

eRotor

Configuration guide

Technical descriptions and software tool



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eRotor - configuration

Electronic siren eRotor can be widely configured thus adjusting it to actual requirements. eRotor siren has DSP processor which replays audio files stored on standard MMC memory card. Using computer it is easy to save any audio files to MMC card. DSP processor can process the following audio files:

- MPEG 1 & 2 audio layer III (CBR +VBR +ABR);
- WMA 4.0/4.1/7/8/9 all profiles (5-384kbps);
- WAV (PCM + IMA ADPCM);
- General MIDI / SP-MIDI files

eRotor is configured using special PC software. It is possible to choose the audio file names on the MMC card and assign them the captions which are displayed on the siren LCD while replaying them. Siren can be also configured for remote control. It also possible to assign a serial link commands to eRotor ("sx commands" and "sx alarms") and to assign the binary input control (external button).

Following chapters describes the remote control: serial link protocol definitions and binary control configuration. Next chapters describe all the variables which can be configured in eRotor.

eRotor - connectors

Connector: J8

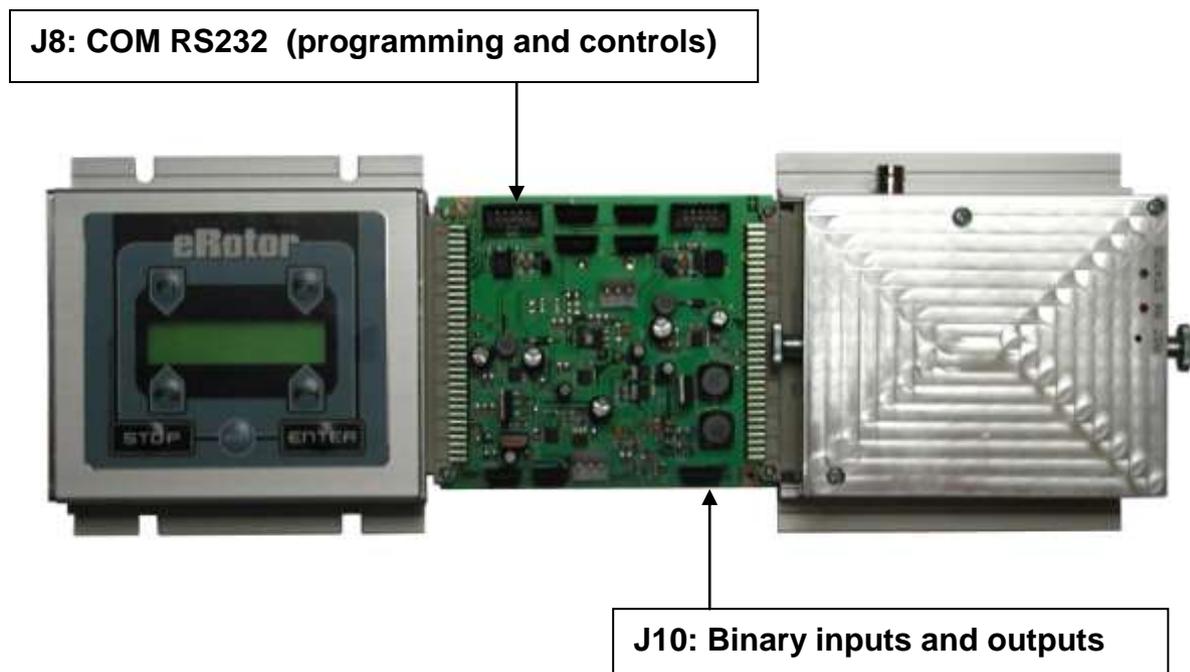
COM MB

1		2	GND
3	MBCOM1TX	4	GND
5		6	GND
7	MBCOM1RX	8	GND
9		10	GND

Connector: J10

BINARY IN/OUT

1	AK_TL1
2	GND
3	GND
4	AK_TL2
5	OUT1
6	OUT2



eRotor remote control description

Siren can be controlled remotely by these means:

- Serial port (RS232, 9600 baud, 8N1)
- CAN bus
- Binary inputs

Serial port – protocol definitions

Siren can be controlled by serial port with following settings: 9600 baud, 8bit, no parity, 1 stop bit.

Siren is activated by character sequence starting with '?'. If it is parsed successfully, siren responds by same string, only with '+' at the beginning.

There are two kinds of sequences: Sx commands and sx alarms. They are described below with extended Backus-Naur form.

Sx commands starts with '?' character followed by twice repeated number of the command (0-6) and end with '%' character. They have the following syntax:

```
cmd := "00" | "11" | "33" | "44" | "55" | "66"  
sxc := "?", cmd, "%"
```

Siren allows performing following actions:

- **Reset** – Performs restart of siren as if siren is connected to power supply.
- **Test** – Starts test of siren, measures amplifiers and drivers with 15kHz signal
- **Play file** – Replays a file from MMC card. Name of file is set during siren configuration.
- **AUX input** – Starts replaying AUX input, which was configured during siren configuration.
- **Stop** – Stops current action and erases the queue of actions.
- **None** – Blank action, siren will perform no action.

In standard configuration are Sx commands assigned as follows:

```
?00% Reset  
?22% is reserved for Sx alarms.  
?33% Test  
?44% Stop
```

Other commands: ?11%, ?55%, ?66% are not used (set as "None").

Sx command ?44% is hardcoded for stop action and ?22% for Sx alarms, others are user configurable. However we recommend to not change the default configuration of set Sx commands and if necessary use free commands (?11%, ?55%, ?66%).

Sx alarms starts with "?22;" string followed by twice repeated number of alarms, semicolon and specific alarm number, each repeated twice. They have following syntax:

```
count := "11" | "22" | "33" | "44"  
alarm := "00" | ... | "99" | "AA" | ... | "ZZ"  
sxa := "?22;", count, ";", alarm, [alarm, [alarm, [alarm]]], "%"
```

Count has to be the number of alarms in the Sx alarm directive.

For example ?22;33;88AA99% executes following 3 alarms: 88, AA and 99.

All Sx alarms are user configurable. During siren configuration all Sx alarms have assigned a name on MMC card or AUX input. Command example above will perform following action (default configuration):

gong sound: 8GONG1.WAV (assigned 88),
voice message: AMSGTST.WAV (assigned AA)
other gong sound: 9GONG2.WAV (assigned 99).

During siren configuration, user assign which files or AUX inputs are assigned to Sx alarms. In theory it is possible to assign to Sx alarms also other siren actions (Test, Stop, Reset), but it is not commonly used. These siren actions are performed using Sx commands. Siren allows wide commands configuration possibilities. It is up to user if he will follow used conventions or he will create his own specific siren control.

Other commands (default configuration):

?22;11;II% starts AUX input IN1

?22;11;JJ% starts internal FM radio, radio frequency was assigned during configuration

Note: while replaying files from MMC card is stopped automatically on end of file, replaying AUX input is performed until stop command is issued (?44%). So AUX input needs to be stopped always by command!

Special commands

Siren firmware was extended from version 3.01 with following commands:

Volume control (output level)

Siren allows to change volume of audio output which is put through amplifiers. For volume regulation new command was defined, similar to Sx command but with different numeric syntax. Command starts with "?88" with two following numbers which defines volume output and ends with "%" symbol. See following extended Backus-Naur form:

```
digit := "0"|"1"|"2"|"3"|"4"|"5"|"6"|"7"|"8"|"9"  
sxvolume := "?88;", digit, digit, "%"
```

Output level can be changed from +6dB to -42dB with step of 1dB. These values are valid if the input is on level 0dB (0.778V). Value from 00 to 48 is set in command, which represents the following level of low frequency output:

Digits	Output
00	+6dB
01	+5dB
02	+4dB
03	+3dB
04	+2dB
05	+1dB
06	0dB
07	-1dB
08	-2dB
....
47	-41dB
48	-42dB

Command accepts also higher numbers. For example "?8899%" command is also accepted but will perform only as it was set the value of 48. Siren will reply with confirmation of "+8848%" and input will be set to lowest dB level of -42dB.

It is necessary to assign always both digits, also first zero (see chart above).

Siren has default value: "Output volume" which is written during configuration into flash memory and during siren reset is always set to this value. Default is -6dB. This value can be changed during configuration. Command "?88xx%" will change volume value immediately and this change will be valid until the next siren reset or until next change by command.

Important note: high level can damage amplifiers (PA08) and/or drivers. Maximum signal on input of amplifiers must be -6dB (384mV). If this value will be crossed the producer is not held responsible for damages nor will held warranty on damaged amplifiers and drivers!

If input driving signal has lower value than 0dB (778mV) user can of course set higher output volume value in a way he needs it to activate amplifiers. However maximum value of -6dB (384mV) always should be kept on input of amplifiers. In such cases do not forget to set the standard value -6dB (?8812%), which is suitable for replaying of WAV files in normalized volume.

Examples:

Standard output value: ?8812% (-6dB)

Maximum damping: ?8848% (-42dB)

Maximal amplification ?8800% (+6dB) – Be careful not to harm amplifiers or drivers!

Siren status report

Using serial link it is possible to request a siren status. Siren will reply with complete status report. Command has simple syntax:

```
sxstatus := "?S"
```

To command: "?S" siren will reply: "+Status[" following with new-line symbol (0x0A) and list of status items which changes according to siren status. Begin of reply "+Status[" will appear immediately after the received command "?S", but other list of items is dependant on siren actual actions. If for example siren test is performed, siren will finish this report only after the test. This can take several seconds. Reply of the siren is always ending with "]" symbol.

Status items

Reported items are displayed between "[" brackets. Every item consists of text indication of item, ":" colon symbol and actual value. Item is always ended with new-line symbol (0x0A).

Table: status items

Item	Meaning	Values
Fw	Firmware version identification	Example: EROTOR 3.01.58
SirenType	Set siren type	AUDIO, 250, 500, 750, 1000, 1500
Active	Actual siren status	0=stand-by, 1=siren active
Queue	Number of commands in queue	Number, 0=queue is empty
Input	Actual siren input	0 = none 1 = DSP processor (replay from MMC) 2 = Microphone input 3 = FM Radio 4 = AUX IN1 5 = AUX IN2 6 = AUX IN3
File ²⁾	File name	Example: „8GONG1.WAV“
Title ²⁾	Text label on LCD	Example: „Gong 1“
Playtime ¹⁾	Replay time	Time in seconds
Volume ⁴⁾	Volume of low freq. output	00 to 48, value in dB is in brackets
Fmradio	FM radio frequency	Value in MHz
Batery ³⁾	Measured battery voltage	Vaule in V
Charger ³⁾	Measured voltage of charger	Vaule in V
Temp ³⁾	CPU temperature	Vaule in degrees Celsius
Cabinet ⁴⁾	Door sensor status	OPEN, CLOSED
Power ⁵⁾	Power supply status	ON, OFF
Test	Result of last test	N/A – test was not performed yet OK – all tests are ok ERROR – error was detected, with following list of errors

1) Item is listed only if siren is active

2) Item is listed only if siren is replaying file from MMC card

3) Measurements are performed during siren test and periodically every 256 seconds (4.3 minutes)

4) Actual value detected during listing of status

5) Actual value detected during listing of status, but if power supply failure occurred, this value is set to OFF only after several minutes due to charge in capacitor. This will also eliminates short power supply failures.

List of failures

If test ended with error it will report status: **Test:ERROR "list of failures"**. Every error is ended with new-line symbol (0x0A). There can be more errors at one time.

BadAmplifiers:N Reports number of faulty amplifiers.

BadDrivers:N Reports number of faulty drivers. If there is faulty amplifier test can't perform the test of following drivers. This means that if there is faulty amplifier the number of faulty drivers can be higher as detected by test.

Power failure Power supply failure. (must be Power:OFF)

Charger failure Battery charging failure. Charger doesn't supply enough voltage.

Battery low Battery voltage is too low.

Example 1. Siren is in stand-by, after reset. Test was not performed yet.

```
+Status [  
Fw:  
SirenType:AUDIO  
Active:0  
Queue:0  
Input:0  
Volume:12 (-6dB)  
FMradio:103.9MHz  
Baterly:26.88V  
Charger:27.42V  
Temp:33.5C  
Cabinet:CLOSED  
Power:ON  
Test:N/A  
]
```

Example 2. Siren replays file AMMSG.WAV for 3 seconds. In queue are two next orders waiting for perform. Doors are opened, last test detected power supply failure, one faulty amplifier and two faulty drivers:

```
+Status [  
Fw:EROTOR 3.01.58  
SirenType:750  
Active:1  
Queue:2  
Input:1  
File:AMMSG .WAV  
Title:Test of siren  
Playtime:3  
Volume:12 (-6dB)  
FMradio:103.9MHz  
Baterly:25.36V  
Charger:0.05V  
Temp:34.7C  
Cabinet:OPEN  
Power:OFF  
Test:ERROR  
BadAmplifiers:1  
BadDrivers:2  
Power failure  
]
```

Inputs

eRotor can also be controlled by two binary inputs (A1 and A2). Different actions for both opening and closing the input contact can be set up. Close the contact (START) by short-circuiting the contact braces. That is by connecting the input brace with ground (0V). Opening the contact (STOP) is done by disconnecting the contact braces.

Inputs are protected from oscillation by software, so opening/closing of the contact has to be longer than 100 milliseconds.

Using the configuration tool

Siren eRotor is configured using special PC software, which allows to save and load the variables using RS232 serial link. Variables can be saved to PC disk. It is also possible to directly control the siren using this software. Configuration SW is designed for MS Windows and Linux systems.

Menu items

Read

Read configuration from siren connected to serial port

Write

Write configuration to siren connected to serial port

Load

Read siren configuration from YAML file on PC

Save

Write siren configuration to YAML file on PC

Direct control

It is possible to send all configured Sx commands and Sx alarms directly to siren via serial port. Sx commands and Sx alarms are described in detail in Serial port section.

Generic settings

Siren type

Siren type is specified by the number of amplifiers and drivers. This setting is important for siren test, because it used to diagnose amplifier and driver failures.

If you change type of siren, it is necessary to perform new calibration.

FM Radio

Sets the frequency of built-in radio receiver.

Output volume

Sets the output level of the basic eRotor unit. When used with PA08 amplifiers the output level should not exceed -6dB. With higher setting you may damage drivers. Although PA08 amplifiers have temperature protection, they may get damaged too.

When eRotor is used as a general-purpose source of audio signal, it is possible to set the output volume in full scale as needed.

MMC files

All files need to be stored in root directory of the MMC Card. They are checked on siren start, so it is advisable to keep the number of files small for fast startup. If any file is not found, siren is restarted.

Filename

Filename is uppercase and in DOS 8.3 notation, unused characters from name and extensions are padded with spaces.

LCD Title

Text that is shown on siren LCD when playing this file.

Siren actions (Sx commands, Sx alarms, Inputs)

Sx commands and Sx alarms are described in [Serial port](#) section.

Siren action

Action to do when specified command/alarm/input is activated.

None

No action is performed

Reset

Restart the siren

Test

Performs test of siren, same as test from siren panel. Checks amplifiers, drivers, power, battery state etc. Result is shown on LCD panel.

Play file

Play file from MMC files table

AUX input

Play signal from auxiliary input

Stop

Stop performing any actions with same or lower priority

Parameter

Parameter depends on selected action:

Play file

File to play, from MMC files table

AUX input

Specifies AUX input to play

For other actions parameter is ignored.

Priority

Priority of given action in queue. It is recommended to leave default values which are:

Action	Priority
None	0
Reset	200
Test	20
Play file	20
AUX input	20
Stop	100

By assigning higher priority to binary inputs or Sx commands/alarms you can choose which can be interrupted by other. Stop command always needs higher priority than the corresponding command you want to stop.

Outputs

Siren is equipped with two output relays, each of them can be configured to react to different condition.

Trigger

Trigger sets the initial condition which controls the output. One of the following options can be used:

- **Siren is active** – Output copies the activity of siren permanently.
- **Siren is activated** – If siren is activated the output is connected for a duration specified in "Duration" parameter
- **Sx Alarm: X** - When alarm X is started the output is connected for a duration specified in "Duration" parameter
- **Error conditions** – Connects output if some failure occurs (see List of failures)
- **None** – Output doesn't do anything

Duration

Length in seconds of the impulse generated on the relay. In case that this value has no sense, f.e. Trigger = Siren is active, then Duration is not available to fill and this item is not available.

MMC card check

Siren performs MMC card files check during startup (reset). All files listed in configuration SW (MMC files tab) has to be present in the main directory (root) of the MMC card, if some of the listed files are not found then the check is stopped and following message will display:

```
MMC card error!  
S T O P !
```

This message is displayed for several seconds and then the siren automatically reset itself. During this period it is possible to skip the MMC card check or to initiate the default configuration of the eRotor siren. For activation of these functions it is necessary to press two keys and hold them until the system activates itself.

Note: These functions are available only for firmware versions 2.16 and higher.

F2+F3 MMC card check skip

If the buttons "F2" and "F3" are pressed during the error message then the check of the card immediately stops. The message „**Test aborted!**“ will be displayed on LCD and eRotor will start normally. In this situation it is possible to perform any functions of the siren. Mainly it is possible to connect the siren to PC with configuration SW and change the siren configuration.

If any request occurs for audio files which are missing on the MMC card, only error message on the LCD will be displayed.

In next reset the system will perform MMC card check again, so if the problem was not solved the error message will be displayed again and eRotor will reset itself.

F1+F4 Default configuration restoration

If the buttons "F1" and "F4" are pressed during the error message then system will rewrite all values to default configuration. The message „**Default config.**“ will be displayed and siren reset itself after. Standard configuration will rewrite all variables to default settings.

List of files on the MMC card required for default configuration:

"1KATASTR.WAV"	"DMSG.WAV"	"UMSG.WAV"
"2VYSTRAH.WAV"	"EMSG.WAV"	"VMSG.WAV"
"3ZATOPA.WAV"	"FMSG.WAV"	"XMSG.WAV"
"4POZARNI.WAV"	"GMSG.WAV"	"YMSG.WAV"
"8GONG1.WAV"	"PMSG.WAV"	"TST_15K.WAV"
"9GONG2.WAV"	"QMSG.WAV"	"TST1K0DB.WAV"
"AMSG.WAV"	"RMSG.WAV"	"TST_10K.WAV"
"BMSG.WAV"	"SMSG.WAV"	"TST_440.WAV"
"CMSG.WAV"	"TMSG.WAV"	