

ABCL Full-Duplex application

Introduction

The ABCL firmware kit is an optional firmware for the Barix audio devices. The main difference to the standard firmware is, that it can works in full-duplex mode and that the application itself can be modified/changed. That means the existing application can be changed, new features or customized designs or also complete new application can be added.

What is ABCL:

ABCL is the Audio BARIX Control Language, it is a simple (like Basic) but very powerful programming language to control BARIX devices like Annuncicom, Exstreamer and Instreamer.

ABCL gives access to almost all interfaces of the BARIX devices available on our Audio devices, e.g. Audio, network, serial, USB, LCD display, LED control, IO control and some more.

The ABCL firmware kit contains the complete development tools and environment and also one fully working DEMO application – the "Full-duplex application".

On the BARIX Homepage some more ABCL DEMO applications are available.

More information to the ABCL programming are available in the BCL programmers manual, this is available for download on:

http://www.barix.com/index.php?id=151

The same link is containing also the ABCL technical documentation.

Full-duplex application

This application allows to use the Barix Annuncicom series or Exstreamer500/1000 to communicate in full-duplex mode, speaking and listening to another device at the same time with a minimum delay. The firmware/application runs also on the BARIX Instreamer and the other BARIX Exstreamer devices, but then not in Full-duplex mode, there it works only uni-directional.

The Full-duplex application supports the following key features :

- audio communication uni-directional and bi-directional (half- and full-duplex)
- audio codecs : G.711 (uLaw / aLaw in 8 / 24 kHz) and PCM 16-bit (8 or 24 kHz)
- audio buffer/delay control for lowest latency
- serial gateway / tunnel over network
- relay activation (if available on the hardware) on received audio stream

How to use the Full-duplex application:

At the first time access the BARIX device's homepage, under settings select the active application. There select "Full-duplex Annuncicom (annunfdx)" from the pull-down menu.

If necessary define also valid IP setting for the current network environment and click on the "Apply" button at the bottom of the page (scroll down).

Thereafter the device will save the new setup values and automatically reboot.

🖉 Barix BCL - Windows In	ternet Explorer				
	2.168.110.177/		• +	X Google	₽ -
🔆 Favoriten 🄏 Barix BO	2		1		
	MAC 00:08:E1:00 Firmware VB0.35 (12/ Web application V01.14 Bootloader V99.19 DEFAULTS REBOOT UPDATE ETH	08/2010)	Application Application versio	V01.01 V08.17 (Dec 8 2010) V02.05 annunfdx n V0.22 03.06.2010	
APPLICATION			APPLICATIO	N	<u> </u>
Application	Full-duplex Annuncicom (annunfdx)	•	Select the des	sired BCL application you want to run.	
			NETWORK S	ETTINGS	
NETWORK SETT	INGS		Use SonicIP		
Use SoniclP	⊙ Yes ⊂ No		If set to "yes", audio output.	the device will announce its IP address or	ver the
IP Address	0.0.0		Default: "yes"		
Netmask	0.0.0		IP Address		
Gateway IP Address	0.0.0			lues of the desired device IP address e.g.: utomatic discovery (DHCP/Bootp, IPzator,	
Primary DNS				" for an internal LAN	
Alternative DNS	0 . 0 . 0 . 0		Netmask		
Syslog Address	0 . 0 . 0 . 0			lues of the desired Static IP e.g.: default Netmask depending on the used If	Þ
DHCP Host Name			Address. "255 255 255	0" for a C class network	
Web Server Port	80		Default: "255.		
			Gateway IP	Address	
SNMP SETTINGS	1		Enter the 4 va "0.0.0.0" for n	lues of the desired Gateway IP address e. o Gateway	g.:
System Name			"192.168.0.1"	for a Gateway in a LAN teway has to be set only when connecting	ta athaa
System Location			devices over the	he WAN (through a router).	to other
System Contact			Default: "0.0.0		
SERIAL 1			alternativ DNS www.radio.cor Example: "19	u can give the Exstreamer the desired prin IP address to be able to connect to URLs n). 5.186.1.111"	
Use Serial 1 For	BCL Application		Default: "0.0.0).0"	
Baud rate	9600	•	Alternative D	INS u can give the Exstreamer the desired alte	ernativ 💌

As shown on the picture above, on the left side are the settings and on the right side of the web page is an online help for each setup item.

When the "Full-duplex Annuncicom" application is selected (and applied) then the "APPLICATION" button will bring you to the FULL DUPLEX INTERCOM menu (see following screen shot).

AUDIO			
Input Source	O Line 💿 Mic		To store changed settings click on "Apply" at the bottom of the page.
Encoding	uLaw / 24 kHz (G.711) 💌		The device will restart with the new setting.
	70 • %		Input Source
Volume	70 💌 %		Choose the desired input source.
Microphone Gain	21 💌 dB		Default setting is <i>"Mic</i> ".
A/D Amplifier Gain	0 🔽 dB		Encoding
			Choose between different encoding types and sampling
STREAMING			frequencies ("uLaw", "aLaw" or "PCM" at 8 or 24 kHz). Default setting is "uLaw 24 kHz".
RTP mode	on 💌		
Streaming Mode	send on I0/DI1 🔻		Volume Choose between "0"% and "100"% in 5% steps.
Input Trigger Level	1000		Default: "50"%
			Microphone Gain
Inactivity Timeout	1000 msec		Microphone gain dB, increase if your microphone is too
Destination IP	0.0.0		faint, decrease if it's too loud or overdriven. Default: "21dB"
Destination Port	3030		A/D Amplifier Gain
Source IP			A/D converter preamplification in dB. Increase if the
Source IP			audio signal too faint, decrease if it's too loud or overdriven. Default: "0dB"
Local Receive Port	3030		
			RTP mode If set, audio will be transmitted over RTP (used in VoIP
ADVANCED SETTINGS			systems), if not set raw UDP will be used as the
Keepalives	off 💌		transport protocol which is the default.
Delay	100 milliseconds		In RTP mode packet size is given by the encoding used and can not be altered by the user (the packet
Frame duration	20 milliseconds		size setting below is ignored).
Frame duration	20 milliseconds		Default setting is "OFF".
Relay Off Delay	1200 milliseconds		Streaming mode
			"send always" will stream always
SERIAL GATEWAY			"send on level" will stream if the input audio level goes above the configured "Input Trigger Level"
Communication Protoco	UDP -		"send on I0/DI1" will stream if the I0
Communication Port	10000		(Annuncicom100/Legacy) or DI1
	10000		(Annuncicom1000/Exstreamer1000) is activated "respond" will stream back as long as a stream is
Apply Cancel		_	beeing received
•			Default setting is "send always".

Also here is a online help for each setup item available.

For the application setup make sure both sites/devices have configured the same encoding parameter and the same protocol (RTP mode).

If the "Serial Gateway" should be used, then the serial parameters, like baud rate, parity,data bits, stop bits and flow control must be configured on the "SETTINGS" page.

The application can be used for "point to point" communication. In a LAN environment also a broadcast IP address or Multicast IP address is possible, then it can be also used for "point to multi-point" applications, but in this case not more than one device should answer (at the same time).

Supported BARIX RTP payload types:

0 = uLaw / 8kHz	97 = uLaw / 24kHz
8 = aLaw / 8kHz	98 = aLaw / 24kHz
96 = PCM / 8kHz	99 = PCM / 24 kHz

When a audio stream is received then the relay will go on for the time of a incoming audio stream, this function is configurable (can be also disabled) over the function "Relay Off Delay".

It can be used e.g. to switch a notification light or to turn on an attached amplifier / intercom panel.

Status page:

The status page is also available over the web server.

This page offers information over the device itself and the loaded software, like :

- uptime
- MAC address
- IP address
- hardware type
- firmware and application version
- detected USB devices

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	P -
Average Favoriten Average http://192.168.110.177/status	
System status: Ticks: 576188 ms Uptime: 576 s	4
Device information: Hardware type: Annuncicom 100/IC (ID 7) IP address: 192.168.110.177 MAC address: 00:08:E1:00:53:72	
FW version: B0.35 (12/08/2010) WEB version: 01.14 Bootloader version: 99.19 Setup version: 01.01 Sg version: 08.17 (Dec 8 2010) Fs version: 02.05 (12/08/2010)	
BCL application: Name: annunfdx Version: V0.22 03.06.2010	
USB device info: Device detected: no Vendor ID: 0x0000 Product ID: 0x0000 Device class: 0x0 subclass: 0x0 Interface class: 0x0 subclass: 0x0 Maximum power: 0 mA Device capacity: 0 kB	
Filesystem info: Filesystem attached: yes Filesystem type: unknown Serial number: 00000000	T