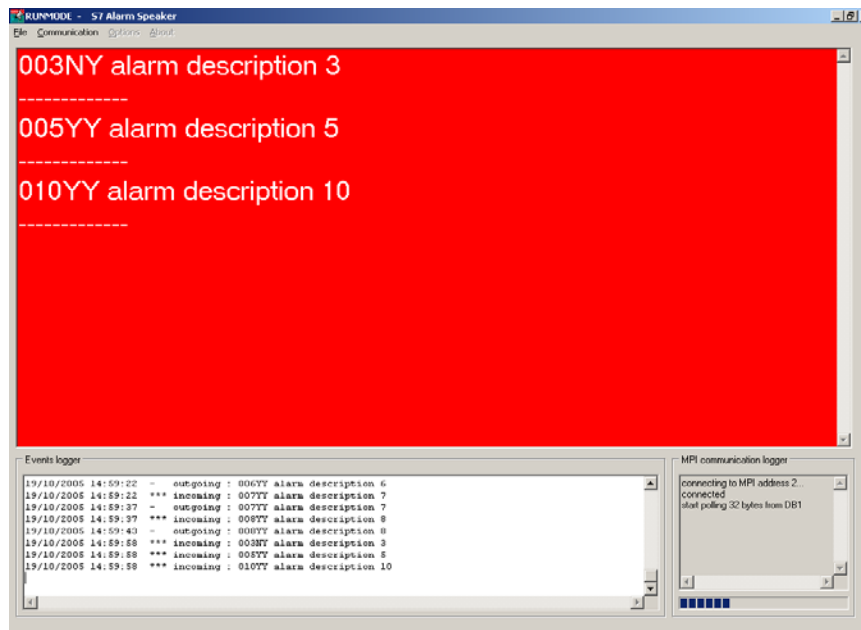


RUNMODE S7 ALARM SPEAKER

Audible alarm messages player for
Siemens S7-300 / S7-400 PLCs



Last revised: November 14, 2005

Forewords

The Runmode S7alarmSpeaker is a MS Windows application that reads alarm flags stored in a S7 datablock and plays correspondent audible messages by means of customizable audio files in WAV format.

Alarm events are also displayed on screen in wide format and stored in historical log file.

The application has been developed in order to allow a basic thus effective use:

No installation needed, no registry issues, no files added in Windows' system folder

Alarm descriptions and historical log files are stored in a pure text format

Requirements

Runmode S7 Alarm Speaker is a 32 bit application for Microsoft Windows 95/98/ME/NT/2000/XP.

The application support Siemens Simatic S7-300 and S7-400 PLCs only,

S7-200 and Logo! are not supported.

The application uses Siemens Prodrive MPI (version 3.0 or higher) additional package to communicate with the PLC.

Siemens Prodrive MPI is a Siemens product; it is not included in Runmode S7 Alarm Speaker.

Siemens Prodrive MPI works with standard interfaces commonly used by Siemens Step7 programming package, such as CP5511, CP5512, CP5611, RS232/MPI converter, USB/MPI converter, etc.

Third party interfaces and OPC are not supported by Prodrive

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Installing S7 Alarm Speaker

1. The S7 Alarm Speaker does not need setup; just unzip all the files to a folder of your choice.
2. Edit the ALARMLIST.TXT file and insert the proper alarms description.
3. Run Windows' Sound recorder application (or other software capable of recording WAV sound files) and record a separate message for each alarm.

Note: Siemens Prodave MPI must be installed in your system.

Please refer to Prodave manual for details on installation and PG/PC interface setup.

If you own the "Prodave Mini" version, please make a copy of your W95_S7MINI.DLL and rename it W95_S7.DLL. The W95_S7.DLL must be then available in the S7alarmSpeaker folder or in the Windows System32 folder.

Configuring S7 Alarm Speaker

MPI communication.

Select MPI setup from Communication menu and set proper MPI communication parameters. A default button is provided to reset all parameters to the most common values.

The screenshot shows the 'MPI communication setup' dialog box with the following settings:

- MPI address:** MPI node: 2, CPU installed in slot nr: 2
- Polling time:** interval: 1000 mS
- Interface datablock:** DB number: 1
- Sign-of-life:** DB number: 3, DW: 8, send sign-of-life
- alarm addressing in PLC:** Byte array, Little-Endian word array (Protocol compatible)

Buttons at the bottom: Default, OK, Cancel.

- MPI node: MPI address of the PLC you want to communicate with
- CPU slot nr: S7-400 may use slot 2 or 3, S7-300 use slot 2
- Polling time: interval between two consecutive readings from PLC memory.
- Interface datablock: datablock containing the alarm flags. Alarm area must begin at byte 0 and end at byte 31 (256 alarms)
- Sign-of-life: if the option is selected, the indicated dataword in the PLC memory will be incremented by 1 at each communication. The PLC can use the information to detect whether the S7alarmSpeaker is currently running.
- Alarm addressing in PLC: select the way the alarm flags are assigned in the PLC memory. See the following figures:

The screenshot shows a SIMATIC Manager window titled "LAD/STL/FBD - [DB1 -- almspeak\SIMATIC 300(1)\CPU 314]". The main area displays a table with the following columns: Address, Name, Type, Initial value, Actual value, and Comment. The table lists 28 alarm variables (alm[1] to alm[28]) with addresses from 0.0 to 3.3. All variables are of type BOOL and have an initial value of FALSE.

Address	Name	Type	Initial value	Actual value	Comment
0.0	alm[1]	BOOL	FALSE	FALSE	
0.1	alm[2]	BOOL	FALSE	FALSE	
0.2	alm[3]	BOOL	FALSE	FALSE	
0.3	alm[4]	BOOL	FALSE	FALSE	
0.4	alm[5]	BOOL	FALSE	FALSE	
0.5	alm[6]	BOOL	FALSE	FALSE	
0.6	alm[7]	BOOL	FALSE	FALSE	
0.7	alm[8]	BOOL	FALSE	FALSE	
1.0	alm[9]	BOOL	FALSE	FALSE	
1.1	alm[10]	BOOL	FALSE	FALSE	
1.2	alm[11]	BOOL	FALSE	FALSE	
1.3	alm[12]	BOOL	FALSE	FALSE	
1.4	alm[13]	BOOL	FALSE	FALSE	
1.5	alm[14]	BOOL	FALSE	FALSE	
1.6	alm[15]	BOOL	FALSE	FALSE	
1.7	alm[16]	BOOL	FALSE	FALSE	
2.0	alm[17]	BOOL	FALSE	FALSE	
2.1	alm[18]	BOOL	FALSE	FALSE	
2.2	alm[19]	BOOL	FALSE	FALSE	
2.3	alm[20]	BOOL	FALSE	FALSE	
2.4	alm[21]	BOOL	FALSE	FALSE	
2.5	alm[22]	BOOL	FALSE	FALSE	
2.6	alm[23]	BOOL	FALSE	FALSE	
2.7	alm[24]	BOOL	FALSE	FALSE	
3.0	alm[25]	BOOL	FALSE	FALSE	
3.1	alm[26]	BOOL	FALSE	FALSE	
3.2	alm[27]	BOOL	FALSE	FALSE	
3.3	alm[28]	BOOL	FALSE	FALSE	

Use "byte array" if alarms are numbered progressively from 1 to 256 laying progressively from byte 0 to 31 (e.g. alarms 1..8 in byte 0, alarms 9..16 in byte 1, alarms 17..24 in byte 2, alarms 25..32 in byte 3, etc)

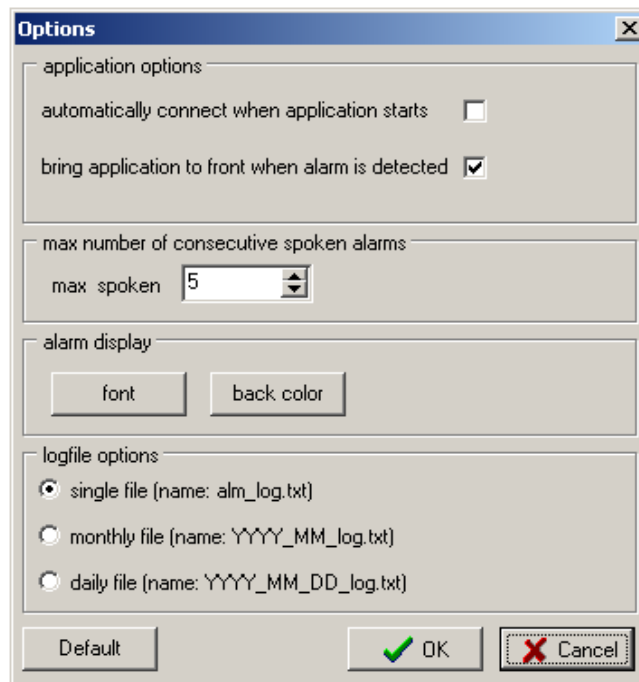
The screenshot shows a SIMATIC Manager window titled "LAD/STL/FBD - [DB5 -- \"OP7_DBallarmi\" -- hpm16\SIMATIC 300(1)\CPU 313\...\DB5]". The main area displays a table with the following columns: Address, Name, Type, Initial value, and Comment. The table starts with a STRUCT at address 0.0, followed by 20 individual BOOL variables (Alm9 to Alm20) with addresses from +0.0 to +3.3. All variables have an initial value of FALSE.

Address	Name	Type	Initial value	Comment
0.0		STRUCT		
+0.0	Alm9	BOOL	FALSE	
+0.1	Alm10	BOOL	FALSE	
+0.2	Alm11	BOOL	FALSE	
+0.3	Alm12	BOOL	FALSE	
+0.4	Alm13	BOOL	FALSE	
+0.5	Alm14	BOOL	FALSE	
+0.6	Alm15	BOOL	FALSE	
+0.7	Alm16	BOOL	FALSE	
+1.0	Alm1	BOOL	FALSE	
+1.1	Alm2	BOOL	FALSE	
+1.2	Alm3	BOOL	FALSE	
+1.3	Alm4	BOOL	FALSE	
+1.4	Alm5	BOOL	FALSE	
+1.5	Alm6	BOOL	FALSE	
+1.6	Alm7	BOOL	FALSE	
+1.7	Alm8	BOOL	FALSE	
+2.0	Alm25	BOOL	FALSE	
+2.1	Alm26	BOOL	FALSE	
+2.2	Alm27	BOOL	FALSE	
+2.3	Alm28	BOOL	FALSE	
+2.4	Alm29	BOOL	FALSE	
+2.5	Alm30	BOOL	FALSE	
+2.6	Alm31	BOOL	FALSE	
+2.7	Alm32	BOOL	FALSE	
+3.0	Alm17	BOOL	FALSE	
+3.1	Alm18	BOOL	FALSE	
+3.2	Alm19	BOOL	FALSE	
+3.3	Alm20	BOOL	FALSE	

Use "Little-Endian word array" if alarms are stored in swapped-bytes sequence (e.g. alarms 1..8 in byte 1, alarms 9..16 in byte 0, alarms 17..24 in byte 3, alarms 25..32 in byte 2, etc)

Options

From *Options* menu select the available options

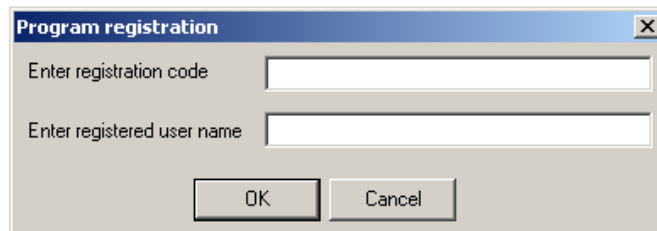


- Automatically connect when application starts: place a checkmark if you want the S7alarmSpeaker to connect automatically to the PLC as soon as the application runs.
- Bring application to front: place a checkmark if you want the application to be automatically brought as topmost window if an alarm is detected. The feature works only if the S7alarmSpeakr has previously been minimized.
Note: MS changed the behavior of SetForegroundWindow in Win98/2000/XP. A background application can no longer push itself into the foreground and interrupt the user in whatever he is currently doing. Instead the taskbar button will flash a few times to indicate that the application requires attention.
- Max number of consecutive spoken alarms: just in case a whole lot of alarms are detected at a time, you may not want the application to stuck playing an exaggerated amount of messages. This value limits the number of playable messages per alarm scan.
- Alarm display font and color: assign here main display's font and background color.
- Logfile options: any event is recorded to an historical log file. The user can chose among a single, all inclusive file or separated monthly or daily files. In the latter case, the files are named upon the current date.

Registering S7 Alarm Speaker

PLC communication actually takes place only if the S7alarmSpeaker has been properly registered.

Select “register S7alarmSpeaker” form the “Help” menu and insert the registration data. Please note that registration data is case-sensitive, make sure to enter the text exactly as received by email, avoiding possible leading or trailing blanks.



The image shows a standard Windows-style dialog box titled "Program registration". It has a blue title bar with a close button (X) on the right. The dialog contains two text input fields. The first field is labeled "Enter registration code" and the second is labeled "Enter registered user name". Below the input fields are two buttons: "OK" and "Cancel".

Customizing alarms and messages

Customizing alarms description file

Alarms' enumeration and description are located in the ALARMLIST.TXT text file; enumeration must begin with alarm 001 and must end with alarm 256.

Do not use word wrapping in alarmlist.txt file, each line must contain just one alarm description.

Alarm description format: NNNI O TTTTTTTT where:

NNN = three digit alarm number

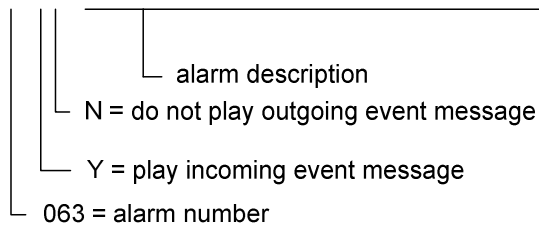
I = request to play a message in case an Incoming event is detected (alarm ON)

O = request to play a message in case an Outgoing event is detected (alarm OFF)

TTTT..= text of the message (unlimited length)

Example 1:

063YN Belt conveyor M7 overload. Check the belt before restarting.



Example 2:

001YN alarm description 1 (wav file 001.WAV will be played at incoming but not at outgoing event)

002YY alarm description 2 (wav file 002.WAV will be played both at incoming and outgoing event)

003NY alarm description 3 (wav file 003.WAV will be not played at incoming but played at outgoing event)

004NN alarm description 4 (wav file 004.WAV will be never played)

005YY alarm description 5 (...)

Customizing WAV files

S7alarmSpeaker does not make use speech synthesis but rather plays messages pre-recorded by the user. The solution allows a variety of customizations and is not constrained by possible text-to-speech engine limitations. Recording WAV files is extremely easy, as a sound recorder application is included in all MS Windows versions. See Windows' help for details on Sound Recorder application.

The S7alarmSpeaker folder will then contain a series of wav files, one for each separate alarm. Sound files name must be a three-digit number, e.g from 001.WAV to 256.WAV

Example:

001.WAV
002.WAV
003.WAV
004.WAV
005.WAV
...

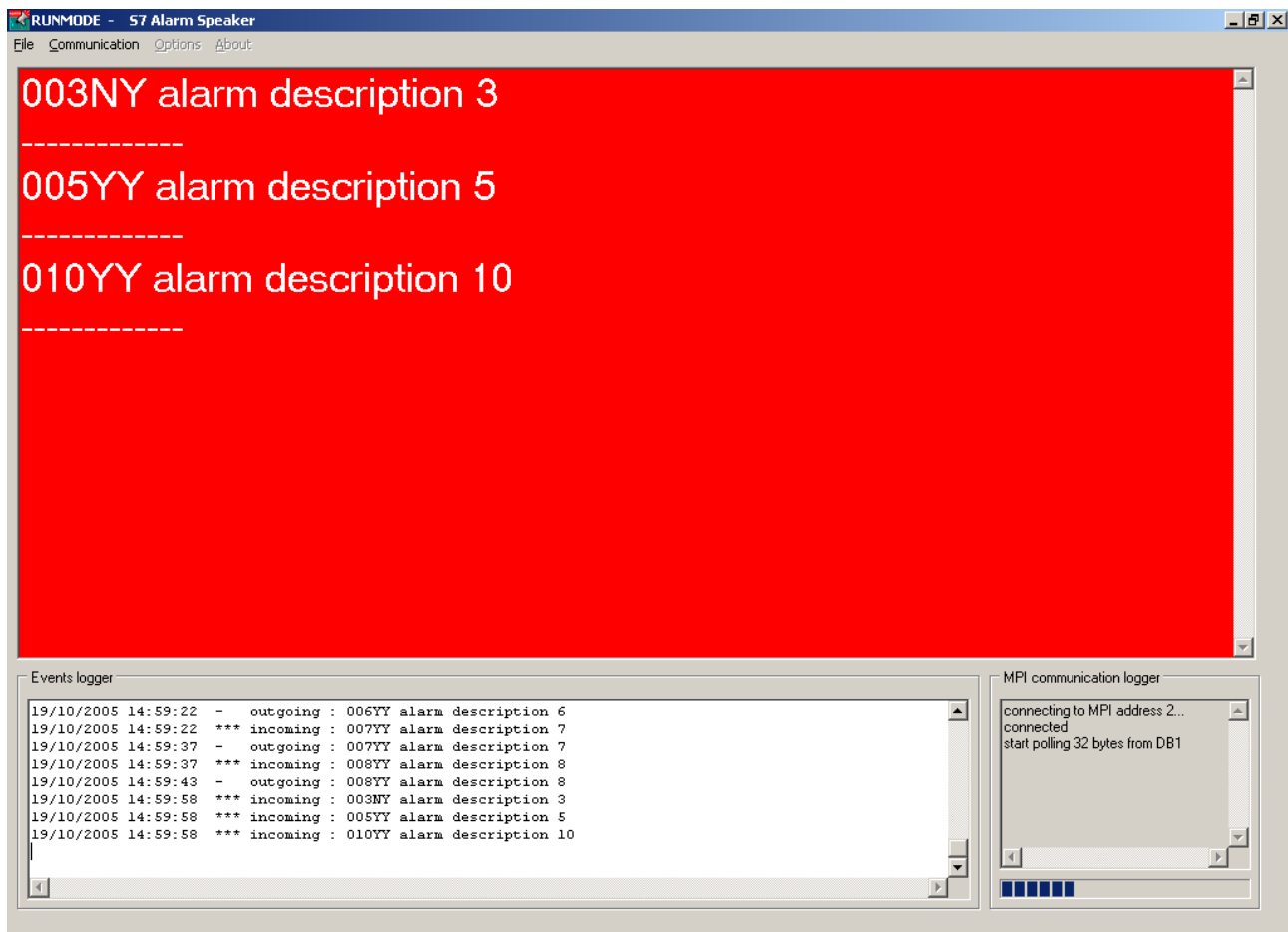
Incoming and outgoing events are distinguished by the ON.WAV and OFF.WAV sound file that will be played after the alarm's sound file.

Example:

Incoming event 044: S7alarmSpeaker will play 044.WAV immediately followed by ON.WAV.
Outgoing event 012: S7alarmSpeaker will play 012.WAV immediately followed by OFF.WAV.

Running the program

If selected on the options, S7alarmSpeaker will start communicating with the PLC automatically, otherwise select the *Communication* menu and click *Start*.



The main panel shows the currently active alarms, while the events logger panel lists all the past activity.

The content of the Events Logger panel is also written to a logger file according to the method set in the Options menu.

The MPI communication logger displays the communication status; communication-related events are not logged to file.

Acknowledgements

Ronald van der Weegen , for beta testing and suggestions.

Version history

Version 1.00 Initial commercial release

Author's notes

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