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Digital Message Repeater Application

Stored messages playback, triggered by the network interface (CGI, UDP), by push buttons or by the serial interface.

Application User Manuale

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FW Version:	v0.02
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Supported on:	All Barix Audio hardware

1 Introduction

1.1 About Digital Message Repeater application

Digital Message Repeater is an application which can be used on Barix audio hardware. Its intended use is to provide stored MP3 messages playback, triggered by the network interface (CGI, UDP), by push-buttons or by the serial interface.

If available in hardware, a relay can be activated when a message is played.

Messages can be stored on a USB flash stick or in the (limited) internal flash of the device. If a file is stored in both places, the USB has precedence (so tones delivered in the device can be replaced without deleting the resource file).

On devices with input and output, the message can be mixed with audio from the line level input (which can be attenuated or muted while the message plays).

The Barix X8 can be used to have additional inputs to trigger messages from the application.

Output volume control is possible via CGI, UDP and serial interface.

An optional directory file (messages.txt) can be present on the USB stick or in flash memory. If found, it will be used to find “friendly names” for the messages, which will be used in the web interface.

1.2 Audio files naming

The files must adhere to the following name scheme.

msgXXY.mp3

where:

XX is the message number (00..99);

Y is a flag which indicates if a message is:

- M - momentarily played only while the button is pressed (works for contact inputs or via X8 only, not for serial or UDP/CGI interfaces);
- O - played once;
- R - repeated until another button/command is sent;
- M!, O!, R! - Activate Relay with Message. If a relay is available on the device, the relay is activated while playing back a message.

1.3 Examples

- msg01M.mp3 - this file is played while input 1 is activated;
- msg02O.mp3 - this file is played once after input 2 triggers;
- msg03R.mp3 - this file is played repeatedly after input 3 triggers until either input 3 triggers again or another input gets activated.

1.4 Optional directory file

An optional directory file (messages.txt) can be present on the USB stick or in flash memory. If found, it will be used to find “friendly names” for the messages, which will be used in the web interface to show meaningful title information. Each line should start with the 2-digit message number (so no specific sequence is needed), followed by a colon, directly followed by ASCII message information, terminated by end-of-line.

Example:

```
00:message 0
01:message 1
02:message 2
03:message 3
04:message 4
05:message 5
```

1.5 Loading Digital Message Repeater firmware

No Barix device is supplied with the Digital Message Repeater application preloaded; you will need to update the firmware in the device.

The application (as **custom1**) is inside the “abcl Digital Message Repeater va0.02” package. Unzip the package and follow the instructions in the '_Readme1st' file inside to load the application.

After loading the ABCL firmware and rebooting the device, you need to revert to the factory defaults keeping the Reset button pressed until the red LED starts blinking (approx. 10 seconds). Then select “custom1” on Settings page, Application. Now your device is ready to run the Digital Message Repeater application.

2 Hardware Description

2.1 Annuncicom 100/200/155

With Annuncicom 100/200/155 Digital Message Repeater works as follow:

- msg00M.mp3 - this file is played while input 10 is activated;
- msg01M.mp3 - this file is played while input I1 is activated;
- msg01M!.mp3 - the file is played and relay is closed.

2.2 Exstreamer 1000

With Exstreamer 1000 Digital Message Repeater works as follow:

- msg00M.mp3 - this file is played while input IN1 is activated;
- msg01M.mp3 - this file is played while input IN2 is activated;
- msg02M.mp3 - this file is played while input 1N3 is activated;
- msg03M.mp3 - this file is played while input IN4 is activated;
- msg01M!.mp3 - the file is played and relay 1 is closed.

2.3 Annuncicom 1000

To use the application with input contacts on Annuncicom 1000, it's necessary to make some modification in the code.

2.4 X8 configuration

The X8 can be used to have additional inputs to trigger messages from the application.

For technical details about X8 see the manual on the Barix download page.

X8 is connected via the RS-232 port in all cases (even if RS-485 exists).
Input I0 is used only for volume control.
The other 7 inputs can be used with a resistor matrix. With this connection it's possible to trigger 70 messages (in addition to local inputs). Messages start with number 10.

It works as follow:

	I1	I2	I3	I4	I5	I6	I7
P1	MES 10	MES 20	MES 30	MES 40	MES 50	MES 60	MES 70
P2	MES 11	MES 21	MES 31	MES 41	MES 51	MES 61	MES 71
P3	MES 12	MES 22	MES 32	MES 42	MES 52	MES 62	MES 72
P4	MES 13	MES 23	MES 33	MES 43	MES 53	MES 63	MES 73
P5	MES 14	MES 24	MES 34	MES 44	MES 54	MES 64	MES 74
P6	MES 15	MES 25	MES 35	MES 45	MES 55	MES 65	MES 75
P7	MES 16	MES 26	MES 36	MES 46	MES 56	MES 66	MES 76
P8	MES 17	MES 27	MES 37	MES 47	MES 57	MES 67	MES 77
P9	MES 18	MES 28	MES 38	MES 48	MES 58	MES 68	MES 78
P10	MES 19	MES 29	MES 39	MES 49	MES 59	MES 69	MES 79

1) The X8 needs to be configured for this special mode.

- Connect inputs I0 and I1together (pins 9 and 8 of J1).
- Connect inputs I7 and I4 to ground (pins 2 and 5 of J1 to pin 1 of J1).
- Power up the X8. The device will reconfigure itself for the special “Digital Message Repeater” mode: all LEDs will be illuminated, LED 3 will blink.
- Remove the power, then remove the connections. The X8 is now ready for use.

  After restart on the X8 the left LED will be permanently on and LED 2 will blink every second.
  If the device does NOT blink as expected, it may be loaded with an old firmware version, in which case the device first needs a firmware update (typically done using a Barionet).
  To return the X8 back to default mode, power off the X8 , connect pin 8 & 9 of J1 together and
  power on.

2) Wire the X8 to the RS-232 connector.

- Power from device for the X8 is supplied
  on pin 4 of the RS-232 connector.
- Ground from the device is available on pin 5 of the RS-232 connector.
- The serial data stream from the X8 needs to be input to pin 2 on the device RS-232 interface. Although the X8 transmits using RS-485 voltage levels and the device input is RS-232, the connection as described below works and is working reliably and within the specs.

  So, do the following connections:

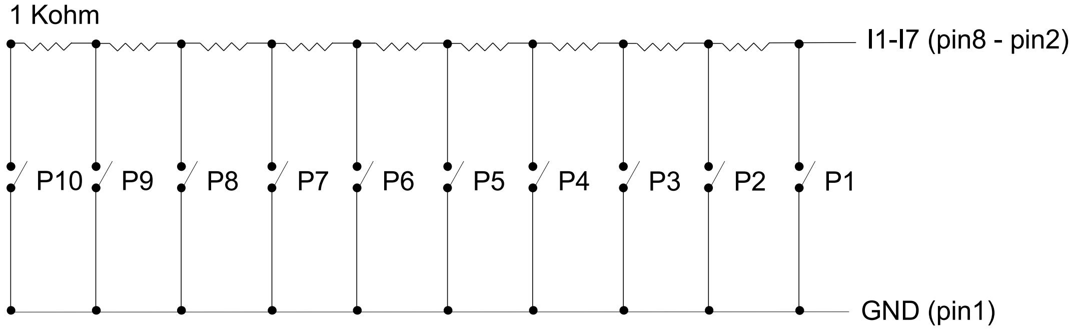
- PIN 5 of J3 of X8 to PIN 5 of RS-232 connector on device

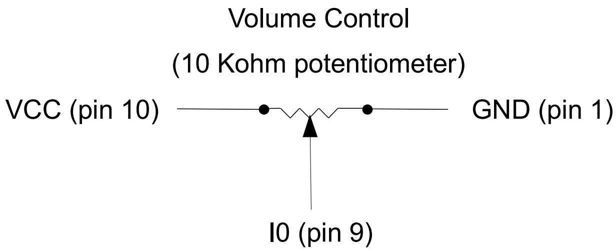
- PIN 4 of J3 of X8 to PIN 4 of RS-232 connector on device

- PIN 3 of J3 of X8 to PIN 2 of RS-232 connector on device

3) Wire buttons to the X8.

All resistors (up to 9) used for the chain connection to “signal ground” (Pin 1 of J1) must have the same value. The application will automatically calculate the proper voltages in this chain on the base of this value and define the proper closed button (from 0 up to 9) for inputs I1-I7 (Pins 8-2 of J1).
To avoid the possible mistakes with buttons recognition it is recommended to use a value from 500 to 3000 Ohm (optimal 1000 Ohm).





4) Serial settings:

Serial 1
Baud rate = 19200
Data bits = 8
Parity = no
Stop bits = 1
Handshake = none
Local Port = 0

3 Control Interfaces

Various control interfaces are implemented for maximum flexibility.
All interfaces which can be used from other programs or devices (UDP, CGI, serial) use ASCII commands which are of the structure command=value.
The serial port is set fixed to 19200,N,8,1.
The interface handler reacts both on X8 specific (“analog values”) messages as well as on the defined commands.
Commands on the serial port must be terminated with a <CR>, on UDP this is not necessary.
The “basic.cgi” handler is used for sending commands via CGI interface.

ASCII Message format:

- m=xx - message trigger, message number xx. Depending on the file name flag (M, O, R), message is played once O or repeatedly R (also for “M”);

- v=xx - set the output volume (0..20, 20=100%).

4 Web UI

4.1 Application parameters

Max. output volume

The max. audio output level is configured
here. Volume control via any of the interfaces will cover the range from 0 to this configured parameter.

Input gain

On hardware with audio input, this controls the
input gain of the LINE analog input.

Input attenuation with message

On hardware with audio input, it controls how much the input signal will be attenuated when a message is played.

UDP Port number

It selects the UDP port number on which the
device will wait for commands (0 to disable the UDP interface).

Resistor Value

The value (in Ohm) of resistor that you use for
chain connected to "signal ground" of X8 (Pin 1 of J1).

4.2 Web based “trigger/control” pages

The page Message Table shows all available messages with the behaviour (once, momentarily, repeat), relay behaviour, and proper title from file “messages.txt” (if exists). By clicking a message number, a CGI control to start that message is initiated.

The page Button Panel shows a number of buttons (one button per message found in file “messages.txt”) with title information from the list on each button.
By clicking a button, a CGI control to start that message is initiated.

Status screen is accessible via web browser, showing the current state (if playing a message, the message number) and the last command with source of this command.

5 Loading Message Files Into the Flash

5.1 Flash size and layout

In order the files to be loaded, they have to be packaged in a COB file, which then has to be uploaded into the flash. The following rules apply:

- the flash is divided into portions of 64kB, called WEB pages;
- on Barix devices with 1 MB flash the WEB pages are numbered WEB0 to WEB15, on Barix devices with 2 MB flash from WEB0 to WEB31;
- the flash layout is described in the gen.bat file in the update_rescue directory from the provided FW package;
- from two files with the same name, the one in the lower flash memory page is read first;
- a single file, stored in the COB file cannot be bigger than 64kB;
- in the current package, the following pages are free:
- WEB10-31

5.2 Preparing the COB file

For this task you need the following files (assuming you are using Windows OS);

- web2cob.exe, which you can get from the tools folder from the FW package;
- mimetype.ini;
- your message files named msgXXY.mp3.

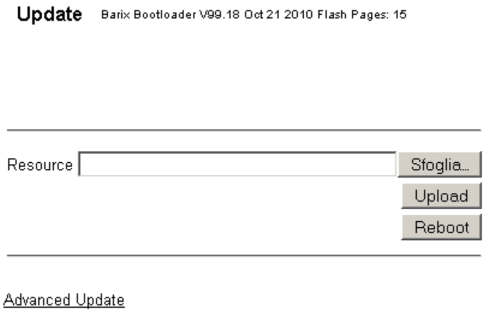
Here are the steps to follow:

- create a temporary directory, for example messages_cob, and copy there the web2cob.exe and mimetype.ini files;
- create another directory within the messages_cob directory, and name it messages. Copy there your message files. Take care that none of them is bigger than 64kB;
- run the web2cob application to generate the COB file:

```
web2cob.exe /o messages.cob /d messages
```

5.3 Loading the messages in the flash

Suppose that we have created a messages.cob file with size less than 128kB (i.e. it can fit on WEB10 and WEB11)
Open the device web page, and click “Update” menu tab. When the update page appears, click on the “Advanced Update” link to open the advanced update web page:



Type “WEB10” as target, and select the file you would like to upload. Click the Upload button to start uploading. Once the process is finished, click the Reboot button to restart the device.

6 Legal Information

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