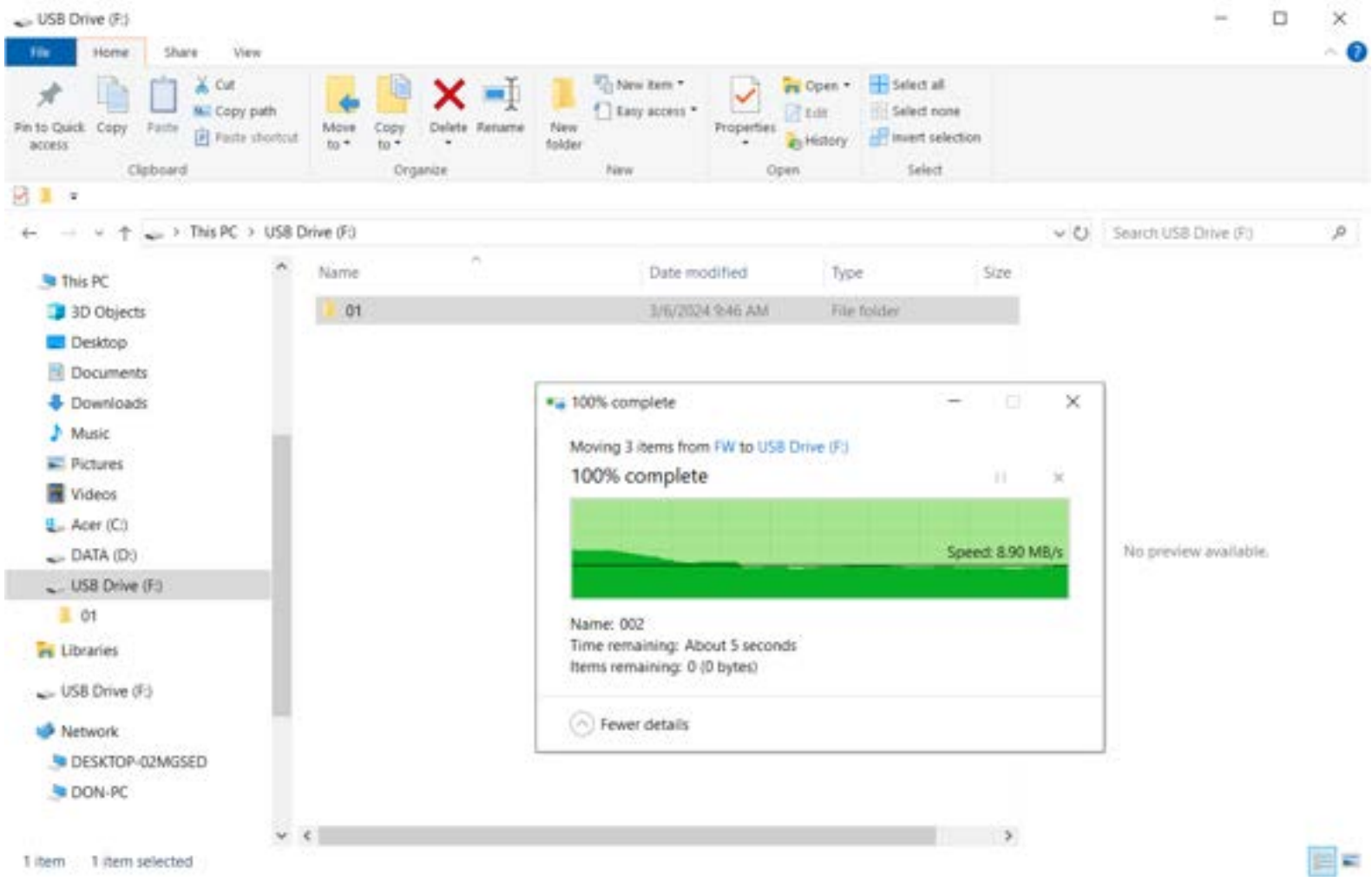


(6) Turn off and on the device. The flash drive should be empty as the picture shown below.



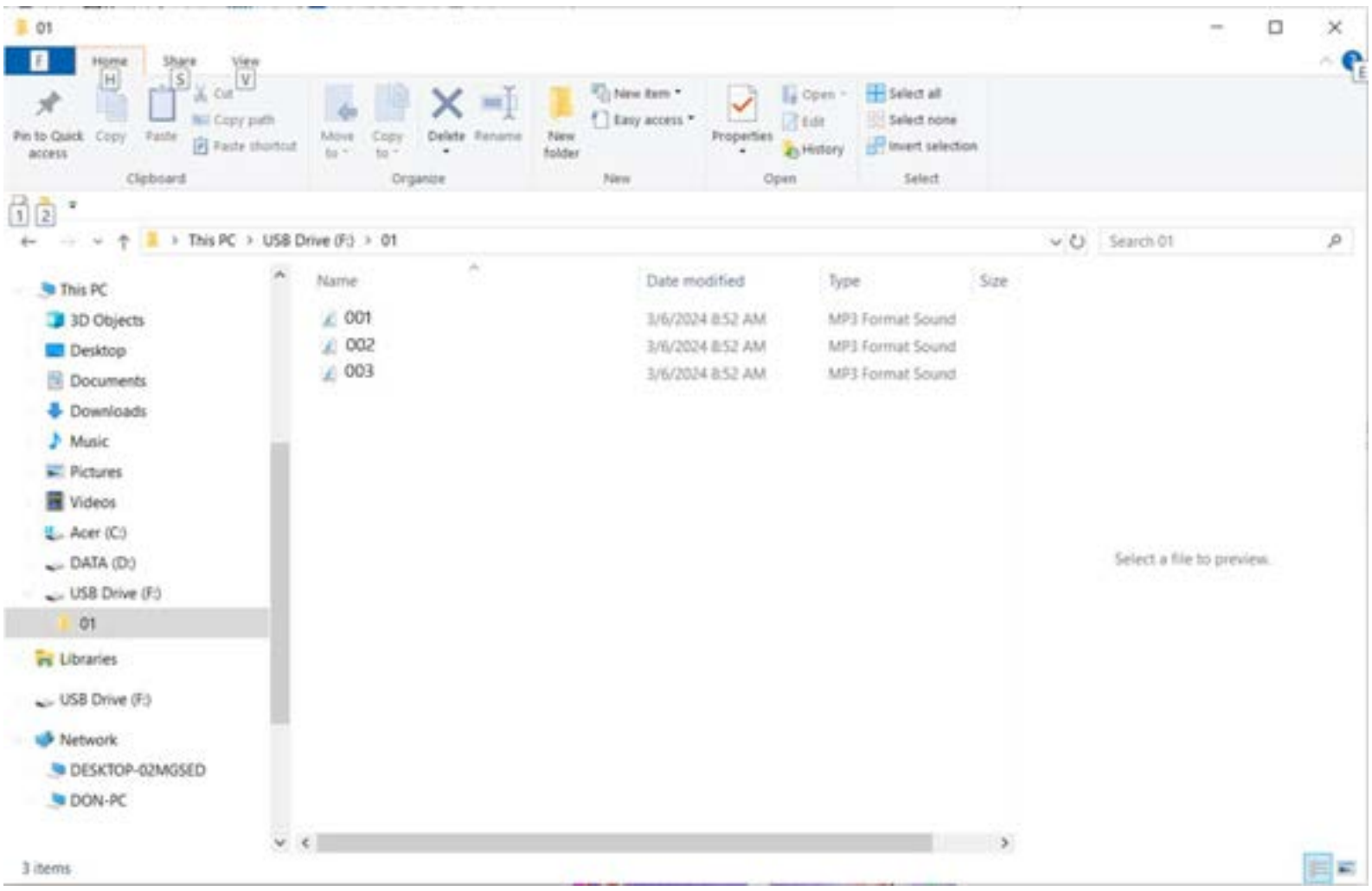
(7) Create a new folder in USB Drive and rename it as 01.

(8) Put all files of audio alerts in the 01 folder.



(9) Name all audio alerts as 00x.mp3.

Default: 001.mp3: Emergency
002.mp3: Doorbell
003.mp3: Burglar
004.mp3: Water leaking
005.mp3: Help
006.mp3: No smoking
007.mp3: Poor air quality
008.mp3: The temperature is too high
009.mp3: Thief
010.mp3: Welcome



Note: (1) The folder and audio alerts should be named according to the default setting.

(2) The file type of audio alerts should always be mp3.

(3) The above procedure should be followed when uploading new audio alerts.

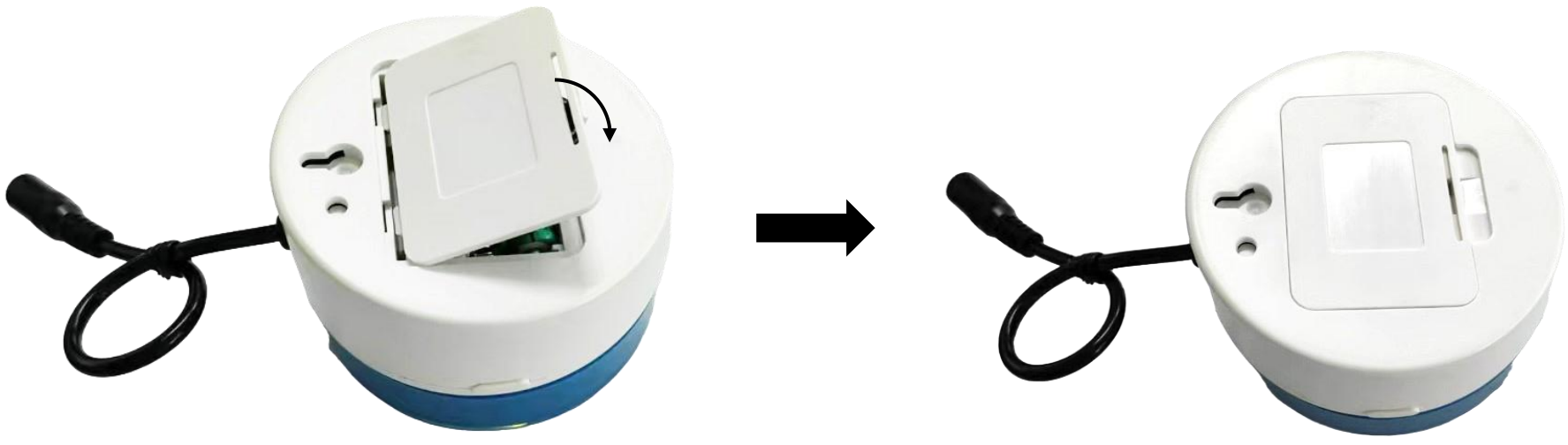
(4) The storage capacity of the flash drive is 16MB by default.

6. Installation Instructions

(1) Turn R603 over and hold the clip to remove the cover.

(2) Check the polarity and insert 3* AAA 1.2V Ni-MH batteries.

(3) Close the battery cover.



(4) Plug in the DC12V cable.

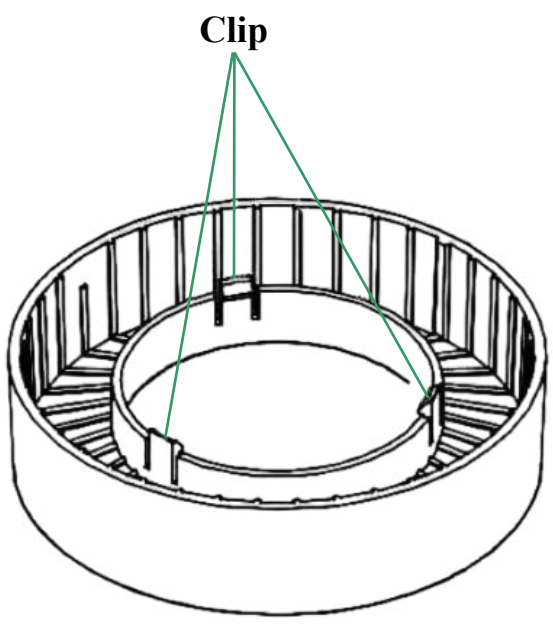
(5) Open the lid of R603.

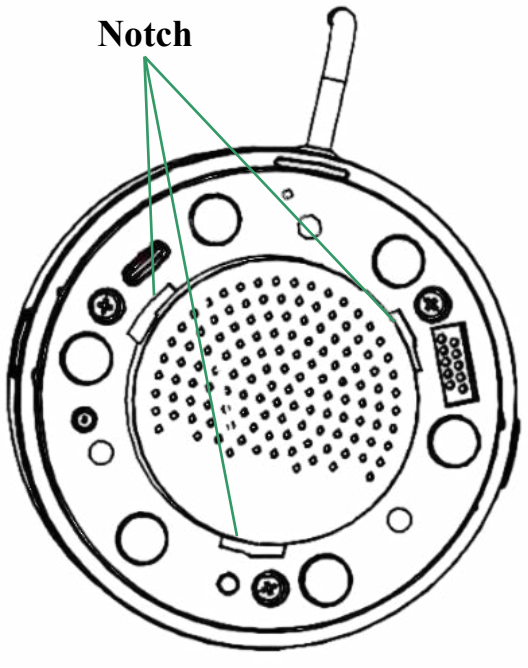
Hold R603 with your left hand and turn the lid counterclockwise with your right hand.

(6) Short press the function key to test R603.

(7) Close the lid back to R603 by turning clockwise.

Note: Please make sure the clips match the notches before turning the lid.





7. Important Maintenance Instructions

Kindly pay attention to the following to achieve the best maintenance of the product:

- Keep the device dry. Rain, moisture, or any liquid might contain minerals and thus corrode electronic circuits. If the device gets wet, please dry it completely.
- Do not use or store the device in a dusty or dirty environment. It might damage its detachable parts and electronic components.
- Do not store the device under extremely hot conditions. High temperatures can shorten the life of electronic devices, destroy batteries, and deform or melt some plastic parts.
- Do not store the device in places that are too cold. Otherwise, when the temperature rises, moisture that forms inside the device will damage the board.
- Do not throw, knock, or shake the device. Rough handling of equipment can destroy internal circuit boards and delicate structures.
- Do not clean the device with strong chemicals, detergents, or strong detergents.
- Do not apply the device with paint. Smudges might block the device and affect the operation.
- Do not throw the battery into the fire, or the battery will explode. Damaged batteries may also explode.

All of the above applies to your device, battery, and accessories. If any device is not operating properly, please take it to the nearest authorized service facility for repair.