

Digital Recorder CARD24S

Operation Manual

Overlook, Recorder's Appearance

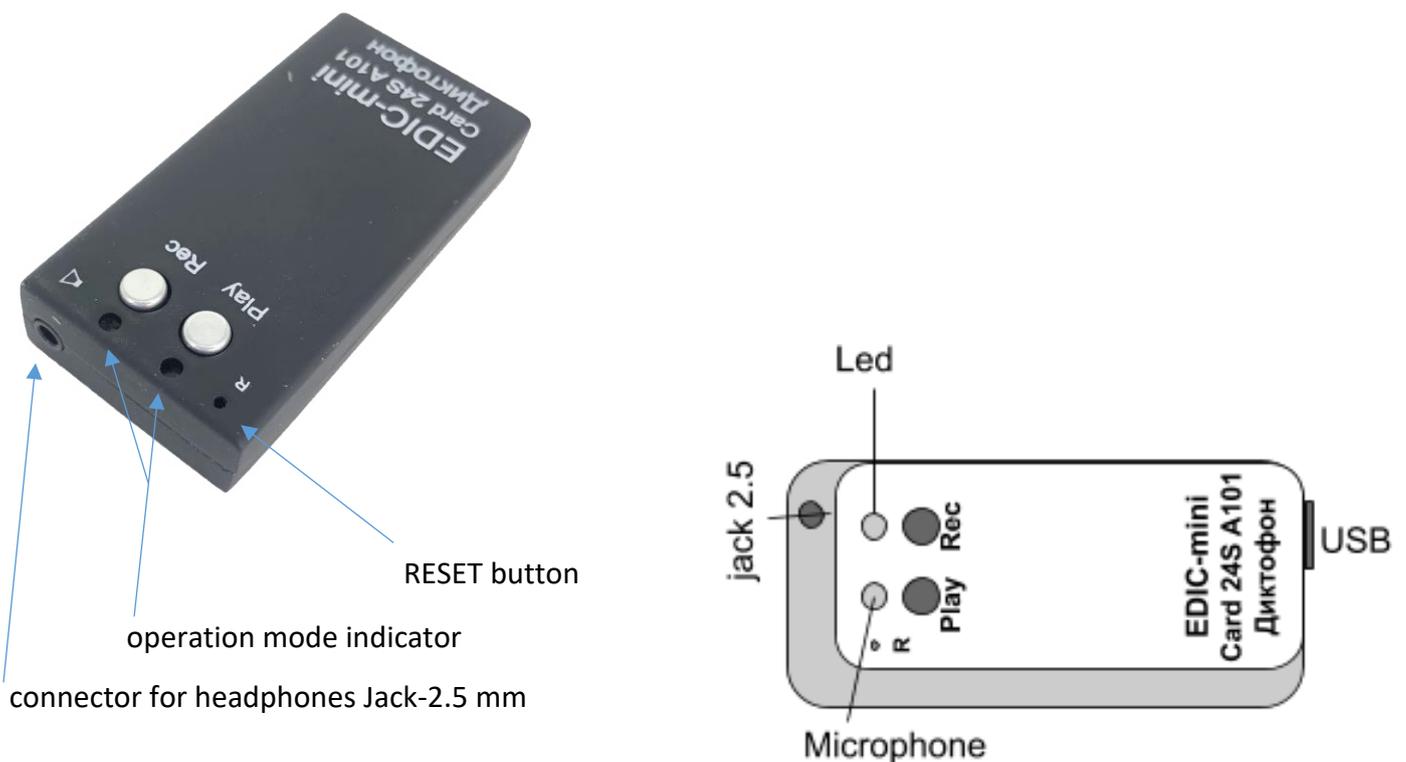
CARD24S (A101) Recorder is a professional device intended for sound recording in WAV format onto microSD memory card. The recordings can be played back using headphones connected to the Recorder with 2.5 mm mini-jack connector, or any device supporting operation with microSD memory cards and audio files in WAV format. The recording is made in stereo format, the signals of two tracks are formed by microphones located inside the Recorder's body according to the original scheme. This provides both stereo recording format and a uniform directional pattern. The files are recorded onto a microSD memory card installed into the Recorder, the built-in rechargeable battery providing high autonomy level. The Recorder has a timer recording function set for a specific date and time. The Recorder is controlled using two buttons REC and PLAY marked with symbols [R] and [P], respectively.

LEDs are used to indicate the Recorder's battery charge level and free memory capacity.

Setting the operating modes of the Recorder is carried out using a special configuration file previously recorded on the memory card.

There is a configuration file on the memory card to set Recorder's operation modes. This is a regular text file and can be edited with any text editor on the PC.

Recorder's Appearance:



Technical Characteristics

- Signal-to-noise ratio: 65dB
- Dynamic range: 116 dB
- Microphones sensitivity: -26dB
- Record format: mono/stereo
- Sampling rate: 8/16/32 KHz (At 32KHz, recording is only in mono mode, regardless of the settings)
- Frequency band: from 60 to 15 000Hz
- Bitrate: 8/16/24 bit (At 8-bit, u-Law compression is used)
- Average current consumption in record mode: 16KHz 16bit (stereo) 3.4 - 7 mA (current consumption depends on the type of memory card in use)
- Current consumption in Continuous Sound Check mode: 3 mA
- Current consumption in Periodical Sound Check mode with intervals from 30 to 120 sec
 - In Standby Mode, in specified interval from 30 to 120 sec: 5 µA
 - In direct Sound Level Control mode: 3 mA
(after sound level activation, during the time interval while recording is being carried out, current consumption will correspond to regular record mode)
- Average current consumption in Playback mode: up to 15 mA
- Current consumption in off state with memory card installed: 5,5 µA
- Current consumption in off state with memory card removed: 2,5 µA

All recorded files are protected by a digital signature. Use a special utility to prove the authenticity of files and check for any editing.

The files can also be protected by a user password. While playing back these files there will be only 'white noise'. Use a special utility to decode it.

The above utilities can be downloaded from the Telesystems website.

Preparing microSD Card

MicroSD card which is in the delivery set, doesn't require any preliminary preparation. It has a configuration text file CONFIG.INI containing Recorder's settings. After inserting memory card into the Recorder, there will be a short flash of the red LED, and the Recorder will write CONFIG_CARD24.INI configuration file of the operation modes onto the card. After that, the card can be removed and the configuration file can be edited in accordance with the settings needed.

The memory card used in the Recorder must be formatted in accordance with FAT 16, FAT 32 or exFAT file system - for memory cards with a capacity of more than 32 GB.

After inserting a formatted memory card into the Recorder, there will be a short flash of the red LED, and the Recorder will write CONFIG_CARD24.INI configuration file of the operation modes onto the card.

After that, the card can be removed and the configuration file can be edited in accordance with the settings needed. For more details see the section 'Changing Recorder's Settings Using Configuration File'.

If a new memory card needs to be used, first make sure that the file system installed on the card is FAT32 or ExFat. Next, install a new microSD into the Recorder. The Recorder will generate a configuration file.

Recorder's Operation Modes

Notes:

Pressing the button twice - briefly press the button twice within two seconds.

Pressing the button three times - shortly press the button three times within 3 seconds.

Single pressing of two buttons - press and release both buttons simultaneously, so that they are pressed simultaneously.

Standby Mode:

When none of the functions of the Recorder is activated, the Recorder is in Standby mode, and there is no LED indication.

Install/Remove Memory Card

Insert memory card into the slot by pressing it with a little effort (press again to remove the memory card). The Recorder will automatically check the card, and if it is operational, formatted and suitable for recording, there will be a short flash of the red LED (the LED flashes during card initialization time; as a rule, this process takes several seconds).

If the red LED starts flashing frequently (indicating card error), remove the card, wait until the LED stops flashing, and then reinstall the card.

If the above procedure did not help and the LED continues to flash frequently, that means the card is not operational, not formatted, or not suitable for recording. In this case, remove the card and check it on any other device, and if necessary the card can be formatted.

Record Mode

After a single short pressing of the REC button, the Recorder switches from Standby mode to Record mode, and there is a short flash of the red LED. After that the Recorder starts recording. During recording, the red LED indicates operating mode in two series of flashes.

The first series of LED flashes corresponds to battery charge level and the second to free memory capacity. The interval between the first and second series of flashes is 3 seconds, and between the second and first 7 seconds.

The dependence of the number of flashes on the battery charge level, or on the amount of free memory is shown in the following table:

Number of flashes	Battery charge level (1st series)	Free memory capacity (2nd series)
1	80-100%	75-100%
2	20-80%	50-75%
3	2-20%	25-50%
4		1-25%

To stop recording, press the REC button once. Red LED will be on to indicate recording has stopped.

Since the Recorder needs some time to close the recorded file (about 3 seconds), the red LED will be indicating this process and stating the card can't be removed. As soon as the LED goes off, the memory card can be removed. Failure to do so may damage the recorded file.

If during recording free memory runs out and circular recording function is not enabled in the Recorder's settings, the Recorder makes three flashes of the yellow LED, stops recording and switches to Standby mode. Further attempts to enable recording (with circular recording turned off) will lead to triple flashes of the yellow indicator stating there is no capacity on the memory card, and the Recorder will go to standby mode.

If during recording, battery charge level is too low, the Recorder stops recording, closes current file and exits operating mode.

Each time recording is enabled, a new file is created, the name of which corresponds to:

<EM_CARD24S_yyyymmdd-hhmmss_123_xxxxxx.wav>

Where: yyyymmdd - year, month and date of recording, respectively;

hhmmss - recording start time, hours, minutes and seconds, respectively;

123 - options for the recorded file:

1 - voice activation system (VAS): N - disabled, V - enabled;

2 - start recording by one of the timers: T - recording started by timer, M - recording was made in regular mode;

3 - recording mode: L - linear recording mode, C - circular mode;

xxxxxx is a six-digit serial number.

Circular Recording

Use configuration file to enable and configure circular recording. If circular recording is enabled, after the entire memory capacity is full, the oldest data are deleted to continue recording over the freed space.

Setting File Size Restrictions

File size restrictions can be activated and adjusted via configuration file. If during recording, file size exceeds maximum permitted size, the file is closed and recording continues in a new file. If at the end of recording, the recorded file is smaller than the minimum allowable size, it is deleted. Restrictions are operational only as long as they are active. If the restrictions are off, files of any small size are saved in the Recorder's memory card. Old file is closed and the recording continues in a new file only in case of file size approaching the level of 2GB.

Record Playback

The Recorder switches from standby mode to playback mode by a short once pressing the PLAY button. The Recorder starts playing back the last file recorded indicating battery charge level with periodic series of green LED flashes.

- single flashes indicate the battery is fully charged;

- double flashes indicate average battery charge;
- triple flashes mean the battery is low and the Recorder must be charged.

When there is an end of recording, or after moving to the end of it using navigation functions, playback stops, and the green LED starts flashing frequently. After that, if there are no buttons pressed for 10 seconds, the Recorder switches to standby mode.

Navigation in Playback Mode

Enter Playback Mode..... Press PLAY button once

Quit Playback Mode.....Press both buttons simultaneously once

Go to the beginning of current record.....Press the REC button once

Go to the end of current record.....Press the PLAY button once

Go to the beginning of the previous record..... Press the REC button twice

Go to the beginning of the next record..... press the PLAY button twice

Go to the beginning of the first record.....Press the REC button thrice

Go to the beginning of the last record..... Press the PLAY button thrice

Voice Activation System (VAS)

Recording by sound level can be activated and adjusted via configuration file. If the function of sound level recording is on, then when switching to record mode, the Recorder does not start recording immediately, but needs to check sound level, blue LED will be flashing frequently. After the sound appears, its level exceeding threshold specified in configuration file, the Recorder starts recording. Red and green LEDs start flashing simultaneously, the number of flashes corresponding to battery charge level and free memory capacity, similar to the record process.

If there is no sound, the Recorder continues recording for the time set in the configuration file. After that the Recorder stops recording.

Sound check can be continuous, or periodical. During periodic testing, current consumption is reduced, but sounds that fall between the checks are not recorded. During recording, the Recorder checks sound level continuously, regardless of check regularity configured. While checking sound level, there are short blue LED flashes with the interval of 3 seconds.

While periodic testing with the interval from 15 to 120 seconds, the LED will flash right at the moment of testing, i.e. once in 15, 30, 60 or 120 seconds with the interval of about 6 seconds.

Timer Recording

The Recorder has 4 timers to automatically start recording at the preset time.

Timers are enabled and configured via configuration file (CONFIG_CARD24.INI).

If at least one of the timers is on, the Recorder will switch from standby mode to record mode at the specified time, which is indicated by flashes of the red LED.

Password Protection of Records

Use configuration file (CONFIG_CARD24.INI) to set password protection of records. Password is set in the corresponding section [Security]. Enter a 8-digit password in the field 'Password'.

After memory card has been installed into the Recorder, the digits of the password in configuration file will be automatically replaced with '*' symbols to avoid obtaining the password by unauthorized persons. To cancel password protection, enter 8 zeros in the field Password. To change the previously set password, instead of the symbols ***** simply enter a new digital password in the Password field.

Setting Time and Date

Time and date can be set via configuration file [Service]. Time and date need to be set correctly for proper timer operation and system time accounting.

In order to set new time, specify new time and date values in the corresponding fields of the configuration file and allow time update by setting the SysUpdate option value as 1, and insert memory card into the Recorder.

The Recorder reads configuration file each time a new memory card is inserted into the slot. In this case, the red LED makes a short flash, stating the configuration file has been read successfully.

After the Recorder sets system time, the SysUpdate option in the configuration file is automatically rewritten to '0'. It is done so in order there is no subsequent change in system time during subsequent installation and removal of the card, if this is not required by the user.

Changing Settings with Configuration File (CONFIG_CARD24.INI).

All the Recorder's settings are made using the CONFIG_CARD24.INI configuration file. This is a text configuration file, which is to be written by the user onto memory card.

Any word processor on your PC can be used to open the CONFIG_CARD24.INI file, make changes to it, save. Then insert memory card into the Recorder, and the file will be read by the Recorder, which will be indicated by the flash of the red LED indicator for several seconds, and the settings specified in the file will be accepted by the Recorder.

The lines of the configuration file should be edited only in the corresponding fields; adding new comments to the file or deleting existing lines is not permissible, and may lead to incorrect reading of the file.

If you accidentally delete a configuration file, a sample of it will be automatically rewritten onto memory card.

Attention, before removing microSD card, the record must not be in one of the operation modes, and the LED indication should be off. Failure to do so may result in an incorrect recording completion and loss of all information on the memory card.

If a memory card error occurred during Recorder's operation, the Recorder's LED will start flashing frequently. In this case remove memory card and check its functionality on any other device.

Battery Charging

Charge this model via memory card connector using USB cable from the delivery set.

Connect the cable to any power supply unit with a current of at least 500 mA, and the other end (resembling memory card) must be installed into the Recorder's memory card connector.

The blue LED will be on to indicate battery charging process. After that the green LED will be on to indicate charging has been completed. To disconnect the cable, gently press it and remove it from the Recorder. Important! Do not pull the charging cable out of the slot, this may lead to failure of the card reader slot.

Note: if you connect the charging cable in reverse order, i.e. first insert the charging cable into the memory card connector, and then turn on the charger, in this case when the cable is connected to the Recorder, the red indicator will start flashing and it will be on until the charger is turned on.

Indication of errors in the operation of the Recorder and troubleshooting:

- Sequential three-fold flashing of the red and green indicators - firmware file is damaged, software needs to be updated.
- Frequent continuous flashing of the red indicator - the memory card can not be initialized or unusable for recording. Remove the card, wait about 2 seconds and reinstall it.

see section "Inserting / Removing a Memory Card" section.