



COLIBRI-SD
STEREO DIGITAL VOICE RECORDER
Technical Description
Operation Manual

INTRODUCTION

This Operation Manual is intended to study the Colibri-SD product (hereinafter the product), its principle and components, the order to prepare them for work and use, as well as to get acquainted with the conditions of storage and transport.

The device should be maintained by those who:

- studied this Operation Manual;
- have expertise in operating PC in Microsoft Windows operating system.

1. DESCRIPTION AND CHARACTERISTICS OF THE PRODUCT

1.1. COMPOSITION OF THE PRODUCT

The device includes:

- Voice Recorder;
- USB adapter (for charging recorder from PC);
- Micro SD card with software;
- Micro SD adapter.

1.2 OVERLOOK

Digital Voice Recorder provides high quality of voice recording in complicated acoustic environment, including noisy areas and streets. It features the thickness of only 2.7 mm, high microphones sensitivity, micro-SD card and battery life up to 20 hours in Record Mode.

Information recorded onto the Voice Recorder is protected by digital signature, which makes it possible to identify whether the recorded voice information has been modified.

This Voice Recorder provides Timer Recording. There have been implemented two types of timers, which are:

- Daily Timer to set daily record start time and record stop time
- Schedule Timer to set time and date of record start and stop time

These service functions can be activated using software after they are saved on micro-SD card. For that insert SD-card to the appropriate socket and make initialization of recorder (see detailed description in paragraph 3.4).

Control and indication of the Recorder's modes are carried out using two hole-buttons and three-color LED (between buttons on the edge of recorder) on the front side of the device.

Files can be played back in Windows Media of the operating system.

1.3 TECHNICAL CHARACTERISTICS OF THE PRODUCT

- Dimensions: 86 x 54 x 2.7 mm
- Weight: 17 grams.
- Battery life in record mode: at least 20 hours.
- Dynamic range: 80 dB.
- Frequency band: at least 16 kHz (depends on clock frequency).
- Power supply: built-in lithium-polymer rechargeable battery.
- Built-in battery capacity: 120-180 mA·h.
- Battery life in Power Saving Mode: more than 3000 hours.
- Charging: connecting the product to USB port of the PC using adapter.
- Charging time: 2 hours.
- The verification of the recorded file to identify any modifications made since.
- Option to automatically record by two timers:
 - Daily Timer to set daily record start time and record stop time
 - Schedule Timer to set time and date of record start and stop time.
- Recording format: WAVE PCM Stereo 8 kHz, 16 kHz, 32 kHz, 44.1 kHz.
- 16-bit audio codec.
- Maximum total record time: depends on SD-card memory capacity.
- Reading time is determined by micro-SD card capacity.

Table 1. Dependence of recording time from sample rate.

Discretization frequency (Sample rate)	Bitrate	For 1 hour of recording	4GB memory card	128GB memory card
8 kHz	32 kB/s	115 MB	34h	1100h (45.8days)
16 kHz	64 kB/s	230 MB	17h	550h (22.9d)
32 kHz	128 kB/s	460 MB	8h	280h (11.6d)
44.1 kHz	176 kB/s	635 MB	6h	200h (8.3d)

1.4. OPERATING CONDITIONS

The product should be used in the following modes:

- ambient temperature from -10°C to $+40^{\circ}\text{C}$.
- humidity less than 85% at $+25^{\circ}\text{C}$.
- pressure of 760 ± 20 mm Hg. Art.

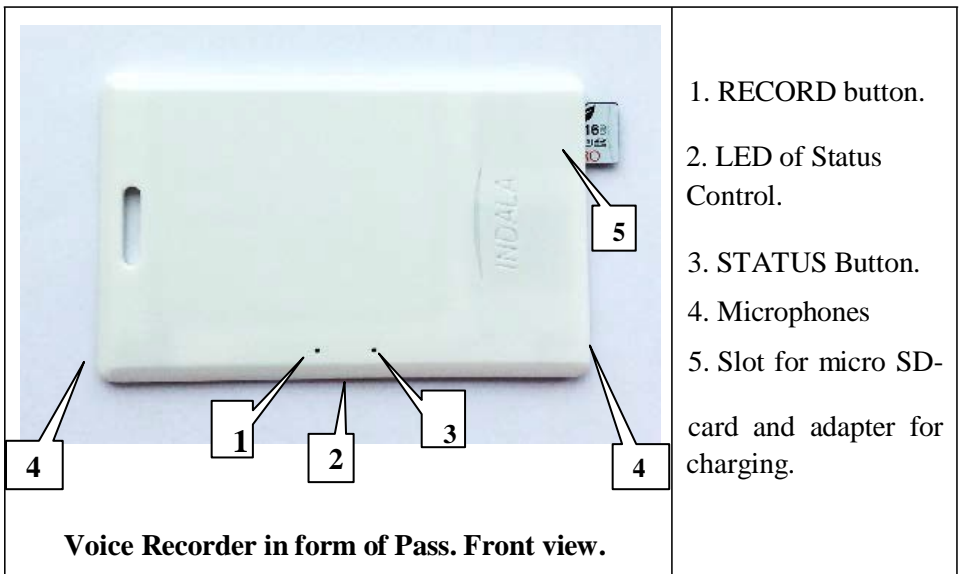
Direct precipitation on the product should be avoided.

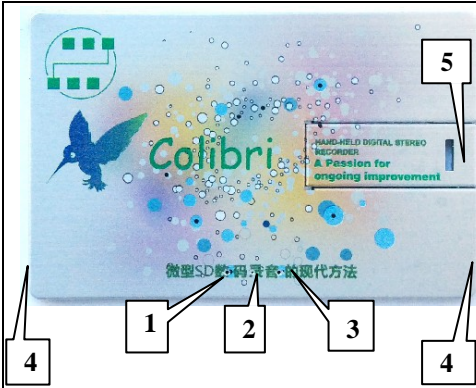
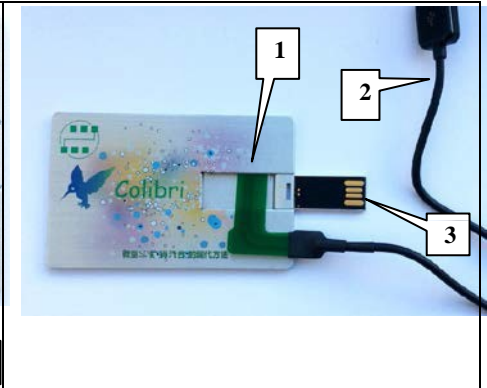
2. PRODUCT DESIGN

2.1 VOICE RECORDER DESIGN

The product is manufactured in the form of USB-flash Drive or Access Card (Pass, RFID card) - thin rectangular plates, the width and height of which correspond of credit card form factor ID-1 ISO/IEC 7810. Plate thickness is only 2.7 mm. There are built-in microphones, a microcontroller, nonvolatile memory, a lithium-polymer rechargeable battery and slot for micro-SD card inside the product.

Control of the operation modes and status monitoring is carried out using the hole-buttons and three-color LED which located between buttons (Flash Drive) or on the edge of the device (Access Card) (see pictures below). For pressing hole-buttons it is recommended to use fine wooden or plastic stick.



	
<p>Voice Recorder in form of USB-flash. Front view.</p>	<p>Opened Recorder. USB-charger.</p>
<ol style="list-style-type: none"> 1. RECORD button. 2. LED of Status Control. 3. STATUS Button. 4. Microphones 5. To open flash card chip push down on the right edge of the outlined rectangular area. 	<ol style="list-style-type: none"> 1. Slot for micro SD-card and adapter for charging. 2. Micro SD – USB adapter for connecting to PC for charging. 3. Flash card chip

3. OPERATING THE PRODUCT

Please note! Due to shape of a thin rectangular plate the Recorder must be handled carefully! Do not place the device into the pants pocket; it could be damaged when sitting down. Do not bend or hit the Recorder! It is also recommended to store the device in a protective case.

3.1. GETTING STARTED

To start operating the product, go through the following steps:

- Take the product out of the package. Check the product for mechanical damage or any swelling of the rechargeable battery.
- Carefully read the instructions.
- Software is stored into the memory of the Recorder.
- Check battery charge level. If pressing the Status button, the LED doesn't flash – the battery level is low. Charge the battery (see. 3.3 Battery Charging).
- Write configuration to SD-card using supplied software and then to the recorder by inserting micro-SD card and pressing Record button. This will set correct current time and date.

3.2. VOICE RECORDER MODES

To view the Recorder's status, use Status button. If you press the Status button, Status Control LED lights up for a moment. LED color corresponds to mode the Recorder is in at the moment. By default, Recorder is in Standby Mode.

The list of modes and their corresponding LED colors are specified in the Table below:

LED color	Mode
Switched off	Battery is discharged
Red	Voice Recorder is in Record Mode . Information from the Mic is recorded onto memory
Green	Standby Mode , micro-SD card connected. Recorder is ready to operate.
Blue	Micro SD card is not inserted. Recording is impossible.

For manual activation of Record Mode, insert micro SD-card and press the Record button (left one). The LED flashes, its color changing in the following order: Red → green → off.

To stop recording, press the Record button. The LED flashes red twice, its color changing in the following order: red → off → red → off.

To playback recorded information pull out micro-SD card and insert it to card reader (if recording is on, stop it). Then connect card reader with SD card to PC, open program file and listen to records.

3.3 RECORDER'S BATTERY CHARGING

To charge the built-in rechargeable battery pull out micro-SD card and insert in this slot Micro SD – USB adapter. Then connect Recorder with adapter to USB port of computer. After 15-30 seconds green LED lights up.

Charging takes approximately 1-2 hours. After the LED turns off disconnect the adapter from the USB port of PC and from the Recorder.

In case of complete discharge of the rechargeable battery, charge it and re-write configuration onto the Recorder.

3.4 RECORDING CONFIGURATION

To change configuration and to work with recorded files saved on micro-SD, connect micro-SD card to the PC with Windows operating system via card reader.

To do this, go through the following steps:

- Insert micro-SD card to PC using adapter
- Change configuration using program (see paragraph 3.6)
- Quickly pull out micro-SD card from PC, insert it to Recorder

and press Record button (left one). LED flashes red then blue and then turns off. Configuration is written successfully.

3.5 SOFTWARE TO OPERATE THE RECORDER

Specialized software is supplied with the device to change configuration, set current time and operate with the recorded files (playback, digital signature check, deletion).

To run this program, launch the Application **Kolibri_5.exe**. The appearance of the main window is shown in Figure 6.

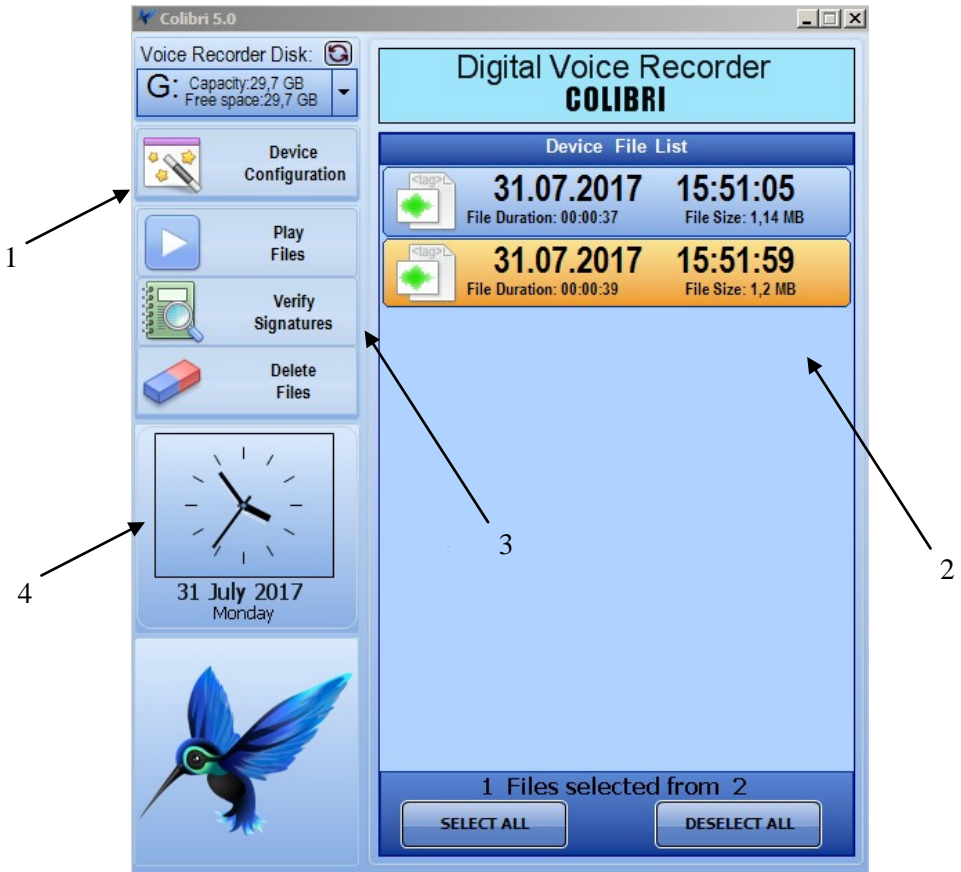


Figure 6. Colibri.exe Program

Figure notes:

1. Change Configuration
2. List of recorded files
3. Functional buttons to process recorded files
4. Current time

The program has a context menu that is displayed when you right-click on a bird picture. The user can select one of the built-in color themes (Figure 7).

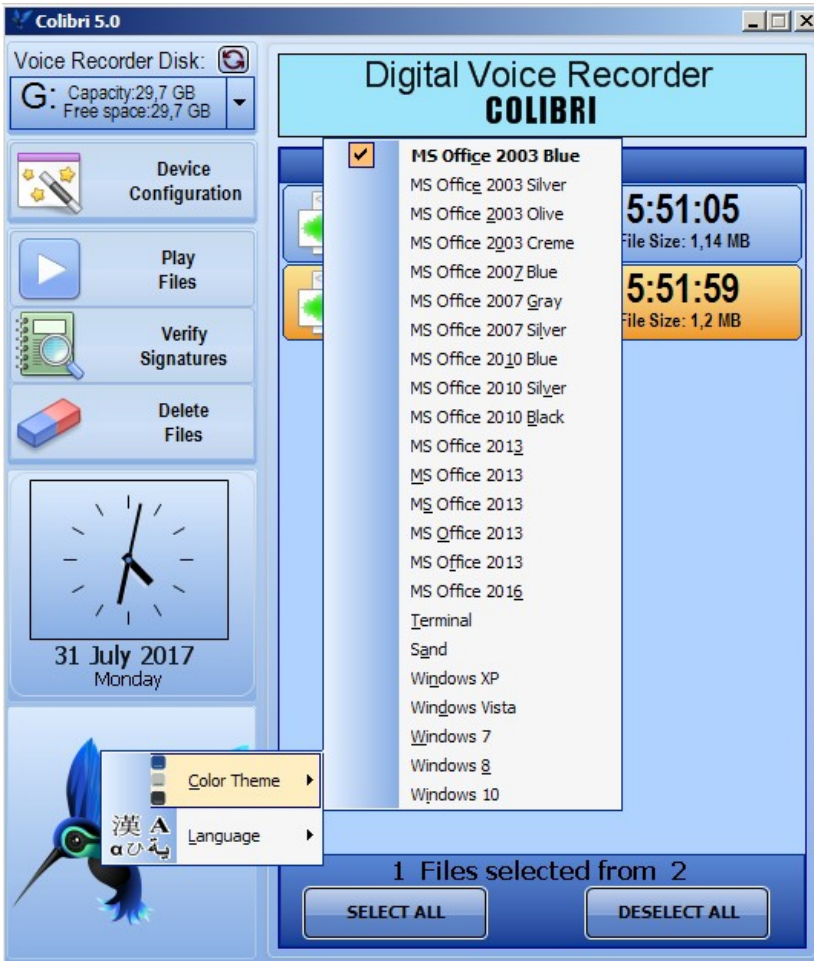


Figure 7. Selecting Color Theme

If more than one card is connected to your computer, you can select the one to operate with. The device with lower volume letter will be active by default. Under ordinary circumstances, only one disk is connected, and we see only it in the list (Figure 8).



Figure 8. Disk Selection

3.6. CONFIGURATION

3.6.1. Calendar Recording

Calendar Recording is the mode of single automatic recording between two timestamps. Controls of Calendar Recording are shown in Figure 9:

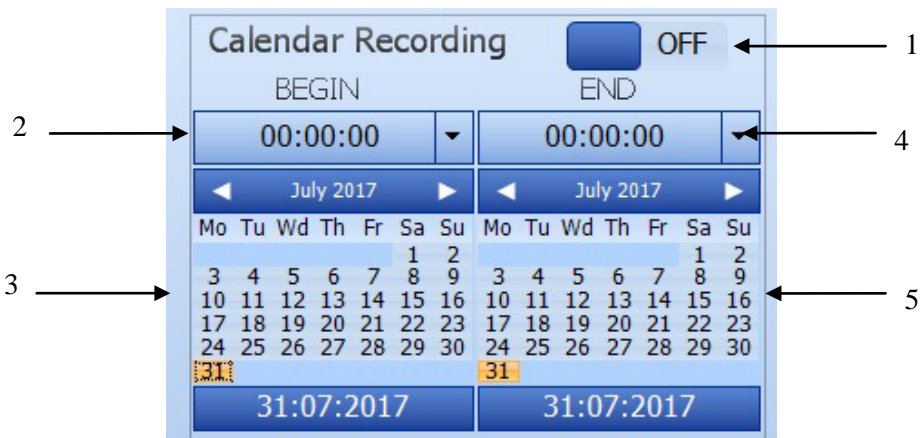


Figure 9. Schedule Recording

Figure notes:

1. ON/OFF Slider.
2. Record start time.
3. Record start date.
4. Record stop time.
5. Record stop date.

By default Calendar recording is off. Shift the Switch 1 to enable the mode. Shift the slider by moving the mouse or left-clicking alongside of the slider. The Switch has two positions of the Slider, as specified in the Table:

 OFF	ON 
Slider in OFF state	Slider in ON state

Time is set in a special editor window (Figure 10). There are three sliders in the window to set hours, minutes and seconds.

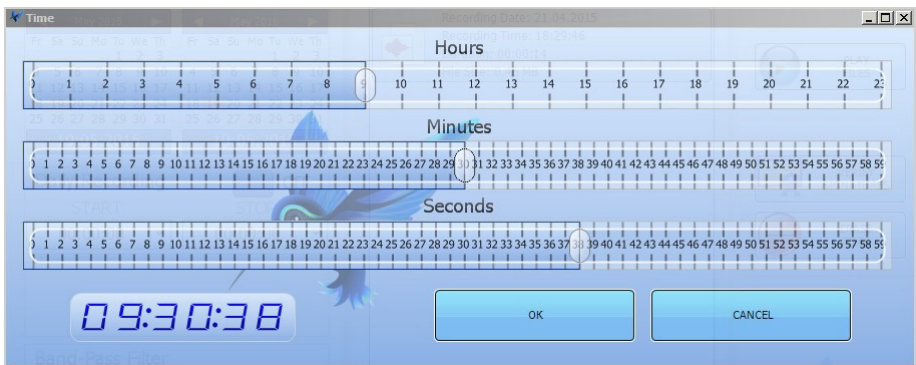


Figure 10. Time Setting.

The Slider is shifted by moving the mouse or left-clicking alongside of the slider, and by the arrow keys. Entered time is also displayed on the indicator in the lower left corner.

Date is set in the calendar. The buttons in the calendar's title intended for quick scrolling month/year forward or backward. Calendar has three display modes that are switched by double-clicking on its title. They are shown in the Table below:

		
Selection of Day	Quick Selection of Month	Quick Selection of Year

3.6.2. Everyday Recording

Daily Recording is the mode of continuous automatic recording between two timestamps. Controls of schedule recording are specified in Figure 11:



Figure 11. Daily Recording.

Figure notes:

1. ON/OFF Slider.
2. Record start time.
3. Record stop time.

If record stop time is less than the start time, the recording stops on the following day. **Time interval less than 10 seconds of recording is not applied.**

3.7. WORKING WITH RECORDED FILES

Controls to operate with the files recorded onto the SD card's memory are specified in Figure 12:

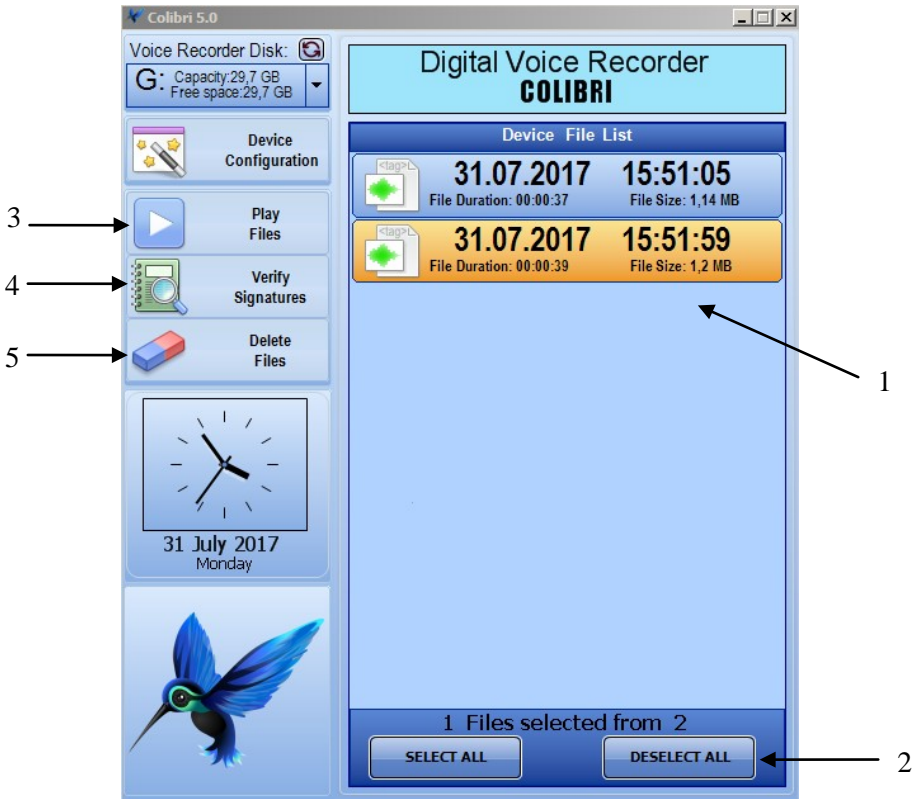


Figure 12. Files Manager.

Figure 20 notes:

1. List of files.
2. Shortcut keys.
3. Start playback.
4. Digital signature verifying.
5. Erase files.

All audio files of the Voice Recorder are combined into a single list. For each file, the parameters of time, date, duration and size are specified.



To select or deselect file, left-click its description. The file changes its color depending on the choice. Two shortcut keys allow it to select all the files and cancel selection.

3.7.1. File Playback

File playback is enabled by the button "PLAY files" (Figure 12).

The selected files are played back sequentially one after the other.

3.7.2. Digital Signature Verifying

Digital Signature Verifying Mode is enabled by pressing functional button VERIFY SIGNATURES (Figure 12). Digital signatures of all the selected files are verified. Verification results are displayed in the following message (Figure 13):



Figure 13. Signature Verification Results

3.7.3. Erasing Files

File Erasing Mode is enabled by pressing functional button DELETE FILES (Figure 12). The program asks to confirm deletion and simultaneously specifies the files to be deleted:

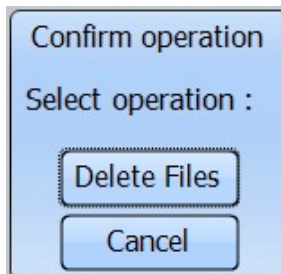


Figure 14. Selecting File Deletion Option

Erasing original files saves card space, but does not guarantee that the file has not been modified, since it removes the signed original. You can delete them both.

3.7.4. Opening files in external program

To extend the functionality of the program, there is a partially supported context menu of the operating system called by right-clicking an individual file.

At the same time, regardless of the previous selections, only one file from the list is selected (under the mouse pointer), and a menu opens (Figure 15). The menu includes all the operations with this file type, registered in the programs of your PC. Also, it may be helpful to use "Open With", allowing it to select program associated with the WAV files (Figure 16).

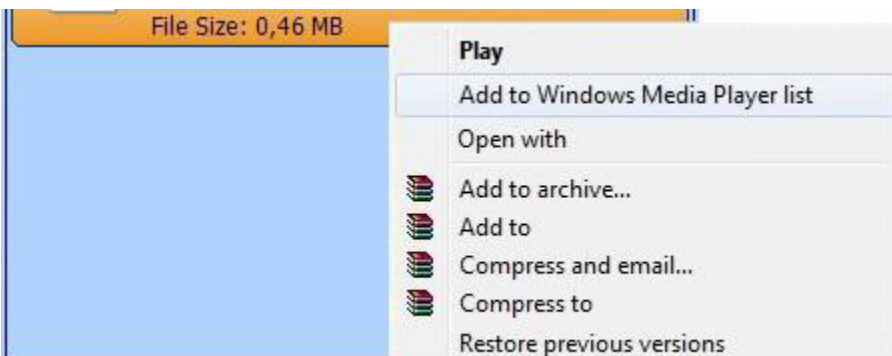


Figure 15. Context File Menu.



Figure 16. Selecting Program to Open File.

Using this Menu you can easily save any external program, in order for it to be used to open this file type. That can be media players Windows Media, Winamp, VLC, Foobar, Aimp and audio editors Adobe Audition, Sony Sound Forge, GoldWave.

4. TECHNICAL MAINTENANCE OF THE PRODUCT

4.1 GENERAL RECOMMENDATIONS

Technical Maintenance of the device should be carried out at least once every two months and should include rechargeable battery charging and product functional check in accordance with this Operation Manual.

4.2 SAFETY MEASURES

All the operations with the product should be performed by the staff who have at least secondary education, have the right to work with electrical installations up to 1000 V and who have studied this Operation Manual.

5. STORAGE

The product should be stored packed in heated and ventilated areas at temperature from 5° C to 40° C and relative humidity up to 80% at a temperature of 25° C, at no vapors of chemically active components in these premises.

6. TRANSPORTATION

The product can be transported by private means of transport of any type in transport package and in low-duty conditions. When transporting the product, the measures should be taken to avoid displacement of package with the product in the vehicle body.

Transportation of the packaged product may take place at ambient temperature of minus 10°C to 60°C.

After transporting, the product must be kept at operating temperature conditions for 6 hours.

7. ENVIRONMENTAL REQUIREMENTS

Disassembly, recycling and destruction of the product can be carried out by any method. This however must not be applied to lithium rechargeable battery. Lithium battery is subject to disposal by the licensed organizations.

8. WARRANTY

The manufacturer guarantees that the product complies with the technical requirements provided the customer observes operating conditions, as well as transport and storage conditions, set in the specifications.

Warranty period - 2 years from the date of issue. Issue date is to be confirmed by the corresponding record in the passport. With the loss of passport, product warranties become invalid.

In the event of failure of the product during warranty period, provided the customer observed maintenance requirements as well as transportation and storage conditions of the Manual, the supplier is obliged to eliminate failure free of charge and take measures to avoid these defects in all subsequent items.

Average operating lifetime (before write-off) - 5 years.