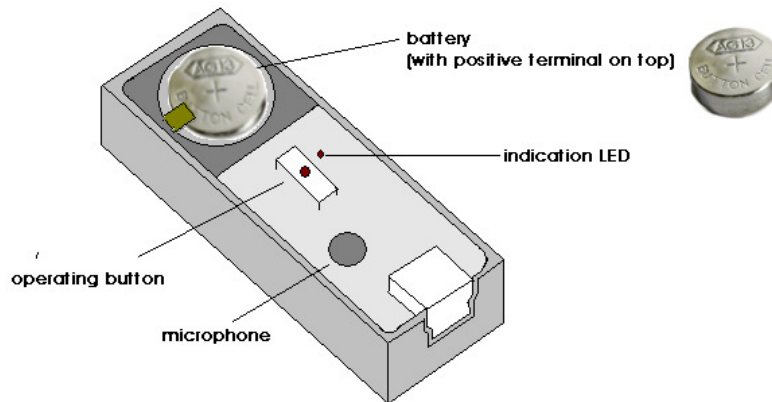# Tiny audio recorder TAR-22

User manual
Version 1.16

To quickly operate TAR-22 recorder, following steps must be done:

1) Insert Zinc Air or alkaline battery according the picture with the positive terminal on top. After inserting the battery, you must observe one single flash of LED after about 5 seconds, which indicates that the recorder is in stand-by mode (this indicates completion of start-up cycle). When the battery is partially or fully discharged, the recorder is not able to complete start-up cycle and this battery can't be used.
2) To turn on recording mode, press button for a few seconds. Following long flashes (between 1 to 4) indicates available memory space (4-maximum, 1-minimum) and recording is started. If LED is enabled during recording, each 2 seconds you should observe one single flash.
3) To stop recording mode, hold the button for a few seconds. During the time, when this button is pressed you will observe 3 long LED flashes. After releasing the button, recorder can continue with start-up cycle (same like when the battery is inserted) and is ready for next action in about 5 seconds, indicated by one single LED flash.
4) For connecting recorder with PC you need to have record manager downloaded to your PC. Recorder should be connected to PC only when it is in stand-by mode, otherwise you will get message „USB device can't be detected". Recorder should be connected to PC even without battery.

Powering TAR-22 via USB during recording

TAR-22 recorder can take a power from USB for recording in case, when it is available. At any time, when it is recording, you can connect it with USB charger or with PC and it takes all required power from USB, instead of discharging inserted battery. Battery is used as a backup, when this power from USB is interrupted. When it's connected with PC and the recording is in progress, you will get message „unrecognized USB device", but at this time you should ignore it in this step. When using external power for powering TAR-22 you must ensure continuous recording without any break, which means you can't use operating button to stop and start recording again or using any scheduled recording in recorder's settings. Voice activated recording for this operation from external power source is still available.

Detailed description

This recorder let's you to record any audio or human conversation in high quality and store all into build-in FLASH memory. The great advantage is in very small size and very long battery life in recording mode, which allows you to make continuous recording in length of several days. This recorder is equipped with very high sensitive microphone and wide dynamic range and is able to record conversation from distance over 30 feet (10 meters). All stored recordings should be downloaded via USB. All audio processing is done at PC by using record manager developed for all models of ours audio recorders. This software includes fast overview of each record and simple editing functions. For protection of stored data is possible to set password access for all stored recordings. Integrated real time clock should start recording in any specific period of each day or at any specific date. All recorded data are stored with time marks, which gives you very good overview in case of long time recording.

Technical data:

Dimensions:	46x9x16mm (1,65x0,35x0,63")
Battery:	one single 1,5V Zinc-Air ZA675 or AG13
Battery life in recording mode:	85 hours with Zinc-Air battery
Memory capacity for recording:	848 hours with 5.5kHz sample rate and ADPCM 2 bit compression
Internal memory size:	4GB
Signal to noise ratio:	65dB
Compression methods:	16bit no compression, uLaw logarithmic, 4bit ADPCM, or 2bit ADPCM
Sample rate:	22kHz, 16kHz, 11.025kHz, 8kHz, 5.5kHz
Bit width:	16bits
Microphone sensitivity:	10 meters (32 feet)
Current consumption in stand-by mode:	less than 200uA
Voice activated recording:	user selectable
Data transfer to PC:	via USB
Scheduled recording:	available

Memory capacity in hours for all sample rates and compression methods

Sample rate	None	ULaw	4bit ADPCM	2bit ADPCM
5,5kHz	106	212	424	848
8kHz	72	145	291	582
11kHz	53	105	211	422
16kHz	36	72	145	290
22kHz	26	52	-	-

Battery life for all sample rates and compression methods (Zinc-Air battery, type ZA675)

Sample rate	None	ULaw	4bit ADPCM	2bit ADPCM
5,5kHz	85	85	75	82
8kHz	70	73	60	70
11kHz	57	67	45	60
16kHz	43	52	31	36
22kHz	26	28	-	-

Battery life for all sample rates and compression methods (alkaline battery, type AG13)

Sample rate	None	uLaw	4bit ADPCM	2bit ADPCM
5,5kHz	19	19	12	12
8kHz	12	12	12	11
11kHz	10	10	9	10
16kHz	9	9	7	9
22kHz	7	7	-	-

Operating instructions

For controlling all functions is used one operating button and multifunctional LED. This button works in single click mode, where each click must be at least 3 seconds long. In case of selecting optional double click mode, it requires one click in length of at least 3 seconds followed by pause in length of 1 second and second same click again.

When the battery is inserted, one short LED flash must follow after about 5 seconds. If this single flash is not observed, use fresh battery instead of partly discharged or check battery contacts.

Start and stop the recording

Using operating button activates those actions. Before the recording starts, the LED flashing sequence will follow. When it flashes only ones, the memory is full and recording can't be started. Flashing 2 to 4 times indicates available memory space. (4 flashes – more than 75% space available, 3 flashes – more than 50% space available, 2 flashes – less than 25% space available). The recorder should store up to 255 records. If this count has exceeded, the memory is considered as full. When the recording is in progress, the LED makes short flash each 2 seconds. This function should be disabled for discrete recording. When the voice-activated recording is enabled, the LED flashes only, when the sound level is above selected threshold and recording is in progress. The recording is stopped when the memory is full or by pressing the operating button. 3 LED flashes indicate stop sequence. This sequence is followed after about one second, when you press operating button. To recognize clearly this state, this sequence of 3 flashes is followed during the time when you hold the button (when you start recording by using the button LED flash sequence starts after you release the button).

Battery types

For longest battery life in recording mode the Zinc-air batteries must be used. Recommended type us ZA675 or PR44. Optionally alkaline 1,5V batteries of the same size should be used, but the battery life will be shorter.

Using recorder - manager application
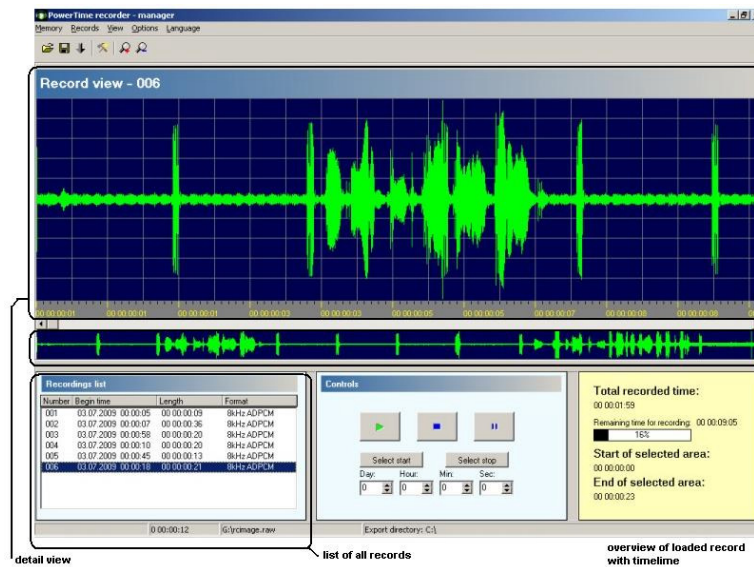
This software is used for overview, export and replay of all stored data. When you start this application you must open the image file, which is stored in internal memory of recorder. When the recorder is connected to PC, it is detected as USB flash drive, containing file „rcimage.raw". When this action is complete, all records will be visible in recordings list. To load each record, double click on selected record you whish to load. For using the detailed view you should select only specific area by using mouse left and right button and clicking on full record's overview window. When the mouse is moved over this area, the time is visible in bottom status bar. This time scale should be non-linear, when the voice activated recording was used.
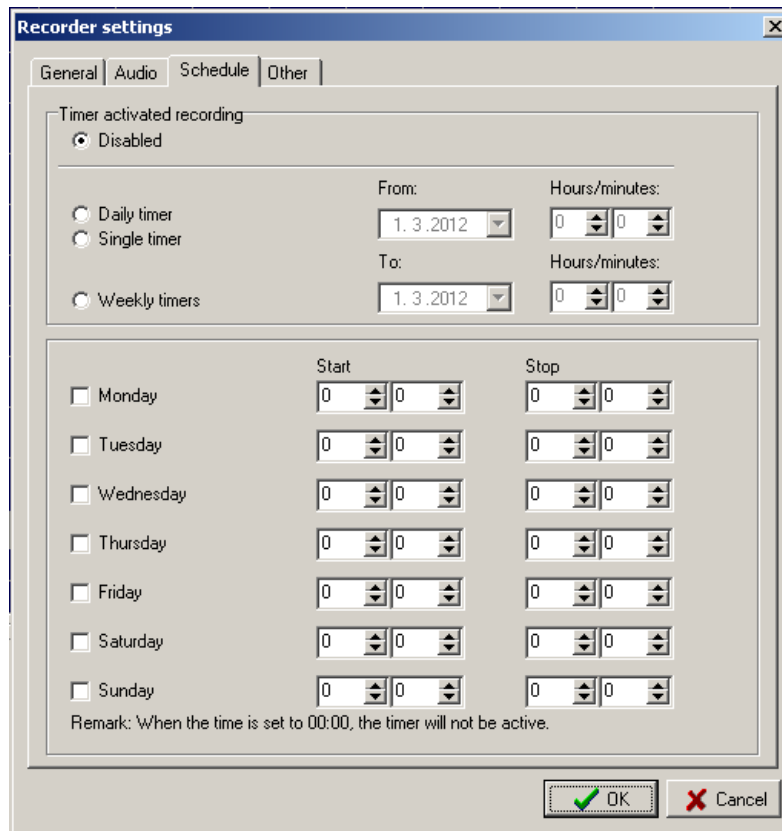
Recorder's settings

All configuration is stored in internal memory. The configuration should be changed in main menu by selecting „Options -> Recorder settings". This windows is divided into 4 following sections:
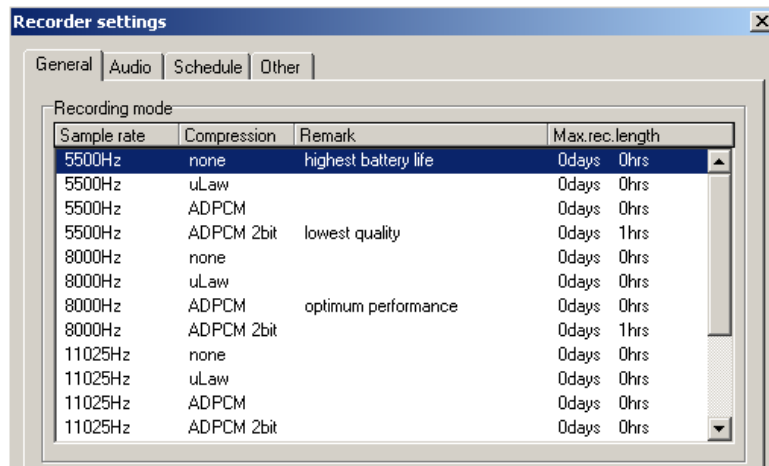
The first general part is used to select recording sample rate and compression method. To achieve the best quality you should use 16kHz or 22kHz without compression, but this mode takes the most power from the battery and will use most of the space for storing the data. For best performance check table showing battery life and memory capacity for each specific mode. Using ADPCM 2bit compression results in worst audio quality.
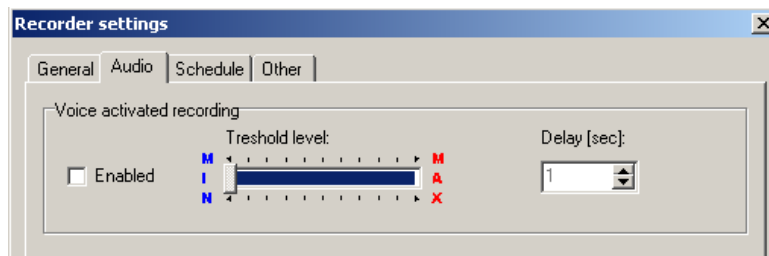
Next page is used for voice activated recording. When this option is enabled, recorder is recording only when it detects sound above selected threshold level. Minimum level means the highest sensitivity. Delay is specifying the time, for how long recording continues after this sound level is not detected anymore. Recommended value is 5 seconds or more. When LED is enabled to flash during recording, it is flashing only when recording is in progress and not when the recorder is in idle mode waiting for exceeding the selected threshold level. This mode saves significantly the battery energy resulting much longer time of operation.
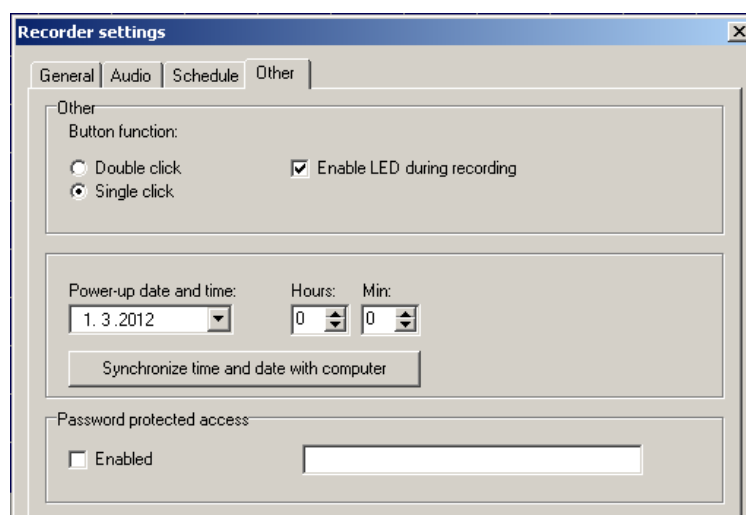
Recorder is equipped with internal real time clock and recording scheduler. If you want to use time activated recording, you can choose from 3 options. Daily timer enables recording scheduler to start and stop recording at the specified time period, which repeats every day. Single timer is used to start and stop only once at given time and date. The last is weekly timer, where you can specify a different time periods for each day of a week. Every time set to 00:00 is ignored, which enables to schedule recording for example over the midnight.

The last part of a configuration contains various options. Button function should be selected to double click or single click. Double click operation is described in the section "Start and

stop recording". LED should be disabled in this window to allow discrete mode of operation. Only flashes during recording are disabled. Indication of power up, start and stop sequence is not affected by this option. The real time clock is synchronized with the PC by pressing the button "Synchronize time and date with computer". After this action the battery must be inserted in the recorder all the time. Once it is removed or discharged, the real time is lost and must be set again. If you want to keep the time running and replace the battery, connect the recorder to USB to any power source and change the battery. All recordings should be password protected by using password protection.

Export of records

Each record should be exported and stored to your local hard drive in WAV format. To do this, select from one exporting options in main menu „Records". All records are stored to selected directory, which you can change by menu item „Select directory for export". Long records should be split into more files. Use option in menu "Records->Maximum size of exported file" to specify maximum size of each exported WAV file.

FAQ:

Q: Can't start recording – LED flashes only once and the card is not full.
A: The card contains 255 records. For next recording you must delete at least last record from the list.

Q: When the battery is inserted, there is no LED indication and recording can't be started.
A: Battery is partially discharged or there is no proper contact with the battery. Check battery contacts, or use new battery. Partially discharged battery should power recorder for such a long time, but might not be sufficient for start-up cycle.

Q: The beginning time of recording is incorrect.
A: This time is always equivalent to the real time clock, which are synchronized when the recorder is connected via PC and user press the button "Synchronize time with computer" in the configuration window. The time is lost, when the recorder is not connected via USB and the battery is removed.

Q: Recorder was operating until the batteries were empty.
A: For this case the last record will be stored properly without any problems.