



ICGRAPH

## Software Manual

# Universal Java-based communication and control software

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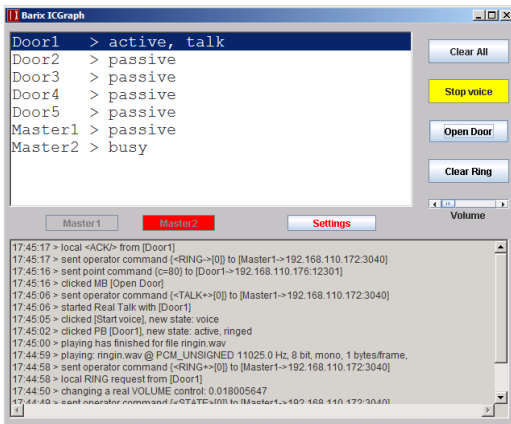
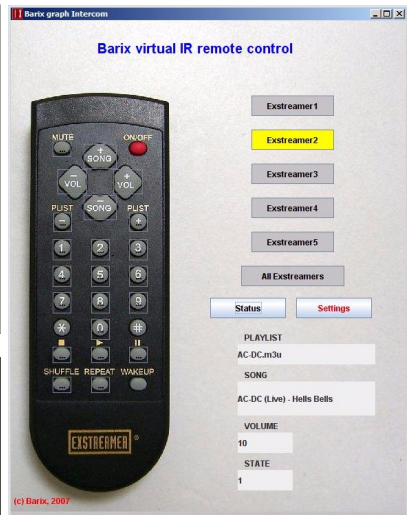
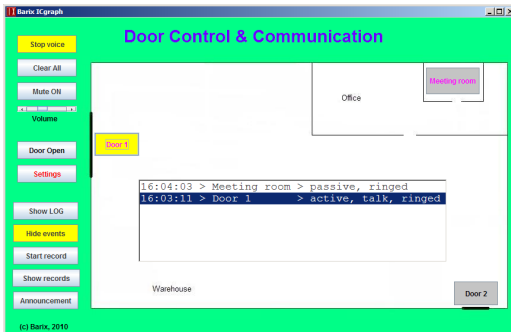


# I Introduction

## I.1 About “ICgraph”

ICgraph is a Java based PC software to communicate (VoIP) to Barix Audio products, and also it allows remote control and remote monitoring of Barix products. It is extremely flexible!

Here are some possible DEMO screenshots of the application :



The graphical design or the table design (see left, e.g. like the older SoftIC application), both can be done with the same software and is configurable .

## 1.2 Features

- Free configurable and unlimited user interface (background picture and buttons)
- unlimited points / targets (only desktop space defines the limits)
- Full-duplex communication to Annunicom/Exstreamer I000 (by using ABCL firmware)
- Half-duplex communication with Annunicom standard firmware
- Unidirectional announcements to Exstreamer / Annunicom / IPAM
- Multi-Master functionality, multiple masters can exchange status information
- Logging function ( to LOG window and LOG file)
- Audio recording for incoming and outgoing communication
- Send audio message to one, to some selected, to predefined groups or to all
- Switching relay on the remote Annunicom or Barionet, e.g. to open the door
- can execute local commands/start applications on local PC, e.g. open browser
- Selective Ring sound notification for incoming requests with visual notification
- Visible notification for incoming audio streams and for selected (active) communication
- can send any UDP commands (also periodically) to other Barix devices (e.g. Barionet)
- can display status messages / reports from Barix devices (give state information)

## 2 Installation

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ICgraph is developed with Sun's Java development kit 6.0 and is compatible to Sun Java Runtime Environment (JRE) 6.0 and probably earlier versions, this must run on the ICgraph PC.

This JRE is available for free for many operating systems (e.g. Windows, Mac, Linux) and is downloadable from : [www.java.sun.com](http://www.java.sun.com) !

Sun JRE should be installed first on the PC, when this is already installed on the PC then it's ok and you can go to the next step. Otherwise please download and install the JRE on your PC.

**Note**, we have tested the application with JRE6.0, this JRE version should be also backward compatible to JRE 5.0 or 4.0.

Please reboot the PC after the JRE installation!

If the PC is restarted then extract the ICgraph.zip in a separate folder.

That's all for the normal installation .

For PCM and G.711 codec all libraries are already included.

Now it's working when you will work with G.711 or with PCM!

If you will use the MP3 codec instead of the already installed PCM or G.711 codec, then please read and follow the following instructions carefully!

**Note**, the recording function works only over MP3 (also when a PCM or G.711 Codec is used), if used then you have also to copy the MP3 libraries (see next page) to your ICgraph PC.

Because of copyright and patent issues we cannot deliver the MP3 libraries together with the ICgraph software package. You have to download these from the Internet by yourself.

For the MP3 mode in ICgraph the following files are required on the following locations :

**Lame\_enc.dll** >> to Windows subfolder \system32  
(e.g. C:\windows\system32 )

**Lametriconus.dll** >> to Windows subfolder \system32  
(e.g. C:\windows\system32 )

**Tritonus\_mp3-0.3.6.jar** >> to Java subfolder \lib\ext  
(e.g. C:\Programs\Java\jre6\lib\ext )

**Tritonus\_share-0.3.6.jar** >> to Java subfolder \lib\ext  
(e.g. C:\Programs\Java\jre6\lib\ext )

**jl0.4.jar** >> to Java subfolder \lib\ext  
(e.g. C:\Programs\Java\jre6\lib\ext )

All the files can be found and downloaded from the Internet, e.g.:

- from <http://tritonus.org/plugins.html>

**Tritonus\_mp3-0.3.6.jar**, **Tritonus\_share-0.3.6.jar** and **Tritonus-mp3enc-2001-04-25.zip** (contains **lametriconus.dll**)

- from [http://www.free-codecs.com/Lame\\_Encoder\\_download.htm](http://www.free-codecs.com/Lame_Encoder_download.htm)

the **Lame\_enc.dll** (in lame3.98.zip)

- from <http://www.javazoom.net/javayer/sources.html>

the **jl0.4.jar**

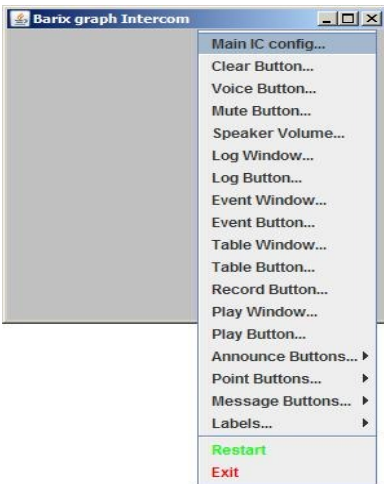
Thereafter reboot your PC so that Java can initialize the new libraries!

**If you use the above mentioned files then please respect the copyrights of the software owners!**

## 2.1 ICgraph configuration

ICgraph has two options for configuration available, there is a menu bar when you click with the right mouse button into the background of the ICgraph application (not on a button!) or you can modify the ICgraph.cfg file by using any editor (e.g. notepad).

For the most users it is probably the easiest to create a completely new ICgraph user interface. That’s done in two minutes.



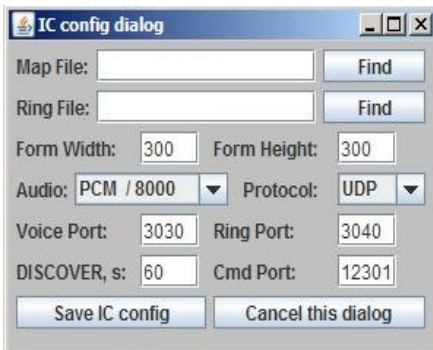
For audio communication is required :

- a “Main IC configuration”
- a Voice button
- and one or more Point buttons

Start the ICgraph.bat file. This will open up a blank (grey) window.

When clicking into this window with the right mouse button a menu bar will appear.

Click on “Main IC config...” in the menu to select/open the Main IC Configuration. A little config dialog window will appear.



There the audio format/protocol, size, background picture, network ports and some other parameters can be defined. For the beginning define only the same audio format and protocol which is also used in the Barix device and the “Ring File” (e.g. Ringin.wav from ICgraph folder).

To resize/enlarge the ICgraph window change the parameters in the dialog box or resize now the ICgraph application window with your mouse directly. When the window/button size is changed by mouse (while dialog window is open) the new values for “Width” and “Height” are automatically overtaken into the dialog window.

Click on button “Save IC config” to save values and close window.



Next is the required "Voice Button" .

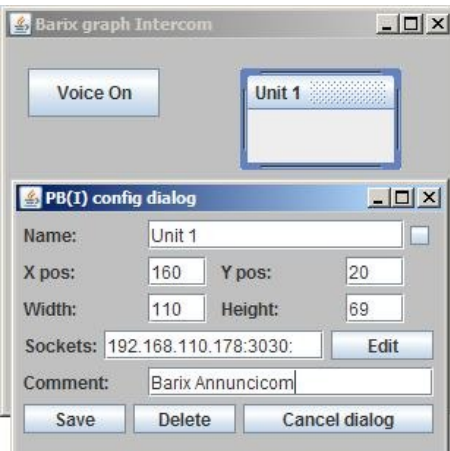
For that click again with the right mouse button into the ICgraph window. From appearing menu select "Voice Button".

It will open a "VB config" window and automatically add a button on the your ICgraph window.

In the Config window define the "Name" for the button and name for the button when pressed. Use the mouse to move

the button on the desired place or define the position manually in the config box.

When everything is set, then click on save and to save the values and to close the window. To get the new settings active you have to restart ICgraph. For that click with the right mouse button into ICgraph window and select "Restart". After few seconds ICgraph will be restarted and shows now your Voice button.



Now configure your Point button, this is required to select your Barix device for communication.

For that click again with the right mouse button into the ICgraph window. From appearing menu select "Point Button" - "New individual...".

In the opening PB(I) config window also define a unique "Name" and under "Sockets" set the IP address and port number (with columns in between and thereafter) of your Barix device.

**NOTE**, all button names **must be unique** in ICgraph, please do not use the same name twice !

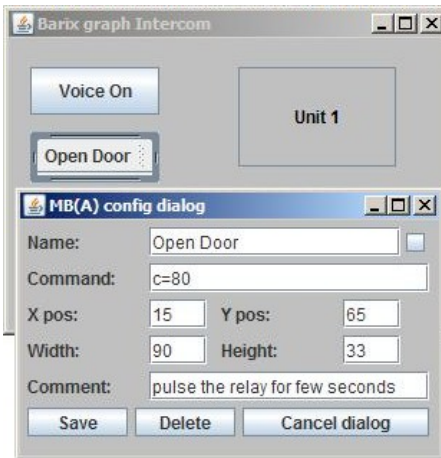
Define here also the position/size of the Point button or resize the button with your mouse directly. At the end click on "Save" to save and exit the config window.

To get the new settings active you have to restart ICgraph.

When ICgraph is restarted it will show the Voice button and the Point button.

Now you have a minimum ICgraph configuration to communicate with an Barix device.

If your Barix device is also properly configured (see next chapter) then you should be able now to communicate with your Barix device !



If ICgraph should be also used to pulse the internal relay of an Annunicom or Exstreamer500/1000, e.g. to open a door, then it also needs a Message button.

For that select from the menu “Message Buttons” - “New active”. In the opened config window define a “Name” for the button, the “Command” which should be send to the Barix device and set the position of the button here or by mouse directly.

Thereafter click on “Save” and restart the ICgraph application to get the change active.

More details about the ICgraph configuration you can find in chapter “ICgraph configuration menu items” and in the “Advanced user section”.

## 2.2 Configuration Barix devices

ICgraph can use for communication the G.711, PCM and MP3 audio formats.

As transport protocols are available RAW UDP or RTP.

In ICgraph can be defined only one audio format and one protocol type for all points.

That means all must use the same! If you will use different target devices (e.g. Annunicoms and Exstreamers), then you have to make the right selection to be compatible with all devices.

### Overview about supported codecs on Barix devices/firmwares :

Annunicom or Exstreamer500/1000 – contained ABCL firmware with CustomI.cob:  
PCM, G.711

The Full-duplex communication works only with ABCL firmware (usage of contained ABCL firmware package recommended !) by using the PCM or G.711 codec !

Annunicom – Standard firmware (half-duplex only!): PCM, G.711, MP3  
(must be RAW UDP protocol in ICgraph config)

Exstreamer - Standard Firmware v8.24 or higher: MP3, G.711  
(G,711/PCM on RTP Receive Port only , MP3 also on UDP (Priority) Receive Port)

Exstreamer - ABCL Firmware (Full-duplex application): PCM, G.711  
(The Exstreamer 100/110/120/200 can only listen/receive !)

Exstreamer - Streaming Client version 2.x : MP3, PCM, G.711  
(over Streaming Client's "Priority Port" or "rtp://0.0.0.0:port number", must be RTP protocol)

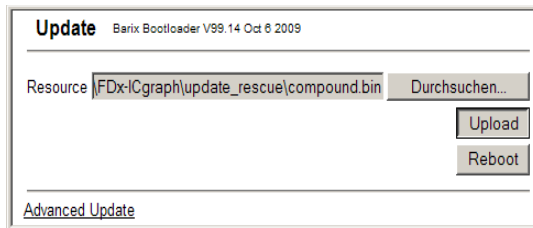
MP3 works only half-duplex, but is perfect for announcements to the Exstreamer (e.g. to UDP Priority Streaming Listen Port).

Annunicom or Exstreamer500/1000 with Full-duplex configuration for ICgraph:

That's probably the best option for two-way communication. Load the firmware (contained in ICgraph package) over serial or web update to your Barix device.

For the web update use your browser to enter the configuration of your Barix device, then click on "Update" and confirm the following message.

The unit will reboot and the browser should display the update page. There, in the resource field, select the file Compound.bin (ICgraph sub folder "\FDx-ICgraph\update\_rescue") and click on "Upload".

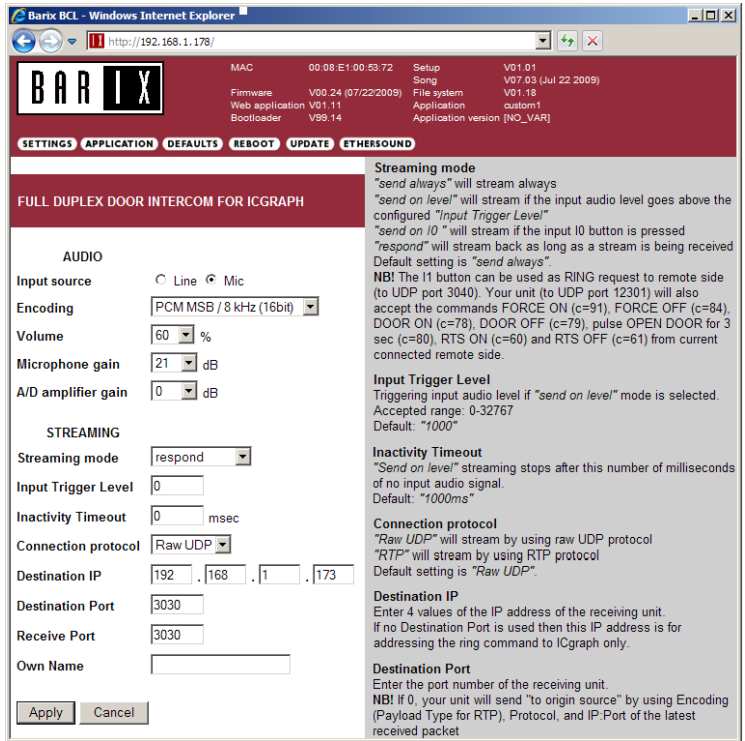


Then wait until a successful message appears. After the "successful" message reboot the Annunicom, few seconds later you can enter the Annunicom's home page again.

**Note**, it could happen that updating the Annunicom firmware resets the IP address. In this case please assign the IP address again!

If you have entered the ABCL configuration, then please check first the IP settings, select Application "Custom Application I (custom I)" and click on "Apply".

Thereafter you can use the "APPLICATION" button to enter the application menu.



The online help explains all available settings very clear.

The “Encoding”, “Connection protocol” must have the same settings as used in ICgraph (Main IC config).

As Streaming mode are available “send always”, “send on level”, “send on I0” and “respond”. “Respond” will only stream when there is also a incoming network stream, else it stops streaming immediately. For the most the installations the “respond” mode is probably the best option.

The input “I” is usable as “ring” button, if pressed it sends a “ring” - message to Destination IP.

When ICgraph is used in Multi-master mode then it’s recommended (see online help for details) to use the “Auto detect” mode. This mode can be activated when “Destination port” is set to 0 (zero). If Destination Port is set to 0 (zero) then also the RTP protocol must be used on this FDx-ICgraph ABCL software !

Annunicom with Standard Firmware (half-duplex only):

Use the following configuration in the Annunicom:

**Audio / Encoding Frequency** = MP3 , PCM or G.711  
(must be same as used in ICgraph)

**Audio / MP3 Bitreservoir Mode** = kept empty  
(important for MP3)

**Streaming / Own Name** = .....  
(only required when discovering is used)

**Streaming / Mode** = "send on Talk" (for the most the best)  
or "Send on Level" or "auto answer"

**Streaming / Non MP3 Packet Size** = 500  
(only important for G.711 8khz !)

**Streaming / Stream Packet Strategy** = lowest Latency  
(important for MP3)

**Streaming / Receive Timeout** = 200  
(important!)

**Streaming / UDP Receive Port** = 3030  
(e.g. , must the same as used in ICgraph configuration)

**Streaming / Stream to** = from table  
(**"origin Source"** recommended for Multi-Master mode)

**Streaming /Table I / #I** = RAW UDP : IP of ICgraph-PC :3030  
(port configurable in ICgraph.cfg)

**IO / IO push command** = c=91  
(important!)

**IO / IO release command** = c=84

**IO / II push command** = r="IP address of PC":3040/ring  
(e.g. r=192.168.1.20:3040/ring)

**IO / II release command** =

To start/stop to audio stream from the Annunicom to PC the Annunicom's IO button can be used or the ICgraph user can switch from talk to listen by double clicking the target button.

If a II button is connected on the Annunicom, then it can be used to send a Ring command (bell sound) to ICgraph. If the II button is then pressed a ring sound will be played on the ICgraph PC and the ICgraph Target button for this Annunicom will change the his colour (magenta) as optical notification. If Multi-Master configuration is used, then the notification will come on all masters.

For the Exstreamer (receive only, for announcements from ICgraph) :

To receive audio streams from ICgraph, the standard firmware or also the Streaming Client firmware can be used.

Standard firmware :

receiving **MP3 streams** from ICgraph on the following Ports :

"UDP Priority Streaming Listen Port" , "UDP Streaming Listen Port" or "RTP Receive Port"

For the "RTP Receive Port" or the "UDP Streaming Listen Port" the Exstreamer should be configured in **Mode = 4 Streaming Receiver** .

The "UDP Priority Streaming Listen Port" works in all modes in the Exstreamer configuration.

Please make sure that the same port number is not used two times in the Exstreamer setup!

If the Exstreamer should be used also for MP3 background music or any other MP3 streams then also ICgraph must send in MP3! The use two different codecs on the same unit is not recommended.

**For G.711** you should use the following configuration (requires minimum firmware va8.24).

**Mode = 4 Streaming Receiver**

**RTP Receiver Port = 3030** (as example, must be the same port number as used on ICgraph Point button)

Note, if G.711 is used on the Exstreamer then the it cannot listen any other MP3 applications!

Streaming Client firmware :

The Streaming Client firmware (version 2.17 or higher) can decode all possible ICgraph audio, but the RTP protocol must be used. Preferred setting should be to use the PRIORITY Port on the Exstreamer for the ICgraph audio stream.

Barix Instreamer with Standard Firmware (ICgraph listening only):

**Audio / Encoding Frequency** = MP3, PCM, G.711  
(must be same as used in ICgraph)

**Audio / MP3 Bitreservoir Mode** = kept empty  
(important for MP3)

**Streaming / Own Name** = .....  
(only required when discovering is used)

**Streaming / Stream Packet Strategy** = lowest Latency  
(important for MP3)

**Streaming / Stream to** = RAW UDP or RTP : IP address : Port  
number

### 3 How to use ICgraph

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When everything is installed and configured then start the "ICgraph.bat" (on Windows PCs ) which is also located in the ICgraph folder. Two windows are opening now, both are needed.

The black command window you should minimize to the task bar.

**Note**, when you create a shortcut for the ICgraph.bat on your desktop, then you can assign in the properties "Run : minimized", this will load the black window automatically to the task bar !

The ICgraph.jar application file can also started directly (without batch file) on the most PCs, in this case no command prompt window will be opened.

To get any audio communication working - press the "Start voice" button. The button colour is thereafter changing to yellow and is labelled then "Stop voice"! Only when "Start Voice" is pressed you can make any communication !

#### Yellow & green (static) target button :



If you click now on any point / target button then it changes the colour to yellow. Yellow target button means open communication. If a full-duplex firmware is used in the Annunicom then you can speak and listen now.

If the standard firmware is used in the Annunicom then it is working only half duplex, what means when one is speaking then the other can only listen.

To turnaround the communication make the double click on the yellow target button and it will change the colour to green (static), now the Annunicom can speak and ICgraph is listening.

To turn to speak again make a double click on the green button. Also the I0 button connected on the Annunicom can be used to change the communication direction. Note, deactivating a point button works only in yellow state, not from green state !

Green blinking target button :

It's a visual notification that ICgraph is currently receiving data or a stream from this point/target, but you cannot hear it because the channel is not selected. Click on the blinking target button (colour changes to yellow) and the incoming stream is audibly on the PC, if desired. Green blinking stops automatically when remote device stops sending.

Magenta (blinking / static) target button :



A magenta blinking button is a notification for a incoming ring. If not disabled then you should hear also the ring sound on the PC (moreover, this sound can be tuned individually for each point, if needed). The button blinks 3 times, thereafter only the name of the button remains in magenta. Using double-click on the target button, "Door open", "Remote Voice start/stop" or "Clear all" will reset to normal colour.

It is also possible to select multiple target buttons for outgoing streams at the same time, but make sure they do not answer all, otherwise the incoming audio is stuttering .

For the use of a "new active" message buttons one or more targets buttons must be selected before. The command behind message button is sent to selected targets then. This works also if "Start voice" is inactive!

Red button (static) :



Happens only in Multi-Master mode. When the red colour appears on a target button then the device is busy and used from another master (also red displayed). No other activity will work in this state with this target (no voice, no message button) .

## Keyboard control

ICgraph is designed to control it via mouse or mouse-less via touch panel ,but also the control over keyboard possible.

- previously press Start Voice button (then use the usual system means – move focus by TAB and select by SPACE)
- with TAB set focus to any point button (for graphical control) or into Table or Event window (for table control)
- the following buttons can be used for operation control:
  - **ESC** instead Clear button
  - **ENTER** instead the first message button (e.g. Open Door)
  - **SPACE** instead one mouse click (passive/active)
  - **double SPACE** instead double click (listen/force talk)
  - **arrows UP/DOWN** to move focus from point to point
- additionally, if there are no already active or ringed points, for graphical control the focus will be automatically moved to just now ringed point button
- to close ICgraph use standard **ALT-F4**

## 4 ICgraph configuration :

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ICgraph has two options for configuration available, there is a menu bar when you click with the right mouse button into the background of the ICgraph application (not on a button!) or you can modify the ICgraph.cfg file by using any editor (e.g. notepad).

### 4.1 ICgraph menu

The picture on the left side shows the menu bar. With this menu almost all parameters can be set. This allows to create new windows/buttons /labels or modifying/deleting existing items!

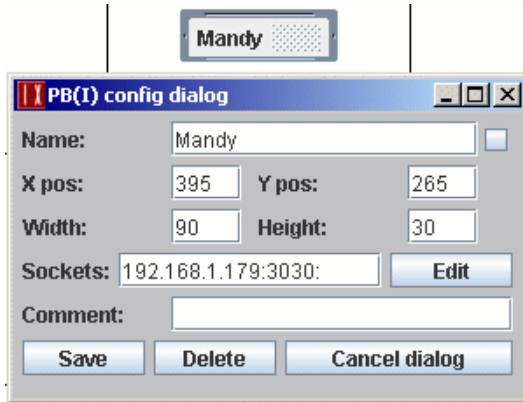


There you can select the item group .

Here see/select existing items / buttons of the selected group. Click on an existing item to modify or delete.

There you can create new items / buttons in this group.

When any item is selected then a dialog box for this item opens. Here can be defined parameters settings for selected item. The selected item (e.g. button) is marked/inverted also on the ICgraph GUI so you know which item you have currently in work.



When a item is marked (and config dialog box is open) then you can also move (and relocate) the marked item or resize it by mouse drawing. You should see then that the position values in the config dialog box are changing automatically .

The very most of the parameters are configurable so very comfortable. To get the new values active, save the new values and restart ICgraph.

**Note!** If a password is set in the IC line (only in ICgraph.cfg possible) then the config menu bar is disabled / removed. Password "0" (zero) disables also the menu without activating the password function .

## Main IC config:

Here define the environment for the ICgraph application:

<b>Map File</b>	background picture (if available), when empty then grey background
<b>Ring File</b>	played on PC at incoming ring requests, must be WAV or MP3 file
<b>Form Width/Height</b>	if 0 then size of the selected background JPG file is used
<b>Audio (codec) and Protocol</b>	settings depending from settings in used remote devices, must be the same
<b>Voice Port</b>	UDP port for incoming audio streams from remote Annunicoms
<b>Ring Port</b>	UDP port for incoming commands, e.g. ring command
<b>Discover,s</b>	feature to check existing Barix devices, use 0 to disable, see following section “Point Button”
<b>Command Port</b>	UDP port for outgoing commands, should be Barix UDP command port

Additional (and optional) can be configured by editing the ICgraph.cfg directly only:

Password (**if set, then no config menu!**) , Title (for ICgraph window), Command button colour

**Clear Button:**

Button is optionally and can be used to clear/close any open communication.

<b>Name</b>	name of the button, is displayed on the button
<b>Xpos / Ypos</b>	horizontal/vertical position of the button on ICgraph window
<b>Width / Height</b>	button size, a leading 0 on Width makes the button transparent
<b>Comment</b>	help / comment is displayed when the mouse points on the button

**Voice Button:**

Button is necessary when audio communication function is used in ICgraph !

<b>Name</b>	name of the button, is displayed on the button when not pressed
<b>Pressed Name</b>	this name is displayed when the button is pressed
<b>Xpos / Ypos</b>	horizontal/vertical position of the button on ICgraph window
<b>Width / Height</b>	button size, a leading 0 on Width makes the button transparent
<b>Comment</b>	help / comment is displayed when the mouse points on the button

**Mute Button:**

This optional button can turn off/on the PC's microphone (for communication to remote points) .

<b>Name</b>	name of the button, is displayed on the button when not pressed
<b>Pressed Name</b>	this name is displayed when the button is pressed
<b>Xpos / Ypos</b>	horizontal/vertical position of the button on ICgraph window
<b>Width / Height</b>	button size, a leading 0 on Width makes the button transparent
<b>Comment</b>	help / comment is displayed when the mouse points on the button

**Speaker Volume:**

Optional Volume slider to change the output volume on ICgraph application.

Works on the most PCs, but unfortunately not on all , then is has no function.

<b>Xpos / Ypos</b>	horizontal/vertical position of the slider on ICgraph window
<b>Width / Height</b>	size for the volume slider
<b>Comment</b>	help / comment is displayed when the mouse points on the slider

### Log Window:

Optional window for information about all activities on ICgraph, contains also informations about background activities and automated procedures .

<b>Font size</b>	select the size for the displayed information
<b>Xpos / Ypos</b>	horizontal/vertical position of the window on ICgraph window
<b>Width / Height</b>	size for the output window
<b>Text color</b>	select the colour for the displayed information
<b>Comment</b>	help / comment is displayed when the mouse points on the window

### Log Button:

Optional button can turn off/on the Log window, if no Log button exists then a defined Log window is permanently displayed.

<b>Name</b>	name of the button, is displayed on the button when not pressed
<b>Pressed Name</b>	this name is displayed when the button is pressed
<b>Xpos / Ypos</b>	horizontal/vertical position of the button on ICgraph window
<b>Width / Height</b>	button size, a leading 0 on Width makes the button transparent
<b>Comment</b>	help / comment is displayed when the mouse points on the button

### **Event Window:**

Optional Event window contains only information about current operations for the operator and all entries can be also selected from here by double-clicking instead of using the point buttons.

The use of this feature is recommended for larger installation with 50 ringing targets or more. So it is easier to retain the overview about tasks/activities or the sequence of rings.

<b>Font size</b>	select the size for the displayed information
<b>Xpos / Ypos</b>	horizontal/vertical position of the window in the ICgraph application
<b>Width / Height</b>	size for the output window
<b>Text color</b>	select the colour for the displayed information
<b>Comment</b>	help / comment is displayed when the mouse points on the window

### **Event Button:**

Optional button can turn off/on the Event window, if no Event button exists then a defined Event window is permanently displayed.

<b>Name</b>	name of the button, is displayed on the button
<b>Pressed Name</b>	is displayed when the button is pressed
<b>Xpos / Ypos</b>	horizontal/vertical position of the button on ICgraph window
<b>Width / Height</b>	button size, a leading 0 on Width makes the button transparent
<b>Comment</b>	help / comment is displayed when the PC mouse points on the button

### Table Window:

This is an optional feature, you can use it instead or also together with the graphical interface. It lists all available points/targets in a table form with the status behind.

If the point buttons are not needed then make them invisible by assigning the size 0 to the button or a unused place of the application, e.g. *PB:Door2:0:0:0:0:192.168.1.177:3030:*

The "Table view" example (see page 77) shows a simple table view configuration. Copy it into the ICgraph folder to activate it.

<b>Font size</b>	select the size for the displayed information
<b>Xpos / Ypos</b>	horizontal/vertical position of the window in the ICgraph application
<b>Width / Height</b>	size for the output window
<b>Text color</b>	select the colour for the displayed information
<b>Comment</b>	help / comment is displayed when the mouse points on the window

### Table Button:

Optional button can turn off/on the Table window, if no Table button exists then a defined Table window is permanently displayed.

<b>Name</b>	name of the button, is displayed on the button when not pressed
<b>Pressed Name</b>	is displayed on the button when pressed
<b>Xpos / Ypos</b>	horizontal/vertical position of the button on ICgraph window

<b>Width / Height</b>	button size, a leading 0 on Width makes the button transparent
<b>Comment</b>	help / comment is displayed when the mouse points on the button

**Record Button:**

Optional button can turn off/on the integrated recording function. This function can record outgoing and incoming audio communication to the ICgraph program folder (subfolder “Records”).

**Note**, the recording function works only when the MP3 libraries are installed (see section “Installation”) !

All created files have MP3 format with time stamp and button name in the file name. The extension “\_S” at the end marks Stereo records for incoming & outgoing direction.

```
2008/07/01 15:58:31 [home ] S
2008/07/01 17:13:58 [all ] M
```

The extension “\_M” marks Mono records (outgoing only), such files can be sent also to remote targets for announcements. If the “Play window” function is used then recorded files can be selected from there to listen it on the PC or to stream it to selected targets/points (“\_M”-files only) by double-clicking it.

<b>Name</b>	name of the button, is displayed on the button
<b>Pressed Name</b>	is displayed when button is pressed
<b>Xpos / Ypos</b>	horizontal/vertical position of the button on ICgraph window
<b>Width / Height</b>	button size, a leading 0 on Width makes the button transparent
<b>Comment</b>	help / comment is displayed when the mouse points on the button

## Play Window:

Optional Play window shows live recorded (see Record Button) audio files and allows selecting the files. Double-clicking of one of the recorded files will play the MP3 file locally on ICgraph PC.

<b>Font size</b>	select the size for the displayed informations
<b>Xpos / Ypos</b>	horizontal/vertical position of the window in the ICgraph application
<b>Width / Height</b>	size for the output window
<b>Text color</b>	select the colour for the displayed information
<b>Comment</b>	help / comment is displayed when the mouse points on the window

There are two different file types, "...\_S" and "...\_M", please see section Record Button for details! Only files with extension "...\_M" (for Mono) files can be sent also to selected targets.

## Play Button:

Optional button can turn off/on the Play window, if no Play button exists then a defined Play window is permanently displayed.

<b>Name</b>	name of the button, is displayed on the button
<b>Pressed Name</b>	is displayed when button is pressed
<b>Xpos / Ypos</b>	horizontal/vertical position of the button on ICgraph window
<b>Width / Height</b>	button size, a leading 0 on Width makes the button transparent
<b>Comment</b>	help / comment is displayed when the mouse points on the button

**Announcement Button:**

Optional button can send/stream a pre-recorded audio file to dynamically selected targets! Note, only audio files in WAV or MP3 format can be used for announcements. The audio files must be in 16-bit in mono and have the same frequency as configured in ICgraph (IC line). If live-recorded ICgraph audio files are used then they must have an “.....\_M” extension. When MP3 files are used then the MP3 libraries are required, as described in section “Installation”. Audio files in stereo or with wrong frequency will be played locally on ICgraph-PC only.

<b>Name</b>	name of the button, is displayed on the button
<b>Pressed Name</b>	is displayed on the button when is pressed
<b>Xpos / Ypos</b>	horizontal/vertical position of the button on ICgraph window
<b>Width / Height</b>	button size, a leading 0 on Width makes the button transparent
<b>Announcement File</b>	select audio file (WMA or MP3) to stream/play
<b>Comment</b>	help / comment is displayed when the mouse touches the button

**Labels:**

Optional Labels can be used to describe some items in the ICgraph window or to display information from remote points.

<b>Name</b>	name of the button, is displayed on the button
<b>Font size</b>	define the size of displayed text, default is 12
<b>Xpos / Ypos</b>	horizontal/vertical position of the button on ICgraph window

<b>Width / Height</b>	button size, a leading 0 on Width makes the button transparent
<b>Text color</b>	define the colour of the displayed text, default is black
<b>Comment</b>	help / comment is displayed when the mouse points on the button

Possible are also dynamic labels which can display requested status information of any UDP controlled Barix device, e.g. the current played song of an Exstreamer or an input of a Barionet.

ICgraph can sort the incoming messages and will display only the defined information for the field. It can filter by IP address, own name or HTML information, or also by a combination of both.

The filter must be defined in the Name for the line. More details are available in the "Advanced User Section".

Over a Message Button (see following) a device can be periodically polled for status information and the dynamic label field can display these information.

For dynamic Labels you have to use in the "Name" field :

- "[IP]/[tag]" -> dynamic Label (by gotten reply)
- if IP is empty -> reply from any IP will be checked
- if IP is "name" -> fix or dynamic IP of point "name" will be used
- if tag is empty -> all one-line reply text will be shown
- if tag is "<HTML>" -> all multi-line reply text with HTML formatting
- if tag is "<xxxx>" -> one-line reply text between <xxxx> and </xxxx>
- else -> only one-line reply text after tag will be shown

## Message Button:

The optional Message Buttons can send UDP commands to Barix devices to control them. With such control commands any API commands (check technical documentation of the Barix device) can be sent to control or to check status information (see also dynamic Label).

The "local" Message Button can also start a local application on the PC (e.g. browser).

There are three types of Message buttons :

- \* new active                      will send UDP command to currently selected (active) targets/points.
- \* new direct                      will send the UDP command to a fix defined target
- \* new local                      does not send UDP message, but can start/open application on local PC

Examples (from IGgraph.cfg – see advanced user section):

*MB:Door Open:20:210:100:30:c=80::*  
(pulses Annunicom relay for 3 seconds)

*MB:Barionet state:600:718:90:45:setio,l:192.168.1.179:12301:*  
(change state of Barionet relay 1)

*MB:Settings:870:725:120:30:>/Programs/Internet Explorer/iexplore.exe <IP>::*  
(open Internet browser with WEB settings for point)



The different message button types are displayed in different colours (red,blue and black).

<b>Name</b>	name of the button, is displayed on the button
<b>Command</b>	command string is send when button is pressed
<b>Xpos / Ypos</b>	horizontal/vertical position of the button on ICgraph window
<b>Width / Height</b>	button size, a leading 0 on Width makes the button transparent
<b>Comment</b>	help / comment is displayed when the mouse points on the button
<b>Sockets</b>	target IP address & port number where to sent the command to
<b>Send Period</b>	optional – time in seconds when to repeat the command automatically
<b>Line</b>	instead of "Command", define here path to program on local PC

**NOTE**, an UDP command can contain every characters excepting the global delimiter (default ":"). If the ":" is needed in the UDP command (e.g. `s=cfg://1`) then you have to replace all delimiters in all ICgraph.cfg command lines with any other not existing character (e.g: " ^ ", but not " # "). Also hex strings can be sent, for that start the string with a leading " # ".

e.g.

`MB:Door Open:20:210:100:30:#48454c4c4f:`

This sends the string "HELLO".

## Point Buttons:

The optional Point Buttons define the targets / remote devices. A Point button can be a single device (new individual), a group of devices (new group) or another ICgraph Master PC .

<b>Name</b>	name of the button, is displayed on the button
<b>Xpos / Ypos</b>	horizontal/vertical position of the button on ICgraph window
<b>Width / Height</b>	button size, a leading 0 on Width makes the button transparent
<b>Sockets</b>	target IP address & port number the for audio stream
<b>Comment</b>	help / comment is displayed when the mouse points on the button

ICgraph has a "Discovering" function for Barix audio devices in the same network. To activate this function assign no IP address to the point button (PB), for example :

*PB:Door 1:650:400:50:30::3030:*

For successful discovering the "Name" (e.g. **Door 1**) in the PB line (in the ICgraph.cfg) must be the same (case sensitive) as in the Annunicom/In-/Exstreamer configuration under "Own name"!

The advantage of this solution is the use of dynamic IP addresses (e.g. DHCP) and the optical notification when a unit is not available or not more reachable over network.



Undiscovered units are marked with a dark grey target button without functionality. Discovered units have light grey button as normal Point buttons with a fix IP address.

ICgraph is also Multi-Master capable, for details check the Multi-Master section on the next pages .

## 4.2 Configuring ICgraph over ICgraph.cfg file

For experts editing the ICgraph.cfg file is often the faster option than using the Config menu.

The complete configuration file is human readable, it's in plain text and can be edited with any editor (e.g. notepad). If an ICgraph configuration is created "from zero" then you will miss the syntax description in your ICgraph.cfg, also it's not in right sequence as here in the following example.

The file looks very long but the very most are only help comments. Not needed functions you can out-comment or remove. Really required are only the "IC" and the "VB" (for communication) line.

The syntax of the command lines below are marked in blue.

The red lines are the description of the syntax. The active configuration is marked in bold!

Not needed commands or buttons can be outlined with "#" (marked as comment) at the beginning of the line. More details you can find in following chapter "Advanced User section".

Following is ICgraph.cfg file from the example screen shot on page 81 (Door Control and Communication):

```
#####  
# ICgraph main configuration:  
# IC:MF:W:H:AF[SR]:PR:LP:RP:DT:CP:RF:[PW:[TL:[BC:]]]  
# NB! if need, use ICx to set 'x' as new global delimiter instead '!'  
# MF is map file (jpg), if empty -> usual background  
# if MF exists and W=0 or H=0 -> the proper size by picture  
# AF is audio format, mono: P(PCM MSB,default)/F(PCM LSB)/U(uLAW)/A(aLAW)/M(MP3)  
# SR is sample rate, Hz: 8000,default/16000/22050/24000/32000/44100/48000  
# PR is sending protocol (receiving auto): U(UDP,default)/R(RTP)  
# LP is local voice UDP/RTP receiving port (default 3030)  
# RP is local ring port (default 3040 for UDP RING request)  
# DT is DISCOVER timeout (default 60 sec), if 0 -> disabled,  
# if DT > 0 -> sends DISCOVER requests and checks replies  
# if DT < 0 -> only checks replies (unit will be lost after 3*DT)  
# CP is remote command port (default 12301 for UDP commands)
```

```
# RF is ring file (wav or mp3), if empty -> no ring sound
# PW is optional startup password, if empty or 0 -> no password
# TL is optional title for customization, if empty -> "Barix graph Intercom"
# BC is optional command buttons color (RGB,R:16-23,G:8-15,B:0-7 bits)
IC:house.jpg:0:0:P8000:U:3030:3040::l 230l:ringin.wav::Barix ICgraph:
#####
# any element below can be commented by # -> will disappear
# [-] marker does any element as invisible with start
# [#] marker does any element Name as invisible
# N is element Name, must be unique for all ICgraph
# X,Y,W,H are coordinates and sizes of rectangle element
# if 0W, any element will be transparent in passive state
# N2 is optional alternative name in pressed/active state
# FS is optional font size for text in element (default 12)
# TC is optional text color (RGB,R:16-23,G:8-15,B:0-7 bits)
#####
# Clear button
# CB:[~][#]N:X:Y:W:H:[[:]]
CB:Clear All:20:70:100:30::
#####
# Voice & mUte buttons
# VB:[~][#]N:X:Y:W:H:N2:[:]
# UB:[~][#]N:X:Y:W:H:N2:[:]
VB:Start voice:20:30:100:30:Stop voice:: # start/stop voice mode
UB:Mute ON:20:110:100:30:Mute OFF:: # Mute ON/OFF
#####
# any element below can be commented by # -> will disappear
# [-] marker does any element as invisible with start
# [#] marker does any element Name as invisible
# N is element Name, must be unique for all ICgraph
# X,Y,W,H are coordinates and sizes of rectangle element
# if 0W, any element will be transparent in passive state
# N2 is optional alternative name in pressed/active state
# FS is optional font size for text in element (default 12)
# TC is optional text color (RGB,R:16-23,G:8-15,B:0-7 bits)
#####
# Speaker Volume slider
# SV:[~][#][N]:X:Y:W:H:[[:]]
# if W>H -> horizontal, else vertical slider
SV::20:150:100:10:: # current Speaker Volume
#####
# Log Button & Log Window
# LW::X:Y:W:H:[font size (default 12):[TC:]]
# LB:name:X:Y:W:H:name2 (pressed state):[:]
# if LB is absent -> LW is visible constantly
# TC is optional text color (RGB,R:16-23,G:8-15,B:0-7 bits)
LW::225:275:550:140::3355443: #
LB:Show LOG:13:313:110:30:Hide LOG:: # show/hide Log Window
```

```
#####  
# Event Button & Event Window  
# EW:[~][#][N]:X:Y:W:H:[FS:[TC:]]  
# EB:[~][#][N]:X:Y:W:H:N2:[~]  
# if EB is absent -> EW is visible constantly (if no ~)  
EW::225:275:520:140:18:3355443: #  
EB:Show events:13:351:110:30:Hide events::  
#####  
# Table Button & Table Window  
# TW:[~][#][N]:X:Y:W:H:[FS:[TC:]]  
# TB:[~][#][N]:X:Y:W:H:N2:[~]  
# if TB is absent -> TW is visible constantly (if no ~)  
#TW::225:275:520:100:20:255: #  
#TB:Show table:10:330:0120:30:Hide table: # show/hide Table View  
#####  
# Record Button  
# RB:[~][#][N]:X:Y:W:H:N2:[~]  
RB:Start record:13:389:110:30:Stop record::  
#####  
# Play Button & Play Window  
# YW:[~][#][N]:X:Y:W:H:[FS:[TC:]]  
# YB:[~][#][N]:X:Y:W:H:N2:[~]  
# if YB is absent -> YW is visible constantly (if no ~)  
YW::225:275:550:140:20:: #  
YB:Show records:12:427:114:30:Hide records:: # show/hide Records Table  
#####  
# Announcement/Playing Buttons  
# AB:[~][#][N]:X:Y:W:H:N2:AF:  
# AF is path to audio file, for playing -> any audio format,  
# for announcement -> only MONO with proper sample rate accepted  
# AB:Announcement:13:465:110:30:Stop ANN:barix.wav:  
#####  
# Labels  
# LL:[~][#][N]:X:Y:W:H:[FS:[TC:]]  
# if name has ".jpg|.gif" extention -> graphical Label from the file  
# if name is "[IP]/[tag]" -> dynamic Label (by gotten reply)  
# if IP is empty -> reply from any IP will be checked  
# if IP is "name" -> fix or dyn IP of point "name" will be used  
# if tag is empty -> all one-line reply text will be shown  
# if tag is "<HTML>" -> all multi-line reply text with HTML formatting  
# if tag is "<xxxx>" -> one-line reply text between <xxxx> and </xxxx>  
# else -> only one-line reply text after "tag" will be shown  
LL:Door Control & Communication:200:15:0450:33:29:6684927:  
LL:Volume:45:165:050:12:: #current Volume settings  
LL:(c) Barix, 2010:24:514:090:20::0: # Barix copyrights  
#####  
# Messages buttons (can have some IP items for direct commands)  
# MB:[~][#][N]:X:Y:W:H:[>#]text command:[IP1:port1:[IP2:port2:]...[SP:]]
```

```
# [>] marker is used to execute local command in this OS, where
# also possible substitutions <NAME> and <IP> for active points
# [#] marker converts HEX to binary command, where also possible
# substitutions <ID> and <BM> for own ID and active points Bitmap
# optional IP items are used for direct commands (without points)
# if IPx is "name" -> fix or dyn IP of point "name" will be used
# if an optional port is empty -> CP will be used
# SP is optional sending period, sec, if 0 or empty -> disable
MB:Door Open:20:210:100:30:c=80:: # Open door
# MB:Light on/off:20:330:100:30:setio,1,999:192.168.1.179:12301:
MB:Settings:20:250:110:30:>/Program files/Internet Explorer/iexplore.exe <IP>::
#####
# Points buttons (each can be with some IP items for group)
# PB:[~][#][*]N:X:Y:W:H:IP1:port1:[IP2:port2:]...[[+|-]ring file:]
# [*] asterisk is used for Operator points in Multi Master Mode
# if name has "=N" extention -> BARP ID number is N (1-1024)
# Please, set individual IP points before group IP points!
# if IPx is empty -> dynamic IP will be gotten from "name" unit
# if IPx is "name" -> fix or dyn IP of previous "name" will be used
# if portx is empty -> port of "name" (else LP) will be used
# optional ring file for the point, if empty -> no sound
# if optional ring file is absent -> RF will be used
# [+|-] optional RING action -> to make active/passive
PB:Meeting room:710:85:90:45:192.168.1.178:3030:
PB:Door 1:150:195:76:40:192.168.1.176:3030: # Front door
PB:Door 2:757:448:74:40:192.168.1.177:3030: # Back door
# PB:*Master 1:315:505:90:30:192.168.1.173:3030: # Master operator
# PB:*Master 2:462:505:90:30:192.168.1.172:3030: # Master operator
# PB:all:145:505:060:30:192.168.1.255:3030: # speak to all
#### End of configuration #####
```

There is no limitation for the number of buttons or targets/points on ICgraph.

As background picture any picture in JPG format can be used. If desired, created your own background picture in JPG format with any graphic program, e.g. Paint in Windows XP. When no background picture is used then the size of the application should be defined (in the "IC" parameter line) otherwise you have it always to enlarge the application window after startup.

The buttons must be not contained in the background picture, they are configured in the Icgraph.cfg or over the menu! All buttons a can be defined also transparent or invisible.

When the ICgraph.cfg is changed then the ICgraph application must be restarted to get the new changes active!

**Note**, each button name (e.g. message or point) must be unique in the Icgraph.cfg , otherwise the application will perhaps not properly work !

There is also a "quick info" feature which gets active when the mouse arrow points on any button. The quick info text you can add for each button behind the button configuration line after the "#", e.g. :

*MB:Open Door:20:160:100:30:c=80: # Opens door for 3 sec*  
(the end of the "quick info" requires no delimiter !)

When the PC mouse is touching this button, then automatically the "quick info" field with the information "Opens door for 3 sec" appears. Each button can have a own quick info.

If you will use another existing example then copy all files from the desired example sub folder in the main program directory.

## 4.3 Password

The password protection (configurable in the "IC" parameter line in Icgraph.cfg file directly) is surely only very simple and no hard protection against hackers or similar. To increase the security you can hide the ICgraph.cfg or make this file inaccessible for others.

If no password is set, then the config menu is available by clicking with the right mouse button on the applications background. Any password or "0" disables the config menu.

## 4.4 Log file function

If ICgraph is started over the batch file it will log every activity on the application in the ICgraph.log . Per default this log file is renewed / deleted by reopening the ICgraph application.

To disable the function “Log to file” change the command in the ICgraph.bat to :

```
java -jar ICgraph.jar
```

Alternatively start the ICgraph.jar file directly without batch file.

To append (instead of deleting) new log entries to the LOG file by restarting ICgraph, change the start command in the ICgraph.bat to :

```
java -jar ICgraph.jar >>ICgraph.log
```

If multiple PC users should access the same ICgraph folder from a network share, then you have to disable the LOG file or to create for each user a separate BAT file with a separate LOG file.

Multiple users cannot access the same LOG file at the same time.

## 4.5 Multi-Master function

ICgraph can work also in a Multi-Master mode, means all the Annunicoms can be controlled from two or more ICgraph PCs.

If one of the masters is communicating with an Annunicom or Exstreamer, then the target button for this device is marked in red on all other masters, so they can see that this device is in use by any other ICgraph Master-PC. For all other masters the red target is not usable for any activities.

All Masters must be defined in the ICgraph.cfg in the Point Buttons (PB) section, they must be marked with a "\*" at the beginning of the button name , e.g. :

PB:\*Master1:20:600:100:30:192.168.1.172:3030:



If you use ICgraph in the Multi-Master mode then you have to make sure that also the Annunicom devices uses a dynamic mode (e.g. origin source), that it can respond to each master!

On the Annunicom standard firmware you have a feature "**origin source**", on the ICgraph ABCL Full-duplex software is "**Destination Port = 0**" according to "origin source" setting!

If you will use the ring button on the Annunicom, then you should define for the ring the IP address of one of the masters, this master will receive the ring and forward the information to all other masters.

The ring sound/notification will appear on all masters. When this ring request is answered by one of the masters, the target button resets automatically to normal state on all masters.

All masters are exchanging status information over their "Ring Port" (per default UDP Port 3040).

Note, by using the dynamic modes on the Annunicom, the message buttons are working only after communication!  
Opening the door directly after incoming ring will not work !

If you use the LOG file function and you start the ICgraph from a shared network folder then it needs multiple batch files (one for each master) to start to the application. Each PC needs to write in his own log file.

In that case create new ICgraphI.bat which writes to another log file (e.g. ICgraphI.log).

Otherwise the application on the second PC will not start, because both PCs cannot write the same log file at the same time! Or disable the LOG file function (see section 4.4).

Voice communication between the Master-PCs is also possible.

## 4.6 Auto-Discovering Mode

ICgraph allows to discover Barix devices in the local network. Over the point button colour the status of the device can be checked. If ICgraph discovers a device in the local network then the colour of this point button will change from dark grey to light grey.

necessary settings to activate Auto-discovering mode :

- make sure a DT value (Discover time) is set in the IC line, default is 30 seconds
- the button name of the Point buttons must match the "Own Name" in the device's web setup
- the Point button (PB) should not contain an IP address, the IP addresses will be learned automatically by the response of the devices

## 4.7 Announcement of pre-recorded audio files

When a pre-recorded audio file is sent to the Barix audio device, then it's played on ICgraph locally and on the selected Barix devices. But when the audio file has the wrong format, then it will be played only locally on the ICgraph PC, and not on the Barix device . The correct format for the audio file is :

- WAV or MP3 format (MP3 format needs MP3 libraries)
- mono (!)
- same frequency as used in IC line (!) , means when there is defined e.g. :

*IC::0:0:P24000:R:3030:3040::12301:ringin.wav:::*

**Then the audio file must be recorded in 24000 Hz mono !**

## 4.8 Work with incoming network messages

Incoming network messages could be displayed in ICgraph (e.g. over dynamic labels) or could be used in macros to activate those. For both it is senseful to activate general tracking of incoming network messages by the following config line :

```
LL://0:0:0:0:
```

Note, this is not necessary for the normal RING procedure !

When this config line is used, then ICgraph can e.g. poll devices with a command (MB button) and display (dynamic labels) response

e.g.

```
MB:Input 1:0:0:0:getio,201:192.168.1.25:12301:10:
```

```
LL:/192.168.1.25/state,201,:50:100:30:30:
```

The MB button above is requesting the Barionet status of Input 1 every 10 seconds, the response (e.g. state,201,x) behind "state,201," will be displayed in ICgraph window.

## 4.9 Migration from the oldest to newer ICgraph version

The latest version 2.02 has no changes to the previous version 1.46 ! But there were some changes from the very first ICgraph version to ICgraph version 1.46 in the configuration syntax. This means the ICgraph.cfg file from earliest ICgraph versions is not compatible with the current version. Here are the steps to get your old ICgraph.cfg file in the new version working :

- PTT Button is now Voice Button called

e.g. old: **PB:Start voice:20:100:100:30:Stop voice:**

new: **VB:Start voice:20:100:100:30:Stop voice:**

- Point Buttons are starting now with PB, please add "PB:" at the begin of each Point Button

e.g. old : *Door1:150:195:76:40:192.168.1.176:3030:*

new : **PB:***Door1:150:195:76:40:192.168.1.176:3030:*

- Audio Format in IC -line changed, e.g.:

old

*IC:House.jpg:0:0:P:U:3030:3040::12301:ring.wav::Barix Icgraph:*

new

*IC:house.jpg:0:0:**P8000**:U:3030:3040::12301:ring.wav::Barix Icgraph:*

Also the button style has changed a little bit, so maybe it needs also some cosmetic changes.

Because of a new design mask (was necessary to get MAC compatible) the style and the size of the buttons/points is little bit different.

The recording function was changed in the version 1.46, the oldest version could record only in WAV format. The version 1.46 and newer record now only in MP3 format (also if any other audio format is selected in IC line) to save hard disk space. For that reason the MP3 libraries (see section "Installation") are definitively necessary, when the recording feature is used !

## 5 Advanced User section:

---

The ICgraph program file is the ICgraph.jar. When this is starting, it checks for the ICgraph configuration file, the ICgraph.cfg. If there is no ICgraph.cfg existing it will open a blank window. By using the ICgraph config menu it will create an ICgraph.cfg file and add entries according to the setup. Over the ICgraph setup menu can be used approximately 90 percent of the features. All features (e.g. also password and macro) are only available by editing the ICgraph.cfg file directly.

For professional users editing the ICgraph.cfg file directly could be the most effective way. In this case the lines in the config file can be written in the right sequence for a better overview, otherwise they are unordered (when menu is used).

The following section describes the syntax in the ICgraph.cfg and gives more details.

### 5.1 Icgraph.cfg

#### ICgraph main configuration:

```
# IC:MF:W:H:AF[SR]:PR:LP:RP:DT:CP:RF:[PW:[TL:[BC:]]]
```

*# NB! if need, use ICx to set 'x' as new global delimiter instead ':'*

This line describes the main general parameters of ICgraph at all, starts always with prefix "IC", and has the fixed syntax (blue colour line above). Call your attention that a global ICgraph delimiter (default ":" ) is not fixed. You can use any another char if need, but you must be sure that this delimiter will not be used inside any ICgraph parameter later. So, ICgraph will recognize automatically the character after "IC" prefix as the new global delimiter for the complete CFG file.

Also you can see that some parameters and delimiters are enclosed by square brackets – it means that you can omit these values as optional. Almost all other parameters in CFG file also

can be omitted (then ICgraph will use the default values) but the proper delimiters must be left!

*# MF is map file (jpg), if empty -> usual background*

*# if MF exists and W=0 or H=0 -> the proper size by picture*

The map file is a picture (usually in JPG format) that ICgraph uses as background from the left top corner of window. When this parameter is omitted the ICgraph just uses a light gray background colour. The parameters W (width) and H (height) are usually obligatory and give the ICgraph window size on the screen, however if one (or both) size is zero, ICgraph will automatically use the proper size of given picture (or collapsed window if a map file is absent). At last, when a size parameter is omitted, then ICgraph will use default size 300 pixels instead. ICgraph does not scroll a picture when the size is more than the given window or even screen – it's in your responsibility to fit a proper picture size in advance for your project.

*# AF is audio format, mono: P(PCM MSB,default)/F(PCM LSB)/U(uLAW)/A(aLAW)/M(MP3)*

*# SR is sample rate, Hz: 8000/16000/22050/24000/32000/44100/48000*

The audio format and sample rate you can define over right mouse button menu but it allows using only the main encoding formats of Barix devices. In the Icgraph.cfg file is allowed to use considerably more variants that you can use also for other tasks, for example, in VoIP system. However ICgraph always uses mono audio format because it is intercom and paging system firstly.

*# PR is sending protocol (receiving auto): U(UDP,default)/R(RTP)*

*# LP is local voice UDP/RTP receiving port (default 3030)*

*# RP is local ring port (default 3040 for UDP RING request)*

The ICgraph can use raw UDP and RTP protocols for unicast, broadcast, and multicast (for paging) sending audio packages. With voice stream receiving the ICgraph automatically

recognizes the protocol of packages gotten on local voice port (default 3030 if omitted). Also the ICgraph can catch the control UDP messages gotten on local "ring" port (default 3040 if omitted). The ICgraph uses this port for getting:

- acknowledge and discover messages from Barix devices
- mutual status and sync messages in ICgraph Multi-Master mode
- reply messages from Barix devices for ICgraph dynamic labels
- secret macro commands from remote operators or devices
- DOOR RING requests from Barix Annunicoms

*# DT is DISCOVER timeout (default 60 sec), if 0 -> disabled,*

*# if DT > 0 -> sends DISCOVER requests and checks replies*

*# if DT < 0 -> only checks replies (unit will be lost after 3\*DT)*

This parameter defines the behavior of ICgraph with discovering Barix devices , it allows automatically to recognize the devices with dynamic IPs and to watch their live status on-line in network. If this value (default 60 sec) is more than zero, the ICgraph sends the broadcast discover requests (c=65535) within this period and checks incoming replies to identify by name the Barix Annunicoms, Exstreamers and Instreamers. If a device does not reply for more than three times of these value, the status is changed to dead. Alive or dead status is shown on screen. If this value is less than zero, then ICgraph does not send the broadcast discover requests, but checks the proper "replies" all the same. It allows discovering the active Barix devices that send these "replies" themselves even if they are out of this local network. Beside that the same discover method also is used for Barix devices with Paging Client SW that send the BARP paging status messages to paging status port (see below).

*# CP is remote command port (default 12301 for UDP commands)*

The remote command port is a UDP port (usually 12301) that the Barix devices use for getting remote command from ICgraph

or another operator. For example, ICgraph sends to this port the mentioned broadcast discover request or command "OPEN DOOR for 3 sec" (c=80), etc.

*# RF is ring file (wav or mp3 w/o header), if empty -> no ring sound*

The ring file is proper sound file that ICgraph will play (with getting DOOR RING request on local "ring" port) together with magenta colour notification for proper device point button. Usually it is normal WAV file. If you want to use MP3 file, you must have installed the proper MP3 extension libraries. If this parameter is omitted, ICgraph will play no sound on DOOR RING request at all.

*# PW is optional startup password, if empty or 0 -> no password*

The optional startup password is open text in CFG file and not really secret protection – it only blocks accidental start from shortcut (of course, to increase the security you can hide the CFG file or make this file inaccessible for others by OS means). If the password is omitted, the ICgraph will start without password protection at all. If the password is set, the ICgraph will wait for 10 sec the correct password, else it will exit. Also if the password is set, the right mouse button menu cannot be used for configuration (only for Restart and Exit). The special case is if the password is "0" – then no password protection, but the right mouse button menu cannot be used for configuration too.

*# TL is optional title for customization, if empty -> "Barix graph Intercom"*

The optional title you can use to show your own text as the ICgraph window title (for example, to show your project name). If it is omitted, the ICgraph will show the standard title "Barix graph Intercom". Also you can use for additional customization your own icon – just named "barix.jpg" and placed instead of the original Barix icon file in ICgraph directory. Beside that you can add your own data in LOG file by using own text instead "IC" line comment after "#" char (here is "comment to LOG with startup", see below).

*# BC is optional command buttons color (RGB,R:16-23,G:8-15,B:0-7 bits)*

This optional parameter sets a new general colour for command buttons in ICgraph. If it is omitted, the ICgraph uses default “metal” colour. To set a new RGB colour you should convert the decimal values (0 – 255) for Red, Green and Blue to general decimal value =  $(R*256+G)*256+B$ .

Here is example of ICgraph main configuration line:

*IC:map.jpg:952:697:U24000:R:3030:3040:30:12301:ringin.wav:: #comment for LOG file*

This config line means e.g.:

- background picture from file “map.jpg”
- window with width of 952 pixels and height of 697 pixels
- uLaw (G.711) 24 kHz audio format and RTP protocol for audio stream
- local voice port 3030 and local “ring” port 3040
- 30 sec period for broadcast sending to port 12301 of Barix devices the discover requests
- DOOR RING sound from file “ringin.wav”
- text “comment for LOG file” for customization output in LOG file/window at ICgraph startup

## General configuration rules and parameters in ICgraph.cfg

# any element below can be commented by # -> will disappear

Each ICgraph element is described by one line in CFG file. Generally the order of elements is free, but you should follow logic – if a new element configuration has reference to another element, then this element should be described before. Any element can be out-commented by “#” char in the first position of configuration line – after restart ICgraph will not use/display the out-commented element anymore.

# [~] marker makes any element as invisible with start

# [#] marker makes any element Name as invisible

# N is element Name, must be unique for all defined ICgraph items

The main parameter for any ICgraph element is Name! The Name must be unique in all ICgraph because other elements can use the Name of this element as reference. If needed, you can use the special optional markers before name:

- marker “~” will hide this element constantly or temporary, i.e. ICgraph will operate with this element as usual, but the element will be invisible – such element in future can become visible again by using the proper marker “=” in macro button (see below)
- marker “#” will hide only name of this element – it can be useful, for example, to locate transparent elements on map picture that already has all necessary decorations

Some ICgraph elements (volume slider, info windows) have optional names – you should use a name only if you are going to control visibility of these elements by macro buttons (see below).

At last, for any ICgraph element you can use the name with HTML formatting for multi-line output, specific colour or font, or other decoration. The same you can use also for optional alternative names and mouse point comments (see below).

*# X,Y,W,H are coordinates and sizes of rectangle element*

*# if 0W, any element will be transparent in passive state*

The coordinates (X,Y) and sizes (W,H) of rectangle area for a element always follow the element name. Also you can constantly hide the element by using zero values for width and height of the element. Beside that the leading zero before "width" value has a special sense – the element will be transparent in passive state, e.g. for viewing background picture.

*# N2 is optional alternative name in pressed/active state*

Some elements (toggle command buttons) can have this optional different name in the active state (usually shown with yellow background colour). If you want to use the same name, just repeat the element name in this parameter. If you want to hide the name in the active state, just leave this parameter empty.

*# FS is optional font size for text in element (default 12)*

*# TC is optional text colour (RGB,R:16-23,G:8-15,B:0-7 bits)*

Some elements (info windows) can use these optional parameters for additional decoration. You can tune the size of text and text colour as RGB value (see BC description above). If parameters are omitted, the ICgraph will use the default size 12 and black as foreground colour.

At last, for any ICgraph element you can use in the end of its CFG line the mouse point comment that starts after char "#" – The ICgraph will show this comment automatically when the mouse will shortly stop over this element.

According with logic, usually you should place the elements in following order:

- command buttons and windows
- point buttons (first individual points, then group points)
- message buttons and label elements
- macro buttons

## Command buttons and windows configuration in Icgraph.cfg

Most of the following examples are used from the contained “Marco + BARP DEMO” example.

### Clear button

```
# CB:[~][#]N:X:Y:W:H:[:]:]
```

```
CB:Clear All:10:10:0120:30:: # total clearing and disconnect
```

The Clear button allows very fast to restore the source passive state for all points and to stop intercom or page stream to Barix devices. This example shows the Clear button with name “**Clear All**”, proper coordinates and sizes, transparent, and mouse point comment “**total clearing and disconnect**”. It’s not recommended to use this button in Multi-Master mode !

### Voice & mUte buttons

```
# VB:[~][#]N:X:Y:W:H:N2:[:]
```

```
# UB:[~][#]N:X:Y:W:H:N2:[:]
```

```
VB:Start voice:10:50:0120:30:Stop voice:: # start/stop voice mode
```

```
UB:Mute ON: 10:90:0120:30:Mute OFF:: # Mute ON/OFF
```

These buttons are used for the standard intercom voice connection with active points. Usually for intercom mode the Voice button is constantly active and an operator switches real connections by mouse clicking on the necessary points. If need to switch own microphone OFF, an operator can press Mute button. Because these buttons are toggle buttons, you can use the alternative button name in active/pressed state.

## PaGe button (usually for BARP paging & control)

# PG:[~][#]N:X:Y:W:H:N2:Pr:IP:port\_a:port\_c:port\_s:

# Pr is BARP Priority parameter 0-255 (default 100)

# IP is multi/broadcast IP for audio/control/status (default broadcast)

# port\_a is target port for sending audio (default 5555)

# port\_c is target port for sending control (default 5556)

# port\_s is local port for receiving status (default 5557)

*PG:Start page:800:50:120:30:Stop page:200:..... # start/stop page*

This button / function is only required, when the special Barix Paging Client software is used on the Barix devices ! With Barix standard firmware or ICgraph ABCL application it is not necessary.

The Page button is used for supporting the paging mode of Barix devices with Paging Client Software according with the special BARP protocol. It allows sending the page audio stream to many Barix devices simultaneously by using multicast or broadcast and given priority. The parameters of Page button allow agreeing ICgraph paging with proper parameters of Barix devices in network.

ICgraph allows to configure the Voice and Page buttons simultaneously, but you can use them only alternate (if try to use both simultaneously, the Voice intercom mode will have priority) because they must use the same active points set. However theoretically it is possible to develop the combination of full duplex intercom SW and Paging Client SW on the same Barix devices and to use both modes in the same network simultaneously (especially in Multi-Master mode).

## Speaker Volume slider

```
# SV:[~][#][N]:X:Y:W:H:[[:]]
```

```
# if W>H -> horizontal, else vertical slider
```

```
SV::140:10:020:230:: # current Speaker Volume
```

The Speaker Volume slider allows changing the ICgraph output volume on-the-fly. Unfortunately this feature is HW and OS dependent, ICgraph usually sends message to Log if using the Speaker Volume slider is not possible. The slider allows not only changing the volume from ICgraph, but also shows the external volume changing from other PC applications, if exist.

## Log Button & Log Window

```
# LW:[~][#][N]:X:Y:W:H:[FS:[TC:]]
```

```
# LB:[~][#]N:X:Y:W:H:N2:[:]
```

```
# if LB is absent -> LW is visible constantly (if no ~)
```

```
LW::180:10:520:230::39168: #
```

```
LB:Show LOG:10:250:0120:30:Hide LOG:: # show/hide Log Window
```

Beside this Log window function all the Log output can be written also in a Log file (by console redirection in your OS, see chapter 4.4 Log file function). The LOG window will display all ICgraph activities (even background activities) with current time stamp on the fly. Log button controls visibility of Log window, although now you can use the macro button for it instead. If Log button is absent, the Log window will be shown constantly (if not marked with "~").

All written/displayed output in Log window or Log file can be used for automated macros, more details are in the following macro section.

## Event Button & Event Window

# *EW*:[~][#][N]:X:Y:W:H:[FS:[TC:]]

# *EB*:[~][#]N:X:Y:W:H:N2:[:]

# if *EB* is absent -> *EW* is visible constantly (if no ~)

*EW*::180:440:520:100:20:16711680: #

*EB*:Show events:10:290:0120:30:Hide events: # show/hide Event Table

This button and window you can use like previous for event control, the window shows on-the-fly the table of recent events with points. It allows seeing the time order of the latest events (voice and ring requests, changing operational mode, etc.) and to react properly and maximal fast directly over the event window.

## Table Button & Table Window

# *TW*:[~][#][N]:X:Y:W:H:[FS:[TC:]]

# *TB*:[~][#]N:X:Y:W:H:N2:[:]

# if *TB* is absent -> *TW* is visible constantly (if no ~)

*TW*::180:550:520:100:20:255: #

*TB*:Show table:10:330:0120:30:Hide table: # show/hide Table View

This button and window you can use like previous for table control, the window shows on-the-fly the table of points and allows to use table view instead or together with graphical view.

## Record Button

# *RB*:[~][#]N:X:Y:W:H:N2:[:]

*RB*:Start record:10:370:0120:30:Stop record: # start/stop talk recording...

The Record button is used to record the current conversation on-the-fly, just click this button for start of recording and then

again for finish. The ICgraph automatically saves the full-duplex (non-MP3 stream) conversation in Stereo MP3 file with proper sample rate in directory RECORDS with name YYYY\_MM\_DD\_hh\_mm\_ss\_[name]\_S.mp3, where “name” is name of active point for this conversation, and suffix “\_S” means that the file recorded as quasi Stereo – left channel for “ICgraph to point” direction, and right channel for “point to ICgraph” direction. However, if you select a group point (when obviously you use only one direction to notify) or use half-duplex (MP3 stream) conversation the ICgraph records only Mono MP3 file with suffix “\_M”. Such files you can be used for direct announcement to points too (see below).

**Note:** Call you attention that for saving your disk space this ICgraph version does not support recording to WAV format anymore (only to MP3 file). Therefore, if you want to use the recording feature then you must have installed the proper MP3 extension libraries (please see chapter „Installation“) !

## PlaY Button & PlaY Window

# YW:[~][#][N]:X:Y:W:H:[FS:[TC:]]

# YB:[~][#][N]:X:Y:W:H:N2:[:]

# if YB is absent -> YW is visible constantly (if no ~)

YW::180:245:520:100:20:: #

YB:Show records:10:410:0120:30:Hide records: # show/hide Records Table

This button and window you can use for direct access to files recorded by Record button (see above). Play button controls visibility of Play Window that shows the list of MP3 files in RECORDS directory. You can select any file and play it in ICgraph by mouse double-click. To stop playback before finish you can just select another file in this list or close Play window by clicking on Play button again (here this button will have at this moment the alternative optional name “Hide records”). If the played file is Mono and has the current ICgraph sample rate format, you can play this file in ICgraph and simultaneously send this audio stream to selected points in active Voice or Page mode as announcement.

## Announcement/Playing Buttons

# *AB:[~][#]N:X:Y:W:H:N2:AF:*

# *AF is path to audio file, for playing -> any audio format,*

# *for announcement -> only MONO with proper sample rate accepted*

*AB:Start ANN:10:450:0120:30:Stop ANN:barix.mp3: # play "Welcome to Barix"*

*AB:RING ON:10:490:0120:30:RING OFF:ringin.wav: # playing usual RING sound*

The Announcement/Playing buttons allow to play any WAV or MP3 files from any given place of your PC. You should just point the necessary path to the desirable file in configuration line. As soon as you click this button, ICgraph will play this file until you click the button again or file will finish itself (then the button automatically return to source passive state and name). When the played file is Mono (16-bit) and has the current ICgraph sample rate format (defined in IC line), you can play this file on ICgraph-PC and simultaneously send it as audio stream to selected points in active Voice or Page mode as announcement or pre-gong. ICgraph sends during playback the important info in Log, and you can check directly in Log the original file format, converted formats, availability of the file for announcement, etc. By using macro (see below) you can send the necessary announcements, voice commands or pre-saved directives to different points or group automatically.

## Points buttons

# *PB:[~][#][\*]N:X:Y:W:H:IP1:port1:[IP2:port2:]...[[+]-]ring file:*

# *[\*] asterisk is used for Operator points in Multi Master Mode*

# *if name has "=N" extension -> BARP ID number is N (1-1024)*

# *Please, set individual IP points before group IP points!*

The Point buttons are graphical equivalents of Barix devices. By common sense there are three main kinds of Point buttons:

- individual (a separate Barix device – Annunicom, Instreamer, Exstreamer, Barionet)

- master (any copy of ICgraph in Multi-Master mode)
- group (join point for some individual or master points together)

Formally all kinds of points are equivalent each other – ICgraph fulfills all actions for all points by the same way and generally you can use only individual points (especially by using macro buttons for grouping). Nevertheless the ICgraph uses the difference for some additional services , e.g. for exchanging status and sync messages between ICgraph operators (e.g. master points that have prefix "\*" before name). Also for supporting BARP protocol a point name can use suffix "=N" where N means an ID number of a Barix device.

Generally the order of points in CFG is free. But for decreasing ICgraph start time it is strongly recommended to use a logical order, e.g. to locate the individual points before the group points because the group points can use references to the individual points. Else ICgraph will try to recognize any such reference as external DNS name and spend the considerable time for it.

*# if IPx is empty -> dynamic IP will be gotten from "name" unit*

Usually it is possible only for the individual points that use the dynamical IP address from DHCP server (it's more comfortable for Administrator of bigger LANs and easier for possible replacement of Barix devices). ICgraph will automatically try to recognize such Barix devices by its "Own Name" / ID with using DISCOVER method or BARP status messages. Also an additional advantage is that you can see on-line status of all devices and react to a possible damage. If this field is not empty then ICgraph will try to recognize it as real IP. Therefore you can use also a DNS name . If ICgraph can get the real IP the point button will be shown as light gray or transparent, otherwise it's dark gray.

*# if IPx is "name" -> fix or dyn IP of previous "name" will be used*

It is possible only for the group points that use the names of individual points as references / aliases. The group point will be shown as recognized only when all aliases used in its CFG line are recognized by ICgraph.

*# if portx is empty -> port of "name" (else LP) will be used*

Usually for voice streaming to any Barix device of your LAN you use the same port (typically the LP from the main "IC" line, default 3030). However by your own reasons you can tune the local voice port of any point individually and send the stream to different ports. For example, it could allow decreasing traffic in a big LAN by using the broadcast stream from individual points to the specific ports for the specific groups instead using the group points that really send many unicast streams. Also theoretically you can write for Barix device an application that will receive the voice stream from several different ports and use it from one or some ICgraph for access to different names of the same physical Barix device. If you omitted the port parameter, the ICgraph will take automatically for group point the port of the proper individual point (by alias name) or, if this port is also omitted, the general LP port.

*# optional ring file for the point, if empty -> no sound*

*# if optional ring file is absent -> RF will be used*

*# [+/-] optional RING action -> to make active/passive*

Usually you use the same RING sound (RF from main CFG line) for any ring request. But for each point you also can use a specific sound (an optional ring file), then the operator will react automatically to the ring request by ear. If this parameter field is used but empty the sound for this point will not be played at all, e.g. by such way you can cancel RF parameter for specific individual point.

Beside that by using the prefix you can use the ring request to make the proper point automatically active (prefix "+") or passive (prefix "-"). For example, it can be useful if you would like to answer to this point automatically by ring request, then (when Voice mode is already active) such ring request will automatically activate this point and start voice conversation.

Or vice versa, you want to use the ICgraph in order to see and log who is late to job place – then (when firstly all points were selected and each person should press ring button on his device) you can see all truants at any moment.

Some examples:

*PB:home: 650:350:070:30:192.168.1.25:3030: # User 2*

This point is a typical Barix intercom device with own name “home” and fix IP address and port number.

*PB:work: 400:400:070:30:::notify.mp3: # User 1*

This point is similar as above but has a specific ring tone from file “notify.mp3”. Also it is using no IP address or port number, because it is using Discovering feature to detect the IP address.

*PB:\*ak50:750:450:070:30:192.168.1.50:: # Master Operator*

*PB:\*ak53:750:500:070:30:192.168.1.53:: # additional Operator*

These points are the master points – usually the master points have the fixed IP. The ICgraph automatically marks the own point as busy (red). Also when another operator talks with a point, the sync messages show this info on the screen of your ICgraph also as busy (red) for both. The similar sync messages also show the info about ring request activation/deactivation even when this request is gotten by another master. It allows each operator to see the same state of your intercom network and to act independently. Beside that, if needed, the operator can talk each other as with any another point and agree their actions. Call you attention that Multi-Master mode works correct only when all operators use the copies of the ICgraph with the same CFG file.

*PB:all: 650:400:070:30:home::work:: # home&work together*

This is a group point, practically using this point is the same as using macro (see below) for activation these individual points (“home” and “work”) together.

*PB:brcst:650:200:070:30:192.168.1.255:: # broadcast*

This formally individual point can be used as real “all group”

point by using the broadcast IP for this LAN. You can page your messages to all points by using usual Voice mode, because of the existing IP address setting the point is automatically recognized (transparent immediately).

*PB:INstr:650:250:070:30:: # Instreamer*

It is an usual point but you are going to use it for listening from Instreamer (mono only). The ICgraph must automatically discover the Barix Instreamer by own name "INstr", show that this device is accessible (transparent) and workable (green blinking), then you can activate this button (yellow) and listen the stream from Instreamer, however in such case ICgraph will work in full duplex mode and automatically send the useless voice stream to Instreamer, therefore it is better to double-click the point (green) and stop sending from ICgraph.

*PB:door=41: 650:300:070:30:: # Vernosti 48*

This point has suffix "=41", e.g. can be used in ICgraph Page mode. According with BARP protocol, when this point is active, the ICgraph in Page mode will send the special binary messages to target control port (port\_c) where it will mark the bit 41 in the point Bitmap field. The Paging Client SW on this Barix device will accept these messages and (if the current ICgraph page priority level is enough) to activate receiving the page stream on to the target audio port (port\_a).

## Message buttons

# *MB:[~][#]N:X:Y:W:H:[>#]text command:[IP1:port1:[IP2:port2:]...[SP:]*

The Message buttons are used to send a command to the Barix device or call a command line. The ICgraph uses the following variants of Message buttons:

- active (sends UDP message to all active points)
- direct (sends UDP message to the sockets specified in CFG line)
- local (calls the OS command line with parameters of the active point)

Formally the Message buttons of ICgraph you can use to control any Barix or other devices.

The advantage of Barix devices is that you can easy program them and agree the commands and replies in order to create the very complex system by easy means.

# *[>]* marker is used to execute local command in this OS, where

# also possible substitutions *<NAME>* and *<IP>* for active points

The marker ">" as start char of the text command means that it is the local Message button and the following message (text command) is the call of the command line for this OS. You can use in this command line two types of substitutions: the name and the IP address of the active point. If you have activated some points the calls will be fulfilled in series. Call you attention that generally you must close these call windows before exit from ICgraph at all.

# *[#]* marker converts HEX to binary command, where also possible

# substitutions *<ID>* and *<BM>* for own ID and active points Bitmap

The marker "#" as start char of the text command means that the following text is a hex string that ICgraph must convert to binary array and send as active or direct message. Usually it is

used for supporting the commands of BARP protocol. Therefore you can use here two specific BARP substitutions: the own ID number of the master point of this ICgraph (if known, else 2 zero bytes) and the point Bitmap field (1024 bits with set bits of the active points). However generally you can use the binary messages instead text messages anywhere (for example, by security reasons).

*# optional IP items are used for direct commands (without points)*

*# if IPx is "name" -> fix or dyn IP of point "name" will be used*

*# if an optional port is empty -> CP will be used*

*# SP is optional sending period, sec, if 0 or empty -> disable*

If after text command there is a list of sockets it is the direct Message button and this message will be sent directly to these sockets. You can use the fixed IP (including DNS names) or alias names of already mentioned Point buttons – obviously, the message will be sent really only if the proper IP is already resolved or recognized. Also if the port is omitted the ICgraph will use CP from the main CFG line (default 12301).

The direct message can be sent manually by clicking on this button, but also can be sent periodically and automatically if its CFG line has the optional sending period. Usually it is used for getting automatic replies from the Barix devices in order to control on-the-fly their status and to show it on the ICgraph application screen by using dynamical Labels (see below).

Some examples:

*MB:Open Door:10:130:0|20:30:c=80:*

This Message button sends the command (**c=80**) to all selected points / button (Annunicoms). "c=80" is open door/relay command.

*MB:Open Door:10:170:0|20:30:c=80:192.168.1.25:12301::*

But this Message button sends the same command only to Annunicom with defined IP address and port number.



## Labels

# *LL:[~][#]N:X:Y:W:H:[FS:[TC:]]*

The Labels are used to show on ICgraph screen any static or dynamic info. The ICgraph uses the following variants of Labels:

- static textual (shows a text in given place of screen)
- static graphical (shows a picture in given place of screen)
- dynamic textual (shows a text reply from Barix devices in given place of screen)

By default the Labels is a static textual – the ICgraph shows the name of Label as usual text in given place of screen with optional font size "FS" and foreground colour "TC". For example :

*LL:Schwenningen:710:10:0230:40:30:255: # map Title*

*LL:(c) Barix, 2007:10:630:0120:20::16711680: # Barix copyrights*

# if name has ".jpg|.gif" extension -> graphical Label from the file

However, if the name ends with JPG or GIF extension, the ICgraph understands it as path to the graphical file and automatically shows this picture in given place of screen. The ICgraph shows the graphical file "as is" without resizing; therefore you should fit yourself the Label and picture sizes.

For example here:

*LL:door\_closed.gif:140:570:030:30::: # current state picture - closed door*

*LL:~door\_opened.gif:140:570:030:30::: # current state picture - opened door*

*LL:~ak.jpg:0:0:1000:1000::: # ak*

```
# if name is "/[IP]/[tag]" -> dynamic Label (by gotten reply)
# if IP is empty -> reply from any IP will be checked
# if IP is "name" -> fix or dyn IP of point "name" will be used
# if tag is empty -> all one-line reply text will be shown
# if tag is "<HTML>" -> all multi-line reply text with HTML formatting
# if tag is "<xxxx>" -> one-line reply text between <xxxx> and </xxxx>
# else -> only one-line reply text after "tag" will be shown
```

If the name of Label starts with slash char “/” the ICgraph understands it as dynamic Label and will check all non-standard messages gotten on ring or BARP status port on matching the conditions given in CFG line. The name of dynamic Label can include two optional fields: IP of remote Barix device and (after next obligatory slash char) the search text tag. As usually the IP can be replaced by proper point name . The proper IP will be used automatically after the point will be resolved or recognized.

If IP in CFG line is omitted then ICgraph will check for this Label the message from any remote Barix device, else it will pass only the message from the given IP. Call you attention that if this remote Barix device should be recognized by discover or BARP status method and will be lost, the ICgraph will automatically clean the dynamic Labels with proper IP.

If the search text tag is omitted then ICgraph will output all gotten one-line message into this Label. If it is necessary to output the multi-line message, you should use the “<HTML>” tag. Then ICgraph will automatically add the start (<html>) and end (</html>) tags, and insert new line tag (<br>) after each line of the gotten multi-line message, for example:

**LL:/home/<HTML>:730:50:200:290::**

Generally speaking, if it is necessary to output the message with specific format, you should program the remote Barix device to send the message with proper HTML formatting (then you can use empty tag here – ICgraph will automatically recognize HTML format and display the proper output).

If the search text **tag** is enclosed by angle brackets the ICgraph will search in the gotten message and output the text between the XML tags: **<tag>** and **</tag>**. It can be useful if you must select the specific part from a big XML info string, for example:

```
MB:<html>Get State for<br>Exstreamer</html>:800:60:120:60:L=getstate.ack:home::20:  
LL:/home/<SONG>:730:350:200:30::: # dynamic Label
```

These two CFG lines allow to send each **20** seconds the status requests to Exstreamer with name "home", select from Exstreamer reply the current song between tags **<SONG>** and **</SONG>**, and output it in this dynamic Label.

If the tag is just usual search text, ICgraph will search in the gotten message this text and output all one-line text after this tag, for example:

```
MB:Relay status:600:720:140:30:getio,l:192.168.1.55:12301::  
LL:/192.168.1.55/,l:,400:720:150:30::0:
```

On getting the request "getio,l", the Barionet will send reply "state,l,0" or "state,l,1". Therefore, after the search text ",l," the Label will find and output the necessary Relay status line: "0" or "1".

At last, if both parameters (IP and tag) are omitted, you can catch all messages from all remote Barix devices (including the DOOR RING requests from Barix Annunicoms), for example:

```
#LL://0:0:0:0: #total LOG for all replies
```

Such dynamic Label outputs nothing, but all remote messages will be printed in ICgraph Log. It allow using the very powerful means of ICgraph macro. By catching in Log the given text you can create instead standard reaction any special reaction by starting the proper Macro button.

## Macro function

ICgraph offers also an Macro function, this can be use to combine any activities or change the design of ICgraph. Macros cannot be changed/created over the menu, Macros can be created/edited only in the ICgraph.cfg file!

The Macro buttons allow using the macro sequences that can imitate the operator actions, control visibility and activity of ICgraph elements or changing some parameters of these elements on-the-fly. They can be used to combine any activities or change the design of ICgraph. As any buttons the Macro buttons can start by mouse clicking, but also they can start automatically by event when the proper search text will be found in ICgraph Log. Typically the Log text has time stamp and short text description of internal ICgraph events, actions of operator, and caught external UDP messages. Therefore you can create any macro reaction for any ICgraph event that you can see in Log, for example:

- create scheduled macro by using the time stamp from Log string
- use a keyword (IP, name, file, etc) in standard Log for proper ICgraph action/reaction
- create secret reaction for specific string sent by UDP from another or the same PC, etc

To change the ICgraph design the following operators are available :

- = makes an element visible
- ~ makes an element invisible
- + activates a Point button (yellow state)
- deactivates a Point button (light grey state)

These markers control visibility and activity of ICgraph elements, they set this new state independently on previous state.

Sometimes, in order to be sure in initial state of the elements you should use these markers before start of your main macro sequence.

```
# XB:[~][#]N:X:Y:W:H:event:[=|-|+|-|#]name1:[[=|-|+|-|#]name2:]...
```

# event is LOG text that will call this macro automatically

Here are some simple examples :

>> to bring a point button into the listening (green) state

e.g. *XB:listening Joe:20:20:1 20:25::+Joe:Joe:Joe:*

+Joe means activate the button "Joe", each further listing of Joe in this command line is according to one mouse click.

>> or change multiple item states at once

e.g. *XB:select all:1 0:530:0 1 20:30::+home:home:home:+work:*

Up to 100 elements (same or different) you can combine in one macro, including other macro buttons. Practically you can always organize the nested calls of the macros like calls of the subroutines with usual programming. However you cannot use the direct or indirect recursive calls (else the ICgraph will be cycling endless).

The next example macro changes background picture of ICgraph and plays an audio file thereafter it hides the new background picture again.

For that the following is required:

- a second picture in the ICgraph folder, e.g. *ak.jpg*
- an LL: (label) entry to define the position of the hidden (~) new picture, e.g.: *LL:~ak.jpg:0:0:1 000:1 000:::*
- an Announcement button, e.g.:  
*AB:Start ANN:1 0:450:0 1 20:30:Stop ANN:barix.mp3:*

- the macro which automates the operation, e.g. :  
*XB:~welcome:0:0:0:0:end of initialization:=ak.jpg:Start ANN:*  
*XB:~wel\_end:0:0:0:0:Stop ANN:~ak.jpg:*

Here the two hidden macros “welcome” and “wel\_end” perform together the audio-visual startup of ICgraph. The first macro “welcome” starts automatically, when ICgraph finishes the initialization and outputs the phrase “end of initialization” in the Log. Then used prefix “=” (=ak.jpg) makes the hidden picture visible and the following “Start Ann” and starts the announcement by quasi “clicking” the Announcement button “Start ANN”. Then ICgraph plays the file “barix.mp3” as announcement with proper messages into Log:

*12:39:07 > playing: barix.mp3 @ MPEG2DOT5L3 8000.0 Hz, unknown bits per sample, mono, unknown frame rate,*

*12:39:07 > barix.mp3 is converted to PCM\_SIGNED 8000.0 Hz, 16 bit, mono, 2 bytes/frame, big-endian*

*12:39:07 > File barix.mp3 is NOT possible for announcement*

*12:39:08 > gotten remote DISCOVER reply from [work=10->192.168.1.56]. Dynamic IP is resolved.*

*12:39:08 > gotten remote DISCOVER reply from [home=40->192.168.1.51]. Dynamic IP is resolved.*

*12:39:12 > playing has finished for file barix.mp3*

When the audio file finishes then ICgraph automatically “clicks” the Announcement button again in order to return the Announcement button in start state with proper message:

*12:39:12 > clicked AB [**Stop ANN**], new state: silent*

This phrase “Stop ANN” runs the second macro “wel\_end” that just hides (prefix “~”) again the picture “ak.jpg” and returns the ICgraph in source state.

Also for dynamic Labels it is used for the specific action that operator cannot do by mouse, e.g. to clean a current text of a dynamic Label. It can be used in scheduled macro in order to clean in time the false values gotten long time ago from lost Barix devices to avoid confusion.

Next (and last) is an complex example to open/close door (as FLIP button) with changing status pictures, for example :

*MB:open:0:0:0:c=78: # invisible Open Door*

*MB:close:0:0:0:c=79: # invisible Close Door*

*LL:door\_closed.gif:140:570:030:30::: # current state picture - closed door*

*LL:~door\_opened.gif:140:570:030:30::: # current state picture - opened door*

# example of text/color/picture/command combination in macro as flip button

```
XB:<html><body bgcolor="red">[ Open Door ]</body></html>:10:570:0120:30:open
door from UDP:=<html><body bgcolor="lime">[ Close Door ]</body></html>:~<html>
<body bgcolor="red">[ Open Door ]</body></html>:open:=door_opened.gif:
~door_closed.gif:welcome:
```

```
XB:~<html><body bgcolor="lime">[ Close Door ]</body></html>:10:570:0120:30:
:=<html><body bgcolor="red">[ Open Door ]</body></html>:~<html><body
bgcolor="lime">[ Close Door ]</body></html>:close:=door_closed.gif:~door_opened.gif:
```

Here there are two macros with HTML formatting (therefore the names are so long and the macros conventionally are shown as multi-line although really the CFG line is only one long line for each macro). Call your attention that the Macro buttons have the same location and size, and the first Macro button is visible with start state, but the second Macro button is invisible with start state.

It allows to create the flip-flop effect when these macros alternate each other in the same place.

In source state this "flip" button the first Macro button is visible and has red colour (that means: door is closed now) and picture shows the same (graphical Label "door\_closed.gif" is visible too). The name of the first macro shows the possible action ("... **Open Door**...") and you can click the Macro button in order to open the door for an active point (alternative start is possible by using the secret external UDP command "**open door from UDP**" to ring port that will be shown in Log and call this macro).

One click on first macro button executes the following steps:

- shows alternative flip macro (prefix “=”) – the second Macro button
- hides itself (prefix “~”)
- clicks the Message button in order to open door really (“open”)
- shows alternative flip picture (“=door\_opened.gif”)
- hides previous flip picture (“~door\_closed.gif”)
- and fulfills the greeting macro (“welcome”) described above for visitor invitation

Now you can see the “flip” state: the second Macro button is visible and has lime colour (that means: door is opened now) and picture shows the same (the graphical Label “door\_opened.gif”

is visible too). The name of the second macro shows the possible action (“...Close Door...”) and you can click the Macro button in order to close the door for an active point.

One click on second macro button executes the following steps:

- shows alternative flip macro (prefix “=”) – the first Macro button again
- hides itself (prefix “~”)
- clicks the Message button in order to close door really (“close”)
- shows alternative flip picture (“=door\_closed.gif”)
- hides previous flip picture (“~door\_opened.gif”)
- then ICgraph returns to source state...

So, you can create many own macros to make your ICgraph as possible as comfortable and smart. Also call your attention that Macro buttons have the highest level on ICgraph screen, i.e. cover any other elements over (even if transparent).

## 6 Contained example configurations:

As written before the ICgraph application is extremely flexible.

We have created several demo configurations to give you an idea about the functionality and the flexibility. These Demo configurations are coming with the ICgraph application and are stored in the ICgraph subfolder "Examples".

If you will use it then copy the content of the subfolder into the ICgraph main folder and start the file ICgraph.bat thereafter.

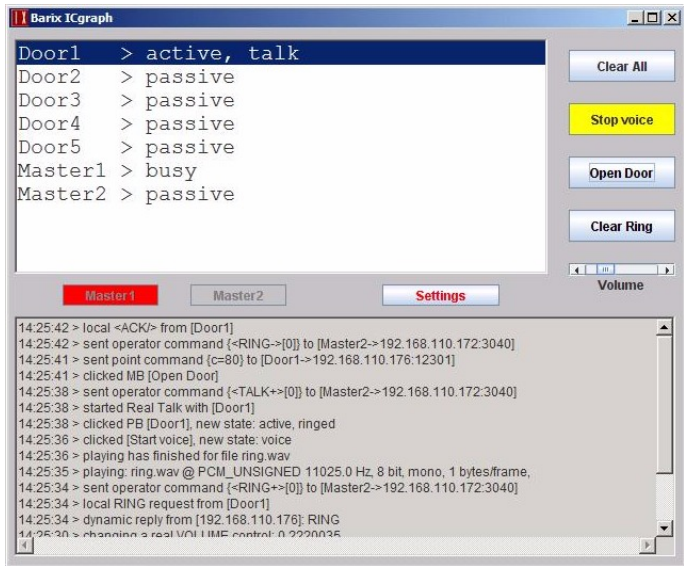
Following is a short description and a screenshot for each example.

### Virtual remote control for Exstreamers



The demo sends no audio to the Exstreamer. It works like the original Exstreamer IR remote control, but over network and the buttons have the same functionality. The buttons here are invisible / transparent over the IR-remote control picture. Additionally, it allows to check the status of the selected Exstreamer or to open the browser with the Exstreamer config menu. The advantage is that this remote control works also when you are not in the same room or allows to select a single Exstreamer, also if you have multiple Exstreamers in one room. This example contains also the "Label" function to display status information from the Barix devices.

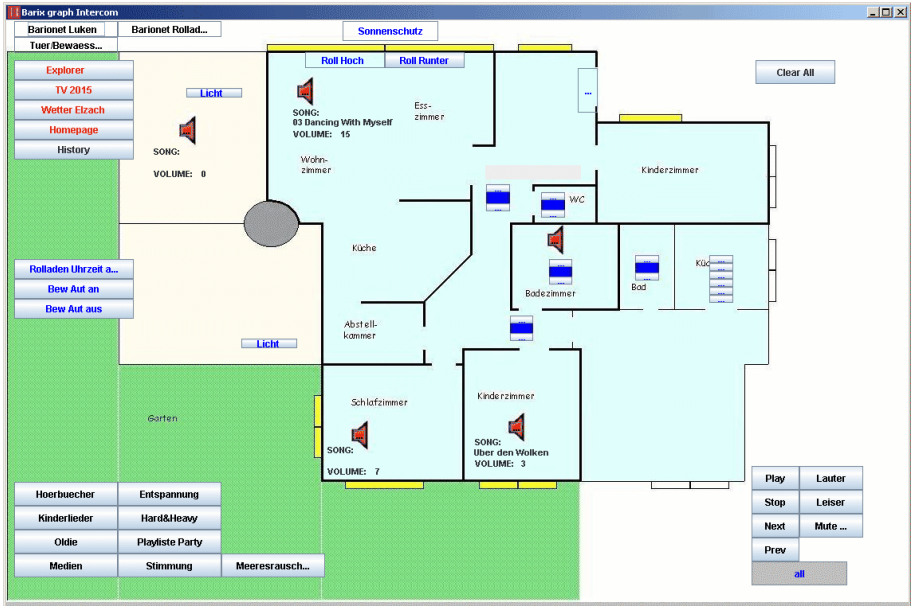
**Table view**



This design is similar to the older SoftIC application. It allows communication (also full-duplex) with multiple Annunicoms and Exstreamers (unidirectional).

The design is just simpler but it has the same functionality as the graphical design. Additional it allows to open the door (switching relay) on the selected Annunicom or to open the browser with the Annunicom/Exstreamer config menu.

## Home automation & control

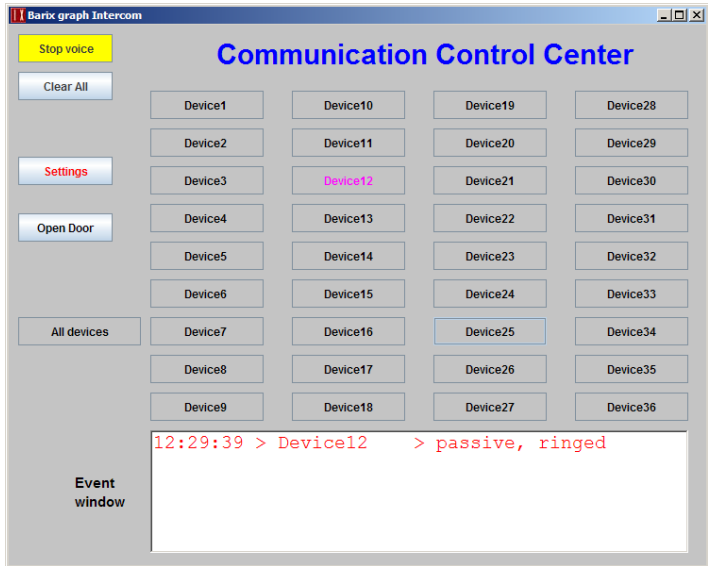


ICgraph is not used for voice intercom here, it is used as control center for the complete home.

Many Barionets and Exstreamers are used in this installation. The Barionets control shades, roof hatches, lights and flower/green irrigation. The Exstreamers are playing music (predefined playlists from webserver) in the house .

Everything can be controlled/monitored by the ICgraph application. This example contains also the "Label" function to display status information from the Barix devices together with hidden message buttons which poll the "L=getstate.ack" command every 15 seconds to the Exstreamers.

### 36 target/point buttons



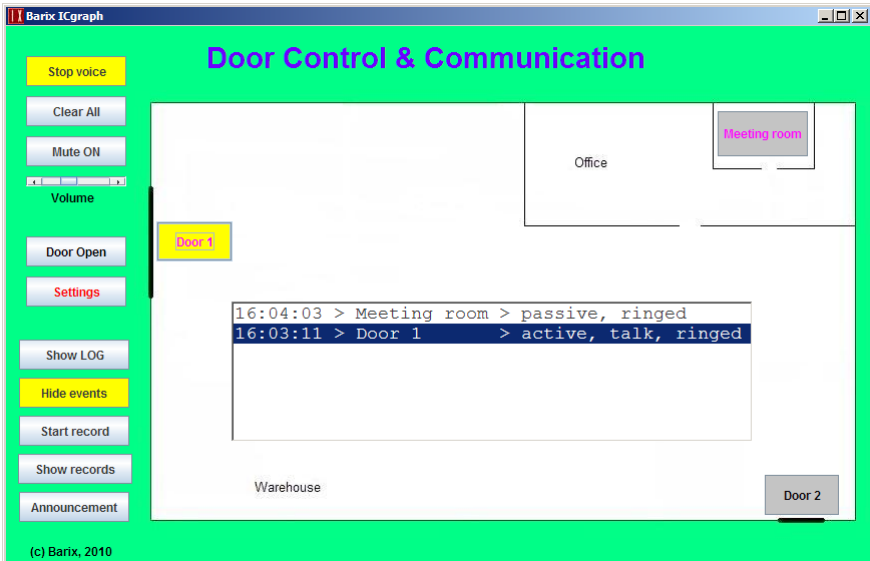
This is a simple example for users who need many targets, so they can save some work. The example is using no background picture, for that reason the size is defined in the “IC” configuration. The “Start voice” button is activated per macro automatically at startup. A event window is very useful in larger installations because it will show all incoming requests/rings in the right sequence.

## Macro + BARP DEMO



This is an advanced example, it shows config examples of some advanced ICgraph functionalities (like macro, dynamic label, multi-master and discovering). Additionally it shows a example for the usage of the BARP protocol (Barix Paging Protocol).

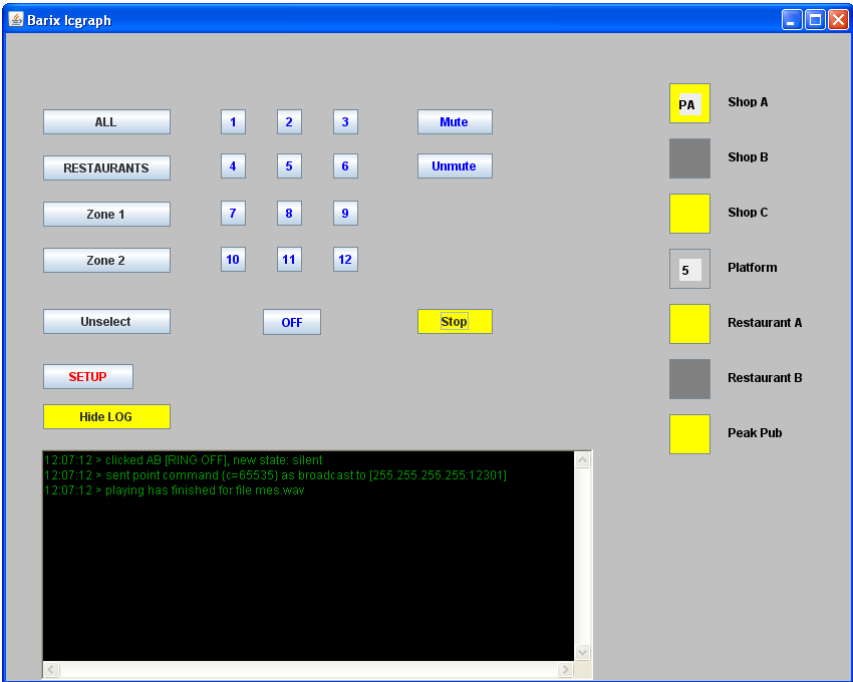
## Door Control & Communication



Simple example with background picture for three points and Log or Event window. In the ICgraph.cfg file is additionally (but out-commented) a macro to start automatically the Voice button and the use of the Multi-Master mode.

## BARP Paging Demo

This solution is ideal for the complete audio control (voice and music) in hotels, Ski & Sport resorts, shopping malls or entertainment parks and is used there already.



On ICgraph all the Barix devices can be monitored (current status and network status). ICgraph tries to discover all Barix devices in the network. If available, the Barix devices can be selected (one or multiple devices or a group or all) for live paging or to receive a pre-recorded message from ICgraph – PC. An Intro-gong/message before the paging is also possible. The devices report their current status and ICgraph can display it. The channel for the background music can be set remotely from ICgraph - PC or locally over a Barix VSC interface (connected to Barix device).

This solution requires also another ABCL software for paging on the Barix devices, please contact Barix for that if interested.

## 7 Legal Information

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